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MY FRIEND, DR. ROY D. McCLURE*

JEAN PAUL PRATT, M.D.**

As one who knew Roy D. McClure, and was associated with him for most of his life, I feel that it is a great privilege to be asked to give this annual memorial lecture. Our first contact was when we were assembling in a French class at Ohio State University, where, in his characteristic manner, he introduced himself and our friendship began. From that time our association continued with brief interruptions, and therefore qualifies me to speak of my friend Roy D. McClure.

Previous lectures have recounted Dr. McClure's achievements as a surgeon. His valuable contributions to surgical societies and medical journals have been related and need not be repeated here. The chapter in his life which includes his education and preparation as a surgeon is probably not so well known to you. My association with him during those years permits me to recall some of the important events.

Construction of a building does not begin with the roof, but completion of the structure is possible only when a proper foundation is laid. Likewise, present day surgery did not suddenly appear, but the experience and contributions of the past have built a suitable foundation for the development of present methods. It is fitting, therefore, to inquire into some of the events of his earlier life which influenced his career. With your indulgence an attempt will be made to catch a glimpse of medicine as practiced and taught at that time, and try to show the influence of some of the teachers.

My impression is that there was no particular time at which Roy McClure decided to study medicine, but it was just assumed that he would follow the family tradition. His father, grandfather and great grandfather were doctors. I knew his father as a devoted physician who was in active practice to the last year of his life. He was justly proud of his son.

Although Roy was born in Bellville, Ohio the family moved to Columbus in time for his school and college education. When Roy entered Ohio State University in 1900 the total enrollment of that institution was slightly over 1200. The small classes had the great advantage of close contact of students with teachers. He especially liked Dean McPherson who was head of chemistry, and Landacre in biology. With the latter he took 3 courses, general zoology, comparative anatomy and embryology. In these courses a spirit of investigation and research was emphasized rather than memorization. This was a good foundation for his future study of medicine. Perhaps, also this spirit accounted for a summer vacation that Roy spent with Dr. Mills exploring the Indian Serpent Mound in southern Ohio. Besides participating in the excavation of the specimens, he helped Dr. Mills prepare and display, in the museum, the products of their explorations.

Included among the friends at O.S.U. was no less than the President of the University, Dr. Wm. O. Thompson. Their friendship continued and Dr. Thompson paid a personal visit to Roy at the Henry Ford Hospital in 1917. A part of their

*The Roy D. McClure Lecture, presented May 23, 1961.

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conversation has often been repeated. In response to a request for his opinion about the general unrest at that time, President Thompson remarked that in his years as an educator it had been his opportunity to observe the growth and development of this group or that group, this sect or that sect, this faction or that faction, and to hear expressed a fear that one or another of these would spread out and overrun the state. He was not disturbed because every year the backbone of the country, the average American Citizen, came to the polls to cast his vote and thereby stabilized the situation.

Throughout the 4 years at Ohio State Roy maintained a high scholastic rating, and he received the degree of B.A. in 1904. The courses were chosen to comply with the entrance requirements of Johns Hopkins. Besides the scientific courses in biology, physics and chemistry, requirements included 2 years of Latin and a reading knowledge of French and German.



Back Row - Hale - Coach: Clark - O: Surface - T: Jones - R: H: Lincoln - F: B: Walker - L: H: Maynard - E: Hagaman - M: Tilton - Ass: Coach McClure - Manager

Figure 1

Ohio State University football team, 1903. Roy McClure on the extreme right was manager.

In 1903 he was manager of the football team (Fig. 1). He played varsity basketball in 1903 and 1904. In 1904 he was captain of the basketball team.

In the photograph (Fig. 2) George Bellows is shown at his right. One can see from the photographs that Bellows was physically strong. He was a superb ballplayer. His personal charm and accomplishments in Art endeared him to many Americans because his portrayal of America of his day was so realistic. His pictures are found in many museums and are a monument to him. Roy was always proud



Figure 2

Roy playing center was captain of the O.S.U. basketball team, 1904.

of their friendship which came to an untimely end with the death of Bellows from appendicitis at age 43.

Roy received the honorary fraternity memberships in Phi Beta Kappa, Sigma Xi, and an honorary Doctor of Science in 1936. He was president of the Detroit Alumni Club of O.S.U. 1939 to 1942, and was national Alumni President 1925 to 1927. He was a member of the committee of 100 (alumni) who organized and launched the Ohio State Development Fund, and he had a hand in planning the University Research Foundation.

The photograph (Fig. 3) was taken when he was presiding at the annual business meeting of the Board of Directors meeting, and forum of the Alumni Association in 1926.

The selection of a medical school in 1904 was a very different problem than it is today. In general, medical education in the United States was at a low ebb. There were really less than a half dozen schools worthy of consideration by a serious student. The status of medical education was appreciated by Abraham Flexner who was assigned by the Carnegie Foundation for the advancement of Teaching to investigate the medical schools in this country. In 1907 he found 155 existing schools and suggested that the number should be reduced by 120. Actually it was reduced



Figure 3

Roy, 1926, was presiding at the annual Board of Directors meeting of the Ohio State University Alumni Association. This is a distance shot, but he is on the platform and the only one facing the camera.

to less than 70. In his "Bulletin Number Four" he wrote;¹ "The schools were essentially private ventures, money making in spirit and object. A school that began in October would graduate a class next spring; it mattered not that the course of study was two or three years; immigration recruited a senior class at the start. Income was simply divided among the lecturers, who reaped a rich harvest. 'Chairs' were therefore valuable pieces of property, their prices varying with what was termed their 'reflex' — No applicant for instruction who could pay his fees or sign his note was turned down. The examinations, brief, oral, and secret plucked almost none at all: even at Harvard, a student for whom a majority of nine professors 'voted' was passed. The man who had settled his tuition bill was thus practically assured of his degree, whether he had regularly attended lectures or not. Accordingly, the business thrived. Rivalry between different so-called medical centers was ludicrously bitter."

The Johns Hopkins Medical School graduated its first class in 1897. Thus was introduced a new model which embodied the best features of education in England, France and Germany adapted to American conditions. In retrospect it would seem that it would have been easy to choose the one best medical school, but the ideals of the Hopkins school were new and perhaps revolutionary. Then, too, there were solicitations by agents from the various schools in existence. Today the situation is different. There is no best medical school. One has a wide choice of good schools.

THE JOHNS HOPKINS MEDICAL SCHOOL

The spectacular success of the Johns Hopkins University and Hospital was not a mere accident. It was through the foresight and wisdom of a few men who were

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the nucleus that the development of these institutions was completed. First of all, the founder, Johns Hopkins, amassed a fortune of seven million dollars which he regarded as a trust to be disposed of for the benefit of his fellow men. According to his instructions one half of the money was used for the university, and the other half was for a hospital. Six years before his death he personally selected the Board of Trustees who faithfully carried out his plans. In retrospect, it is apparent that Mr. Hopkins's fondest hopes and wishes were fulfilled and that for the "benefit of his fellowmen", education in general and medical education in particular were profoundly influenced.

In a letter of instructions to his trustees he wrote, — "In all your arrangements in relation to this hospital, you will bear constantly in mind that it is my wish and purpose that the institution should ultimately form a part of the medical school of that university for which I have made ample provision by my will." The close association between the hospital and medical school was unique and presented a new impetus to medical education.

Mr. Hopkins, in his letter of instructions to the trustees also wrote,² — "I have given you in your capacity of trustees, thirteen acres of land, situated in the city of Baltimore — upon which I desire you to erect a hospital." — "It is my wish that the plan — shall provide for a hospital which shall in construction and arrangement compare favorably with any other institution of like character in this country or in Europe. It will therefore be your duty to obtain the advice and assistance of those at home or abroad who have achieved the greatest success in the construction and management of hospitals". — "It will be your especial duty to secure for the service of the hospital, surgeons and physicians of the highest character and of the greatest skill."

The University, Medical School, and Hospital were established by the conscientious effort of many farsighted men. With due regard to the trustees and their advisers, it is apparent that the key man, second to the founder, was the first president of the University, Daniel C. Gilman. He already had experience as an administrator in other schools. He had studied educational methods abroad and was personally acquainted with many men and women who were prominent in teaching and research in Europe and at home. He knew when and where to seek advice. For his faculty he selected outstanding scholars and scientists and then he let them alone. The same policy was continued for the selection of heads of departments in the Medical School. For the first Dean he chose Dr. William H. Welch and time has demonstrated the wisdom of his choice. Dr. Welch was also Professor of Pathology with a special interest in research which he imparted to students as well as to other members of the medical faculty. Dr. William Osler was appointed Professor of Medicine and his contributions were different from those of Welch but no less important.

