

Preserving the Heritage of Canadian Anesthesiology

A Panorama of People, Ideas, Techniques and Events



SCIENCE • VIGILANCE • COMPASSION

David AE Shephard, MB FRCPC, Archivist, CAS
Kim E Turner, BScPhm MD FRCPC, Deputy Archivist, CAS

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A WORLD OF PEOPLE

alive & well
À la santé du monde !



Abbott Laboratories, Limited
Laboratoires Abbott, Limitée

In the early years, “almost anyone who could hold a mask and pour on some drug was allowed to administer an anaesthetic.”

— *Samuel Johnston, 1927*

Anesthesia was at first a craft; from 1920 to 1943 it was a discipline; and from then on, anesthesia grew rapidly as an increasingly sophisticated medical specialty.

How did this evolution come about? Who among our professional predecessors took part in this development? In short, who laid the basis of Canadian anesthesia? Many of our predecessors applied the knowledge as it developed, particularly in the United States, Great Britain, and Europe, but a few contributed by recognizing, facing, and overcoming significant challenges, both academic and practical. Today, we (and our patients) have the good fortune of being the beneficiaries of the work of former anesthesiologists in Canada.

The purpose of this publication is to convey a sense of some of the contributions made by Canadian anesthesiologists over the past century and a half. In this way, we can recognize and preserve the professional heritage that we are proud to share.

The new chapter in medicine in Canada opened on 18 January 1847, just three months after William TG Morton gave his convincing demonstration at the Massachusetts General Hospital in Boston. In

Only three months after ether was introduced as an anesthetic in October 1846, Canadian physicians were beginning to give their patients the benefits of this old drug for a new medical procedure. By the spring of 1847, research was added to clinical practice, though teaching came much later.



The Chronicle (*Saint John*)
Friday January 22, 1847



*Dr E Dagge
Worthington*

Saint John, New Brunswick, according to *The New Brunswick Courier*, Samuel Adams, a Boston dentist, administered ether while Dr Hunter Peters excised a tumor from a man's arm. As Saint John is linked by sea and not far from Boston, it is not surprising that ether was first given in British North America there.

The extraordinary value of ether was soon recognized in other regions: 12 March 1847 in Prince Edward Island (Poole, a dentist); 27 April 1847 in Ontario (George Goldstone, a surgeon); sometime in May 1847 in Nova Scotia (L Van Buskirk); and towards the end of July 1847 in Newfoundland

(Edward Keilley, a surgeon).

Some early Canadians used great imagination and technical ingenuity in solving the problems of using ether, and we see that throughout the history of anesthesia, in Canada as elsewhere. One such Canadian was **Dr E Dagge Worthington**, who was puzzling over a challenge in Sherbrooke, Quebec on 11 March 1847. He had a patient with extensive disease of the lower leg who was

in "dreadful" pain and his patient was willing to "try any means" to get rid of the pain. Dr Worthington knew he would have to anesthetize his patient, but his nature was such that he was perhaps leery (as was the famous John Snow) of currently available inhalers. So he set about constructing a Rube Goldberg type of apparatus. He seems to have been quite familiar with the basic problems of anesthesia, and his account is certainly worth study: "A large ox-bladder, with a

stop-cock attached, a mouth-piece, made of thick leather, covered with black silk and well padded round the edges, with a connecting long brass tube that had done service as an umbrella handle in many a shower, formed an apparatus that, though rude looking, and bearing marks of having been got up in haste, presented withal a very business-like, and, for the country, toler-

"Throughout the theme of anaesthesia one finds many instances of serendipity, some associated with chance and others with sagacity."

— *Wesley Bourne, 1938*

ably professional appearance. A couple of ounces of ether were poured into the bladder, which was then filled with air from a bellows. Not having time or ingenuity sufficient to construct a double valve, the objection to inhaling carbonic acid gas again into the lungs was done away with, by simply allowing the patient, after a full inspiration from the bag, to expire through the nose, for three or four times, when the nostrils were kept closed, and the breathing confined to the bladder. From this time about six full inspirations sufficed to produce a complete effect . . .”

Research as well as technical ingenuity was characteristic of anesthesia from the beginning in Canada. A Montreal colleague of Dr Worthington's, **Dr Horace Nelson**, probably in January 1847 recognized the need to conduct research to determine the physiological effects of ether. He chose a dog first. Dr Nelson was evidently au courant with the need to provide respiratory support, for “the breathing tube was applied to the dog's mouth once every eight or ten minutes.” When he was satisfied that “the deadening properties” (not to be taken too literally!) could be reproduced in humans, Dr Nelson began to use ether to allow operations to be done on patients, evidently administering ether on a sponge. Dr Nelson learned about ether as well by inhaling it himself “over one hundred times.”

