

MEMORIES OF

Forty - Five Years

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IN SURGERY

I was very pleased to receive an invitation to speak to you and began at once to think of what I might say that would be of interest. Obviously, there was no surgical subject that I could present more ably than Professor MacKenzie and his colleagues. It occurred to me that I had one advantage in that my memory carries me further back. Perhaps in here I am just a little bit like the federal judge who had just returned from a trip to Paris. When asked how he had enjoyed himself, he said he had a wonderful time and Paris was a grand place, "But I wish I'd made the trip 20 years ago." "You mean when Paris was Paris?" "No", was the answer, "I mean when Smith was Smith."

It is rather startling that my surgical memories really date from the summer of 1915 when I entered the Toronto General Hospital as an undergraduate intern, although one has, of course, many memories of student days. The war had depleted the hospital of graduates and those of us who had enlisted had been discharged from the army in order that we might finish our course in medicine. Forty-five years is a long time in the history of surgery when one recalls that Lister published his description of the antiseptic method in 1865 and that his teaching was not at all generally accepted until the end of the century. I entered medicine in 1911 and it is sad to recall how little Lister's death in 1912 meant to me and how little its historical importance was impressed upon the students. Some years later I was much interested to learn that Professor John Stewart, whom you are so fortunate to claim as a surgical pioneer, had served as Lister's house surgeon.

The Toronto General Hospital had been opened in 1913 and was regarded as one of the most modern on the North American Continent. There were three general surgical wards. No provision was made for the surgical specialties since none existed. Urology was just beginning to branch off because of the newer methods of investigation made possible by special instruments. The material in the wards was very different from what you find today, and much of it had to do with infection—ulcers both varicose and syphilitic, cellulitis, boils and

carbuncles, osteomyelitis, tenosynovitis, septic arthritis, tuberculosis, and syphilis. Antibiotics were, of course, far in the future and syphilis was the only infection for which there was specific therapy. For it, 606 was just coming into use, but mercury and iodides were still standard treatment. Erysipelas was common and, in the very young and very old, often fatal. One recalls the streptococcal wound rashes that so often complicated war wounds. I shall always remember a child with an osteomyelitis of the Os Calcis who was a patient at the hospital for Sick Children in 1920. It was recognized that he was a carrier of scarlet fever because each time he was returned to the wards after a period in the isolation hospital there was an outbreak of fever. It never occurred to anyone that the streptococcus in his wound was the organism that caused scarlet fever until Dick & Dick came forward with the answer.

In the 20's tuberculosis of bones and joints was extremely common. The surgical wards of the childrens' Hospital were full of advanced cases many with abscesses, all too many which were secondarily infected with pyogenic organisms. Many such patients developed amyloid disease. My chief at that time, Professor Clarence Starr, achieved international recognition by being the first to advocate surgical evacuation of such tuberculosis abscesses and immediate closure to prevent the dreaded secondary infection.

The surgical dressing carriage has disappeared from most hospitals fortunately, but it is not very long since infected wounds of various kinds were so common as to occupy the time of the dressing nurse and, during the teaching session, a final year student, for a couple of hours each morning.

It was difficult for my generation to appreciate what hospitals must have been like in the days before Lister; when they spoke of laudable pus and the wards were full of hospital gangrene, phagedena, cancrum oris and often had to be closed completely when infection became too rampant. I am sure it is almost as difficult for you to appreciate what they were like half a century ago because the change is almost as great.

Most of the material upon the surgical wards today is new. Much of what was surgical yesterday is now medical. One would think that the need for surgical therapy, and therefore for trained surgeons, would decrease but so far there is no such indication and the replacement is more rapid than the depletion.

