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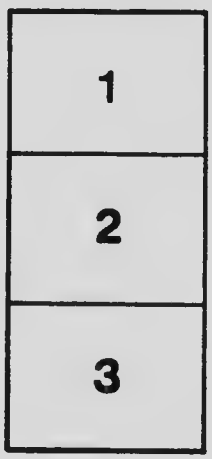

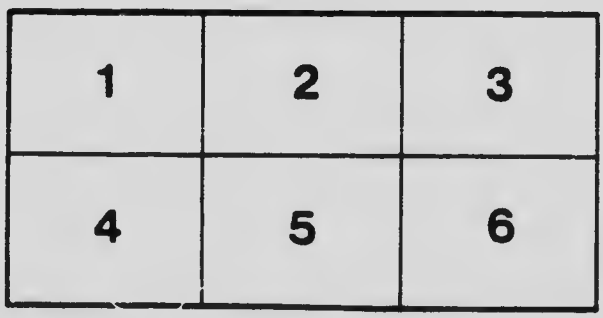

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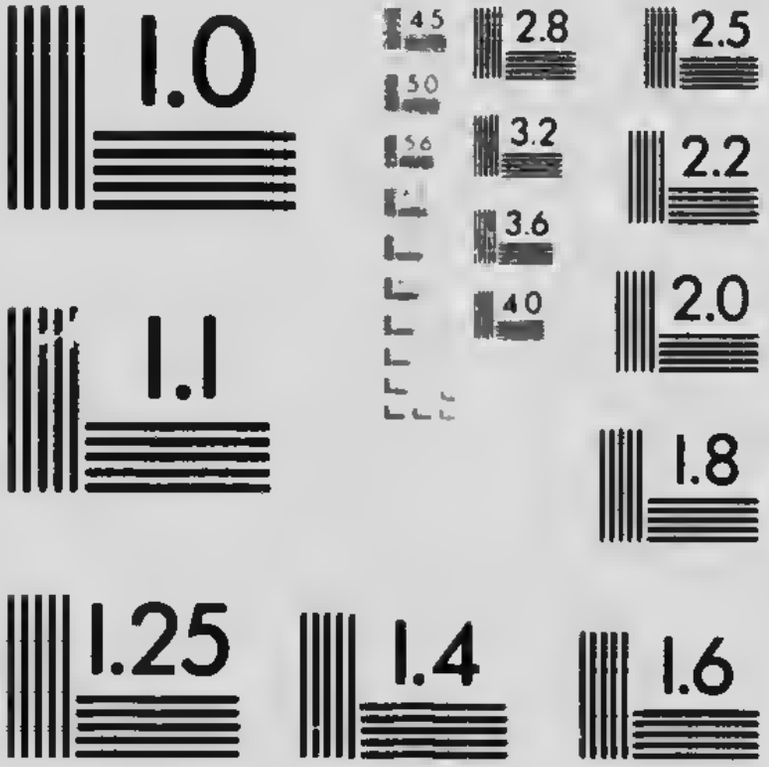

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Sir Michael Foster.
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No 1.

A GREAT TEACHER (SIR MICHAEL FOSTER) AND HIS INFLUENCE.

BY

J. GEORGE ADAMI, M.A., M.D., D.Sc., F.R.S.

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Quasi cursores vitai lampada tradunt."

IN medicine, as in every other profession, it is the personal factor—the character—and through that the influence of the individual, which tells. And in medicine, however great our knowledge, however great our mastery of disease and its prevention, to the end of the chapter it is the patient we have to treat and not the disease. But granting this, it must equally be granted that he will be the greatest physician who combines great knowledge with great character. That Medical School will turn out the finest men and be of the foremost service to the community which realizes that its duties are not merely to pump into the students the maximum of facts but to make men of them, through the influence of the general spirit and tradition of the school in the first place, through the education of humanity that comes from the intimate association of the individual at the most susceptible period of life with those of divers aims and divers powers (and for this it is absolutely essential that the medical school be not a separate body, but be part of a University of many Faculties), and thirdly, through the personal influence of the teachers.