Chloroform was used for the first time in Canada on 24 January 1848, a little over two months after Sir James Y Simpson had introduced it in Edinburgh. Dr Worthington was again first on the scene here. But then there was something of a latent period in anesthesia over the next few years, only nitrous oxide, which Horace Wells had used in 1844, reentering practice in the late 1860s. In the second half of the 19th century, anesthesia remained just a craft. This is confirmed by the publication in 1901 of an entertaining set of “anaesthetic requirements” by **Dr Charles O'Reilly**, of the Toronto General Hospital.

The need for feathers and also ice for the rectum also suggests that anesthesia had not advanced much since the days of Drs Worthington and Nelson. However, things started picking up from 1905 on. The appointment of **Dr William Webster** as Lecturer in Anaesthesia at the Manitoba Medical College was the first academic appointment in Canada. He had been appointed Honorary Anaesthetist to the Winnipeg General Hospital two years earlier, and by 1907 he decided to limit his work to anesthesia — another first. Dr Webster convinced his surgical

AN ANAESTHETIC CHART.

The following chart arranged by Dr. Charles O'Reilly, of the Toronto General Hospital, has been widely adopted in Hospital practice.

ANÆSTHETIC REQUIREMENTS.

Instruments.

Tongue Forceps.
Mouth Gag.
Tongue Depressor.
Sponge and Holder.
Tracheotomy Tube.
Tracheotomy Knife.
Feathers, for tube.
Hypodermic Syringes.
Oesophageal Forceps.
Davidson Syringe.

Miscellaneous.

Wax Candle and Matches.
Large Fan.
Blocks or Bricks to elevate table.
Conical Jaw Opener.
Battery.

Restoratives.

Liq. Amm. Fort.
Spts. Amm. Arom.
Brandy and Whiskey.
Liq. Strychnin. (dose 5-10 minims.)
Ether.
Tr. Digitalis.
Sol. Green Tea
Amyl. Nitrat. (Pearls.)
Oxygen Gas.
Nitro-glycerine $\frac{1}{2}$ gr.

Miscellaneous.

Towels for Friction.
Hot water Bottles, Cold Water.
Ice, for rectum.
Forced Respiration Apparatus.
Saline Solution, \mathfrak{z} i. to \mathfrak{v} i.

The publication in 1901 of anaesthetic requirements.

“Those of us who have had the good fortune to be on the scene . . . during the great developments in the anaesthetic world in the past thirty or forty years, and who have taken some part, perhaps, in the building of the present structure, have no fear for the future of anaesthesia in Canada. We know that it rests in very able hands.”

— *Hf Shields, 1955*



Dr William Webster

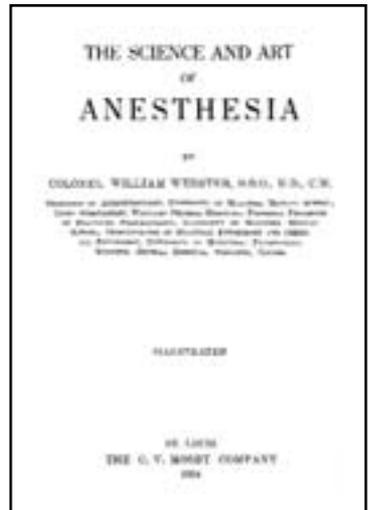
colleagues of the value of a competent and interested anesthesiologist. As a colleague noted, “surgeons quickly found that the ‘proverbial whiff’ went along more smoothly in the hands of one who endeavored to understand the basic laws of inhalational anesthesia rather than an individual who looked upon the administration of an anesthetic as the passing of an easy hurdle towards the month’s rent.” Dr Webster became increasingly active in teaching, and in 1924 he distilled his wide knowledge of anesthesia in *The Science and Art of Anesthesia*, the first Canadian text on anesthesia.

At about the same time as Dr Webster was convincing surgeons in Winnipeg of the need for competent anesthesiologists, **Dr Samuel Johnston** was doing much the same in Toronto.