Infections were treated by incision and drainage and there was the never ending quest for the ideal antiseptic which would kill the bacteria but not the tissue cells—a quest that was, of course, doomed to failure. The principles of immunity must have been poorly understood since one recalls that it was common practice to incise a spreading subcutaneous cellulitis in the hope of limiting its progress, to open boils early and to incise an acute mastitis while it was still a cellulitis. From your knowledge of pathology and immunity you know, of course, that such incisions could do nothing but harm. Major gastrointestinal surgery was done rarely. Gastroenterostomy was the operation for duodenal ulcer. Cholecystectomies were just beginning to be done generally instead of drainage of the gall-bladder. Gastrointestinal diagnosis was still almost entirely clinical since radiological diagnosis was in its infancy and, in fact, the very small department was in charge of a technician. Not until 1918 did it acquire a medical director. Roentgen had discovered x-ray only in 1895. Its use in the management of skeletal trauma was developed rapidly but radiological diagnosis as we know it today has been developed very gradually. The old vaccum tubes were still in existence long exposures were required and pictures generally speaking, were of poor quality. Glass plates were used, by the way, since films were not introduced until 1924 or 1925. Little help could be expected in the diagnosis of gall-bladder disease since plain plate examination only was available. Cholecystography awaited the description of the excretory test by Graham and Cole in 1924. Chest plates were of poor quality although of great help.

One might expect that clinical diagnosis was more acute because x-ray and many of the modern laboratory tests were not available, and indeed this may be true, but only surgery or the autopsy disclosed the physician's errors. I suspect that many of the claims in this regard are dependent upon the happy faculty that we all possess of forgetting our errors and less happy experiences and remembering only our successes. When house physicians to the then professor of medicine, Alexander McPhedran, one of the greatest clinical teachers I have known, it was a source of chagrin to me that he could know, observing from

the foot of the bed, that a recently admitted patient had pneumonia before I was able to discover any alteration of chest signs; but I know now that it was only a highly developed clinical sense as a result of long experience. It is the same sort of thing that has made it possible for me on many occasions to recognize that a patient had a post-operative atelectasis by looking at him and his chart before my resident had found changes in his chest findings. It is, however, true that today's clinician will fail to develop this clinical astuteness if he neglects to exploit fully the clinical history and examination before employing laboratory and mechanical methods of diagnosis. It is no accident that those in special fields in which final diagnosis depends upon these aids tend all too frequently to become poor clinicians. I would urge you, therefore, to try in every instance to arrive at a tentative clinical diagnosis on the basis of history and clinical examination before resorting to other diagnostic aids because only in this way can you become a sound clinician. It is worth while to remember that x-ray and laboratory findings may lead one into gross errors when they are not interpreted in the light of the history and clinical findings. The patient whose barium enema has been reported as normal may have a palpable mass in the abdomen that, in association with the history, leaves no doubt as to the diagnosis of cancer of colon, and still more frequently he may have an easily palpable cancer of the rectum. The barium meal may show an apparently easily operable cancer of the stomach but a nodular enlargement of the liver or a rectal shelf may rule out the possibility of a successful resection. A chest film may suggest that a patient with a pulmonary lesion is a suitable candidate for operation but the most cursory clinical examination may reveal a Marie Strumple arthritis. A bronchogram may show an apparently localized bronchiectasis quite suitable for resection but chest examination may make it apparent that a satisfactory result from surgery could not be anticipated.

It is interesting to recall the anaesthesia of those earlier days. General anaesthesia was still mainly by the open or drop method and the usual drug was ether although chloroform was still in use and nitrous oxide was available. Anaesthesia by intubation technique was just beginning in a few centres.

