

AN ANAESTHETIST'S VALEDICTION

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SINCE I have finally decided to retire from active clinical practice I thought it would be an appropriate time to put together a few thoughts with reference to my professional career. A valedictory address usually combines gratitude, reminiscence, admonition, aspiration, and benediction, so it is with the composition of such a theme I propose to occupy myself during these first long months of idleness.

My first thought is that I have been a very fortunate man, and I give thanks to God, and to my parents, to my dear wife and children, to my teachers, and to all my friends. Truly I can say with the psalmist, "The lines are fallen unto me in pleasant places; yea I have a goodly heritage." I am one of those rare Canadians who has just stayed put. I have lived, been educated, and practised my profession all within five miles of the house where I was born in 1894. And yet I think my life has been a full one, with plenty of variety, travel, adventure, and the satisfaction of accomplishment. Canada has always seemed to me "a good land and a large . . . a land flowing with milk and honey," and Montreal the best of all cities. Even now, in the midst of the "quiet revolution," Quebec for me is home, and surrounded as I am by my friends who speak French as well as by those who speak English, I feel indeed "chez nous."

My first personal experience with the administration of anaesthetics was just over 50 years ago. In the summer of 1916 I worked for a few weeks in what was surely one of the strangest hospitals ever devised by man. I was a corporal in No. 6 Canadian Field Ambulance, having enlisted in 1914 when I was just starting my second year in medicine at McGill. After nearly a year in the dreary, muddy Ypres area we were ordered to take charge of a "hospital for self-inflicted wounds," which served the whole of the northern British army area, and which was established in an ancient schoolhouse in a village a few miles behind the trench lines. The idea was that any soldier who was stupid or careless enough to shoot or otherwise injure himself should be sent to a makeshift hospital still within sound of the guns of war, and kept there until his wounds were healed sufficiently for him to be sent to prison, or until he was acquitted by court martial. Our hospital was certainly a makeshift one, for we had no nurses and no proper equipment—our beds were stretchers on trestles and the bedding only rough grey blankets. The patients, about 100 in number, were a motley crew, some tough and tricky and some the victims of unfortunate accidents. The wounds were mostly due to bullets through hands or feet, and all more or less septic (as all wounds were in that war). My responsibility was to look after the daily dressings, and I certainly got plenty of experience in bandaging. What brought the whole situation back into my mind just now is the memory that occasionally when a particularly extensive débridement was to be done I would help the

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surgeon by pouring a few drops of chloroform on a mask held over the patient's face—and that was my first experience as an anaesthetist.

The interesting medical activities of that strange hospital were enlivened some days by a visit from the Major commanding our section. This medical officer spent most of his time happily floating in an alcoholic fog, and it was in this condition that he insisted on making his rounds of the hospital on horseback. After some persuasion the horse was induced to step into the ward and pick its way among the patients' beds. We put up with this performance good naturedly until one day the horse decided to drop his visiting card in the centre of the ward. There was some argument about who was to clean up the mess, so I reported the situation to the Sergeant-Major who then reported to the Colonel, and the equestrian visits came to an end.

Soon we left this quiet village and went on to the more strenuous activities of the terrible battlefield of the Somme. There we watched the first tanks go into action at Courcellette, and our beloved Colonel, "Bly" Campbell, was killed. I stayed with the Ambulance during the next winter, which we spent mainly in the trenches facing Vimy. Shortly after the capture of Vimy Ridge in April, 1917, I managed to wangle my way out of the army and into the Royal Navy as a "Surgeon Sub-Lieutenant," serving as medical officer on a destroyer. I spent a comparatively blissful year at sea, pretending to know more about medicine than I did, and then in the fall of 1918 I finally got back to my long-interrupted medical course at McGill. For two years before I graduated in 1922 I served as a student intern at the Homoeopathic Hospital, then a small downtown general hospital of sixty beds, of which my father had been Medical Superintendent almost since its establishment in 1894. Here my career in anaesthesia began—and here it continued for more than forty years.