To-night I want to talk to you about a Professor, one of the most human, and one of the greatest men with whom it has been my privilege to come into intimate contact: and I want to discuss how that man has influenced medical education throughout the English-speaking world. As with most University men of the first order, it is not the facts of the life, but the life itself that is of prime interest. Your man of thought, your investigator, your teacher who is devoted to his particular subject and who gives his life to that subject, living in his study and in his laboratory leaves no record of brilliant adventure, has few purple patches in his obituary, does not provide the reader or the hearer of the obituary with chapters rivalling, let us say, those of "The Three Musketeers." If such an obituary is to be of interest, the interest

lies rather in the direction of one of George Eliot's novels, in the study and development of character and of the influence of that character upon others. And perhaps the wise man, as a matter of taste, prefers George Eliot to Dumas.

What I shall have to say therefore regarding the life history of Michael Foster will be relatively uninteresting. What I want to put before you this evening is how this one man has told upon his generation and our generation, how much we owe to him.

First then as to his history. You may remember that the Eastern counties of England, Norfolk, Suffolk, Essex, Cambridge, and Huntingdon, were in the 17th century the main home of English nonconformity; that the Pilgrim Fathers came from this region; that Oliver Cromwell himself was a Huntingdon man. It was at Huntingdon, that quiet little town on the sedgy Ouse that Michael Foster was born in March, 1836, the eldest son of Michael Foster, F.R.C.S., a member of one of the leading nonconformist families of East Anglia. That hereditary nonconformity tinged the whole of his early life, nay, we may say the whole of his life, for nonconformity suffering in those days under disabilities, its adherents were inevitably opposed to the old order of things; they were inevitably Liberal rather than Conservative; and inevitably more ready to be carried away by new ideas.

After being educated at the local Grammar School till he was thirteen years of age, he passed to the well-known University College School in London, a school which had been recently established (in 1842), which all through the Victorian era had an extraordinary reputation for developing breadth of thought together with sound scholarship. This School, untrammelled any religious affiliations, was the Mecca of many dissenting families. Under the Head Master, Dr. Key, young Foster devoted himself to Classics. At the age of 18 he took the B.A. of London University (which you must remember is purely an examining body), gaining the first place in Classics, and with it the University scholarship. Had he not been a Nonconformist, so great was his capacity in Classics that now he would have proceeded to Cambridge, for there classical ability secures scholarships so valuable as to cover the whole expenses of the under-graduate career. But until 1880, Fellowships, the final prizes of the two old English universities, were closed to Nonconformists. Thus Cambridge

and a classical career were barred to him, wherefore it was determined that he should follow his father and enter Medicine. This he did at University College, London, and there, after obtaining gold medals in Anatomy, Physiology, and Chemistry, he took his M.B. degree in 1858, his M.D. the following year, at the age of 23. The winter of 1859-60 he spent in Paris. I have here two books belonging to him that clearly date from this period; they are Bichat's celebrated treatise upon *La Vie et la Mort*, and the *Traité des Membranes*. They have his marginal pencilled translations of doubtful words.

Already you will see that Physiology was exercising its fascination upon him. But signs of pulmonary disease showing themselves, his friends obtained for him an appointment as ship's surgeon on the "Union" which went to the Red Sea to build a lighthouse opposite Mount Sinai. The next year he returned to Huntingdon to enter practice with his father, and here two years later he married. But country practice did not appeal to Michael Foster: he was not built that way. A great reader, he would sit up late at night, and then, as once with a reminiscent smile he confessed to me, he could not get up in the morning, and that was bad for routine calls. The daily round did not appeal to him. When therefore six years later his old teacher, Sharpey, invited him back to University College to give a course in Practical Physiology, he accepted the invitation with alacrity and gave up medical practice forever.