Dr. William H. Howell wrote² — "It may be said that the faculty of the medical school as first organized, its so-called Advisory Board, contained no dead wood. All of its members contributed in different ways and to varying degrees to the successful development of the School and Hospital, and to the promotion of

medical knowledge. It was extremely fortunate in having in its group two men, Welch and Osler who were blessed with a magnetic kind of personality that attracted and influenced all who came in contact with them. In almost any assemblage these men would have been selected as leaders, because of their ability and their personal force and charm. One such individual was enough to confer distinction upon a faculty. To have two at the same time was a gift of the Gods."

Welch and Osler, key men of the medical school, profoundly influenced medical education. It would be difficult to estimate their direct influence and impossible to comprehend their indirect influence through the faculty for whose selection they were largely responsible. Although time does not permit, it would be a pleasure to review the personalities and contributions of the brilliant galaxy of teachers. It is pertinent, however, to refer briefly to a few with whom Roy McClure came in closest contact. Among these few, Dr. Halsted comes first, because as student and resident in surgery Roy was associated with him for ten years. Furthermore Roy emulated the Professor.

Halsted's life was divided into two contrasting periods by his experimentation with, and innocent addiction to cocaine. At Yale he distinguished himself in athletics but not as a scholar. He was a model of muscular strength and vigor, full of enthusiasm and the joy of life. From the time he began the study of medicine he was devoted to his profession. He studied in Europe and was very much impressed with the European methods of teaching. Returning to New York his professional advancement was rapid. He was generally considered to be a bold, daring and original surgeon, an indefatigable worker, and an inspiring teacher.

Halsted was a pioneer in antiseptic surgery. He read all of Lister's papers and repeated his experiments on animals with a more thorough study of the results than would have been possible for Lister because of the development of bacteriology. Halsted cultured wounds treated by the use of Lister's methods and found bacteria on the surfaces. This prompted him to a careful microscopic study of wounds. He realized that care in operating, the exact approximation of surfaces and the avoidance of dead spaces was as important for results as the supposed avoidance of bacteria. Everything connected with surgical procedures he studied experimentally.

A new field of investigation was suggested by Koller's announcement in 1884 that with cocaine the conjunctiva and cornea could be anesthetized. Unaware of the habit forming quality of the drug, Halsted and his associates experimented extensively with it. The fortunate outcome of these experiments was the discovery of local anesthesia by injection. The dire consequences were the addiction and subsequent illness of the experimenters, unconscious as they were, of the menace. Although most of the victims succumbed, Halsted conquered it by superhuman strength and determination.

Although Halsted had strength of character to overcome the addiction to cocaine, his personality changed. Medical students and residents knew only the new personality. It is probable that none of them knew of his tragic experience. Dr. Welch knew, and had faith in his possibilities and was responsible for his appointment as Professor

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of Surgery at Hopkins. This challenge and interest coming at that time were opportune as stabilizers, for Dr. Halsted often said that he found the greatest satisfaction of his life in the training of surgeons.

A description of Halsted's personality that would be satisfactory to all is not possible. However, Roy McClure approved of Harvey Cushing's characterization in his biography of Halsted.³ — "A man of unique personality, shy, something of a recluse, fastidious in his tastes and in his friendships, an aristocrat in his breeding, scholarly in his habits, the victim for many years of indifferent health, he nevertheless was one of the few American surgeons who may be considered to have established a school of surgery comparable, in a sense, to the school of Billroth in Vienna.

He had few of the qualities supposed to accompany what the world regards as a successful surgeon. Overmodest about his work, indifferent to matters of priority, caring little for the gregarious gatherings of medical men, unassuming, having little interest in private practice, he spent his medical life avoiding patients — even students, when this was possible — and, when health permitted, working in clinic and laboratory at the solution of a succession of problems which aroused his interest. He had that rare form of imagination which sees problems, and the technical ability combined with persistence which enabled him to attack them with the promise of a successful issue. Many of his contributions, not only to his craft but to the science of medicine in general, were fundamental in character and of enduring importance."

At the opening of the hospital in 1889, Halsted entered a new phase of his life. During the interim after his affliction he was very close to Dr. Welch, who was an understanding friend and a wise counsellor. He came to live with Dr. Welch and worked diligently in his laboratory on basic problems of operations. He thought out a plan for a professor of surgery to follow: — 1. to perfect the technical methods of surgery; 2. to study experimentally the great topics which from the beginning had aroused his interest, and 3. to establish a school of surgery by long and thorough training of his assistants.

Halsted's devoted adherence to his plan was apparent to students and associates. The public appreciation was expressed by repeated reference to the "Halsted school of surgery" and the "Halsted era of surgery". Although his surgical discoveries and inventions were important, it was the training and inspiration of surgeons that built the monument which perpetuated his memory. Among the fortunate few who were selected for the long period of training Roy McClure was rewarded and, in turn, he was able to share later in the development of the Henry Ford Hospital.

At the very time, October 1904, that Roy entered the Hopkins Medical School a new operating room was formally opened, and this was to serve as the center of his activities for the next ten years. In honor of the occasion the staff assisted Dr. Halsted for the first operation in this room. Fig. (4). A copy of this photograph was available to the students and was cherished by them. The picture exemplifies some of the characteristics of surgery as practiced then. You will note the flat top table with no mechanical devices for adjustment of position. Sterile gowns were

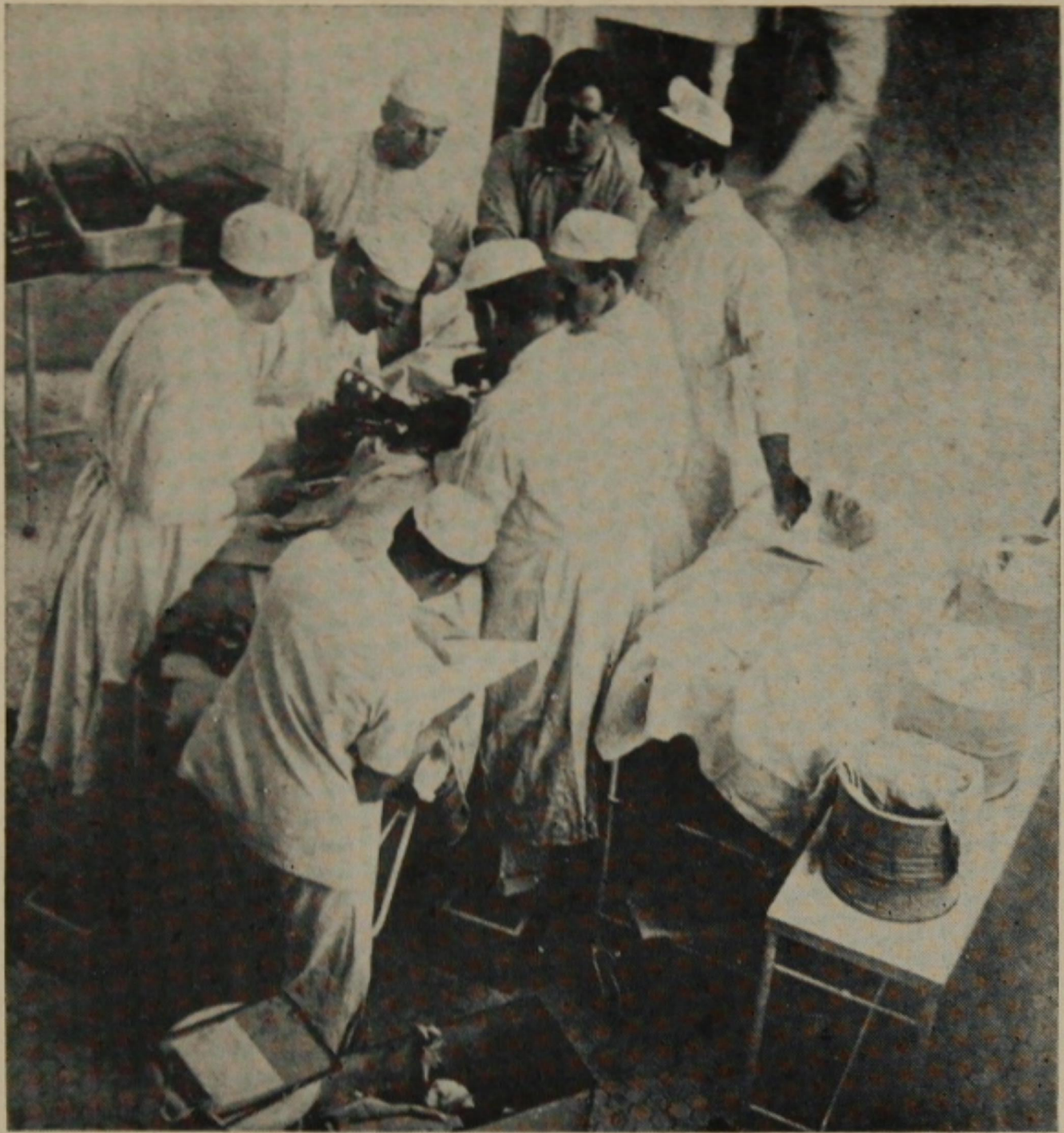


Figure 4

First operation in the new surgical amphitheater, 1904.