My intern colleagues during those student years were Walter Scriver and Gavin Miller. Little did we dream then that one would become Professor of Medicine and the other Professor of Surgery at McGill—and even more unbelievably, that I would eventually sit with them around the faculty table. In those days our professors seemed to us like veritable demigods! Since the hospital had no regular anaesthetist, and we saw a chance to make a few dollars, Walter, Gavin and I learned something about pouring chloroform and ether, and we took turns skipping classes to give anaesthetics. The equipment available was primitive indeed. We had no gas machine, no oxygen, no airways, no suction—only bottles of chloroform and ether, some ethyl chloride for rapid inductions, and gauze-covered wire masks. For tonsillectomies we vaporized the ether with a hand-operated Junker bottle attached to a mouth hook. The story of our adventures and mis-adventures of those days would fill a volume. Almost right away I became seriously interested in anaesthesia, and when I came back to Montreal in 1923, after a year of post-graduate work in Philadelphia, I was appointed the first anaesthetist on the attending staff of the Homoeopathic Hospital. I continued for a good many years to do some general practice, but it seemed to me that the needs and the opportunities in the realm of anaesthesia were almost overwhelming.

The first problem which interested me was the provision of a better airway.

Anaesthesia in those days was all too frequently associated with bubbling, gurgling, retching, regurgitation, tongue-biting, wild thrashing about, and sometimes deadly asphyxia. The first piece of equipment I acquired was a metal pharyngeal airway, and then a small electric suction pump. Intratracheal anaesthesia was my next venture, first by insufflation of ether through a small catheter, and later using gas and oxygen through larger tubes. The endotracheal method was a very great advance, but it came slowly and in the face of much opposition from surgeons and from some anaesthetists. The dire results of trauma to the larynx or trachea, or some other disaster, were pointed out with alarming warnings, but I always felt that the advantages of an unobstructed airway were so great that they must be achieved regardless of risk. Very few anaesthetists of the 1920's were even attempting the endotracheal technique. Ivan Magill in London had just started to preach its advantages, and Charles Stewart in Montreal and Ralph Hargrave in Toronto were early enthusiasts. The tubes we used and the methods of administration were changing frequently, and dexterity at intubation was perhaps more important then than now, since this was long before the advent of muscle relaxants. Gradually many of us abandoned ether insufflation for a semi-closed inhalation technique with more oxygen and nitrous oxide or ethylene, and this called for larger endotracheal tubes. I found some French silk-woven urethral catheters which seemed to be ideally flexible without kinking, and we ordered them directly from the manufacturer in increasingly larger sizes, until they eventually made them for us in size F36. We were amused one year when the manufacturer's representative from France came to the hospital and told us that the girls in his factory had asked him to have a look at those Canadians who needed a size 36 catheter!

From the times of my earliest ventures into anaesthesia I was never satisfied that ether was the ideal agent which many claimed it to be. I had too vivid a memory of a most unpleasant ether anaesthetic I had received for an appendectomy when I was a schoolboy. Surely, I thought, there should be something better than that. I liked to give chloroform but I realized its possible danger. I started to use nitrous oxide, but I never became really expert with it. The technique which McKesson made famous, and which his disciples Clement and McCarthy perpetuated ("secondary saturation"), always made me feel as though the anaesthetist was walking along the top of a narrow fence, in danger on the one hand of providing inadequate oxygen and on the other of giving utterly inefficient anaesthesia. So I liked ethylene when it appeared in 1923, because here was a gas, not very toxic, with which one could give 20 or 25 per cent oxygen and still keep the patient asleep. True, ethylene wasn't a very good muscle relaxant, but one could mix a little ether or chloroform with it when necessary, and for many operations it was quite adequate by itself. So for ten years I made ethylene my agent of choice. Surgeons didn't like its garlicky smell, but I never heard a patient object to it. Some doctors criticized me for using such a dangerous explosive, while at the same time they were using ether without any precautions at all. I guess I was just lucky about explosions, but at least I recognized early that static sparks were the greatest danger, and that one should pay attention to humidity.