However, for too many years, most anesthetics were given by individuals who had very little understanding of the art and

colleagues of the value of a competent and interested anesthesiologist. As a colleague noted, “surgeons quickly found that the ‘proverbial whiff’ went along more smoothly in the hands of one who endeavored to understand the basic laws of inhalational anesthesia rather than an individual who looked upon the administration of an anesthetic as the passing of an

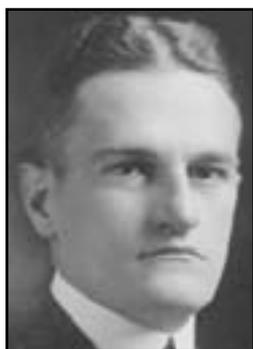
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The Science and Art of Anesthesia, the first Canadian text on anesthesia.



Dr Samuel Johnston



Dr Wesley Bourne

science of anesthesia, and in Toronto two enlightened steps were taken in 1907: a department of anesthesia was established at the Toronto General Hospital and a university lectureship in anesthesia was inaugurated, with Dr Johnston named to both. Dr Johnston did much to open a new era in anesthesia in Toronto, and, indeed, in Canada. Dr Johnston laid the foundations of training in anesthesia in Toronto and his friendship with other Canadian anesthesiologists, particularly Dr William Webster in Winnipeg and **Dr Charles LaRoque** in Montreal, gave him national standing. After the Canadian Society of Anaesthetists was founded in 1920, Dr Johnston was elected President.

The founding of the Canadian Society of Anaesthetists in 1920 was one of many illustrations that Canada was beginning to find itself as a nation. It marks the time when Canadian anesthesia evolved from a craft to a discipline. This is evident in the development of research in the 1920s. **Dr Wesley Bourne** was prominent here. A graduate of McGill University, Dr Bourne's first appointment was as

Demonstrator in Pharmacology; later, he was promoted to Lecturer. It was as an anesthesiologist and pharmacologist that he became most widely known in the 1920s and 1930s. He conducted early research into numerous drugs used in anesthesia and their effects on the body. He was also well known for positions he held as the



*Operating room scene (left to right)
W Bourne, FW Nagle, GM Geldert, c 1915*



*Canadian Society of Anaesthetists
was founded in 1920.*



The Henry Hill Hickman Medal of the Royal Society of Medicine.

Secretary of the Canadian Society of Anaesthetists and as the President of the International Anesthesia Research Society in 1925 and again in 1940. Dr Bourne also represented Canadian anesthesia outside Canada, for in 1935 he was awarded the high honour of the Henry Hill Hickman Medal by the Royal Society of Medicine, and in

1942 he was elected President of the American Society of Anesthesiologists — the only Canadian to be so honoured). In these various capacities, Dr Bourne not only made significant contributions to anesthesia in Canada but he drew the attention of anesthetists outside Canada to what Canadians were doing.

Canadians were increasingly active in the interwar years. In 1923, research on ethylene by **Dr William Easson Brown**, of Toronto, was another indication of the productive investigation that was going on in Canada, coming as it did just after Dr Frederick Banting and Dr Charles Best had done their extraordinary work on insulin. Brown's work was on the cutting edge of research, for it was reported virtually simultaneously with the work of the American team of Arno Luckhardt and Jay Carter. At the end of the 1920s came the first studies of another anesthetic, cyclopropane, by Toronto pharmacologists **Velyien Henderson** and **George Lucas**. Regrettably, a series of



Dr William E Brown



Velyien E Henderson

deaths attributed to anesthesia and awareness of the general problem of explosion put a stop to the research on cyclopropane (in which Dr Brown also took part), and it was in Madison, rather than Toronto, where cyclopropane was introduced into clinical anesthesia by Dr Ralph Waters and his colleagues in 1934.



George H Lucas



Plaque commemorating the first use of divinyl ether in humans.

other words, the anesthetic properties of divinyl ether were divined from the known properties of Brown's ethylene and also ether. Second, some of the first work on divinyl ether was done by two Canadians: internist **Irving R Bell** and physiologist **Samuel Gelfan**, of the University of Alberta in Edmonton. Their article was published in 1933, opening the same issue of the *Journal of Pharmacology and Experimental Therapeutics* that contained the article by Chauncey Leake and Mei-Yu Chen, which was high recognition of the Edmonton work.

