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THE DEVELOPMENT OF OBSTETRICS

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ONE of the characteristics and charms of university life is its division into terms and sessions, each with its definite work apportioned to it, and each at once complete in itself, and yet forming part of the great whole, which constitutes the full curriculum. At the completion of each session, when the strain of teaching and of studying, of examining and being examined, is over, we suddenly relax, and with a comfortable feeling of leaving behind us the year's work well done, and of taking away with us something new added to our store of knowledge, we enjoy our holiday as few others can. Brains exhausted and staled by close application to a more or less limited field of thought have time to recuperate, not—let us hope—by lying fallow, but by being cultivated in other directions. For with the brain, as with the body, the best holiday is a change of work.

The weeks of vacation go quickly by, and almost before we realize it we stand again, as we do to-day, on the threshold of a new session. This time too brings with it its own peculiar sense of exhilaration. We return mentally and physically fit. Tasks which seemed a burden a short three months ago can now be cheerfully faced. We are eager for work, and can look forward with confidence to the future.

It is in such a spirit that we meet to-day, and for that reason it is a singular privilege, accorded me through the courtesy of my colleagues, to address you on this occasion. I welcome the privilege

An inaugural address to the students of the Faculty of Medicine, University of Toronto.

the more, as it gives an opportunity of expressing more publicly than I have yet been able to do my appreciation of the high honour done me in my election to the Chair of Obstetrics and Gynæcology in the University of Toronto. I was proud of my position a year ago, and I am, if possible, still prouder of it to-day, when I have had time to realize even more fully than I did then, the high position which the Toronto Medical School occupies, and the great future which it has before it. In proportion as this feeling has grown, so has my sense of the responsibility of my position increased.

In the ancient universities of the Old World the speaker on such an occasion as this usually seeks to interest his audience by tracing the history of his Chair throughout the past centuries, and by giving some account of the life and work of the men who preceded him. Here we can hardly follow that historical method. The re-organized Faculty of Medicine in this university dates back only to 1887. In that year the duties of the Chair of Obstetrics were assumed by my immediate predecessor, Dr. Adam Wright. At that time the teaching of obstetrics must have been surrounded with great difficulties, for there did not exist the large obstetrical hospitals and maternity charities which were already well established in the older countries. That these difficulties were surmounted and obstetrical teaching brought to a high degree of efficiency will always remain to the credit of Dr. Wright

The Chair of Gynæcology has had two occupants since 1887, the late Dr. Ogden and the late Dr. Ross. And now to-day obstetrics and gynæcology are united under one charge, not, however, for the first time, for Dr. J. A. Temple held the Professorship of Operative Obstetrics and Gynæcology for the six years between 1903 and 1909.

In Britain and in Europe the two subjects have always been closely linked. In Germany the *Frauenklinik* is a constant feature in every medical school, and in it obstetrics and gynæcology are taught under the direction of one head. On this continent the rapid progress of surgery has been responsible for the separation of the two subjects. While this has resulted in notable advances in certain directions, it is questionable whether it has been followed by the best results as far as teaching is concerned. In practice it has on the one hand tended to exaggerate the surgical aspect of gynæcology, often to the exclusion of non-operative and more conservative lines of treatment, and on the other it has deprived the obstetrician of opportunities of perfecting himself in operative technique, and to-day surgical intervention is more and more

resorted to in obstetrics, as being in many instances the safest and most conservative line to adopt in the interests of mother and child.

Gynæcology, in its early days, did much for surgery. The gynæcologist was the first to demonstrate the possibilities of abdominal surgery, and to-day the glamour of the brilliant results achieved by him is apt to fascinate the student, and to throw into the background the more important, though less spectacular, work of the obstetrician. By combining the teaching of the two subjects a better appreciation of their interdependence and of their relative importance can be given.

Gynæcology is a thing of recent growth, but obstetrics goes back to the time of primitive man. To some of the phases in the growth and evolution of obstetric art I should like to direct your attention, not alone because of their historical interest, but also because of the lessons they can teach us to-day.

