(February 13, 1933)

The Romance of Surgery

By the Hon. Dr. Herbert Bruce,
Lieutenant-Governor of Ontario.

President Chalmers:—Your Honor, Your Grace, Mr. Premier, gentlemen, the large and distinguished gathering that is assembled here to-day is an evidence of the affection and esteem in which our guest to-day is held by the people of Toronto and by the people of this Province. We are here to-day to pay tribute to His Majesty's representative in Ontario. But the tribute we pay to-day is two-fold in character: first of all, when we pay tribute to His Honor, we express our devotion and loyalty to the one common link of Empire which holds the British nations together, and also to him as Dr. Bruce in his private life, we pay tribute to the great institution of medicine, for Dr. Bruce—I speak of him as a doctor for the moment—is one of the greatest of Canada's surgeons. We are delighted to-day that His Honor has chosen to address us on his own life-work. His subject to-day is "The Romance of Surgery." I think that very few of us will realize what His Honor has done for us in speaking on this subject. He has been an exceedingly busy person since his appointment, there being no spare corners in his spare time. We greet him as His Honor but he will have the pleasant satisfaction of knowing that while he holds the highest office in the Province and the second highest in Canada, he is, in a sense, one of us, and has addressed the club on one previous occasion. I have the greatest pleasure in calling upon the Lieutenant-Governor.

His Honor Dr. Bruce:—Mr. Chairman, Your Grace, Mr. Prime Minister, gentlemen, I am emerging very timidly and rather nervously from my professional shell to talk to you as a working surgeon and as a fellow member. There is so much I owe to the Canadian Club; so many happy and instructive hours I have spent with you, that I could not fairly resist the importunities of you, Mr. Chairman, and of your committee to discuss some aspects of the history of my profession which I have ventured to call, "The Romance of Surgery." I speak to you as a surgeon, and I earnestly hope, without administering the customary anaesthetic. I trust that this surgery will be of the painless kind and that you will not have occasion to remember the operation.

I will endeavor to point my lancet with general interest rather than with technicalities. If you leave this meeting feeling that I have not given you sufficient knowledge to enable you to adopt my profession, you will, I am sure, excuse me, both on the grounds of consideration for your feelings and of natural disinclination to prejudice my own interests by stimulating competition.

A cynic has said that an appendix is an organ no longer of any use to men but of considerable value to surgeons. Be that as it may, many thousands of men and women are living useful lives to-day because of the surgeon's skill in removing this troublesome relic of a second stomach, and they are but a small part of the great army of people who are now alive because of the progress made in treating malformations and diseases by surgical operations.

It was said only the other day that doctors have aggravated our economic problems by prolonging our lives when society is unable to provide all of us with the promise of a livelihood in our declining years. Such a charge seems to have foundation in fact. In the past ninety years the life expectancy of a man of twenty has increased from forty-one years to fifty years, for which the surgical profession may modestly claim some credit. How this profession progressed in knowledge and skill to such a reprehensible efficiency, it is my hope to review briefly for you to-day.

A barber could speak with as much authority as a

surgeon of the early history of surgery in Britain because there, for many years, "barbery" and surgery were joint professions. In the early ages medicine was practised by the ecclesiastics, but these medical ecclesiastics were forbidden to shed blood. However, much as the ecclesiastical powers frowned upon it, bleeding was then deemed necessary for the curing of most ailments and so it was natural that people turned for assistance to their barbers whom they knew to be dexterous with sharp instruments and well-supplied with basins and towels. When barbers were thus allowed to practise one kind of surgery, they ventured and, in the course of time, were practising surgery independently of the ecclesiastics. The barber-surgeon still survives in some parts of Europe, notably in Russia where fully qualified surgeons are far too few to serve a large and widespread population. But although in Britain surgery and "barbery" may formerly have been united, it would be wrong to suppose that British surgeons are the successors of barbers. Even during their temporary conjunction with the barbers in a common guild, the surgeons held themselves apart as a distinct body. These surgeons later formed a separate guild with a license from the City of London authorities and from the Bishop of London. They made an agreement with the barbers, the chief provision of which was to give the surgeons the control over the practice of surgery. There was, thereafter, no fusion of the two callings. The company had two distinct sections and two names—Barbers and Surgeons. In the one section were the barbers, a few of whom practised some simple parts of surgery; in the other section were the surgeons. The surgeons were denied the privilege of shaving people, for which restriction I have always been devoutly thankful, and the barber-surgeons were not allowed to do more than draw teeth. If any of them became surgeons it was only after they had acquired the necessary education.