In 1867 there was no separate Chair in Physiology, no separate teacher of the subject in any of the British medical schools or universities. Even in Germany it was only in 1865 that Ludwig obtained a separate Chair for Physiology at Leipzig. The great founder of experimental physiology, Johannes Müller, had at Berlin to teach Anatomy, Physiology, Embryology, and Pathology, and in Great Britain, as in Germany, it was the Professor of Anatomy who perforce gave lectures on this subject, where it was not (as in Edinburgh) the Professor of the Institutes of Medicine — a mixture of elementary clinical medicine, physiology and pathology. You can imagine that with the rarest exceptions those lectures were mainly upon what we may term gross Physiology: upon matters which impressed themselves upon the teacher in connection with his gross Anatomy, or his ward work. There might, it is true, be a few histological sections of tissues put under the one or two microscopes which were the Professor's private property, but

that was all. Sharpey, who had been Foster's old teacher at University College, had been an exception. Co-editor with Quain of the celebrated Text Book of Anatomy, he introduced into it the chapters upon Histology and Physiology, and his teaching of Physiology was far ahead of that of any of his British contemporaries. He was the first British teacher to devote his life to the subject, and, what is more, he realized the need of practical instruction. Indeed, he laid down in his courses that lectures alone were of little use, for the student must see the experiments for himself in order to obtain a real knowledge of the subject.

It was to inaugurate a practical course in Physiology and Histology that he invited Foster to return to University College. "What could be done then was very, very little. I had a very small room. I had a few microscopes. But I began to carry out the instruction in a more systematic manner than had been done before. For instance, I made the men prepare the tissues for themselves. That was a new thing in histology. And I also made them do for themselves simple experiments on muscles and nerves and other tissues in live animals. That, I may say, was the beginning of the teaching of practical physiology in England.*

Back in London, Foster soon came under the influence of Huxley, and in 1869 he succeeded him as Fullerian Professor of Physiology in the Royal Institution, while the following year, when Huxley began his course of Elementary Biology to teachers-in-training at South Kensington, Foster became one of his assistants in carrying out the course, along with Ray Lankester, and Rutherford who later became Professor of Physiology at Edinburgh. The course of Elementary Biology inaugurated by Huxley was a revelation to the scientific world, was a revelation to the educational world, and had an enormous influence throughout Great Britain. Thus at the beginning of his career Foster came under the personal influence of two enthusiastic teachers, both filled with the idea that Biological science could not be taught by lectures alone, but that practical work was essential. What I want to point out to you to-day is how the man, admittedly influenced as we all are, by his environment, in his turn influenced or indeed created an

*Address by Sir Michael Foster at Denver, Colo. *Colorado Med. Jl.*, October, 1900.

environment which for the first time in Great Britain brought about the establishment of a school of medical science.

I doubt if any land has produced a longer series of great original medical men than has Great Britain, men, that is, who have had an influence for all time upon medical thought and practice. But has it struck you how isolated have been these men? We hear of no pupils of Harvey. He revolutionized medical conceptions but stands there alone among his contemporaries. Compare Sydenham and Boerhaave, the one a solitary London physician, the other attracting pupils from all over Europe and founding a school of clinical teachers. John Hunter, his brother, the one outstanding pupil of William Hunter, did, it is true, hand on the torch to Edward Jenner; he cannot, however, be said to have founded a school. And so, coming to the nineteenth century, we see this same phenomenon. Think of Bright, Addison, Hodgkin, Todd, Bowman, Gull, Hughlings-Jackson, Graves, Stokes, Simpson, Benjamin Brodie, Astley Cooper, and even Lister. You may object to my including Lister; have we not here in Canada men like Stewart of Halifax, Malloch of Hamilton, Grasett of Toronto, leaders in the profession who are proud to count themselves pupils of the great founder of aseptic surgery. I freely admit that Lister, and, indeed, many of those whose names I have mentioned, had their clinical pupils, but these, with scarce an exception, were followers in clinical medicine and surgery; all these great men made their names by research. It is most striking that they did not hand on the torch of medical research to those under them. Observe the contrast in Germany.

Thus to take a modern leader in his own subject of Pathology: Aschoff is the pupil of Orth, Orth gained his inspiration from Virchow, and Virchow in his turn from Johannes Müller. But what is more remarkable in Germany is the descent of the leading clinicians of to-day from the physiologists, and the amount of research work that is being accomplished under their influence in the clinical laboratories attached to the great hospitals. To quote Flexner: "Three great schools of Physiology have flourished in Germany; Müller's at Berlin, Ludwig's at Leipzig, Voit's at Munich, to one or another of which almost every important clinician of the last fifty years in large measure traces his lineage. Traube and Frerichs . . . had both been profoundly influenced by

Müller. Leyden at Berlin, Naunyn at Strassburg, Quincke at Kiel were among their pupils. Pupils of Naunyn — the third generation of this fecund line—now fill the chairs of medicine at Wurzburg, Breslau and Halle. Ludwig's pupils occupy professorships in Leipzig, Heidelberg and Berlin. From Voit's laboratory in Munich came Friedrich Müller, now Professor of Medicine there; his pupils hold posts in Kiel, Strassburg and Vienna."