Clinical research by **Dr Beverley Leech**, of Regina, also caught the attention of anesthetists. Dr Leech wanted to overcome the problem of making an airtight fit for apparatus through which cyclopropane was administered in a closed circuit. His solution, published in 1937, was comprised of two elements: a) a metal core shaped to be adapted to



The Leech airway

Canadians continued to make significant contributions to anesthesia in the 1930s, on both the research and the clinical fronts. Research on divinyl ether was interesting for two reasons. First, as Chauncey Leake said of it, "here at last had science triumphed in predicting what a new drug might do on living things before it had existence." In



Dr Beverley Leech

the mouth and pharynx, the lower expanded end preventing the epiglottis or other tissue from closing over the lower aperture, and b) a rubber bulb that would conform to the shape of the pharynx. Although its purpose was different from the much later laryngeal mask airway, it was, in a sense, its forerunner of it.

Another Canadian who continued in the line of imaginative and inventive anesthesiologists was **Dr Digby Leigh**, of Montreal before he moved



Dr Digby Leigh



Dr Ron Stephen



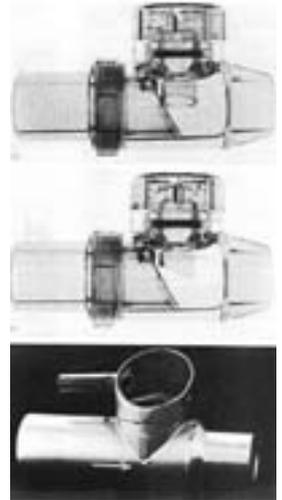
Dr Harry Slater

to Los Angeles in 1954. Dr Leigh was one of Canada's first pediatric anesthesiologists. He invented several pieces of apparatus that enabled innumerable colleagues to adapt agents and techniques of adult anesthesia to pediatric work. Two notable inventions were the non-rebreathing valve and the infant circle filter.

Dr Digby Leigh also made enormous contributions to teaching and to the professionalization of anesthesia in Canada. As a member of "The Great Triumvirate" of Wesley Bourne, Harold Griffith and himself, Dr Leigh was instrumental not only in conducting short courses on anesthesia for doctors about to join the armed forces in World War II, but also being one of the founders of the Canadian Anaesthetists' Society in 1943.

Two other Canadians who were interested in pediatric anesthesia also invented equipment that improved the standard of anesthesia for children. These were **Dr Ron Stephen** and **Dr Harry Slater**. Both at one time

of Montreal, these two anesthesiologists invented the Stephen-Slater non-rebreathing valve. Both of these Canadians were mechanically adept. Dr Slater, for example, invented ingen-



Component parts of a non-rebreathing valve.

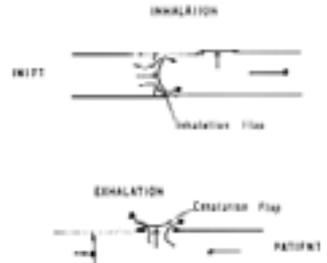


Figure 7.13. Stephen-Slater valve.



The Stephen-Slater non-rebreathing valve.

“Canadian surgeons and anaesthetists were making a valuable contribution to . . . cardiac surgery.”

— *Kenneth Keown, 1956*



The telephone inhaler

ious devices to facilitate the induction of anesthesia in children (eg, the telephone inhaler and the space-helmet inhaler for use with nitrous oxide), and Dr Stephen achieved further renown during his later tenure at Duke University, where he took a leading part in designing the Duke Trilene Inhaler.

At a later stage, anesthesiologist **Dr Dan Revell**, first of Winnipeg and then Victoria, brought his unusual inventive talents to bear on pediatric

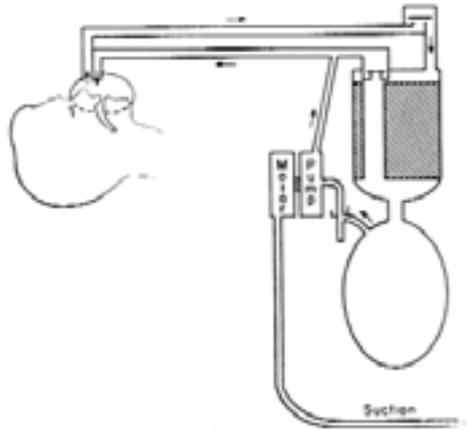
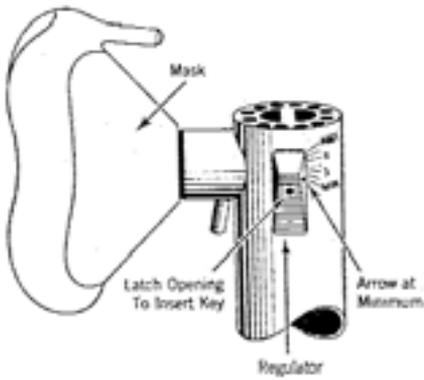