Patients were often cyanosed during most of their anaesthetic and were likely to be returned to the ward in that state. When nitrous oxide was used continuous cyanosis was considered by some as quite acceptable. They were, of course, utilizing the anaesthetic effects of carbon dioxide

as well as nitrous oxide. The real tragedy was illustrated by the patients who had been given a gas anaesthetic in a dentist's office and having failed to recover consciousness were admitted to hospital. Some of these failed to recover and some lived but had permanent cerebral damage. Many patients were wildly excited in the recovery period and had to be restrained. This was especially true of patients who had had thyroidectomies. You would all recognize the pictures I have presented as characteristic of prolonged hypoxia. They were not recognized as such by anaesthetists or surgeons until as late as the 1930's. It is sad to think that the effects of oxygen lack were known to physiologists long before they received clinical recognition. Still later carbon dioxide retention was recognized as a serious matter. I suspect that subtle permanent personality changes may have been common. It is not difficult to call to mind numerous instances in which clinical progress would have been more rapid had clinicians been more familiar with knowledge already possessed by those in basic science departments. I have mentioned already the unwise incisions into spreading cellulitis which would undoubtedly not have been made by anyone who possessed a working knowledge of tissue immunity.

It must be difficult for you to appreciate the changes that have taken place in anaesthesia and that much modern surgery would not be possible had not those advances been made. Early intrathoracic procedures were carried out in negative pressure chambers in the belief that the chest could not otherwise be opened widely. This was probably the result of the application of dog physiology to the human. Since the pleural cavities of the dog communicate, a dog dies if his chest is opened without positive pressure anaesthesia. This is not, of course, true of man. This calls to mind an amusing story. About 1930 a french poodle owned by my house surgeon's wife, was run over by a motor car, his diaphragm was torn widely and he was left with a traumatic hernia of the diaphragm. There was at that time, only one report in veterinary literature of the successful repair of a diaphragmatic hernia in the dog and in that instance the dog had been kept alive by pumping air into his trachea with a bicycle pump. The poodle was brought to the Banting Institute, where I was at that time doing experimental surgery on dog's chests, given an anaesthetic on the machine and the hernia repaired without incident. The veterinary surgeon, who had requested that he be allowed to observe the procedure, learned the trick and in the next few years made

frequent trips of great distances to repair traumatic hernias in dogs. Since the lesion is, I learned, a very common one in dogs and the animals often belonged to wealthy people, I am sure that his income from the repair of hernias of the diaphragm was much greater than I could ever have anticipated from humans. Rudolph Matas of New Orleans began experiments with insufflation intratracheal anaesthesia in 1898 and Meltzer and Aver first used the method in 1909. It was reported to the American Surgical Association in 1913 but did not come into general use until the 1920's. Without it most major thoracic surgery including cardiac surgery could not have been developed. Our early thoracoplasties and even early lobectomies were done under local anaesthesia because of the unsatisfactory state of general anaesthesia. Experiments conducted by the Air Force during the war, into the problems of oxygen lack and carbon dioxide retention, produced much useful information but the majority of surgeons and anaesthetists had little knowledge of the subject until the 1930's. We as surgeons must acknowledge our debt to anaesthesia.

Thoracic empyema has become a rare disease, thanks to the antibiotics, but it used to be extremely common. It is interesting and distressing to recall how badly we treated these patients because of lack of knowledge of the fundamental problems involved. My first term as house physician coincided with an epidemic of pneumonia and many of these patients developed empyema. As soon as turbulent fluid was recognized in the pleural space a patient was transferred to the surgical side where a rib resection was done and open drainage was established under general anaesthesia. The lung was still consolidated and when the open drainage was instituted, air entered the pleural space, the remaining good lung on the diseased side collapsed and the mediastinum receded toward the other side. Thus the amount of functioning lung was reduced to such an extent that tissue aeration could only be accomplished by increase in the respiratory rate and pulse rate. This was all too frequently more than a heart already damaged by toxæmia could stand and, as should have been expected, the death rate was high. The mortality among empyema patients in American Military hospitals during the first war averaged 50% and in some hospitals was 80%. The empyema commission under the late Professor Evarts Graham established the principles of treatment which I am sure you are now taught and the mortality everywhere dropped to a small fraction of what it had been. Indeed, even before the advent of antibiotics, it was possible

to teach that no patient should die of empyema per se.