Do not think from this that I mean to suggest that the great medical men of Great Britain have sailed into and out of the medical firmament like comets. Far from it. They have been the outcome of influences and they have influenced. Studying their lives we find with scarce an exception that they have 'carried on the torch'—from Harvey, who gained his inspiration from Fabritius ab Aquapendente, down to Sir William Osler, who, as you well know from the dedication of his magnum opus, acknowledges his indebtedness to William Arthur Johnson, 'Priest of the Parish of Weston, Ontario,' James Bowell, of Trinity College, Toronto, and Robert Palmer Howard, of McGill University. Time and again we can as it were construct a genealogical tree, showing how the torch has been handed on down the generations. Sometimes, as in Osler's case, there is a double or treble begetting — a leader owes his fire to more than one parent in the spirit. I am reminded of the anecdote, now venerable, that years ago, in the eighties, Professor Gildersleeve of Johns Hopkins brought to us at Cambridge, of the man who, visiting a lunatic asylum, and meeting one of the inmates in the hall, wishing to be pleasant, accosted him with the remark: "It's a fine morning, Sir!" "Sir!" said he, "what do you mean? Do you not know that I am Pio Nono?" "Your Holiness," retorted he, "I owe you most contrite apologies." "Oh, say no more," replied the inmate, "it *is* a singularly fine morning," and so they parted. Having finished his business the visitor again encountered the inmate as he was leaving. "Good-bye, your Holiness," said he. "Your Holiness!" retorted the inmate, "you mistake, you mean Your Majesty. Surely you must recognize that I am the Emperor Napoleon?" "But your Majesty," urged the perplexed visitor, "do you not remember that when we met an hour ago you were the Pope?" "Yes," replied the lunatic, "that is quite true. I am the Pope, and I am the Emperor; but it was by a different mother you know!"

And so Sharpey begat Michael Foster, but another had also a part in the begetting, namely Huxley. Both impressed upon him that science developed through experiment. Sharpey made him the physiologist, Huxley made him the biologist, showed him that physiology was not the handmaid of anatomy as it had been in the years before, but was one aspect of biology, of the study of living organisms, of the study of life, and what is more he was an ensample to him in fluent and fascinating exposition.

Why has there been this difference between Germany and Great Britain in the matter of the establishment of schools of medical research and medical advance? I see that Abraham Flexner, in his report upon medical education in Europe ascribes the difference to the fact that one and all the brilliant figures in British medicine up to the last generation have been hospital men, not university professors, whereas in Germany the university professorship has been the goal towards which each bright mind has striven. In Great Britain, an unthinking nation has not, and still does not, subsidize its great men that they may devote themselves at ease to medical advance. So soon as Bright, Addison, and the rest of them, had through their pathological studies and brilliant investigations shown their capacity, the reputation they gained brought busy practice, and that in its turn brought increased fame to the hospitals to which they were attached. They and their families had to live, and so they gave up to patients what was meant for mankind. This may be the proper explanation; I think it is. Certainly Sharpey, the brightest of his generation, being attached to a hospital could not create a school of Physiology. At most he could train his demonstrators, men like Foster and Burdon Sanderson; it was left for one of these, Michael Foster, to create in England the proper conditions for the establishment of a school of Physiology, and this in what may appear to be an indirect way.