In 1928 I read my first paper at a medical meeting, in Boston, entitled "Intra-tracheal Ethylene-Oxygen Anaesthesia." Of the hundred or more anaesthetists who were in the audience probably not more than ten had ever passed an endotracheal tube, so they weren't much interested in what I thought were the fine points of my presentation. But fortunately for me Ralph Waters, then in his early years at the University of Wisconsin, was there, and with his usual friendliness he came up to me afterward, introduced himself, and congratulated me on my paper. The next year he came to a meeting in Montreal and paid me the compliment of coming to my hospital to see me work, and later he invited me to join with him and John Lundy in the group which became known as the "Anaesthetists' Travel Club" (now the Academy of Anesthesiology). Thus began a long friendship which I am happy to say still continues. Waters is one of the three men to whom I am most indebted for inspiration, encouragement, and advice in my career in anaesthesiology. How fortunate I have been in having such mentors! I can hardly call them my teachers, for I taught myself all my good and bad habits, but looking back now after all these years I realize how much I leaned on them for support and guidance.

The first really to influence me toward anaesthesiology was Dr. Frank McMechan, the founder and editor of the International Anesthesia Research Society. I met him in 1923 when I was just starting my medical practice. He had a way with him that made me feel that even I, a young unknown doctor, had something to contribute toward the development of better anaesthesia. McMechan had been fighting a heartbreaking battle for the acceptance of anaesthesiology as a worthwhile medical specialty. Professional attitude in those days was generally to consider anaesthesia as a refuge for the doctor who couldn't succeed at anything else, and there was much antagonism, particularly in the United States, against raising the "ether dropper" to any higher status than that of a technician. McMechan let no obstacle stand in the way of his crusade—and the obstacles were many, for he himself was an arthritic cripple forced to live and work in a portable wheelchair, and in constant pain. Nevertheless, he spoke and wrote with evangelic fervour. We became good friends, and until his death in 1939 he was my counsellor and my inspiration. In later years I tried to carry on McMechan's ideals for better anaesthesia everywhere. In 1948 I joined the Board of Trustees of the I.A.R.S., and I helped to organize an international congress of anaesthetists in London in 1951. From that gathering a committee was formed to plan a world organization. I was elected chairman of this committee, and eventually in 1955 I had the honour of becoming the first president of the World Federation of Societies of Anaesthesiologists. The effective work of this now powerful World Federation is exactly the kind of activity which Frank McMechan started so many years ago.

The third anaesthetist to whom I am deeply indebted is my colleague and friend, Wesley Bourne. He was the great Canadian pioneer of modern anaesthesiology. Before anyone else, he recognized that the basic sciences of physiology, pharmacology, biochemistry, and anatomy are the foundation stones of our castle, and he pleaded and wrote and preached for better educational facilities. In the course of time the seeds he sowed bore fruit, and I had the good fortune

to be associated with him in the establishment of the first really well-organized anaesthesia teaching department in a Canadian medical school. When eventually I succeeded him in the Chair of Anaesthesia at McGill all I tried to do was to travel on in the path along which he had pointed the way.

The 1930's were exciting years to be in anaesthesiology, for so much was needed and many new ideas were being discussed. The problem of better airways had been solved, so far as I was concerned, by the use of endotracheal tubes; but we certainly had not found ideal anaesthetic agents. Avertin (tribromethanol) was introduced and was popular for a while because it provided such a gentle, pleasant induction; but it was soon evident that this was a depressing drug when used in anaesthetic dosage, and too slowly eliminated in sick patients. Then came vinyl ether, with perhaps some slight advantages over ethyl ether, but never very widely accepted. At about the same time, intravenous barbiturates appeared, and at first these were promoted with great enthusiasm for general anaesthesia in all kinds of operations. There was Sodium Amytal, then Eviphan, then Pentothal, and in recent years there have been many others. There is no doubt that the impact of short-acting intravenous barbiturates has been quite revolutionary. As soon as we realized that these drugs should be used in dilute solution, and in minimal dosage for the sole purpose of rendering a patient quickly and pleasantly unconscious, all apprehension and fear was taken away from anaesthesia. What a boon this has been—almost incomprehensible to those who have not been anaesthetists in the days of dreadful fighting inductions!