Suppurative bronchitis was one of the common diagnoses on the medical wards until 1922 when Forrestier described the lipiodol bronchogram. It is astonishing that it had not been recognized from autopsies that the majority of patients had bronchiectasis and the true incidence of this miserable disease remained unappreciated until the routine use of bronchograms was established. This took nearly ten years. There have been many instances of this failure of the pathologist to recognize disease that, once appreciated, seemed so obvious. One need only mention pulmonary embolism, lipoid pneumonia and bronchogenic carcinoma as example. It is, I think true, that "what one knows one sees". Indeed one could almost say that the true pathology of most diseases remained unrecognized until the field was invaded by surgery. This, of course, was because the pathologist was seeing end-stage disease and as Sir Berkeley Moynihan said "Death not only changes the lineaments of a man's face, but so profoundly alters the parts affected by disease that the conditions before and after death may seem hardly comparable." Many problems have been elucidated only when the clear light of surgery has been cast upon them.

What of the field of cancer? There seems to be a tendency today to decry the progress that has been made. In my younger days every surgical ward had in it many cases of advanced and hopeless cancer. Dreadful destructive lesions of the face and mouth were always about. One of the duties of the junior surgeon was to go to the hospital at night and tie an external carotid artery to control bleeding. Patients with carcinoma of the breast with inoperable primary lesions, with widespread post-operative recurrences upon the chest wall or with extensive bony metastases complicated by pathological fractures of vertebrae and long bones were common and little that was worth while could be done for them. A high proportion of patients with cancer of the rectum were beyond the possibility of resection before they were admitted and those with carcinoma of the colon were usually admitted in obstruction. Surveys of the patients in any of these categories from most institutions showed few five year survivals.

I need not contrast for you this picture with the one with which you of today are familiar. The greatest change has been brought about by better surgery aided by earlier diagnosis. In some fields the accomplishments of radiotherapy, when used alone, are most satisfactory and in others, it is a useful adjunct to surgery. More

recently hormone therapy has had an important palliative effect. It appears to be true, unfortunately, that the influence upon the ultimate mortality has been disappointing but there is good reason, in spite of that, for satisfaction in what has been accomplished.

The discovery of insulin by Banting and Best in 1922 placed in our hands a therapeutic agent of inestimable value. It had a further significance in that it initiated a tremendous chain of research into carbohydrate metabolism and pointed the way to further studies in endocrinology, a pursuit that had been so unrewarding that investigators in the field had become discouraged. Indeed the impact upon medicine was so great that it may almost be said to have established a new era. I am sure that it is only possible for you to vaguely imagine what it would be like to treat the various diabetic patients that you see if insulin were not available.

It is difficult for me to recall what happened to patients with what we now recognize as neurosurgical lesions before the development of this specialty. When Dr. K. G. McKenzie began to devote his whole time to neurosurgery in 1924, he was the only surgeon in Canada doing so. I presume the truth is that many of the lesions were unrecognized at the time and, since surgery had so little to offer, those that were diagnosed did not find their way to the surgical wards. General surgeons operated upon depressed fractures of the skull and cases of middle meningeal haemorrhage and did a few temporal decompressions to relieve increased intracranial pressure. A few Gasserian ganglia were excised but usually inexpertly. No one could have foreseen at that time the tremendous field that has been opened up. The chief of surgery thought there would be insufficient work to occupy the full time of one man, and he was the only one in Toronto; yet there are ten neurosurgeons in Toronto today and we will soon have need for more.

I am sure you all recognize the duodenal tube and the use of Wangenstein suction as common sense routine that must always have been employed. Unfortunately that is not true. It was many years before the duodenal tube replaced, in all but a few situations, the stomach tube. Gastrointestinal suction is quite a recent form of therapy although it is, I believe, one of the major contributions of the last twenty years to gastrointestinal surgery. It is so effective, of course, because nearly all abdominal distension is produced by swallowed air. Appendicitis with all its com-

plications was a very common disease and the mortality among cases of perforation was very high. It was only after gastrointestinal suction was available, I think that it was appreciated that most patients did not die, as had been taught, from peritonitis but of intestinal obstruction and that if they could be tidied over the combination of obstruction and ileus they would recover from peritonitis.