As the surgeons became more skilled and influential, and surgery became a science as well as an art, even the appearance of a union became more intolerable, and although the barbers were an influential body of citizens in various lines

of business, and had always, as they said, with the greatest deference, submitted to the surgeons in all matters peculiar to them, yet the surgeons insisted on separation. They gave up all claim to any share in the property or other treasures of the joint company, and obtained for themselves a separate charter which was the progenitor of the present Royal College of Surgeons.

The earliest pictures of surgical operations are engraved on the stones over the tomb in Egypt dating from 2,500 B.C. They show the operation of circumcision and operations on the legs and arms, which, with castration, included all the surgical operations of the Egyptians. All surgery was then wound surgery. It was performed only upon the surface or extremities of the body. Forty-three centuries after these records were inscribed, surgery was still wound surgery.

Like the Egyptians the Babylonians had little knowledge of anatomy, although there were surgeons among them. Certain conditions written into their law certainly would have discouraged reckless surgery. For if, as a result of an operation, the patient lost his life, the surgeon's hand was cut off as a retaliation. Bad surgery probably explains why surgeons were continually in jeopardy of their lives. In A.D. 580 the King of Burgundy had two surgeons executed upon the tomb of his queen because she died of the plague after they had opened her plague sores. In 1337 a surgeon was thrown into the River Oder because he failed to cure John of Bohemia of blindness, and in 1464 the King of Hungary proclaimed that he would reward the surgeon who cured him of the wound of an arrow but would put him to death if he failed. Pope John XII burned an unsuccessful surgeon.

A knowledge of human anatomy, so essential to surgery, was not attained by the Greek physicians because Greek philosophy was hostile to interference with the bodies of the dead. The great Greek physician Galen, who lived in the second century after Christ, derived his knowledge of anatomy from the pig, the ape, the dog and the ox. He assumed that the structures he found in these animals were

identical with the structures of the human body. The hold that Galen's work obtained upon the clerics and physicians of the Middle Ages is indicated by the fact that when Vesalius, in the sixteenth century, showed that Galen's description of the hip bones was wrong, the excuse offered by Galen's followers for his error was that man had changed his shape by wearing tight trousers.

Surgery was so crude and barbarous in the sixth century that Gregory of Tours advised the people to emulate the saints and to endure their pain with patience rather than submit to operations. Even in the eleventh century the armies had no surgeons. In the fifteenth, sixteenth and seventeenth centuries warfare offered the best training available for surgeons, but most surgeons did not care for military life, and in the British army, as late as the seventeenth century, it was necessary to impress them into service. The pay of the British army surgeon was good: a first-class surgeon in the fifteenth century received two hundred dollars a year and twelve cents a day for food. The high pay of the army surgeon drew many quacks into the service. It was only after belief in material resurrection passed away, that bodies of criminals became available for dissection. Grave-robbing finally developed into a profession. To avoid the incentive to crime, laws were enacted in the nineteenth century to provide medical schools with unclaimed bodies. It was only in 1831, barely a century ago, that Massachusetts enacted a law making available for dissection bodies that required to be buried at public expense. Subsequently similar laws have been passed in other countries. The notorious trial in Edinburgh of Burke and Hare, who killed sixteen men and women and disposed of their bodies to a medical school, brought about a realization that the provision of human bodies for dissection was necessary if surgical science was to progress. But although exact knowledge of anatomy made the development of surgery possible, no great advance was made until the discovery of anaesthesia. Before its use the fully conscious victim of the operation was tied with ropes to prevent his escape from the surgeon's knife.