However, it was cyclopropane about which I became really excited in those early days. First reported as an anaesthetic agent in 1929 by Lucas and Henderson, of Toronto, cyclopropane was given an extensive clinical trial by Waters, in Madison, in 1933. After a visit with him, I started using cyclopropane in Montreal the same year, and since then it has remained my favourite anaesthetic agent. But in these reminiscences I must not let myself wander off into a defence of cyclopropane. All I shall say is that it has served me well in many thousands of operations (I numbered the first 10,000 of them), and that I have liked it because it is controllable, it is potent yet relatively non-toxic, and it can be given always with plenty of oxygen. So cyclopropane filled our requirements pretty well. Bev Leech, in Regina, was equally enthusiastic, and by 1940 we pooled our statistics and published a paper, "Cyclopropane Unmixed," in which we reported using this agent alone in over 500 upper abdominal operations. Some of our friends would not believe us, for this was in the heyday of spinal anaesthesia. But I still contend that one can obtain almost complete relaxation with cyclopropane alone in nearly every patient. Since this involved sometimes rather alarmingly high concentrations of the gas, I was somewhat relieved when there appeared on the horizon the possibility of obtaining muscle relaxation in another way.

I have told the story many times of how I had the good fortune first to use curare in anaesthesiology, and I won't repeat it all here. It is enough to recall that the idea was not mine, but came to me from my friend Dr. Lewis Wright, of New York. He told me in 1940 about a newly standardized curare extract, to which Squibb had given the name "Intocostin," and which he thought might be

useful in the operating room. Since by the end of 1941 no one else seemed to have been rash enough to try this drug, I asked Doctor Wright to send me some. On January 23, 1942, Dr. Enid Johnson, my clever resident, and I gave some to a young man during an appendectomy under cyclopropane anaesthesia. Since this turned out to be rather an historic occasion, which to some extent changed the whole practice of anaesthesiology, I feel I should record my conviction that we were not quite so foolhardy as some have thought. "Intocostrin," which until then had not been used in clinical anaesthesia, had been given quite an extensive human trial by Dr. A. E. Bennett, in Nebraska, for the purpose of softening muscle contraction during convulsive shock therapy. We reasoned that if curare did not kill these psychiatric patients it should be at least as safe during surgery, because anaesthetists, even then, were experts at maintaining respiration during temporary paralysis. Anyway, our "Intocostrin" seemed to work in a satisfactory way, and was quite different from anything which had previously been used. So, after a short series of cases, we reported it, and in a surprisingly short time there was widespread acceptance. Of course there were many skeptics and some critics, but it was quite obvious that curare did meet a long-felt need, and with reasonable safety.

In the following years many new muscle relaxant drugs came on the market. We tried them all, and by 1952 came to the conclusion that succinylcholine, because of its short action and its controllability, most satisfactorily met the needs of the anaesthetist. Since then I have used succinylcholine in my own practice almost to the complete exclusion of curare and other relaxants.

The almost fortuitous introduction of curare did have an amazing effect on my own career. I was even written about in *Time* magazine, and was invited to address numerous august medical audiences. In 1944 I was asked to become Consultant in Anaesthesia for the Royal Canadian Air Force, and had the honour to wear His Majesty's uniform once again. Thus, perhaps uniquely, I completed my tour of all three services. I am all in favour of integration, but I must admit a still persisting affection for the Navy. After the war I was plunged quite unexpectedly into the academic world. Because my hospital had no formal connection with McGill, I had never dreamed that I might be given a teaching appointment. But Wesley Bourne was then in the throes of establishing a newly-authorized Department of Anaesthesia in the Faculty of Medicine, and he needed help. Anaesthesia was at that time poorly organized in some of our large teaching hospitals, and Digby Leigh, who had been a mainstay in our teaching efforts during the war, had decided to go to Vancouver. So began a part of my career which has given me much happiness and great satisfaction. Nowadays I can look over the world and watch the careers of literally hundreds of anaesthetists in many countries, knowing that I have had some share in getting them started. No greater reward can come to a teacher than the joy of seeing his pupils contributing in their own way toward better anaesthesia everywhere. We anaesthetists are really lucky fellows, for no matter where we go, in war or in peace, our job is to relieve suffering. Truly it has been said that anaesthesiology is "Deorum ars," or God's own art.