Hand in hand with this, of course, went the control of electrolytes and fluids. A reasonably complete understanding of fluid requirements and the control of blood chemistry is very recent indeed. One looks back upon very ill patients being treated by gastrointestinal suction who remained depressed and asthenic in spite of the fact that they were receiving what was regarded as adequate fluid and electrolyte replacement. It is perfectly clear that they were suffering from lack of potassium, a need which we did not then appreciate. Only in the last fifteen years have surgeons become aware of the changes in blood volume that occur in chronic illness and of the importance of correcting low blood volume before undertaking major surgery.

It is difficult to understand why doctors insisted for so long upon bed rest. The principle of early rising after operations is not new. Surgeons believed, of course, that the wound was more likely to heal kindly if the patient were at rest, that there was less likelihood of wound dehiscence and that pain was more easily controlled. These were mere assumptions and have all been proven untrue. One has to have experienced a period of three weeks in bed, flat upon his back, forbidden to turn on his side to appreciate just how miserable a patient could be made after a relatively simple operation. Then came the period of inactivity in the Fowler's position, made easy by the use of Gatch frames. Plewes showed in 1939 that the incidence of pulmonary embolism in the wards of the Toronto General Hospital had increased six times during the years in which Gatch frames were being introduced, yet his paper aroused little interest at the time. There is no doubt that with early activity and early rising after operations our patients are not only much safer, but much more comfortable.

In spite of the fact that they are over used and unwisely used, antibiotics have had a tremendous impact upon modern surgery. There is, I think little doubt that for a time their routine use led to carelessness in surgical techniques, but experience with insensitive strains of organisms has led to a sober reassessment in the past few years.

Cardiovascular surgery has been developed almost within your time since it is scarcely more than five years old. Operations upon the heart and blood vessels are among the most common in our hospital today and it must be difficult for the student to appreciate just how new it all is.

This has been a thrilling period in the history of surgery. I hope that you have become aware that major advances have been dependent in most instances, upon additions to fundamental knowledge. Technical advances have been important and in spite of the apparent advancement of today, will, I have no doubt, continue to be important.

I suspect that after listening to my recital of the shortcomings of my own generation you have concluded that we were unbelievably stupid and I must admit that I have many times been chagrined because of my own failure to recognize the obvious. Such a charge, however, carries a challenge to your generation to make as great or greater contributions. Certainly much remains to be done.

The unimaginative person wishing to do something worth while may readily develop the feeling that everything important has been done and that surgery is, for that reason, no longer attractive. The imaginative one, however, will recognize upon every ward-round unsolved problems just waiting for some one with the energy and initiative to undertake their solution. It is amazing how many are readily solvable. We, in my generation, have picked from the surface, leaving many gems to be exposed. Fortunately you start with a far better basic knowledge than we did and therefore should be better equipped for the search. For the solution of many of these clinical problems no complicated and expensive apparatus is necessary. I listened two months ago to a thrilling lecture on the pathology and aetiology of osteo arthritis by Professor Trueta of Oxford which illustrated well what can be accomplished by careful observation with imagination and energy. I am sure that it is a most important piece of work yet, the observations were relatively simple and straight forward. I encountered recently a quotation from John Masfield, the Poet Laureate, "Man's body is faulty, his mind untrustworthy, but his imagination has made his remarkable". It is worth remembering because the possession and the use of imagination is what raises a man above the ordinary. I hope that some among you have the urge to make contributions. There is no greater thrill or satisfaction.

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1. Wolf, Olsen and Tyler: *Obstetrics and Gynecology*, Vol. 10, Sept., 1957.
2. Behne, D., et al: *West. J. Surg.*, Vol. 64, March, 1956.