It was in 1871 that some of the brightest spirits at Cambridge, realizing the importance of Physiology, determined that there ought to be some one in that University who, even if he had not a University post, could devote his energies to this subject, and it was at the suggestion of George Eliot and George Henry Lewis, that Michael Foster was invited to become "Prelector" at Trinity College. It is difficult for those on this side to understand the quasi-independence of the Col-

leges in the old English Universities, how each of them is an "imperium in imperio"; the Colleges, that is, choose their own staffs without reference to the University. If the College thinks that it will add to its renown, or that it will be to the benefit of its students, to offer instruction in some subject that is not undertaken by the University, or which while undertaken by the University is not in adequate hands, it proceeds cheerfully—provided it has money—to make an appointment 'on its lonesome.' So it was that Trinity, the largest and, let us admit, the greatest of Cambridge Colleges, appointed Michael Foster as Prelector of Physiology. And Foster very soon showed them that they had made no mistake. He had an extraordinary magnetism. He saw his path before him, regarding himself not merely as a physiologist, but first and foremost as a biologist, and he determined to establish as great and progressive a biological school in Cambridge as was in his power.

The University on its part provided the newcomer with a solitary room in what were known as the New Museums, or more accurately with half a room, a large chamber being divided by a wooden partition into two, the other half, if I mistake not, being occupied by an ancient and reverend gentleman, the Plumian Professor of Astronomy. The accommodation was all too small, but Foster did not complain: with a wise humour he suggested to one of his pupils a research into some of the rarer of the dissociation products of proteid metabolism; if I remember aright, the substance was uroerythrin. It was a research which, in order to obtain an adequate amount of material, demanded the boiling down over several days and weeks of many gallons of excrementitious fluid. The Plumian Professor did not merely vacate the premises: he spread about so dire a report of the disadvantages of close propinquity to the physiological laboratory that by a natural process Foster's laboratory accommodation was doubled, and during the following ten years so great was the demand of students to work under him, that in spite of the fact that he held no University post and was merely a College lecturer, the University was compelled to give him more and more room, and eventually to build in order to accommodate the growing classes.

His teaching brought new life into the old bones. He demanded and afforded a practical course in physiology; what

is more, he demanded that the course be not isolated and apart, but in immediate and intimate association with the lectures. If you remember your Dickens, you will remember that the one and only good feature of the education received at Dotheboys Hall was its practical character. "We go upon the practical system," explained Mr. Squeers to Nicholas Nickleby; "C-l-e-a-n, clean, verb active, to make bright, to scour. W-i-n-d-e-r, winder, a casement; when a boy knows this out of a book he goes and does it."* This, too, was Foster's plan. I can see him now, standing there before the blackboard, with no table before him, without a note, without a diagram save an occasional very elementary figure drawn without artistic pretense upon the board, and can almost hear again the deliberate yet forceful speech, emphasized from time to time by bringing the chalk in the right hand down into the palm of the left. His men were not to depend upon diagrams, but upon what they actually saw. And after the lecture we trooped for a two-hour period into the laboratory where the teaching had, whenever possible, a direct bearing upon the subject of the lecture. To this day in Germany the lectures in physiology form a course apart from the practical work, that course, usually optional, being given in a later semester and by a different teacher, so that the ordinary medical student gains his knowledge of the subject not from first-hand work, but at best from demonstrations conducted during the lecture. We owe to Michael Foster the thorough course in practical physiology common nowadays throughout the English-speaking world.

The effect of the man and of his work was extraordinary. His personal charm and enthusiasm in those early Cambridge days was such that the brightest of the younger men attached themselves to him. Stimulated to a generous enthusiasm they saw in research a noble life work. There seemed then no particular future; there were no well-paid posts to afford a goal to their endeavors; the work in itself appealed to them. And on his part Foster saw that he had to develop along these lines not merely the physiological teaching of the University. It is his pupils who have made the Cambridge school of Biology and of biological research. Thus Francis Balfour, the brother of

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*I owe this illustration to Mr. Abraham Flexner.

A. J. Balfour, had been a keen naturalist while he was a boy at Eton, and, coming under Foster's influence, he was anxious to develop as a biologist. There is an interesting story of how when he came to him for advice, Foster, after his custom, gnawed his moustache for a moment or two in thought, and then his eye falling upon an egg lying upon the laboratory bench, he cracked the shell and showed Balfour the germinal disc floating on the top of the yolk. "What do you think of working at that?" And Balfour took the advice with enthusiasm, becoming the founder of the new science, Comparative Embryology, writing the first great text book on that subject, and incidentally building up at Cambridge a school of keen zoologists.