The space-helmet inhaler

anesthesia. He designed, out of parts that included the motor of an automobile windshield wiper, a circulator to overcome the problems of dead space and resistance in the circle absorption system as used for anes-
the-

“ . . . anaesthesia in Canada today stands at a cross-roads, with boundless opportunity for prestige and economic security if we take the right road. Never has our position been so strong and, if we only will realize it, we actually are able to insist that proper principles are enforced. In my opinion, even more important than declarations of policy or the making of rules, is the necessity for each one of us, young or old, to resolve that he will give the best kind of anaesthetics of which he is capable, without regard for when this may involve sacrifice of time and leisure or material reward. It is by demonstrating that we can give better patient care than the unqualified anaesthetist that we will become respected and secure. In our relations with others let us live as a ‘happy band of brothers.’ ”

— *Harold Griffith, 1951*



Duke Trilene inhaler
 sia in children.

Revell circulator to eliminate dead space



Dr Harold Griffith



Montreal Homeopathic Hospital



Dr Griffith giving an anesthetic

**THE HOMOEOPATHIC HOSPITAL OF MONTREAL
ANAESTHESIA RECORD**

Ward 210 Date Jan 23 1942 Surgical Risk A B C
 Name A. B. Townsend Age 20 Weight 150 (approx)

Operation Proposed _____
 Physical Findings Normal Except Intercostal Spills 15cc
 Cont'd # 255

Preliminary Medication Serum Dose _____ Time 9:15

Anaesthetic Agents Used Cyclopropane

Technique Mask + airway

Remarks: Intercostal Spills (curare) 3.5cc given intravenously in 1 1/2 min. as operation started - no appreciable effect on pulse or respiration. After 5 min. another 1.5cc of Intercostal given. Apparently complete relaxation of abdominal muscles resulted and continued for 20 minutes during which time Cyclopropane was lightened. At end of this period muscle tone returned probably from wearing off of curare effect. Cyclopropane was then increased in concentration and anaesthesia continued in the usual way.
There was no demonstrable change in pulse, B.P. or respiration.

Time -- Anaesthetic Began at 10:05 AM
 Operation Began at 10:17 AM
 Operation Finished at 11:15 AM

Nature of Operation Performed Appendectomy
 Surgeon A. S. Robinson Anaesthetist Dr. E. Johnson & H. S. Hill

Remarks on Postoperative Condition _____

Curare anesthetic record

No. 1017

Toronto, Ontario

It is hereby certified that
Stephen Hemmott Evelyn
Toronto, Ontario

fully registered as a medical practitioner
and in good standing with the
College of Physicians and Surgeons
of Ontario, Canada,
has been granted additional registration
as a specialist in
Anaesthesia

in accordance with the regulations of the
College and under authority of the Medical
Act cited as the Medical Amendment
Act, 1944 re specialists.

Date June 7, 1949



John Sheehan
President

Robert M. Noble
Registrar-Treasurer

Certification by the Royal College of Physicians and Surgeons of Canada in 1947, which thereby gave de facto recognition of specialty status to Canadian anaesthesia.



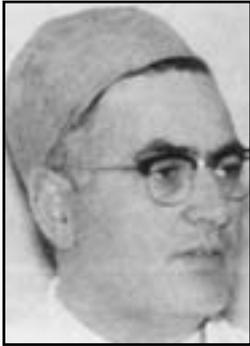
Dr Enid Johnson Macleod

Clinical anesthesia in Canada in the 1930s and 1940s was identified by one man in particular. This was **Dr Harold Griffith** who became as well known outside Canada as within. He rose to prominence in the 1920s as one of the earliest advocates of endotracheal anesthesia. In the 1930s, his expertise lay in the use of cyclopropane and also subarachnoid anesthesia, and throughout his career he remained a superb clinical anesthesiologist. Of course, he is best known for introducing curare in 1942, which completely changed the course of anesthesia. Dr Griffith's understanding of the

need to assist and control ventilation during cyclopropane anesthesia meant that he had no qualms about being asked to try out curare in the completely novel setting of anesthesia.

Dr Griffith's resident in 1942 at the Montreal Homeopathic Hospital was **Dr Enid Johnson Macleod**, who went on to a distinguished career in Nova Scotia. It was some time, however, before she could convince her colleagues that curare was a wonderful drug and not a poison when injected in the operating room!