It has been said that necessity is the mother of invention. This is particularly true in regard to the invention of the use of anaesthetics. In 1846, less than a hundred years ago, a dentist named Morton, who had perfected a plate to hold false teeth, found that he could not apply it until all of the old roots of teeth had been removed from the jaws of his patients. Such an operation was practicable only when insensibility prevailed in the patient and so, out of necessity, ether came into use. It may be of interest to remind you that this discovery of anaesthesia was made at a time, if not within the memory at any rate during the lifetime of some of our people.

Morton learned of the anaesthetic properties of ether from Dr. Jackson at Harvard where ether was sometimes inhaled by medical students at so-called "ether frolics," indulged in for the mild intoxication, or "ether jag," which the vapor produced. It was observed that students under the influence of ether appeared to be insensible to pain caused by falling over furniture, which falls were a somewhat logical consequence of their indulgence. Morton saw the possibilities presented by ether and experimented at home; first, by appropriating the family dog as subject, and finally by anaesthetizing himself. He first used ether for the extraction of teeth and subsequently, at the Massachusetts General Hospital, for a surgical operation, where it proved entirely satisfactory. Soon after the successful use of ether, Morton and Jackson attempted to patent it and to control its use by issuing permits to physicians, for an annual license fee. What a contrast to the action of Dr. Banting, discoverer of insulin, who immediately handed over his discovery for the benefit of humanity! (applause) When he gave his discovery to the world, Dr. Banting acted in accordance with the ethics which govern the conduct of the investigator in medicine and surgery. For in these professions there is no sectional or creed consciousness. There are no embargoes or tariffs to hamper the exchange of knowledge and experience. There is a world state. The man who discovers new information or who develops a new technique is the agent of the profession at large and his

immediate concern is to place his new knowledge or skill at the disposal of all his fellow practitioners so that the benefit to humanity will be most rapidly extended. Since we are discussing the progress of surgery I should like to say, before I pass on from Dr. Banting, that, in my opinion, it was his surgical skill which was chiefly responsible for the success of his experiments. During these experiments, it was necessary to "depancreatize" dogs and, repeatedly, to puncture their veins in order to determine the blood sugar content.

In 1847, one year after Morton's discovery of the efficiency of ether as an anaesthetic, Dr. James Simpson, who was anxiously looking for some method of relieving the pain of childbirth, successfully used chloroform for the purpose. He and his use of chloroform in childbirth were denounced by the clergy, who argued that the pain of childbirth was the preordained law of mankind and that to prevent it was a sacrilege. The ecclesiastical attacks laid stress on the Biblical injunction to the first woman—"In sorrow shalt thou bring forth children."

Two years after Simpson published his paper on the use of chloroform at childbirth he was able to report that it had been administered to forty thousand patients in Edinburgh, both for childbirth and for surgical operations.

In 1853 Queen Victoria took chloroform for the delivery of her seventh child, Prince Leopold, and this had an enormous influence in popularizing anaesthesia at childbirth, not only in Great Britain but in the United States. Simpson was ultimately knighted in recognition of his discovery. It is recorded by Haggard that when this honor was conferred upon Simpson, someone suggested, as a fitting coat of arms to commemorate his work on the use of chloroform, "A wee naked bairn", with underneath the motto, "Does your mother know you're out?"

Anaesthesia has made a most important contribution to the progress of surgical science but the last essential to the development of modern surgery was supplied in 1866, when Joseph Lister discovered a means of preventing infection. Millions of lives have been saved in a little more than half

a century that has passed since Lister introduced antisepsis. Prior to Lister's discovery pus, which is a product of infection, was considered a sign of healing and was called "laudable pus." Now the surgeon operates with the certain knowledge that there will be no infection and no pus. Before Lister introduced antisepsis, death resulted as readily from the small wound of a minor operation as from the large wound of an amputation. At that time amputations were frequent, because nearly all compound fractures ended in amputation, and forty-five per cent of the patients who were operated upon died. In other words, in 1866, a compound fracture was almost as dangerous as the bubonic plague! In hospitals to-day all wounds which are not infected before the time of the operation heal by first intention.