In like manner Foster stimulated Sydney H. Vines to take up vegetable physiology, and in this way Vines, now Professor of Botany at Oxford, founded the modern school of experimental Botany at Cambridge, being succeeded there by another of Foster's pupils, Frank Darwin (now Sir Francis Darwin), and he by Marshall Ward.

But other pupils remained devoted to physiology. The first of these in point of time was Newell Martin, who, accompanying Foster from London, after a brilliant career at Cambridge, became in 1876 the first Professor of Biology in the newly-founded Johns Hopkins University. Martin it was who brought Foster's methods and Foster's enthusiasm for research into the United States. It is no exaggeration to say that H. N. Martin introduced into Johns Hopkins the keenness for practical teaching and for biological research which has made it famous among all American universities, and in the second place introduced the same spirit all over the States not merely in Physiology, but in all branches of experimental medicine. Others, equally keen and equally devoted to research, were afterwards added to the Johns Hopkins staff when the medical school was established, men like Welch and Osler, but Martin was the pioneer, so that the practical teaching of the American student in medical science which to-day is so admirable, traces back to Foster's laboratory in Cambridge.

But other of his pupils remained devoted to Cambridge and the laboratory there. Among these may be mentioned Dew Smith, a man of considerable wealth, who financed the Journal of Physiology established by Foster, and established

the Cambridge Scientific Instrument Co. for the production of physiological apparatus; Gaskell, who worked at the comparative physiology of the nervous system, throwing light upon the nature of the sympathetic system of nerves and demonstrating that peculiar connection between the auricles and ventricles, which to-day is creating such interest in connection with the irregular action of the heart; Langley it was, Foster's eventual successor in the Chair at Cambridge, who first investigated the cell changes which occur in pancreatic secretion, and who has developed methods for studying the sympathetic system of nerve fibres and ganglia. The university had little to offer these men in the way of stipend, the work was all sufficient.

All, however, could not remain in Cambridge. I am not going to give you a detailed list of the men who owed their education to Foster Among those who like Martin went into the outside world I needs must mention Professor Sherrington of Liverpool, into whose laboratory are crowding men from Canada and the States, and from Germany. Sherrington has revolutionized our conception of nervous activities. And here it is but right that I should also mention the name of Henry Head, my contemporary at Cambridge, one who has carried his enthusiasm into clinical medicine and has analysed the different sensory nerves, mapped out the regions of referred pain, and studied the regeneration of sensory nerves by cutting his own external oblique. I mention these names to impress upon you the influence of a great nature stimulating those under him to worthy deeds and in passing on thus the torch of medical science, so that the influence spreads and passes down the generations.

Saying all this is not a little significant to observe that, while inciting others to do yeoman work in biology, Foster was not himself a great investigator; there is no signal piece of research of the first order that stands against his name. I could mention other great teachers of whom the same may be said, and for this state of affairs it seems to me that more than one explanation may be given. For a man to be an investigator of the first order two gifts are pre-requisite: it is not merely necessary to possess a well-ordered and what we may term a philosophic imagination, to possess a mind that is capable of balancing phenomena, seeing their relationship and de-