worn, also a small cap and rubber gloves but no face masks. The ether cone devised by Dr. Halsted was made of pasteboard covered with oiled silk and toweling. A sea sponge was tucked inside the cone to retain the ether. The preparation of the patient consisted of a thorough scrubbing with soap and water. The soap was removed with ether, then alcohol. Potassium permanganate solution was painted on the area, then the mahogany brown of this procedure was removed with oxalic acid. Finally the area was deluged with 1 : 1000 solution of bichloride of mercury. Although the instruments had been boiled for ten minutes they were kept immersed in a 1 : 30 solution of carbolic acid. When the instrument was to be used the solution was shaken off.

The operation was performed for osteomyelitis of the femur which was a subject of especial interest to the professor at that time. He was using his favorite mallet of fiber bound in metal. The team consisted of first assistant Dr. John Finney, second assistant Joseph Bloodgood, third assistant Harvey Cushing and instrument man Hugh Young. These valuable assistants pictured at the operation were important in the training program. Later Roy became very grateful for the friendship of each and every one of them.

EXPERIMENTAL SURGERY

Experimental surgery was an important part of the professors plan. While he was waiting for the hospital to open he spent his time in the laboratory. When the medical school opened he continued his own investigations and allowed some of the staff and students to work with him. An elective course in animal surgery was offered and soon became very popular. Later, much of the responsibility for the course was delegated to Harvey Cushing, (1901-1912). So far as possible the exercise was likened to the actual performance of surgery as conducted on a patient in the hospital. A group of five for each table consisted of an anesthetist, surgeon, two assistants and a family physician. Each week for five weeks the members of the team rotated so that each one had experience in all positions. A history was composed, an anesthetic chart recorded and an operative note written. Meticulous attention to detail was required. The whole procedure was carefully supervised. While this method was an excellent training in surgical technique it also permitted the instructors to see what students were adapted to experimental surgery. That Roy McClure qualified is shown by the publications which resulted from his work. He was especially interested in vascular surgery which brought him association and friendship with Alexis Carrel. His experimental work was continued by spending a year at the Rockefeller Institute with Carrel.

The basic principles of vascular surgery were well established by that time. Reliable methods for repairing and anastomosing blood vessels were well developed. Autologous, homologous and even heterologous transplants had been successful. Some progress had been noted in storage of transplants. Carrel had studied these problems for years. His method of anastomosis, reported in 1902, was widely used. Essentially, his method was the insertion of three traction sutures at equidistant points on the circumference of the vessel. Then a continuous stitch was inserted between each of the guide sutures. The method was as satisfactory clinically as it had been in animal experimentation.

TRANSPLANTATION OF KIDNEYS

At the time that Dr. McClure was working with Carrel, transplantation of the kidneys was a subject of great interest. Tissue transplantation, especially skin graft, was an accepted surgical procedure. However, the transplantation of a whole organ depended upon a means of connecting blood vessels. The development of satisfactory methods of vascular surgery by Carrel provided him with the essential feature for transplantation of organs. The idea of transplantation of organs attracted a number of investigators, and in 1902 Carrel and others reported the transplantation of kidneys into the neck of dogs. There were many failures due to technical difficulties, but there were instances of long survival of autotransplants. One of Carrel's dogs lived for more than 2 years after the autotransplantation of one kidney to the neck and later removal of the other kidney. The animal gave birth to two litters of puppies during this period, but later died from intestinal obstruction.

The experiments performed included transplants to the neck with anastomosis of the renal vessels to the carotid and jugular; transplantation to the groin with anastomosis

of the renal vessels to the femorals; transplantation within the abdomen with re-anastomosis of the vessels to the renals or anastomosis to the splenics or iliac vessels, or to the aorta. Homotransplants were tried with an average survival of about 16 days.

In 1907 Carrel worked out a method for mass transplantation in dogs and cats. Cats seemed to be more suitable for the procedure. He describes four stages in the transplantation en masse;⁴ "(a) preparation of the kidneys; (Fig. 5); (b) perfusion and extirpation of the kidneys; (c) preparation of the host, (Fig. 6); and (d) graft of the kidneys into the abdomen of the host." (Fig. 7).

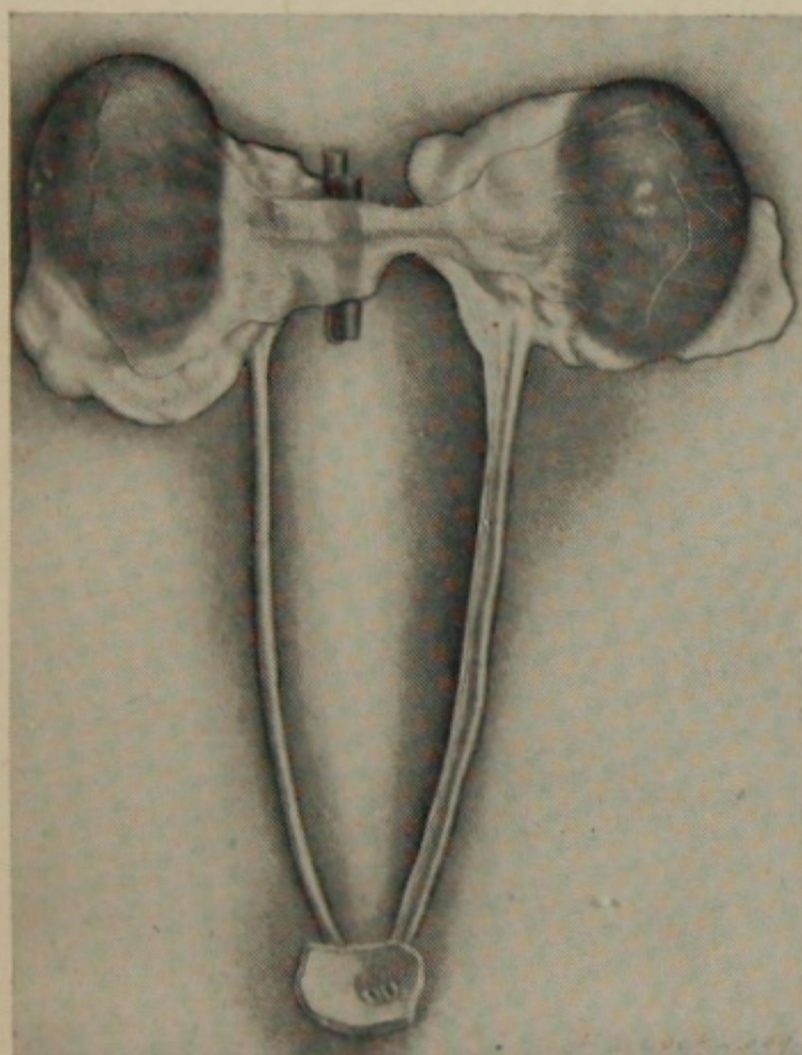


Figure 5

Preparation of the kidneys with ureters and their attachment to the bladder.