Surgery made considerable progress owing to the demands upon the profession during the war. We were able almost entirely to eliminate tetanus by the use of antitetanic serum, so generously supplied by our own Connaught Laboratories. A new and unexpected development of modern warfare brought added fame to a distinguished Toronto bacteriologist—Col. George Nasmith. I shall never forget one day in 1915 seeing a number of our men who had been overcome by a gas attack, stretched out at a casualty clearing station, fighting for breath, enduring an agony so excruciating and terrifying that it chilled even one who, for years, had been accustomed to see practically all forms of physical and mental suffering. That sight was enough to make a pacifist of any man.

It was Col. Nasmith who first determined the composition of the German gas and suggested the way to combat it. He was in command of No. 5 Canadian Mobile Laboratory, and one day while at the Ypres salient observed a dense cloud of yellowish green smoke floating across the British lines. He immediately surmised that it was chlorine gas. Subsequently he verified its nature and wrote directly to General Headquarters and suggested that pads soaked in hyposulphite of soda be used as filters in the masks. He also suggested that careful search be made on the field to discover the enemy's apparatus for protecting his own men from the gas,

and it is interesting to note, that when the first German gas masks were captured it was found that they contained pads saturated in this solution. (applause)

Then we had the wonderful work done by Gillies and his associates in the later period of the war. Men whose faces had been horribly shattered have had chins, mouths and noses restored. This surgical reconstruction has been so delicately and skillfully carried out that not only useful but exceedingly presentable results have been obtained.

In the advanced casualty clearing stations in France I could not help being impressed with the contrast between the humane and scientific care which the wounded then received and the barbarous and callous neglect which was the lot of the fallen soldier in past conflicts. Our wounded had opiates to relieve their pain and anaesthetics for operations, and, at all times, the faithful, devoted services of trained women nurses, for there were women nurses right in the front lines.

In the war blood-transfusions saved many lives. It was Dr. Bruce Robertson of the Hospital for Sick Children who, knowing that severely burned infants died as a result of toxic poisoning in their blood, conceived the idea that the best way to combat this was to remove all their blood—"exsanguination transfusion" is the term we use—and to replace it by a transfusion of normal, healthy blood. When Dr. Robertson went to France he continued to take a leading part in advancing the technique of blood transfusion. I might explain that it is not necessary to transfuse blood directly from the donor to the recipient, but blood taken from a donor can have a solution of citrate added to it to prevent its clotting and then be kept in cold storage until required. The blood from one man will not necessarily mix with that of another. Blood is divided into four groups, and when collecting it from donors, it is typed and labelled according to the group to which it belongs, one, two, three or four. Taking advantage of this fact, the surgeons in France collected quantities of blood from healthy soldiers, grouped it and kept it in cold storage in casualty clearing stations awaiting the time when it would

be needed for transfusions. I had a dozen or more bottles, each containing two quarts of blood, in an ice box, where it was safely kept for a week or more. When a wounded man was brought in bearing evidence of having lost a quantity of blood, he was "typed" in a few minutes and his group ascertained, and then some of this storage blood was injected into his veins. The effect was almost striking; his lips became pink, a warm glow came over him and his life was frequently saved.

When nourishment cannot be taken through the mouth some other method of sustaining life must be found. To attain this purpose, Rudolph Matas, a distinguished surgeon of New Orleans, about ten years ago, proposed the continuous intravenous administration of fluids. By giving patients a solution of sugar and salt we are able to maintain life solely by this means for a week or more. This method is in general use with improved technique developed by Dr. R. I. Harris of Toronto.

