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The European Discovery of American Surgery

Volume 2
Surgical “Mecca”

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The European Discovery of American Surgery

Volume 2

Surgical "Mecca"

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Cover: Participants in the "Fourteenth German Medical Study Tour" visiting the Mayo brothers in Rochester, Minnesota, September 1912 (see Chapter 28). Photograph used with permission of Mayo Foundation for Medical Education and Research, all rights reserved.

A caption on the back of the photograph identifies the following (with some details added from other sources):

Front row (L to R): ?, ?, ?, ?, Carl Bernatzky (Neisse), Emil Adler (Salzburg), Erich Zurhelle (Bonn), Josef Pollak (Graz), H. Eckstein (Berlin), Hermann Engel (Berlin), Paul Pfaehler (Solothurn), M. Lehmann (Königsberg), ?

Middle row (L to R) : ?, ?, ?, Emil Zurhelle (Bonn), H. Fielitz (Halle), Friedrich Merkel (Nürnberg), Theodor Struppler (München), Richard Heigl (Coblenz), Rudolf Lennhof (Berlin), Ernst Graser (Erlangen), William Mayo, Ernst Jonas (St. Louis), Charles Mayo, Karl Mayer (Villingen), Albert Ochsner (Chicago), O. Brigel (Stuttgart), Alfred Bretschneider (Rome), Albert Gerber (Bonfol)

Back row (L to R): ?, Arthur Mechler (Leipzig), Max Walthard (Bern), Karl Heldmann (Lechhausen), Fritz Krauss (Stuttgart), Hugo Menzel (Görlitz), C. Partsch (Breslau), Hubert Gebele (München), Wilhelm Weber (Dresden), Karl Henrici (Schwetzingen), Arthur Fränkel (Berlin), Friedrich Kraft (Salzburg), Franz Brunner (München), Emil Bursche (Warsaw), ?, H. Unruh (Wismar), ?, ?, ?, Edward Starr Judd

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Introduction to Volume 2

Readers of Volume 1, "Land of Unlimited Possibilities," have seen that European visitors at the beginning of the twentieth century were impressed by the technical capabilities of American surgeons, but shook their heads at the uneven quality of American medical education and questioned the originality of American science. While there was admiration for hospital construction, administrative organization, and the training of professional nurses, this was tempered by a perception that the medical profession in America was more commercial than academic. Boston and Philadelphia, which had been the leading intellectual communities since colonial times, were being eclipsed by lavishly endowed institutions in New York, Baltimore, and Chicago. But American progress was continuing, and these opinions would also evolve.

Despite his previous glorification of German achievements, Carl Beck of New York (Chapter 3) wrote an article in 1907 assuring his fellow American surgeons (in English) that they had already gained the respect of leading Europeans. "It is only the small man who enjoys belittling whatever comes from America. 'What good can come out of Nazareth?' those idiots say." He specifically referred to the achievements of "McDowell, Warren, Sims, Mott, Parker, O'Dwyer, and Corning" (the last four from New York), and concluded:

> Yes, the time of reciprocity, for which we hoped so long, has come. Let us compete with our European confrères by mutual exchange. Let us visit Europe as frequently as possible and let the Europeans visit us. Let them give us their refined knowledge, based upon classical and fundamental research, and let us show them the splendid technical achievements which are so characteristic of the United States. If anything can help to secure eternal peace between the nations it is the strengthening of their scientific ties.[1]

Another turning point was the report of Paul Clairmont, an emissary from the world's most prestigious surgical department in Vienna.[2] European surgeons would have to pay attention when Clairmont described Rochester, Minnesota (home of the Mayo brothers) as a "Mecca for surgeons," called Harvey Cushing at the Johns Hopkins Hospital in Baltimore "a man with unusual gifts," and said that "the most memorable operation" was in the animal laboratory of Alexis Carrel at the Rockefeller Institute in New York.

Johns Hopkins University and its Department of Surgery had been explicitly designed after the European model, and the most prominent investigators at the Rockefeller Institute were themselves European immigrants. However, the principal attraction henceforth would be the quintessentially American institution eventually known as the Mayo Clinic.