Long before the phenomena of disease were recognized those of parturition must have appealed to the primitive mind. Later on, as with other branches of medicine, there gathered round obstetrics the superstitions and strange beliefs of primitive religions. "The death of the mother or child at birth was regarded, not as the result of a diseased or abnormal state of the body, but as the curse of a god, whose favour must be secured ere the danger could be averted. The priest who prescribed the mode of atonement played the part of the physician, and thus in a sense our art took its origin within the pale of the Church" (Milne Murray). In Egypt, as early as 3,000 B.C., such a class of priest-physician existed.

It is not until the time of Hippocrates, however, 400 B.C., that any definite writings on the subject are found, and such writings embody the teaching, beliefs and superstitions of the previous two thousand years. Hippocrates knew little of human anatomy, having only dissected animals, and for that reason his teaching was often inaccurate, and in the light of later knowledge sometimes grotesque. The imagination was given full play, and we find such beliefs as that "the uterus was double, and like a double-barrelled gun discharged male foetuses from the right, females from the left barrel: that the foetus sat placidly on the brim of the pelvis, and then took a header into the new element of the outer world: that its time of waiting was spent, amongst other things, in learning the art of sucking, for how otherwise could it do so intelligently from the first?" (Barbour)

It was not until the study of human anatomy was begun,

about the beginning of the Christian era, that any material advance in the science and art of obstetrics was made. The part played by anatomy in the advance of medical knowledge has always been of the first importance, and in no department can this be more clearly demonstrated than in that of obstetrics. Soranus, who probably lived towards the end of the first century,* was the first to give a description of the pelvic organs. That description is wonderfully accurate, and he not only deals with the normal, but also made observations on the alterations produced by disease. He was followed later by Galen (born 130 A.D.) but his account is not so exact, so that it is doubtful if he had ever actually dissected the pelvis. Much of the teaching of Soranus was later incorporated in the work of Moschion, who probably lived in the fourth century, and his writings must have done much to put obstetrics on a surer basis at that time. The work of those men was lost in the darkness of the succeeding centuries, and, until the beginning of the sixteenth, obstetric art was again at a standstill. Its practice passed into the hands of ignorant women, who revived and perpetuated the old beliefs and superstitions. From the sixteenth century onwards there was a succession of great men, each of whom, in addition to other work, contributed greatly to the knowledge of pelvic anatomy. Vesalius, who gave the first description of the bony pelvis, Eustachius and Fallopius, who noted and figured more accurately than any of their predecessors certain of the pelvic structures, are names with which you will all become familiar. They were contemporaries, and each, working independently, contributed much to anatomical knowledge.

These advances induced the men who practised medicine, and more especially surgery, to direct their attention to obstetrics, and so we find Ambroise Paré, the great French surgeon, introducing, or rather rediscovering, the operation of turning in 1550. The practice of the art was still in the hands of untrained women, the surgeon being called in only in cases of special difficulty. In the seventeenth and eighteenth centuries further anatomical advances were made by Albinus, Heller, Roederer and Smellie, and by William Hunter, who in 1774 published his atlas, containing a complete description of the gravid uterus. Through their researches, and those of the men who preceded them, the invention of the obstetric forceps was made possible, and the mechanism of parturition was explained. With the invention of the obstetric forceps in the seventeenth century the practice of obstetrics began to pass

* Some authorities place him in the third century.

out of the hands of women. Men like Smellie and Hunter in England, Levret and Baudelocque in France, Roederer in Germany, contributed in no small measure to the elimination of the fallacious teaching of the previous centuries, and to the establishment of a line of treatment founded upon scientific facts. They laid the foundation of obstetric practice as we know it to-day, and all that they did was the direct outcome of anatomical investigation. In more recent years research has still continued, and men like Barbour, Braune, Waldeyer, Schroeder and others have done much to elucidate the mechanism of parturition by their work in sectional anatomy.