Dr Griffith's career was meteoric after this. He was the first president of the Canadian Anaesthetists' Society upon its founding in 1943, and his international outlook made it natural for him in 1955 to be elected founding president of the World Federation of Societies of Anaesthesiologists.



Dr Arthur Sheridan

Canadian anesthesia continued to make its mark in the 1940s, when it may be said that it finally emerged as a specialty. Several developments point to this. The first development was the groundbreaking initiative of Dr Griffith in having the sheer "guts" as well as clinical understanding to



Dr Earl Wynands



Dr Stuart Vandewater

take charge of a brand new drug and anesthetic technique in the form of curare in 1942. While not in itself an indication of specialty development, it clearly showed that there were anesthesiologists in Canada who were indeed the equal of specialists in any other country. Three other events, however, did serve to mark Canadian anesthesia with specialty status.



Dr Iain MacKay



Dr Code Smith

One of these events was the creation in 1945 of the department of anesthesia at McGill University as an independent university department, in which Dr Bourne was the first professor and chair. The second event was the founding of the



Dr Barrie Fairley

Canadian Anaesthetists' Society in 1943, which showed anesthesiologists everywhere that Canadian anesthesia had come of age. The third key event was the inauguration of Certification by the Royal College of Physicians and Surgeons of Canada in 1947, which thereby gave de facto recognition of specialty status to Canadian anesthesia.

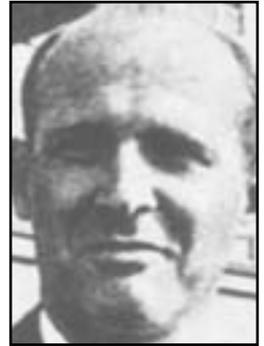
In the 1950s, operations began to become immeasurably more complex, and anesthesia had to keep pace. In fact, none of these operations would have been possible without the availability at the same time of an equally high standard of anesthesia.

Canadian anesthesiologists would from now on have to find ways of applying their art and skill to barrier-crossing invasive heart operations, delicate neurosurgical procedures, and life-giving organ transplants. And these were challenges that were most admirably met.



Dr Emerson Moffitt

That a certain standard of anesthesia would have to be achieved was signaled by the inauguration of the Fellowship examination for anesthesiologists by the Royal College of Physicians and Surgeons of Canada in 1951. The creation of a second autonomous department of anesthesia, at the University of Toronto the following year was a further indication of the steady rise of Canadian anesthesia. Emblematic of the



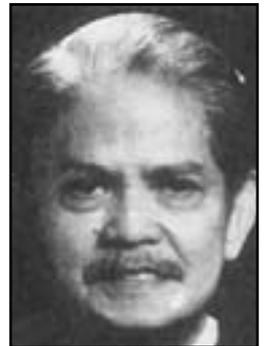
Dr Bernard Paiement



Dr EA Gain

standard that Canadian anesthesiologists were now prepared to uphold was the development of anesthesia for heart surgery, and Canadian anesthesiologists made many key contributions in this field.

Two significant developments occurred in 1950:



Dr Jose Rosales

**THE CANADIAN
ANAESTHETISTS'
SOCIETY JOURNAL**

Vol. 1, No. 1



JULY, 1954

**JOURNAL DE LA
SOCIÉTÉ CANADIENNE
DES ANESTHÉSISTES**

*Cover of first issue of The Canadian Anaesthetists' Society Journal/
Journal de la Société canadienne des anesthésistes.*

the investigation of hypothermia to permit open-heart surgery by Toronto surgeon Dr William Bigelow and the performance of the first myocardial revascularization procedure by Montreal surgeon Dr Arthur Vineberg. Dr Vineberg's anesthesiologist was **Dr Arthur Sheridan**, who passed on many of his skills in cardiac anesthesia to **Dr Earl Wynands**, who would in turn make among the most significant contributions to cardiac anesthesia in later years.

Among other leaders of anesthesia for cardiac surgery were **Dr Stephen Evelyn** and **Dr Iain MacKay** of Toronto, who in 1954 became



Dr Rod Gordon

the first Canadian anesthesiologists to publish a paper on anesthesia for cardiac surgery. Interest in hypothermia continued in these years. Some of the earliest work being done was by **Dr Stuart Vandewater**, who was interested in using it for neurosurgical procedures. **Dr Code Smith**, a pediatric anesthesiologist and also of Toronto, used hypothermia and published the second paper on cardiac anesthesia in 1955. A paper on anesthesia and hypothermia for adult cardiac surgery was published by **Dr Barrie Fairley**, likewise of Toronto,

in 1957.