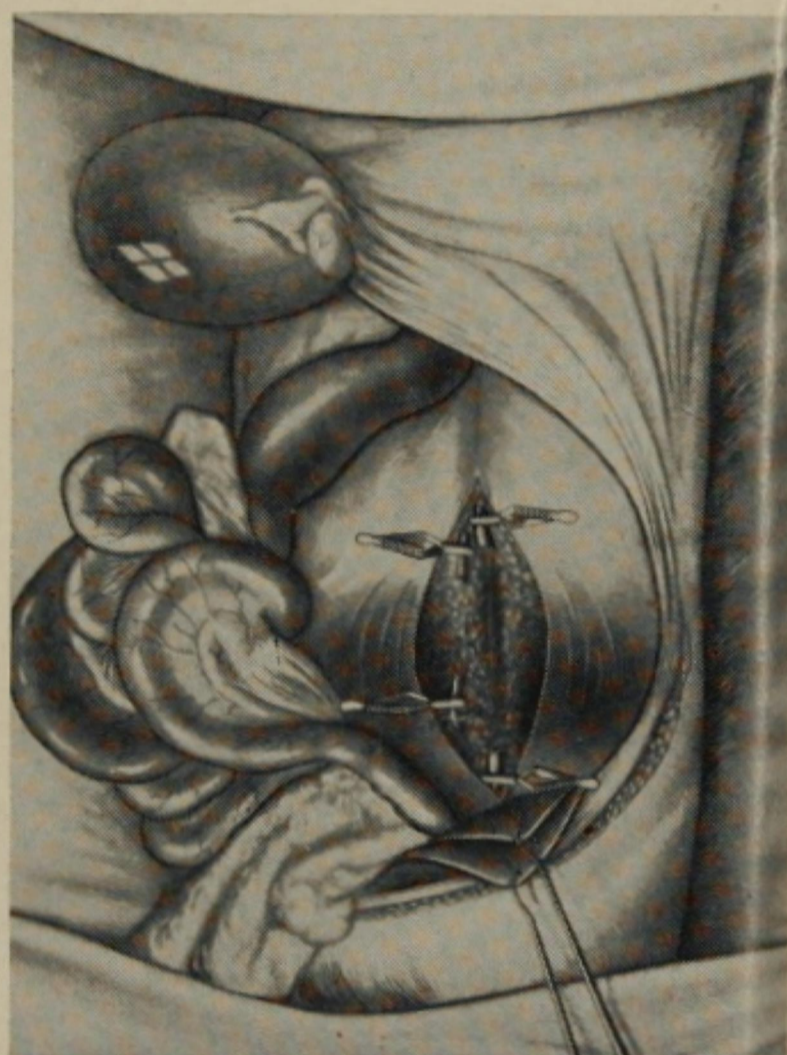


Figure 6

Preparation of the host.

He wrote that "It is evident that all resources of modern surgery must be used to prevent infection and shock after such an operation, which necessitates a large transverse incision of the abdominal wall, the evisceration of the intestines and spleen, a double nephrectomy, the stopping of the aortic and caval circulations, the section of the aorta and vena cava, and the opening of the bladder. The animal is handled and operated upon with the same rigid asepsis and care used for a human patient in a well-equipped hospital."

Fourteen experiments were performed, but five of the animals died almost immediately. The other nine were reported. In a footnote, Carrel writes that "Several of these operations were made with the aid of Mr. R. D. McClure of Johns Hopkins University, whom I wish to thank for his assistance." The designation "Mr." rather than "Dr." was used because it was another year before Roy was graduated. The experiments were reported in great detail. Roy was justly proud of one of these experiments because it was so successful, and secondly he reported it at the seventh International Zoological Congress. The photograph (Fig. 8) shows a very active

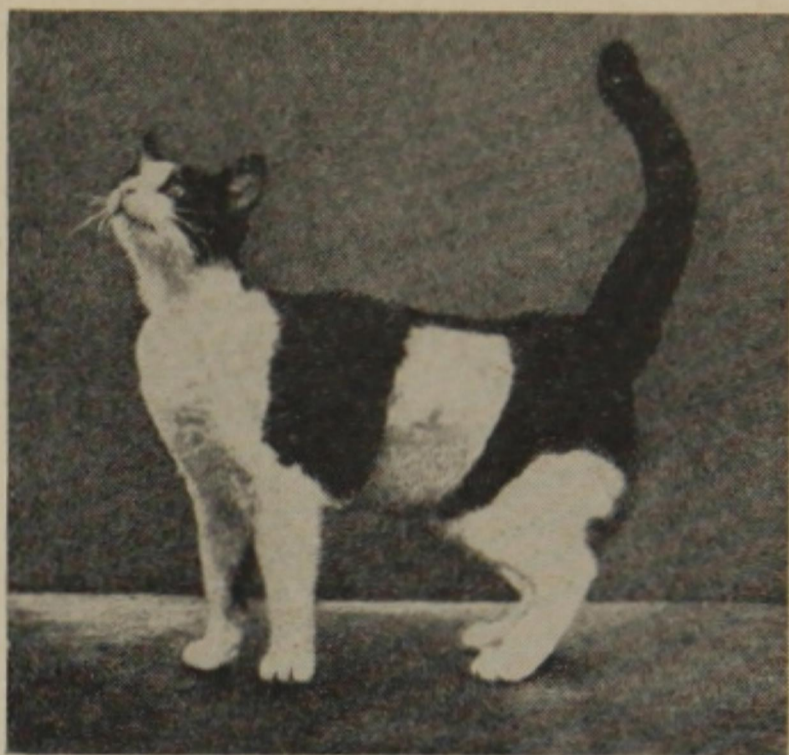
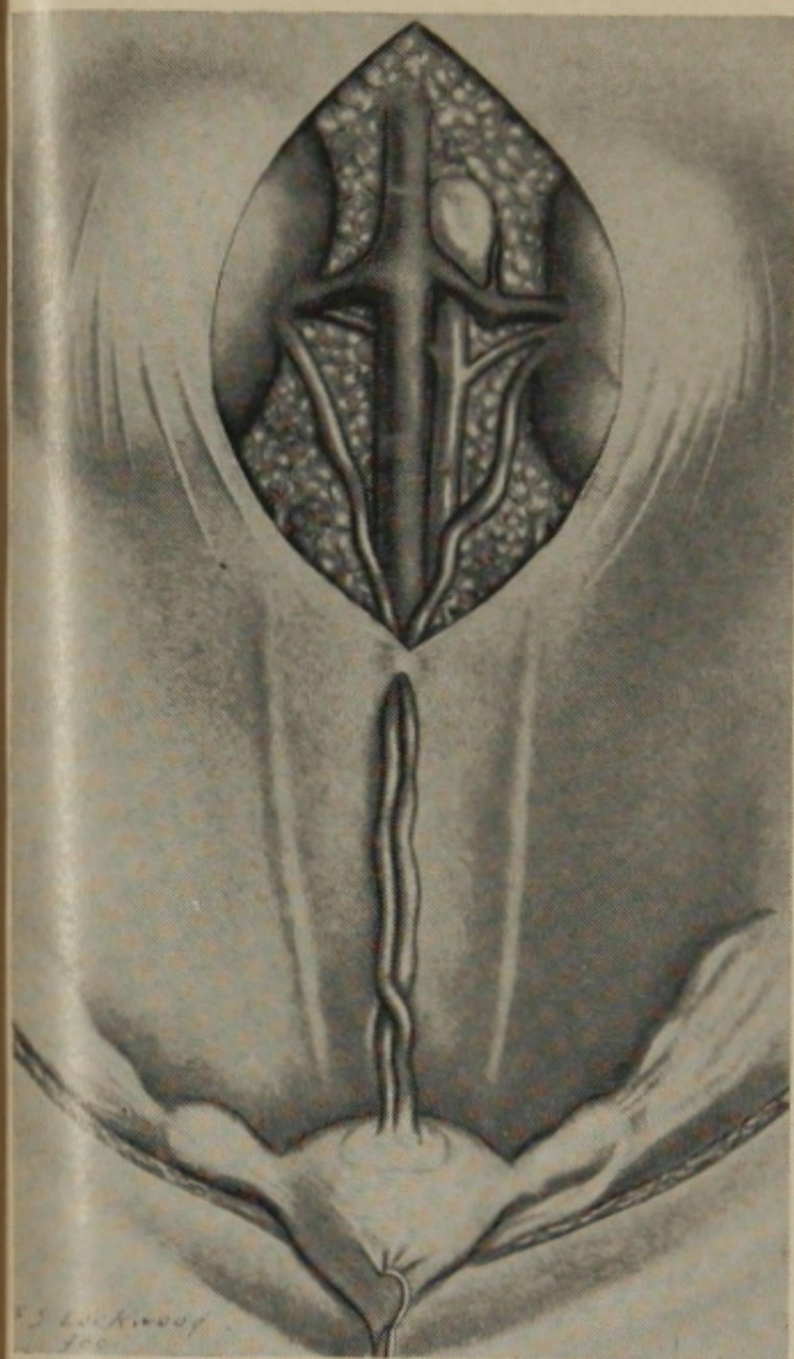


Figure 8
Roy's famous cat.