Many operations are now performed upon the brain. Perhaps the most interesting of these to the lay mind is an operation for the relief of a terribly painful form of neuralgia known as *tic douloureux*. To give access to the brain, a portion of the skull about one and one half inches in diameter is removed. Through this aperture a spatula is introduced and with it the brain is lifted up, so that the surgeon may find the gasserian ganglion, a tiny thing about the size of a small grain of wheat which is located about one and one-half inches from where the opening is made. This ganglion is then separated from the brain, when immediate and permanent relief results. Thirty years ago this was considered a very formidable operation, whereas the technique has been so far improved that now it can be performed with almost as great safety as the removal of an appendix.

As late as 1896, Sir James Paget stated that surgery of the heart had probably reached the limit set by nature and that no new method and no new discovery could overcome the natural difficulties that attend a wound of the heart. Within recent years, however, surgery of the heart has

made considerable progress and we may still hope that the diseases which affect that organ, and which have been responsible for the loss of numbers of our prominent citizens within the last few years, will ultimately yield to surgery. Dr. Cutler of Cleveland has successfully performed operations on the valves of the heart where these had become so thickened as to obstruct the flow of blood. With very delicate instruments, he removed parts of these valves, thus enlarging the opening and restoring normal function. He has operated on patients as young as eleven years and as old as sixty, with results that, considering the gravity of the condition and the difficulty attending the operation, are extremely gratifying. Many operations have been done also for wounds of the heart. The heart is easily exposed by the removal of portions of two or three ribs. A suture may then be passed through the apex of the heart and used to draw the organ into a position desirable to facilitate the repair of wounds. Only last week a Boston surgeon, speaking in Montreal, reported good results from operations to relieve the pain in *angina pectoris*. This can be done in two ways; either by an operation to sever the nerves that carry painful sensations from the heart to the brain, or by injecting these with alcohol. The latest reports on the alcohol injection operation indicate that in more than one-half of the cases the patients were entirely relieved of pain and one-quarter were greatly improved. Although this operation does not cure the disease, it makes it more bearable by removing the terrifying symptoms. This new work is still in its infancy and we may confidently expect further progress.

I fear, Mr. Chairman, that the patients are becoming exhausted so I shall not discuss the many various excursions which we make into the abdominal cavity to remove diseased organs, such as the stomach, the spleen, kidney, gall-bladder and appendix. Nature has been generous in creating our physical structure and these organs may be partially removed without impairing either health or activity. I should like to impress upon you the fact that the abdomen may now be opened with perfect impunity and entirely without

risk. The danger, where such exists in these operations, is due to the disease which the surgeon seeks to relieve.

I have neither the experience in public speaking, nor have I had sufficient time to name the numerous members of my profession in this country who more often than not, without public acclaim or recognition, have, through their own research and skill, made notable contributions to our store of knowledge. This address of mine would not be complete if I failed to express my conviction that in the younger generation of physicians and surgeons in this province we have ample assurance of brilliant achievement and that our people will, in years to come, be better served in both medicine and surgery than any age has ever been. A hundred years from now a surgeon, looking back on our methods, will probably consider many of them as clumsy and unscientific. I hope so. For that would be certain evidence of the continued progress which is the objective of all the devoted men and women in whose hands the honor and the advancement of the profession rest.

MR. CHALMERS:—Your Honor, you have told us of The Romance of Surgery. You have given us high courage. I wish some of the economic doctors could approach their subject with the same certainty. You have mentioned some of the men in Canada who are contributing to the development of surgical science. We are glad to have Col. Nasmith and Dr. Banting at the head table. We have many other distinguished men at the head table who are contributing to the advancement of that science.

Perhaps you will permit me to digress for a moment while I express, on behalf of the Club, congratulations to Mr. Justice Sedgewick who has been appointed to the position of Chairman of the Canadian Tariff Advisory Board.

Now, sir, I assure you the appreciation of this audience. We thank you.