In these same years, interest was steadily growing in the use of cardiopulmonary bypass, and in this setting the Canadian anesthesiologist who made the initial contributions to anesthesia was **Dr Emerson Moffitt**. He published an important paper on blood flow and blood volume in extracorporeal circulation and cardiac support with the Gibbon oxygenator in 1957, while at the Mayo Clinic. Dr Moffitt, like Dr Wynands, made numerous contributions to cardiac anesthesia, and to provided stimuli to other Canadians when he returned to Canada as professor and chair of the department of anesthesia at Dalhousie

“We can all thank God that we are engaged in a vocation which is indispensable, which is fascinating, and which is worth doing well.”

— *Harold Griffith, 1967*

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Société Canadienne des Anesthésistes



Cover of first issue of
Canadian Journal of Anaesthesia/Journal canadien d'anesthésie (CJA)



Drs Douglas Craig, Rod Gordon, David Bevan

University. Other cardiac anesthesiologists who contributed to this field in Canada include **Dr EA Gain**, of Edmonton, who worked on cardiopulmonary bypass, **Drs Marius Dubeau** and **Bernard Paiement**, of Montreal, as well as **Dr Jose Rosales**, also of Montreal, and later of Halifax.



Dr Jean-François Hardy

Among the many papers prepared on cardiac topics was one on the prophylaxis and treatment of cardiac arrest by **Drs Guy Fortin** and **René Letienne** of Montreal. This appeared in the very first issue of the new venture, *The Canadian Anaesthetists' Society Journal/Journal de la Société canadienne des anesthésistes*.

The need for a journal of anesthesia had been expressed three decades earlier, in 1922, by Dr William Webster, President of the earlier Canadian Society of Anaesthetists, when he suggested that the time had arrived to consider the “feasibility” of starting “a journal of our own . . . at an early date.” Dr Webster was thinking in international terms, but the editor of the much later journal, Dr Rod Gordon of Toronto wrote in the initial editorial that the journal would “provide a suitable Canadian medium for the presentation of original work by Canadian anaesthetists.” Events soon showed that was indeed so, and Dr Webster would no doubt have been surprised if he had been able to witness the growth of *CASJ* in the second half of the 20th century.

Publication of the *CASJ* was a landmark event in Canadian anesthesia, and its growth 50 years after its inception provides another illustration of the evolution of Canadian anesthesia. The first issue, published in July



Dr Frank Ruston



Dr Phillip R Bromage

1954, is in itself instructive, and perhaps another indication of how Canadian anesthesia was keeping up with the times. The first issue of *CASJ* contained papers that certainly looked forward. Papers included those on shock, spinal anesthesia in obstetrics, the anesthesiologist's role in the care of respiratory poliomyelitis and hexylcaine hydrochloride. These were of topical interest in 1954, and, in one form or another, numerous topics would continue to occupy the attention of Canadian anesthesiologists in the future. Another two articles concerned muscle relaxants, which later became an area of intensive research in Canada particularly by **Drs David Bevan** and **François Donati** of Montreal in later years.

In 1987, the *CASJ* changed its title to the *Canadian Journal of Anaesthesia/ Journal canadien d'anesthésie (CJA)*.



Infant ready for epidural

The editorial direction also changed with time: **Drs Douglas Craig** (Winnipeg), **Dr Bevan** (of Montreal and then Vancouver) and **Dr Jean-François Hardy** (of Montreal), oversaw the publication of influential papers over the years. Key papers by Canadians provided another view of how Canadian anesthesia was developing. These were some of the most significant:

Ruston FG. Epidural anaesthesia in infants and children (1954)

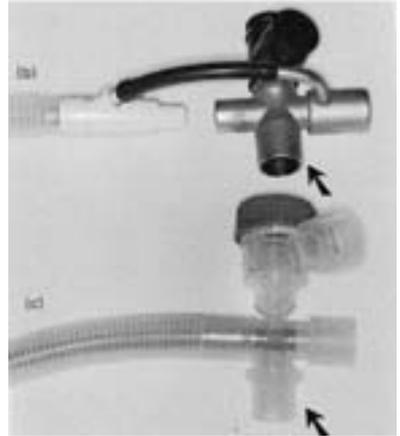
Lucas GHW. The discovery and pharmacology of cyclopropane (1960)

Britt BA, Locher WG, Kalow W. Hereditary aspects of malignant hyperthermia (1969)

Craig DB, Wahba WM, Don HF. Airway closure and lung volumes in surgical positions (1971)

Keeri-Szanto M. Apparatus for demand analgesia (1971)

Bain JA, Spoerel WE. A streamlined anaesthetic system (1972)



Bain circuit

“New challenges face contemporary anaesthetists. The present needs to flourish in the knowledge of the past. The future should be shaped by history. Make history that bridges to the future.”