Figure 7
Transplantation of both kidneys complete. The blood vessels have been anastomosed. The patch of bladder, including ureteral insertion, has been attached.

animal on the twenty-first day after the operation. The death was from an organized hematoma pressing on the renal vessels.

The fundamental technique for the successful transplantation of kidneys was established. It paved the way for continued study of kidney function, which Roy watched with interest although he was occupied with other things. Had he lived a few years more, he would have seen the successful clinical homotransplantation of kidneys which was the ideal that prompted the early experiments.

HYDROCEPHALUS TREATED BY DRAINAGE INTO A VEIN OF THE NECK

At the suggestion of Alexis Carrel and Harvey Cushing experiments were performed on dogs in the Hunterian Laboratory. The purpose of the experiments was to establish a permanent drainage between the intracranial subdural space and the cervical venous system through the interposition of a transplanted blood vessel.

Six experiments were made upon normal dogs. A circular area of the skull was resected. Within this area a flap of dura was turned down and a circular hole about the size of the vessel to be transplanted was made in its center. The external jugular was then bared by continuing the incision over the lower part of the skull and down across the neck. The exposed jugular was then ligated distally and a bull dog clamp placed on its central end. The vessel was cut across and irrigated with salt solution.

The opposite jugular or a femoral was used for the transplant. The valves in these veins prevented the upward flow of blood. A vein was chosen with a bifurcation at one end (Fig. 9a) so this could be opened and a large flange could be made (Fig. 9b). The vein was drawn through the hole in the dura from the inside so that the flange came to lie against the inner surface of the dura. The flange was then stitched to the dura (Fig. 9c).

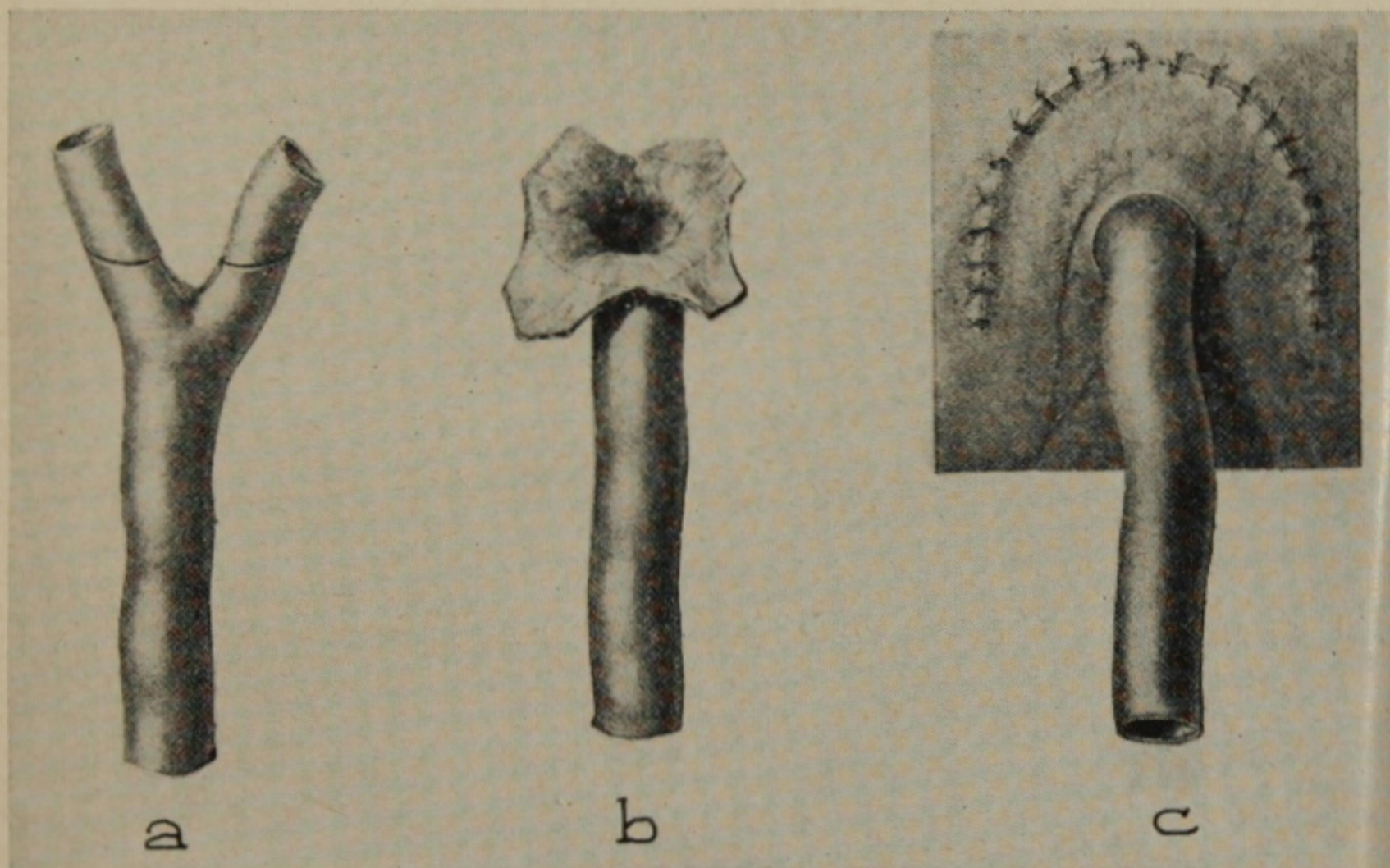


Figure 9

Vein transplanted in dura.

A straight intermuscular channel for the vessel was made by blunt dissection through the muscles to the exposed ends of the jugular vein. The transplanted vessel was drawn through the tunnel and sutured to the end of the divided jugular by the end-to-end method of Carrel.

Since the animal experiments were successful the procedure was tried on one of Dr. Cushing's patients. It was a ten month old baby who had shown, from the time of its premature birth, evidences of hydrocephalus, and during the three months previous to the final operation had undergone numerous attempts to relieve the pressure symptoms of the rapidly enlarging head. At various hands numerous punctures, ventricular and lumbar, had been made, with only temporary relief. Temporary relief had been obtained by a previous operation under the temporal lobe to open the bulging third ventricle. The temporary improvement was suddenly interrupted by a rapid refilling of the ventricles. Then tension became so great that on numerous occasions ventricular punctures were urgently necessitated in order to ward off what seemed to be threatened medullary paralysis from pressure.

"The operation was performed July 23, 1908.⁵ It proved much more simple in accomplishment than had been the case with the canine experiments. Under cocaine

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anaesthesia a portion of the cephalic vein was taken from the father's arm, including the bifurcation of the vessel at the elbow. This vessel was placed in protective vaseline as described in the laboratory experiments. Examination of the child had shown that in the lower portion of the external jugular on the right side there were two valves which prevented any expiratory regurgitation of blood into the external jugular, for the vein proximal to this point dilated markedly when the child cried, and in this part of the vessel could be seen an expiratory pulsation which did not pass above the valves. The condition seemed most favorable, therefore, for the transplantation, and the presence of these valves in the external jugular did not demand the transplantation of a vessel which should also possess them."

"The child stood the operation well, and the fontanelle remained soft, but a few hours later a sudden elevation of temperature occurred such as not uncommonly seen after operations, upon the central nervous system, particularly of infants, supposed in the absence of leucocytosis and with no wound infection to be due to some central thermic disturbance. This unlooked-for complication, which was followed by death shortly after, was the more unexpected, since the child had stood previous rapid withdrawals of fluid by punctures and the earlier and much more serious and extensive operation without any complication whatsoever."

"The report of these experiments and of this single operative experience with a clinical case is presented merely as a suggestion of what may possibly be accomplished by applying the methods of blood vessel anastomosis, which have been perfected by Alexis Carrel, to the establishment of drainage in suitable cases of idiopathic hydrocephalis."

During the past decade there has been a revival of interest in the problem of draining the fluid of hydrocephalus into some other structure. Satisfactory results have been obtained. Unfortunately these reports did not come in time for Dr. McClure to see them.