At the beginning of the nineteenth century a fairly complete knowledge of anatomy served as a sound working knowledge for the obstetrician. The phenomena of normal parturition were known, and the management of abnormal cases was conducted on definite scientific lines. The obstetric forceps were in general use, and other operative procedures could be carried out. These latter, however, were restricted by reason of the suffering they entailed. It remained for the genius of Sir James Y. Simpson to put into the hands of his fellow practitioners the means by which they might soothe to sleep the parturient patient, and so carry out painlessly the most lengthy of these procedures.

As with so many of the other great discoveries in medicine, that of anæsthesia cannot be credited to any one single man. William Thomas Green Morton, a dentist, was the first to demonstrate the feasibility of inducing general anæsthesia by the inhalation of sulphuric ether. In the Massachusetts General Hospital, Boston, on October 16th, 1846, he successfully anæsthetized a patient on whom one of the surgeons operated. Two years previously Horace Wells had rediscovered the anæsthetic properties of nitrous oxide gas, which had been known to Humphrey Davy in 1800. Following the success of Morton, British surgeons, among them Liston, began the use of ether. Reports of their success soon attracted the attention of James Young Simpson, at that time Professor of Midwifery in the University of Edinburgh. He had always been interested in the subject of anæsthesia, and immediately began to enquire into the possibility of using this new anæsthetic during parturition. The problem before him was harder than that which faced the surgeon. In those days the surgeon did his work quickly, so that the patient did not require to be long under the influence of the anæsthetic. The problem presented to Simpson was two-fold. Could the anæsthesia be continued sufficiently long to give appreciable relief? And would the anæsthetic interfere

with uterine contraction? He chose for the first trial a case of contracted pelvis, calling for the operation of turning. He waited for this case because, from the nature of the operation, any interference with uterine contraction by the anæsthetic would be of little moment. On January 19th, 1847, the operation was successfully and painlessly performed under ether anæsthesia, and Simpson was able to satisfy himself that uterine contraction went on normally. He therefore at once proceeded to employ it in normal cases, an account of which he read before the Edinburgh Obstetrical Society on February 10th. The practice was soon taken up in France, in England, in Germany, and a few months later in America.

But Simpson did more than this for anæsthesia, for it was he who first demonstrated the anæsthetic properties of chloroform. Not being altogether satisfied with ether, because of the large quantities required in prolonged cases, and because of the bronchial irritation to which it often gave rise, he had sent him by different chemists various volatile substances which might be inhaled. With these he experimented on himself and on his friends. Amongst these substances was a small quantity of chloroform, which he had procured from Messrs. Duncan and Flockhart. Mr. Waldie, a Scotchman in business as a chemist in Liverpool, had suggested to him that this was probably the anæsthetic substance in the chloric ether which Bigelow in Boston, and Jacob Bell in London, had used successfully. Here is the story of the discovery, as it is graphically told by Professor Miller, a near neighbour of Sir James Simpson in Queen Street, Edinburgh, and quoted by his nephew and successor in the Chair, Sir A. R. Simpson.

“Most of these experiments were performed after the long day’s toil was over—at late night or early morn—and when the greater part of mankind were soundly anæsthetized in the arms of common sleep. Late one evening—it was November 4th, 1847—on returning home after a weary day’s labour, Dr. Simpson, with his two friends and assistants, Drs. Keith and J. M. Duncan, sat down to their somewhat hazardous work in Dr. Simpson’s dining-room. Having inhaled several substances, but without much effect, it occurred to Dr. Simpson to try a ponderous material, which he had formerly set aside on a lumber-table, and which, on account of its great weight, he had hitherto regarded as of no likelihood whatever. That happened to be a small bottle of chloroform. It was searched for, and recovered from beneath a heap of waste paper. And, with each tumbler newly charged, the inhalers resumed their vocation. Immediately an unwonted hilarity seized the party; they became bright-eyed, very happy, and very loquacious—ex-