Where do we go from here? I hesitate to prophesy. We have, by the grace

of God, arrived at a stage where anaesthesia is pleasant, safe, and efficient; and those who practice anaesthesiology are recognized as indispensable members of the modern health team. When I started 50 years ago no one dared dream that all this might happen. Yet I am sure we have not quite reached the promised land. Probably there will be as fantastic changes during the next 50 years as there have been during my lifetime. We are now just beginning to get a glimpse of the mysteries of intracellular metabolism, and we are not even sure of the differences between sleep and anaesthesia. However, we do know that anaesthetized patients are not just "asleep." Perhaps the greatest advance in modern anaesthesiology is the recognition that in order to preserve vital function we must manage anaesthetized patients differently than we would patients who were just in physiological sleep. The most obvious aspect of this problem relates to respiration. Nowadays we *ventilate*. We push oxygen in, and we push carbon dioxide out. If the patient won't do this vigorously for himself, we don't hesitate to do it for him. It would be hard to imagine oneself practising good anaesthesia today without some means of efficient manual or mechanical ventilation in frequent use. But a few years ago things were not like this. If the anaesthetized patient was breathing at all we usually left him alone, on the theory that even a little spontaneous respiration was better than anything we could do for him artificially. The resulting hypoxia, acidosis, atelectasis, pulmonary oedema were all too often attributed to "ether pneumonia," or "cyclopropane shock," or just to "le bon Dieu."

Many factors have contributed to the better understanding and handling of some of these problems in the anaesthetized patient. Careful and intelligent observation of patients by anaesthetists in postoperative recovery rooms and in intensive care units has certainly helped us to realize the disastrous results of under-ventilation. And there is no doubt that the advent of muscle relaxants was also a factor. When we started using muscle relaxants we simply had to do something about supporting respiration, because normal respiration depends on functioning muscles. We piled muscle relaxants on top of narcotics, barbiturates and depressing anaesthetic agents—it is no wonder the patient stopped breathing. In my opinion it has all worked out to the patient's advantage, for now we *know* we have to look after his breathing for him, and with modern equipment we can do this far better than he ever was able to do spontaneously during deep anaesthesia. There should never again be so many postanaesthetic respiratory complications. And better carbon dioxide absorption has been an important factor in making controlled respiration practical and safe.

Attention to ventilation, blood, fluid and electrolyte replacement, and good cardiac monitoring are the very pillars of modern anaesthesiology. The choice of anaesthetic agent is perhaps not so important as it was 25 years ago. So I have watched with nostalgia, but not much opposition, the gradual eclipse of my favourite cyclopropane from Canadian practice. I still think it a very versatile, safe, and satisfactory agent when properly used. But halothane and methoxyflurane have the unquestioned advantage of non-flammability. When they, in turn, are properly used they seem to be just about as safe as cyclopropane, even in bad risk patients. I once thought that, in combination with muscle relaxants, we might see a return of popularity for ethylene, since no anaesthetic ever had a better

pharmacological record, but explosibility was too great a handicap. Muscle relaxants, however, did give new fields of usefulness to nitrous oxide, now probably the most widely used of all anaesthetic agents. The only word of caution I want to insert here is to remind anaesthetists that nitrous oxide when combined with more than 20 per cent oxygen is really not a very good anaesthetic (from the point of view of rendering patients completely unconscious), and that muscle relaxants are not anaesthetics at all. So, with a nitrous-oxide-muscle-relaxant combination there is a danger, however slight, of awareness on the part of the patient, a situation which might lead to terrifying consequences for both patient and anaesthetist.

I haven't said much about the various forms of conduction anaesthesia. I never became very expert with regional blocks, although for some years I did give a lot of spinal anaesthetics, and liked the method, particularly in obstetrics. However, I am convinced that for anything more formidable than a tooth extraction or the suturing of a small laceration most patients prefer to be unconscious during surgery. And now that we have been able to make general anaesthesia quite pleasant and relatively safe, there is seldom a good excuse for subjecting patients to regional anaesthesia for major operating room procedures. For instance, to do a thyroidectomy in a nervous young woman, or to pin a hip in a frail octogenarian, under local anaesthesia, seems to me to be needless cruelty. I may be mistaken, but I think that the practice of regional anaesthesia, even the popular method of peridural anaesthesia, will gradually disappear. Of course I have no objection to doing certain eye and ear and brain operations under local, provided the patient is well sedated and an anaesthetist is present to watch for and control unforeseen reactions.