RESIDENCY

The attraction of experimental surgery influenced Roy's choice of postgraduate training. Because he was rated among the first twelve in his class he was eligible for internship at Hopkins. Instead of accepting this opportunity, he chose to go to New York where he was a voluntary assistant at the Rockefeller Institute with Carrel for a year. Then he served a year as resident at New York Hospital under Dr. Pool. His vacations during these years were pleasant and profitable interludes, because he had the satisfaction of being physician to the Jekyl Island Club.

The Club was located on Jekyl Island, which is just off the coast of Georgia. The membership included many of "the 400" of New York. Among the number were the Goulds, Pierpont Morgans, Pullitzers, Vails, Hills, Rockefellers, Vanderbilts, Whitneys, and many other celebrities of that time. He availed himself of the social and physical culture and acquired many valuable and lasting friendships. He frequently referred to those associations with pride and satisfaction. It was really a great event in his life.

Vascular surgery with its applications as in transplantation of organs and transfusions was the dominant interest during the year at Rockefeller. During the next two years clinical work was foremost, and with Dr. Pool practical application of vascular surgery enabled them to report twelve transfusions by direct anastomosis of artery to vein using the Carrel technique. Roy maintained an active interest in blood transfusion throughout his career.

BLOOD TRANSFUSION

Blood transfusion has now become so commonplace that one is apt to forget the slow evolution of the important historical events that makes the present day method of transfusion possible. Even in the earliest times the importance of blood in the animal economy was appreciated. Blood was regarded as synonymous with life and was thought by the ancients to be the seat of the soul. It was invested with mysterious properties and in medieval times was more closely related to magic than to medicine. For the medical profession the first really fundamental contribution was the publication by William Harvey in 1628 of his conception of the circulation of the blood.

Harvey's discovery opened new possibilities for transfusion. Many different experiments in animals were tried, injecting all sorts of fluids into the circulation and finally blood. Calves or lambs were the most common donors of blood. A large assortment of devices for the transfer of blood were reported. Many claims for priority were asserted. It was generally conceded that Lower of England was first in animal to animal transfusion and Denys of Paris was first for animal to man transfusion. Denys reported some remarkable successes but in 1668 one of his patients died following a third transfusion and the widow instituted proceedings against him. He lost the suit and soon the transfusions were banned in France and a similar silence prevailed in England throughout the Eighteenth Century.

The incompatibility of blood from different species of animals was gradually recognized and the use of animals blood to man was discontinued. Blundell, an English obstetrician was probably the first to record a successful transfusion with human blood in 1829. For postpartum hemorrhage he gave 8 ounces of blood by means of a brass syringe and cannula. Later he added a pump to facilitate the flow and still later used gravity for the driving force. Blundell also demonstrated that blood is not injured by passage through an instrument.

Aveling, another obstetrician, treated a postpartum hemorrhage by transfusion in 1872. His apparatus consisted of an india rubber tube to form an anastomosis between the donor and recipient veins and a little bulb in the middle to act as an auxiliary heart. He used silver tubes to insert into the veins. Various other investigators devised means of connecting donor to recipient by means of tubes.

Up to this time one of the main difficulties in transfusion was clotting of blood. To obviate the difficulty Braxton Hicks in 1869 used blood mixed with one fourth its volume of a solution of sodium phosphate. Unfortunately, all of his four patients died, perhaps from the chemicals used although transfusions were used only in

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extremis. At least he conceived the possibility of a means of overcoming clotting. Defibrinated blood was used, but this procedure lost a valuable portion of the blood.

During the nineteenth century transfusion was used chiefly by obstetricians and usually as a last resource. The results were never very encouraging. Two problems were discouraging, (1) clotting of blood, (2) the number of severe reactions and even death that followed transfusions. In relief of the first problem, the development of vascular surgery became important.

Dr. McClure wrote an article on transfusion of blood in 1917 entitled "Transfusion of Blood.⁶ History, Methods, Dangers, Preliminary Tests, Present Status. Report of one hundred and fifty transfusions." He wrote, "The next great steps were made in this country chiefly in the line of simplifying the technique and making more sure of success in transferring a sufficient quantity of blood from the donor to the recipient. The work of Carrel on the direct successful end-to-end suture of blood vessels (as well as the cannula devised by Crile), added a new interest."

"Carrel's success, as you know, was due mainly to the most rigid aseptic technique and the prevention of blood clotting in the wound, or in the several blood vessels during the operation, by means of careful hemostasis and saline irrigation. His manual dexterity, fine needles and suture materials and exact approximation of intima and media, were also important factors. Then came the Crile cannula with the principle of everting one vessel over a hollow cylinder and inserting this into the recipient vessel. In this method the intima coats are brought together and there are no raw surfaces. Following this there came a number of imitations with improvements, the best of these being the Elsberg cannula."

The main objection to all of these methods is that they cause a considerable amount of inconvenience to both donor and recipient. The amount of blood cannot be determined absolutely excepting, perhaps, by methods suggested by Libman and Ottenberg. Oftentimes the artery would go into a spasm from which it would not recover for half an hour or more, so that only a very small quantity of blood could pass through. This spasm sometimes could be overcome by irrigations of hot salt solution."

At the time Dr. McClure was a student intern and early residency, this direct method of transfusion was in vogue. Soon the method of injection by syringe was perfected, and the blood could be drawn in one room and taken to another for injection into the recipient. The syringe method was first described and used by von Ziemssen in 1892. In 1913 Lindeman reported an elaboration of the method of von Ziemssen.

"At the same time that work was being done to find a mechanical way of preventing clotting, that is, a more rapid or more perfect way of transferring the blood, investigators were turning their attention to the chemical side of the problem with the hope that if the blood could be kept from clotting by means of some chemical, the difficulty of transfusion would be immediately solved. The two chemicals most used have been herudin and sodium citrate."

The second problem of severe reactions and death from transfusions was largely explained by the work of Landsteiner. In 1900 Landsteiner divided human blood into three groups according to the iso-agglutinin content, and his pupils added a fourth in 1902. It was not until 1910 when Moss's paper gave wide publicity to grouping that blood transfusions began to be practiced with confidence. When Dr. McClure came to the Henry Ford Hospital the method of choice was use of syringe and citrated blood. The experience of World War I added impetus to the use of blood transfusions. Now immuno-hematology has become a specialty and the art of blood transfusion has become so complicated a procedure that only a few experts can understand all its ramifications.

By invitation of Dr. Halsted, Roy returned to Hopkins in 1912 to complete his residency. It was apparent from the beginning that Roy had great potentialities as a surgeon, and that his interests were akin to those of Dr. Halsted. They had confidence in each other.

Soon after his return to Baltimore he became ill with typhoid fever which was widespread in the city at that time. He asked me to arrange for a good special nurse. Fortunately I knew that Helen Troxell was available, and she fulfilled all the requirements. She accepted the assignment and that was the beginning of their romance. Four years later they were married.

The clinical material seen by Dr. McClure during his residency was quite different than what he saw in his later years. His illness with typhoid emphasizes the prevalence of infections at that time. Every summer many hospital beds were occupied by typhoid patients, thereby reducing the number of beds available for surgery. One of the serious complications of typhoid was perforation of the intestine. The number of perforations at Hopkins averaged about five a year. This complication offered a difficult problem for diagnosis and those patients were a poor surgical risk. These unfortunate victims provided material for learning and teaching surgical judgment. The incidence of malaria did not equal that of typhoid but it was often seen. While it was primarily a medical problem it also concerned the surgeon in the differential diagnosis of the cause of pre- or post-operative fever. Amebic dysentery and abscesses were relatively common. Management of these infections was only temporizing. The real solution of these problems of infection came through improvement in sanitation — an interesting chapter in medical history. The deformities of rickets provided surgical material. Osteotomies for the correction of bowlegs, knock knees and sabre shins were common procedures. On account of Dr. Halsted's special interest in problems there was an abundance of aneurysms, carcinoma of the breast and thyroids. Endocrinology and psychiatry were in their infancy. There was no insulin, B₁₂, sulfa drugs nor antibiotics. Tumors, benign and malignant, presented the same general types as are seen today, but they were larger and more of them were inoperable. Education of the public has brought a great change in the field of oncology.