patiating on the delicious aroma of the new fluid. The conversation was of unusual intelligence, and quite charmed the listeners—some ladies of the family and a naval officer, brother-in-law of Dr. Simpson. But suddenly there was a talk of sounds being heard like those of a cotton mill, louder and louder: a moment more, then all was quiet, and then—a crash. On awakening, Dr. Simpson's first perception was mental: 'This is far stronger and better than ether,' said he to himself. His second was, to note that he was prostrate on the floor, and that among the friends about him there was both confusion and alarm. Hearing a noise, he turned round and saw Dr. Duncan beneath a chair—his jaw dropped, his eyes staring, his head bent half under him; quite unconscious, and snoring in a most determined and alarming manner. More noise still, and much motion. And then his eyes overtook Dr. Keith's feet and legs, making valorous efforts to overturn the supper-table, or more probably to annihilate everything that was on it: I say, more probably, for frequent repetitions of inhalation have confirmed, in the case of my esteemed friend, a character for maniacal and unrestrainable destructiveness, always under chloroform, in the transition stage. By and by, Dr. Simpson having regained his seat, Dr. Duncan having finished his uncomfortable and unrefreshing slumber, and Dr. Keith having come to an arrangement with the table and its contents, the *sederunt* was resumed. Each expressed himself delighted with the new agent, and its inhalation was repeated many times that night—one of the ladies gallantly taking her place and turn at the table—until the supply of chloroform was fairly exhausted."

Whatever may be the difference of opinion as to the claims for priority in the discovery of anæsthesia and the different anæsthetics, there can be no question that to Simpson belongs the credit of first using it for the relief of suffering women. The story of the bitter opposition to its use in obstetrics, coming from his own profession and from the Church, is known to many of you. Fortunate it was for future generations that Simpson was a man of such strong convictions, such iron will, and so skilled in debate as to beat down that opposition. For "on the man who first dared to apply it for the relief of the pain of labour fell the task of enlightening ignorance, of disarming prejudice, of dispelling superstition, and of vindicating for surgeons and for accoucheurs the right to give, and for sufferers to claim, the ease that anæsthesia is calculated to afford" (A. R. Simpson).

With obstetric science making rapid progress, and with the great boon of anæsthesia added, the practice of the art was still

attended with a frightful mortality from puerperal fever, especially in the large maternity hospitals. From time to time severe epidemics broke out, devastating the wards like a veritable plague.

In the same year as Simpson's discovery of chloroform Semmelweiss, a young obstetrician in Vienna, published a long and elaborate investigation into the causes of this fever. His work extended over several years, and was characterized by the most painstaking scientific accuracy. He began by noting that, while the mortality was 2·7 per cent. in the wards of the hospital where nurses only were in attendance, it was as high as 11·4 per cent. in those to which doctors and students were attached. He further noted that the mortality among patients treated in their own homes was much lower than that among hospital patients. He then found that the appearances in a subject dying from septicæmia, as the result of an autopsy wound, were exactly the same as those present in women dying from puerperal fever. He at once came to the conclusion that puerperal fever was due to the introduction of cadaveric material into puerperal wounds, and that the preponderance of cases among patients attended by students and doctors was due to their attendance at autopsies. Acting on this theory he insisted on careful washing of the hands and the use of a solution of chloride of lime. As a result the mortality was at once reduced to 1·27 per cent.—lower than it had ever been in any part of the hospital.

Before Semmelweiss, Oliver Wendell Holmes, in 1843, published a paper, in which, from a long series of observations, he stated his conclusions that puerperal fever was of the nature of a contagion; that it was conveyed by the hands of nurses and doctors, and that it was a preventable malady. Even before him others in Britain and on the continent of Europe had come to much the same conclusions. In 1869 Sir James Simpson wrote a paper pointing out the same facts which Semmelweiss had noted with regard to the mortality among hospital patients. In one of his lectures he demonstrated the identity in the clinical course and autopsy findings of surgical and puerperal fever, and ascribed both to contagion carried by the hands or person of the operator.

The work of these men received but scant attention until, in 1871, Lister, profiting by the researches of Pasteur and others, gave to the world the principles of antiseptic surgery. After much controversy and bitter opposition these principles were accepted by the profession, and were applied to the practice of obstetrics with the most beneficent results so that with the perfection of technique and the later introduction of the aseptic method the

mortality from puerperal sepsis in maternity hospitals has been reduced almost to vanishing point.