ducing problems that have to be solved and the way in which to solve them; there must be something more, namely, a mechanical ability, a love for technique, and capacity to construct and manipulate the appropriate instruments. This is particularly necessary in connection with physiological research, and while Foster had the first of these gifts to a very remarkable degree, I do not think that instruments and technique as such, interested him. He saw the problems that had to be solved, he could advise others regarding them; no one was a better mentor during the course of an investigation, discussing results and their meaning. It was this power that fitted him so admirably to establish a school of research. But again, this very gift itself inhibited to some extent active investigation on his own behalf. Research demands quiet uninterrupted hours, and such notoriously are wanting to the man who interests himself in the doings of others. But over and above all Foster took a step which hampered him from the pursuit of active investigation for the rest of his career. As his classes steadily increased at Cambridge he realized more and more acutely the absence of any sound text book on Physiology, (I have looked into these older British Physiologies; they are awful books), so he was impelled to write one, and the work itself, published first in 1877, was so great a success and such a model of what a text book ought to be, that the rest of his life was spent in bringing successive editions up to date. What this means, only he who has himself fallen into the pit fully recognizes. It means an uneasy consciousness that every spare moment must be devoted to keeping abreast of the literature of a growing subject; weeks and months must be spent in the weary work of rewriting and correcting chapters, reading galley proof and page proof, and being a slave to one's offspring. I well remember a stroll with Foster around the garden he so loved at Little Shelford on the slope of the God-Magog Hills, outside Cambridge, before I came out to this country. I had been congratulating him upon the latest edition with all its improvements. "Adami," said he, "take warning never to write a text book. If it is a failure it is time thrown away and worse than wasted; if it is a success it is a millstone around your neck for the rest of your life." Despite this advice I have transgressed. This is the worst of advice. I should never have thought of writing a text book but for Michael Foster, for the admirable example he had given of what a text book should be, and for

this suggestion that I might one day perpetrate one. Now in sackcloth and ashes I have to admit the truth of his warning.

And the sad part about text books is that the reputation of the writer is that of the great singer, the popular actor, or the fashionable virtuoso,—that reputation can only be transient. So soon as the author dies or ceases to publish new editions the work is out of date, and rapidly, therefore, out of mind; the same capacity and the same labor devoted to research might have resulted in some discovery which would have permanently advanced science, or advanced mankind. Perhaps this statement is wrong, and we ought to realize that the man who does first class work in any field does that work inevitably in that particular direction; we may be wholly wrong in thinking that he might have done equally good work in other fields. Certainly there is this to say regarding Sir Michael Foster, that his text book has had a most extraordinary influence in matters relating to physiology in the whole of the English-speaking world; it was the only text book in England and America for long years; rapidly also it was translated into other languages. Written in admirable English, it showed the student that science is not the mere memorizing of facts, but is the process of constantly balancing those facts and from the deductions gaining principles. I have here Foster's own copy of his first edition How puny and second class it makes all previous manuals of Physiology! It was no compilation of the contradictory data obtained by LeBlanc of the University of Nesaisquoi, and Schwarz of the University of Weissnicht, but a reasoned endeavor to select the grain from the chaff, an education in the scientific weighing of evidence, a thoughtful and philosophical treatise in pure and delightful English. It was a revelation of the way in which a text book as distinct from a "cram book" should be written; it was, in short, an example of true scientific literature, with an occasional passage that delighted the reader as rising beyond scientific literature into the realm of great and memorable writing. Who of the earlier generation of medical students forgets the opening of that last chapter upon 'Death'? — "When the animal kingdom is surveyed from a broad standpoint, it becomes obvious that the ovum or its correlative, the spermatozoon, is the goal of an individual existence; that life is a cycle beginning in an ovum and coming round to an ovum again. The greater part of the actions which, looking from a

near point of view at the higher animals alone, we are apt to consider as eminently the purposes for which animals come into existence, when viewed from the distant outlook whence the whole living world is surveyed, fade away into the likeness of the mere byplay of ovum-bearing organisms."†

I sometimes wish heartily that this could be driven home to the shrieking sisterhood of childless and monopaedic females* who in these days are lowering their sex in their misguided attempt to increase its—or their own—influence: women out of place in a new country where motherhood is the making of the nation.

But what is true of the writer of a text book is true of the whole teaching profession. Our first function is ephemeral, our first duty is to impress upon the taught the thoughts of others; at most we can clothe the dry bones of ascertained facts with garments of our own particular hue of thought: we give our own particular rendering of the sonata. Very few dare venture safely to teach anything original. But then happily there is the consolation that the material taught is receptive; that good teaching tells upon the next generation, that, to repeat the metaphor once again, the virtue of the teacher is that he is a 'torch bearer,' and that his works do follow him. And there are compensations; I remember the delight with which Professor Foster told me, when over here in 1897 for the meeting of the British Medical Association, on his return from crossing the continent along with Lord Lister, how, travelling through the Yellowstone the waiter at a small hotel hearing someone address him, asked him if he really was *the*

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*Or as our mutual friend, Professor John Macnaughton, with his intimate knowledge of the Scriptures, has recently described them, "the little sisters."