The duties of surgical residency were demanding but rewarding. One could not be sure how he rated with the Professor, but to be chosen as a resident and

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allowed to remain in that position indefinitely was the best evidence that he was liked. Roy was among the few who were favored with the privilege of eating luncheon in the Professor's office. Roy admired and emulated the Professor and unconsciously acquired some of his mannerisms. In addition, he enjoyed a fine friendship with other members of the surgical staff. It was not easy to leave Hopkins, but his regrets were softened by his marriage at that time, and by the challenge of a new undertaking at the Ford Hospital.

"EARLY DAYS AT THE HENRY FORD HOSPITAL"

About fifty years ago, a group of citizens of Detroit subscribed to a fund for the purpose of constructing a hospital, to be the Detroit General Hospital. Their plans incorporated good ideas gained from visits to many other hospitals. Their ambitions were realized for the buildings were considered to be up to date. When the staff was organized, Dr. Frank Sladen, who was the medical resident at Johns Hopkins, was invited to join them as chief of medicine. Fortunately he accepted and came to Detroit in 1913. While waiting for completion of the buildings he engaged in private practice in Detroit. Subscriptions to the hospital fund lagged and Mr. Henry Ford was induced to take over the hospital. He paid back the other contributors and the hospital became his property. The name of the institution was changed to the Henry Ford Hospital. Soon after that he was seated at dinner beside Dr. Will Mayo. Mr. Ford told him that he found himself with a hospital on his hands and asked what to do with it. The reply was to get a full time staff and leave the problem to them. Future events showed that the idea was acceptable.

In October, 1915, Dr. Sladen brought a few of his private patients to the hospital as a nucleus from which the number has continued to increase (Fig. 10).

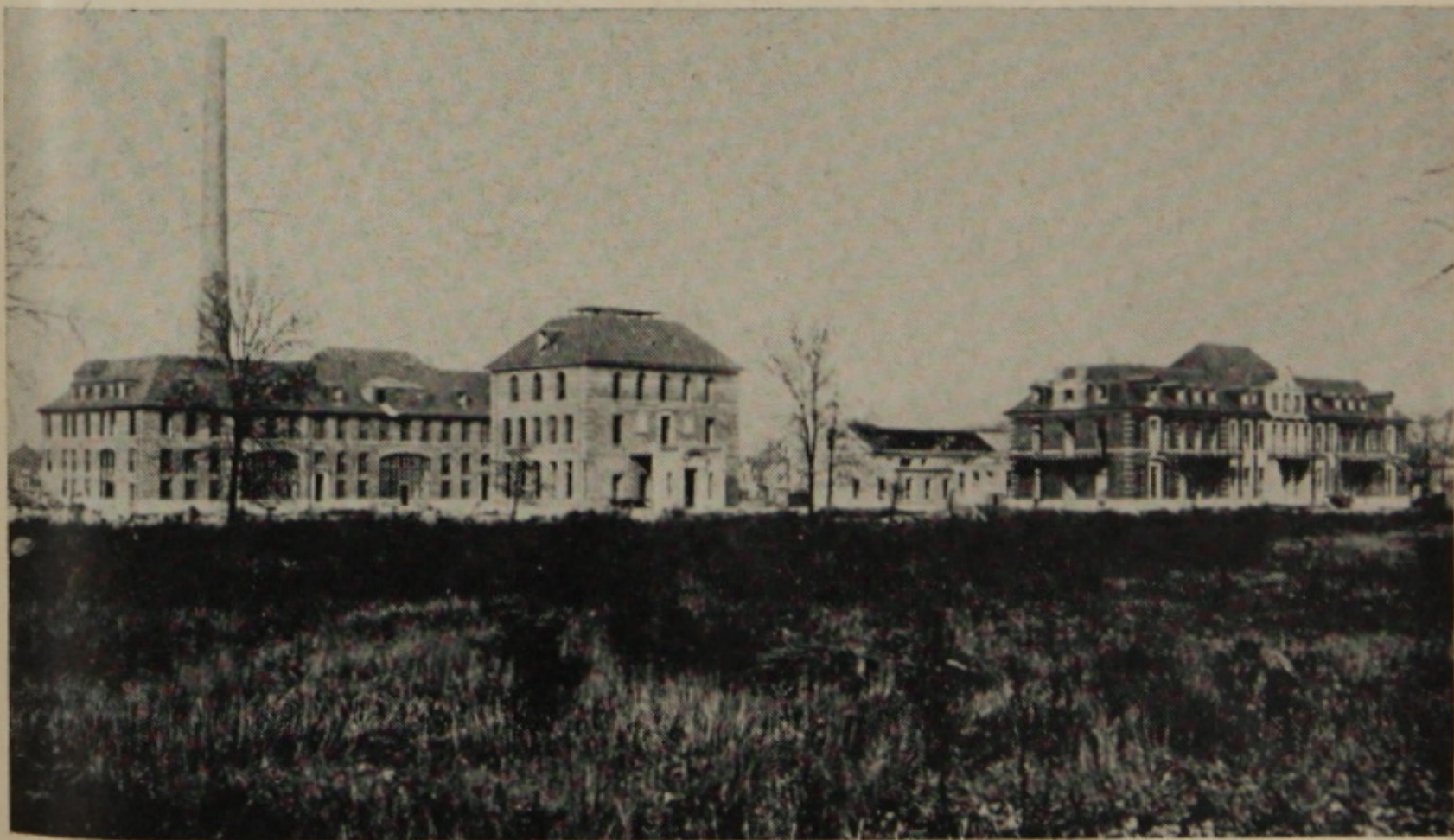


Figure 10

The Henry Ford Hospital, 1915, situated on a 20 acre lot at the geographical center of the city. M-units, laboratory, service building and garage.

A few months later Dr. Janney Smith joined him on the medical staff. There were a number of surgical problems and Dr. McClure was invited to come as Surgeon-in-Chief. He came in the summer of 1916.

It was known that Mr. Ford felt that the rich and the poor received excellent medical care, but the great middle economic group was less fortunate. It was his desire that this hospital should provide good medical care for those who wished to pay but could not afford large fees for the service. Therefore, the prices were to be kept reasonable. There was no provision for charity, a word which was not mentioned in Mr. Ford's presence. However, a great many people who were without funds at the time they needed medical attention were given the best of care and at a later date were given an opportunity to work to pay for the services rendered. Another stipulation of Mr. Ford was that patients should be seen by appointment because he disliked to see a long group of waiters on the bench. While Mr. Ford left the medical policies in the hands of the physicians, one of his representatives sometimes made suggestions. Having in mind the assembly line methods he suggested that they do tonsillectomies on Monday, appendectomies on Tuesday, fractures on Wednesday. He also suggested that there should be no autopsies performed, nor any smallpox vaccine be given at this hospital.

After Dr. McClure came to Detroit it was only two years until the hospital was closed on account of World War I. During that time the surgical staff consisted of enough men for an operating team and one extra for general utility. The buildings completed at that time were the M-Units with a forty-nine bed capacity, the operating room, laboratory, service and maintenance building and the garage. The four story building which now contains the A,B,F,H and I units was under construction (Fig. 11).



Figure 11
Photograph of architects plan, 1917.

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When the shell was completed without any division into rooms, it was leased to the U.S. Government for one dollar a year.

Soon after the M-Units were opened the beds filled. The growth of the clinic was assured. It was apparent that more room would be needed to accommodate the expansion. Besides caring for patients, the staff served as a consulting board for examination of possible rejects from the draft. The war spirit enticed one after another of the staff until too few remained to operate the hospital properly (Fig. 12). The hospital was closed in the summer of 1918, and all who could pass the physical examination entered the service. Dr. McClure was commissioned a major.



Figure 12

Photograph taken 1940 of personnel before war, still in the employ of the hospital. Besides the nurses and doctors are Miss Bateman and Brevick from File and Record. In the back row, Bill Mahan and Alex Croft from Maintenance.

Through a tacit understanding the surgical staff was to form the nucleus of an evacuation hospital staff. On induction we were sent to various camps but soon were assigned to Camp Shelby in Mississippi. There the staff of evacuation hospital 33 was collected and we were led to believe that we would be ordered overseas shortly, as that had been our request on induction.

The organization of the staff was complete, but still no orders to go overseas. By a little sleuthing it was learned that a colonel in camp was conniving to be assigned to command our unit. Thereupon, Major McClure wrote a letter explaining the situation and posted it outside the camp to avoid military channels. The letter reached his friend in Washington and in a few days we were off to Hoboken. On November 10, 1918, we boarded the Sierra which was a ship that had been retired before the war and had just been reconditioned after having a rudder shot off.