Sometimes when I think of the future of our specialty I feel concerned not only about the socialization of medicine and the lack of individual doctor-to-patient contacts, but also about the emphasis which seems to be placed in our teaching programs, our meetings, and our literature, on abstruse subjects with very little possibility of any practical application. We all need to know some biochemistry and some basic physiology, but very few of us even know what is being talked about when the formulae and the equations and the statistical analyses become too sophisticated. A few years ago I wrote a paper on the "Pre-eminence of the Commonplace," and I think that is what should be the principal concern for most of us. Ninety per cent of our work will continue to be the provision of pleasant, efficient, and safe anaesthesia for tonsillectomies, herniotomy, varicose veins, appendectomies, and other abdominal operations, obstetrical deliveries, and other so-called routine procedures. These jobs should be done well, with wisdom, care, and kindness, and it is work which calls for the best that is in each one of us. I admire the anaesthetists who are called upon to guide patients through the complicated and fantastic ordeals of some modern surgery, but I have never either envied them or felt inferior to them. Let us not be ashamed to be just "commonplace" anaesthetists.

Many years ago, more or less accidentally, I drifted into an interest in hospital administration, and for nearly 30 years I was the medical superintendent (unpaid) of our hospital. In the present-day state of complicated hospital organization it would probably not be possible for a busy anaesthetist to bear this kind

of additional burden, but the work did give me some opportunities to demonstrate how an anaesthetist can be useful around a hospital outside of his own specialty. Some of my colleagues used to claim that the position gave me an unfair advantage in keeping the surgeons quiet when I wanted to try out something new on their patients—but on the whole we were blessed with harmonious staff relations. I was, however, in a position to get things done without becoming all tied up in red tape. For instance, back in 1943 I heard about a “postanaesthesia recovery room” which my friend John Lundy had started at the Mayo Clinic. Within a month I acquired space in a solarium, persuaded our Women’s Auxiliary to finance the needed equipment, chose one of our best nurses as supervisor, and opened what was then the first postoperative recovery room in Canada. This sort of activity gave me great satisfaction, and contributed to hospital progress. Nowadays one would have to try to get such a new idea approved “for next year’s budget.”

It has been great fun to see anaesthesiology come of age, just as it has been fun to watch Canada growing up all through the second half of her first century. The best feature of Canada’s progress has been the work of devoted, high-minded men and women. Anaesthesiology has developed only as the result of the same kind of sacrificial service. A great medical organization, such as our Canadian Anaesthetists’ Society, of which I had the honour of being elected the first president, is not just born and does not grow spontaneously. The names of our pioneers—Johnston, Webster, Larocque, Bourne, and many others—should and will be recorded elsewhere. All I am trying to do here is admonish my readers to keep up the good work. We stand at a critical time in medical history, and the greatest danger to our professional liberty lies in our own indifference. So, you young men and women, attend meetings, serve joyfully on committees, run for office; let your voices be heard, not only in your own specialists’ organizations, but also in the hospitals, in general medical meetings, in politics, in school and church activities, and among your neighbours!

I don’t hold with the cynics that life is meaningless and all civilization a farce. In my old age I find my thought going back to things we learned as schoolboys. How many remember these lines?

Tell me not, in mournful numbers,
Life is but an empty dream! . . .
Life is real! Life is earnest!
And the grave is not its goal. . . .
Lives of great men all remind us
We can make our lives sublime. . . .
Let us then be up and doing,
With a heart for any fate:
Still achieving, still pursuing,
Learn to labour and to wait . . .

To me these words don’t even sound “corny” any more. I guess I have just turned into a sentimental old fogey, but somehow there still rings in my ears the advice of St. Paul to Timothy, “Study to show thyself approved unto God, a workman that needeth not to be ashamed, rightly dividing the word of truth.”

And now, Amen—may God bless you all!