† "Horribly materialistic!" I hear many exclaim. And yet, oddly enough, the very evening that I was revising this portion of my speech for the printer and was debating within myself whether I should include this quotation, there came to me a letter from a true woman, in which, after describing the Christmas morning service she had attended and the peace and happiness that came to her, she wrote: "In spite of a feeble sermon, in spite of the unspeakable Athanasian Creed, I felt as never before the divinely human significance of the Holy Nativity—and of this festival of little children. After all, is not the sum and substance of human achievement and of human aspiration expressed in the old words, 'Unto us a son is born, unto us a child is given'?"

Foster. The Professor had little idea that his fame had reached to those remote parts. "Yes, sir," said the man, "I have read your book from cover to cover; it is to me as my Bible. I little thought that I should ever be privileged to meet its author." Needless to say, this waiter was a medical student, acquiring virtue for another year's work.

I have left to the last what was the basis of Foster's success as the founder of a school, namely, his keen interest not merely in the work accomplished by his pupils, but in those pupils themselves. Once he recognized, as he thought, the right spirit in a man, he was that man's steady friend, willing to help him forward by his counsel and by his influence. Indeed, those outside Cambridge, who had not come under his influence, made it a sore point that he was apt to regard his "geese as swans" and by his influence to gain posts for them over better men. This is a matter that the future must determine, whether his judgment was right or no, but assuredly he was a most loyal friend to the men who came under him. We regarded him with an almost filial affection, and in any difficulty we tramped or bicycled out to his house at Little Shelford, or sought him at the laboratory, sure that he would hear and discuss our matter and give us wise impartial advice.

My object this evening is not to give a full biography of the man, but to show how a great teacher may through his work and through his pupils influence an ever-widening circle. Thus I do not intend putting before you in detail the other main facts of Sir Michael Foster's career. I will at most rapidly note that after twelve years at work in Cambridge a Chair of Physiology was founded and he naturally was elected to it; that through him and his success every other reputable English-speaking university has now its physiological department with the practical course given a foremost place; that he established firmly university recognition and endowment of medical research; that he was a prime mover in bringing together all English workers in physiology through foundation of the Physiological Society; that he founded the Journal of Physiology which from the first sought and obtained American as well as English co-operation; that he with Kronecker, of Berne, initiated the International Congress of Physiology which meets every three years, the first Congress being held at Basle in 1888 — a Congress not of set papers but of demonstrations; that in 1881 he succeeded Huxley as one of the secretaries of

the Royal Society, and that for twenty-two years, until his resignation of the post in 1903, he was a powerful influence in making for scientific progress in every direction, making the Society what I would like to see our Canadian Royal Society made, namely, a consultative body always prepared to aid the Government with advice and enquiries upon scientific matters. As Secretary of the Royal Society he brought about the establishment of the International Catalogue of Scientific Literature, a compilation in seven yearly volumes of all the publications throughout the world in natural science. In 1899, in recognition of his many services, he was created a K.C.B. It was, however, an evil day for Cambridge when in 1900 he accepted the invitation to represent London University in Parliament, for this necessitated that he no longer actively taught his subject, and that the younger generation of men no longer came under his influence; in fact, after three years he resigned the Professorship, so that when in 1906 he failed to be re-elected to Parliament he found himself in what might have been a painfully stranded condition were it not that the position of Chairman of the Royal Commission on Tuberculosis gave him abundant interests during the few months which elapsed before his painfully sudden death in January, 1907.

To quote his old pupil and friend, Gaskell:* "There have been many greater scientific men than Foster. But it is hardly too much to say that no man ever devoted himself more wholeheartedly to science, and if science can be served by strengthening the influence and promoting the spread of the scientific spirit, few have done it better service."

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* I am indeed indebted to Gaskell's obituary notice of Sir Michael Foster in the *Proceedings of the Royal Society* for many of the biographical data given in these pages. For a study of Foster's influence upon American medical education reference may well be made to Dr. Sewall's address upon 'Henry Newell Martin.' *Johns Hopkins Hosp. Bulletin* 22: 1911, 327.