The next day, November 11, we heard the great celebration in New York on account of the signing of the armistice. No shore leaves permitted. The news of the armistice aroused hope that the war was all over and that our overseas trip would be cancelled. All doubt was removed when on the next day we sailed in a convoy under strict regulations because the submarines could not yet have been notified to cease activity. It was a rough trip and ninety per cent of the men on board were sea sick. Our destination was Bordeaux. As we sailed up the River Gironde the French children shouted from the banks "La guerre est fini." That was not news because we had already heard about the armistice before we left New York.

After debarkation at Bordeaux, the personnel of "33" were quartered nearby in the town Salle-Boeuf. The population of this town was about 80. It was Major McClure's and my good fortune to have a small up-stairs room in the home of the village blacksmith. According to the social customs, the blacksmith rated high on the scale. In that room were two beds, one chair and a smoking fireplace. If we could tolerate the smoke, we could keep warm. If the smoke was too bad then we could withstand the cold. Through the one window we could watch the ceremony of shoeing an ox, which took place just across the street. With the gesticulations of four men and the activity of the blacksmith, the ox was properly shod. One day we heard a great commotion in the yard back of the house. Upon investigation it was found that the family and neighbors were gathered around a well from which they had just pulled up a drowned dog. Needless-to-say we obtained our drinking water elsewhere after that. During the short time we remained in Salle-Boeuf we learned many interesting things about rural life in France.

Even though the war was over, the chief function of the evacuation hospital was continued, that is to move. The longest stay we had was in Vichy where again the Major and I were favored with exceptional quarters, for we had the privilege of a room in the building that had formerly been the German embassy. This was quite elegant with a private bath. During the time spent in France, Major McClure was intimately associated with Major Evarts Graham who was in command of another evacuation hospital. This proved to be a lasting friendship which endured many years after returning to this country. From November, 1918 to May 1919 we sojourned in France. The return to the States was on board the Alfonso XIII which was just newly equipped for U.S. service but retained the Spanish crew. The pleasant voyage home compensated for the rough exit in November. On arrival in New York we immediately traveled to Camp Dodge in Iowa and the unit was disbanded, and the medical officers discharged.

The condition of the Ford Hospital was the main interest when we returned to Detroit. The shell of the building was occupied by the army. Since there were no partitions on any of the floors, each unit served as a large ward with cots up and down the length of the room. The quarters seemed to be highly satisfactory to the occupants, for it was quite difficult to dislodge them. It was apparent that it was going to be many weeks before the buildings would be vacated. During that time, Dr. McClure invited me to join him in a tour of New England, which was partly

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for investigation of hospitals and medical centers, but largely for pleasure. On that trip the second-hand automobile sometimes faltered. The motor sputtered, hesitated, stopped in some out of the way place. In his characteristic quiet manner Roy heaved a sigh and said "Human life is not so simple." That incident with those words expressed his placid philosophy.

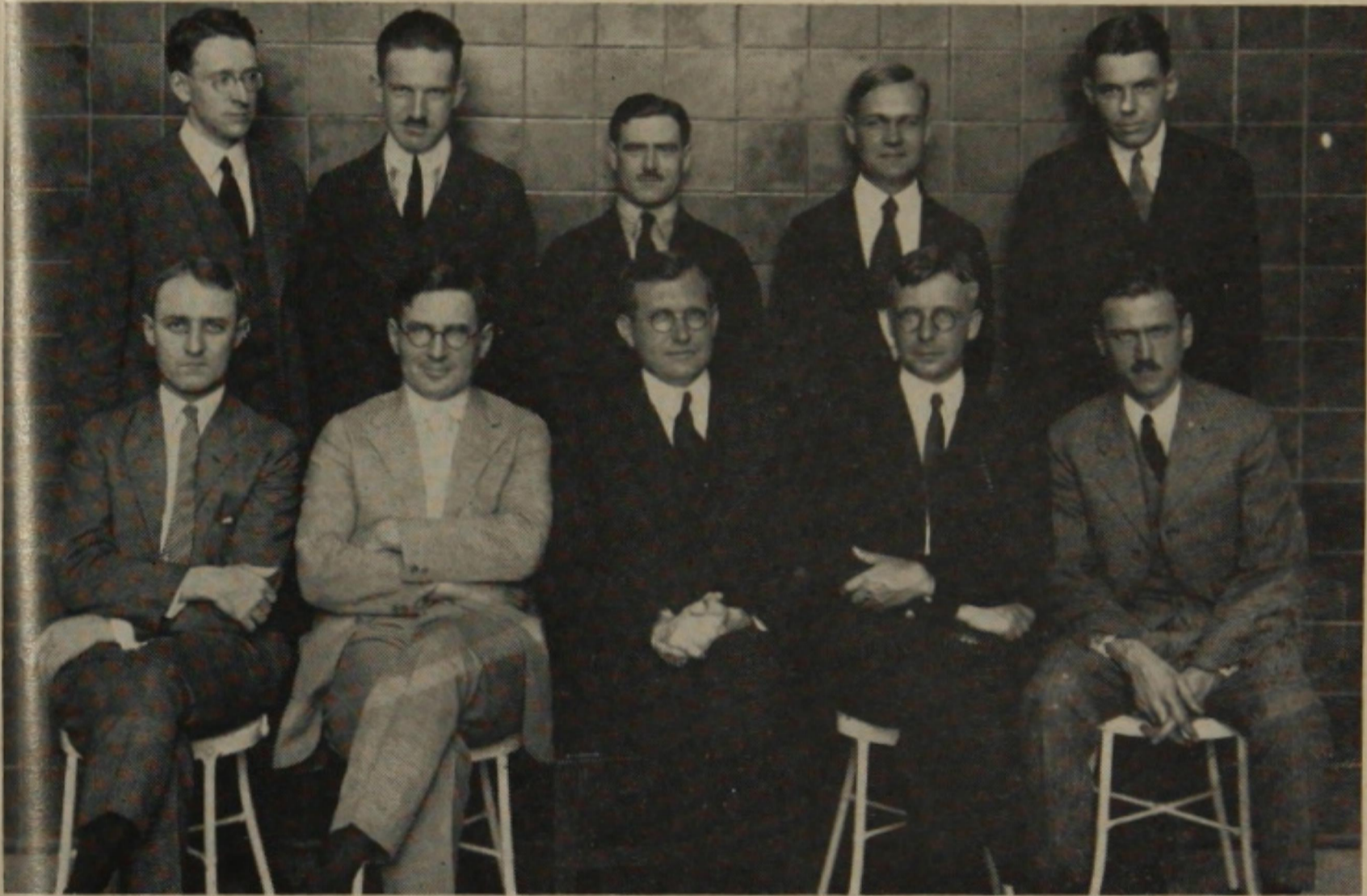


Figure 13
Surgical Staff, 1922.

The M units were reopened November 4, 1919, just a year after the armistice. The former staff returned with enthusiasm for the opportunity to reorganize the clinic. The first new patient was number 5426 continuing the system of records previously used. It was not long until surgery was again interrupted because there was a serious influenza epidemic in Detroit. All available beds were occupied by medical patients and operations were limited to emergencies. Gradually a normal balance was restored and a steady growth of the clinic proceeded continuing even today.

As soon as the military personnel withdrew, construction of the rooms in the new building began. Enough rooms were completed so that the first patient was admitted December 1, 1921. The staff was still small (Fig. 13) but adequate. Gradually the units were equipped and the rooms were occupied as soon as they were ready. The increasing number of patients necessitated an increase in the staff (Fig. 14 and 15). Specialties were developed in the departments of surgery and medicine.

As Surgeon-in-Chief, Dr. McClure was now launched in his life's work from which there were to be no more interruptions. He accepted his responsibilities as administrator. His clinical interest never lagged. Through his ability to gain friends



Figure 14
Surgical Staff, 1923.



Figure 15
Medical Staff, 1925.

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he performed a valuable service in public relations for the hospital and for medicine. A specific instance was his fine relation with Henry Ford Sr. which enabled him to interest Mr. Ford in many medical projects. His surgical achievements have been presented in previous addresses.

Roy McClure was a naturally reserved and dignified person whose charming personality attracted a host of friends. He instinctively cultivated certain friendships with true prediction of their worth. These friendships in turn rewarded him and those with whom he was associated. It was fortunate that Roy studied medicine at the time that there was a revolution in medical education and that he was able to carry on the spirit of his teachers. These annual memorials are a fitting tribute to a dedicated physician.

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