— *Joan Bevan, paraphrasing Frank McMechan's The Bridge Builder, 1996*

Gelb AW, Knill RL. Subanaesthetic halothane: its effect on regulation

of ventilation and relevance to the recovery room (1978)

Noble WH, Kay JC, Fisher JA. The effect of pCO₂ on hypoxic pulmonary vasoconstriction (1981)

Mallampati SR, Gatt SP, Gugino LD, Desai SP, Waraksa B, Freiberger D, Liu PL. A clinical sign to predict difficult tracheal intubation: a prospective study (1985)

Cohen MM, Duncan PG, Pope WDB, Wolkenstein C. A survey of 112,000 anaesthetics at one teaching hospital (1975–83) (1986)

Byrick RJ, Kay JC, Mullen JMB. Pulmonary marrow embolism: a dog model simulating dual component cemented arthroplasty (1987)

Plumley MH, Bevan JC, Saddler JM, Donati F, Bevan DR. Dose-related effects of succinylcholine on the adductor pollicis and masseter muscles in children (1990)

Maltby JR, Lewis P, Martin A, Sutherland LR. Gastric fluid volume and pH in elective patients following unrestricted oral fluid until three hours before surgery (1991)

These articles covered a wide range of subjects, and they illustrate the variety of aspects of anesthesia that interested Canadian anesthesiologists and the contributions they made. These articles are some of many that had significant clinical, educational and research implications.

Consider the article by Dr Frank Ruston, of Hamilton, on epidural anesthesia in infants and children as an example. His purely clinical study is not only illustrative of a field that had important theoretical implications, but also had clinical implications many of which were demonstrated in Canada. Some of this work was conducted by **Dr Phillip Bromage** and his colleagues at McGill University, where the creation of the Wellcome Research Professorship led to wide-ranging investigations on that part of the efferent reflex arc that was blocked by local anesthetics. The article by **Dr Beverly Britt** and her Toronto colleagues may be considered as an example of one that had great research implications, but also directed the attention of anesthesiologists along educational as well as clinical lines. In contrast, the articles by **Drs James Bain** and **Wolfgang Spoerel**, of London, on the Bain circuit and by Dr SR Mallampati and his Toronto colleagues on the prediction of difficult intubation, and by **Dr Roger Maltby** and his associates in Calgary on the preoperative gastric state are examples of contributions with primarily clinical value. But whatever the implications of the differ-

ent articles, they all illustrate the important part the *CASJ* and *CJA* came to play in Canadian anesthesia and how effective a showcase it has been for Canadian anesthesia. As well, they all demonstrate the vigor that has characterized of Canadian anesthesia over this period of 150 years.

The Canadian Anesthesiologists' Society acknowledges with gratitude the support of Abbott Laboratories Limited, Datex-Ohmeda (Canada) Inc., and Tyco Healthcare Canada in the preparation of this informal history of Canadian anesthesia. It is perhaps appropriate here to add a historical note on the relationship that has grown over the years between industry and anesthesia in general, and the Society in particular. It began in November 1847, when Duncan, Flockhart and Company, of Edinburgh, supplied James Young Simpson with chloroform. It continued as ER Squibb and Company supplied ether and, later, a curare preparation to anesthesiologists, among whom Harold Griffith was, of course, the first. Since the Society's founding in 1943, many pharmaceutical and manufacturing companies have continued to nurture a relationship that has been mutually constructive. The Society has appreciated in particular the educational support of industry, and it anticipates a continuation of a mutually constructive relationship that is exemplified by this informal history and the PowerPoint and poster presentations.

“. . . anaesthesia in Canada has evolved and came to have a recognizably Canadian pattern only through the vision, aspiration and persisting efforts of individual physicians who, over the years, have accepted the particular challenges of anaesthesia in Canada. The challenges that early Canadian anaesthetists faced differ from those in later years, but it is through an understanding of how Canadian anaesthesia has evolved, in terms of those anaesthetists and those challenges, that anaesthetists today are linked to the pioneers of Canadian anaesthesia of yesteryear.”

— *David Shephard, 1990*

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