Unfortunately the same good results have not been achieved in private practice. In most countries the mortality from puerperal sepsis still ranges between 1 and 3 per thousand. In Ontario, for the year 1911, it was 2·29 per thousand, and in the principal cities of the province it was as high as 2·4 per thousand.

While recent bacteriological research has shown that the organisms of puerperal sepsis may gain access without the intervention of the doctor, it is yet true that, in the vast majority of instances, the responsibility rests with him or with the others in attendance. The conclusion therefore must be that the Listerian principles are not followed with the same careful attention in private practice as in hospitals. Other causes may be at work as well, but they must be of minor importance. There can scarcely be any question that, if the principles of antiseptic and aseptic surgery were applied as rigidly in private obstetrical as in hospital obstetrical practice, the mortality from puerperal sepsis would practically disappear. The practitioner is too often lulled to a sense of security by the observation of some form of antiseptic technique, and does not pay the attention to detail which he would consider an absolute necessity were he to undertake a surgical operation. It is only by such a rigid observance of detail that this mortality can be reduced. A great responsibility attaches to us as teachers, and to you as students and future practitioners, in this matter.

In the obstetrical hospital you see aseptic teaching carried out in the minutest detail, but this is not enough. You must know how these methods can be applied in the patient's own home. It must be demonstrated to you that, as it is possible to perform a surgical operation with as much hope of success, so far as the aseptic healing of the wound is concerned, in a private home as in a hospital, so is it possible to reduce the incidence of puerperal sepsis in private practice to what it now is in our great institutions. This can best be accomplished through a most carefully conducted out-patient department, such as we hope will soon be established here.

Since the time of Lister's discovery the line of advance in obstetrics has run parallel with that of the allied branches of surgery and medicine. Technique has been so perfected as to render the performance of even the most severe operation almost devoid of risk to life. The whole field of operative gynaecology has developed. The bacteriologist has demonstrated the nature of the infecting organisms in puerperal fever, and has devised a means of treating

it. The organismal nature of a certain general disease, hitherto only surmised, has been demonstrated. The serologist has found a method whereby it can be recognized even in its most obscure forms, whilst the chemist and the experimental pharmacologist have supplied a drug for combating its ravages. The pathologist has demonstrated the nature of the lesions present in the toxæmias of pregnancy, and the bio-chemist and the pathological chemist are endeavouring to explain their causation. The physicist and chemist have given us the x -rays and radium, both most valuable thereapeutic agents, the full possibilities of which are only beginning to be understood. These are the lines along which modern medicine is travelling to-day.

Yet there are those who hold that in the medical curriculum altogether too much time is devoted to the sciences, and to the laboratory side of your training; that the time given to them is wasted, and might more profitably be devoted to clinical work. You have all heard or will hear such opinions expressed. And just at first you may be inclined to agree with them, for it is a disappointment to find that you must spend a full two years in the study of chemistry, physics, biology, anatomy and physiology, and that it is not until the beginning of your third session that you visit the hospital wards, and enter upon what may be termed the human side of your training. This feeling of disappointment is quickly dispelled when you become acquainted with the phases and stages in the development of the science and art of medicine, some of which I have endeavoured to put before you to-day. The whole progress of medicine has always been dependent upon progress and discovery, in those other realms of science. Men, devoting their lives to them, have ever been the pioneers, breaking into new ground, clearing away false beliefs, and devising new methods of investigation. The practical physician, imbued with some of their scientific spirit, has culled here and there the fruits of their labours, making use of their discoveries, and applying their methods for the elucidation of the practical problems of health and disease. In this way has been built up the science and art of medicine as we know it to-day. And how can we hope to understand and appreciate the finished product if we know nothing of the component parts?

The one constant characteristic of all those great men who have done so much for our science is their power of accurate observation and logical deduction. These are faculties which are of the first importance to every one of you, and which it is one of the chief purposes of the medical curriculum to develop in you. This habit

of accurate observation is one which it is not easy to acquire. Listen to what Sir James Paget, himself one of the keenest and most accurate of observers, says regarding it: "By accurate observation we must mean not the mere exercise of the senses, not the mere seeing, or hearing, or touching of a thing, with some levity of thinking about it; we must not mean even the keenest use of the eye cultivated in microscopic work, or of the ear hearing sounds that to the uneducated sense would be inaudible, or the use of the finger with the most refined detective touch. All these higher powers of the sense you must acquire by careful study and practice, and you must learn to exercise them all with all the attention with which a strong will can direct and watch them: but even all this, difficult as it is, is only a part of scientific observation. This must include, besides, an habitual constant watchfulness, the taking notice of all the conditions in which objects or events are found; their concurrence, their sequences, their seeming mutual relations, all their variations. To do this, and to do it again and again, and with constant care, whether it be in things occurring naturally or in experiments—to do this accurately and always is really very difficult. A few seem to have the power naturally; there are some born naturalists, some born physicists; you have had some here; but in nearly all men, and—you may safely believe—in yourselves, the power to observe accurately needs careful self-training, self-suspicion, and self-discipline."

If you enter upon your preliminary studies regarding the work as a necessary drudgery which must be gone through in order to satisfy your examiners at the end of the term, the time will indeed to a great extent have been wasted. You may learn from lecture-notes and from text-books so many facts and a great number of new names, but in the end you will be in very much the same position as when you began, for knowledge so acquired soon slips the memory, and in a few months is as if it had not been. If, however, you are determined to acquire through those studies some of this faculty of close and accurate observation you will find that your interest in them becomes quickened and intensified, that you have no longer to tax your memory with a series of isolated and uninteresting facts. The phenomena which you have yourself observed, the experiments which you have yourself performed, become part of you. You cannot forget them if you will, and round them all the other facts group and arrange themselves in orderly and logical sequence. You are no longer dependent on memory alone: you have begun to observe and think.

But in acquiring this habit you must not be conscious of doing

so, for this "self-training, self-suspicion and self-discipline" consists in absolute concentration on the work which you are doing at the moment, the cultivation of a desire for knowledge for the sake of knowledge alone, and the putting behind you of all desire to generalize or theorize without a thorough sifting of the facts. You must not constantly be looking for the practical application of the knowledge you acquire. Be content to acquire it, resting assured that the practical application will come in some form later. To neglect any opportunity of becoming acquainted with the more scientific side of your profession is to place yourselves in the position of those short-sighted men who, in the time of Soranus, failed to see the necessity for the study of anatomy, and to whom the latter thought it necessary to make the following sarcastic apology: "But since we are about to pass to the description of what occurs in health, we must first explain the structure of the organs, which in part can be studied directly, in part by anatomy. And, although it is of no use, nevertheless, since it is held to be a part of enlightened education, we shall teach what is known of it, for we shall be more readily believed when we say that anatomy is useless if we have first shown ourselves to be acquainted with it, nor shall we provoke the suspicion that, to cover our ignorance, we have depreciated one of those subjects which are deemed useful" (translation by Barbour).

For "anatomy" substitute—or rather to "anatomy" add—chemistry, physics, physiology, bio-chemistry, pathology, bacteriology: these occupy to-day the place that anatomy did in those far distant times. Through them our methods of diagnosis and treatment are being revolutionized. The efficiency of the modern hospital is now gauged, not alone by the number of beds it contains, by the brightness and airiness of its wards, or by the sumptuousness of its furnishings, all-important as these are. Its true efficiency as a school for the training of the future practitioner, as a centre for research, and above all as an institution for the healing of the sick, is measured by the number and the completeness of equipment of its laboratories, and by the skill of the men who direct them. In like manner the real practical physician of to-day is the man who has at his command a knowledge of, and the ability to apply, every aid which science can afford him.

In this university, with its great modern hospital, you have opportunities for qualifying yourselves in these directions, such as none of your predecessors had, and few of your contemporaries in other schools enjoy. We look to you with confidence to take the fullest advantage of them.