The concept of a "Surgical 'Mecca'," adopted as a subtitle for Volume 2, was repeated in several of the subsequent publications from different countries, and in 1914 Robert Proust attributed the phrase to Antoine Depage, President of the International Surgical Society. During the years after 1908, an increasing number of prominent European surgeons would visit American centers, especially in New York, Baltimore, Chicago, and Rochester, Minnesota. Harvey Cushing's move to Boston would reinvigorate the surgical reputation of that city, and Alexis Carrel would be awarded the Nobel Prize.

We know how this exciting era of international scientific exchange ended. But read for yourself how it felt at the time.

Notes

1. Beck C, "The influence of American surgery on Europe," *The Clinical Review* (Chicago) 1907; 24:386-404.
2. Clark DE, "Paul Clairmont and his connections to American surgery," *Langenbeck's Archives of Surgery* 2023; 408:94.

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Paul Clairmont (1908)

Johann Paul Clairmont was born in Vienna in 1875, and graduated from the University of Vienna in 1898. After initial laboratory work in Vienna, he became a surgical assistant to Anton von Eiselsberg, continuing both laboratory and clinical research and achieving the rank of Privat-Dozent in 1907.

In 1908, at the age of 33, he traveled to America and wrote the report that appears in the following pages.

He returned to Eiselsberg's service, was promoted to professorial rank, and became surgical director at the Rudolfspital in Vienna in 1913, where he remained during the First World War. In 1918, he was called to be Professor of Surgery at the University of Zürich, Switzerland, where he served with distinction for the next 23 years. He supervised the training and research of many Swiss surgeons and several foreigners, including Alton Ochsner from the United States. He developed a metastatic cancer and died on the first day of 1942.

Chirurgische Eindrücke aus Nordamerika
Wiener Klinische Wochenschrift 1908; 21:1100-1103, 1130-1133, 1163-1166

Surgical Impressions of North America

by Privat-Dozent[1] Dr. Paul Clairmont,
Assistant in the First Surgical University Clinic

For a long while in our lecture halls, clinics, laboratories, and hospitals, it has been a frequent event to encounter American doctors who are endeavoring to become familiar with the results of European science so that they can put them to use in their own land. For Europe to remain the medical schoolteacher for young America, it seems that the time has come for us to focus our attention upon what is being accomplished across the ocean through earnest effort under the specific conditions there. And we should acknowledge the American criticism that their work and opinions have been almost completely ignored by the medical world in Europe – including Germany.

In view of this, my esteemed Chief, Baron von Eiselsberg, suggested that I make a study tour through the eastern parts of the United States of America, in order to see for myself the status of surgical technique and the condition of hospitals and operating rooms.

My journey was enabled by a benevolently provided stipend from the Imperial and Royal Ministry of Culture and Education, as well as the generous material support of my Chief, to whom I again express my thanks.

The unfailingly kind and hospitable reception that I received from the many American surgeons that I visited on my tour made it possible in seven short weeks to obtain a valuable insight into the activities of their surgical clinics.

Many stimulating observations came especially from my personal conversations with William J. and Charlie H. Mayo in Rochester (Minnesota, the westernmost point of my journey), John B. Murphy in Chicago, and Harvey Cushing in Baltimore, whom along with John B. Deaver of Philadelphia I would regard as the first and foremost surgeons of America.

Before I report on the specific points that impressed me most about surgery in America, it seems advisable to present some general observations about the conditions under which American surgeons work and the advantages and disadvantages attributable to the particular characteristics of their country.

The enterprising spirit, the determination, the optimism, and the child-like humor that enlivens every situation are American qualities that may explain why patients do not spend much time thinking about a proposed operation but accept it easily and quickly. The need to get back to work as soon as possible influences the decision, as I had the definite impression that this consideration plays a greater role than it does with us. And the surgical approach often has the advantage – for example with appendicitis, which is so common – that the patient can return to work more quickly than with nonoperative management. If on the one hand this is advantageous to the patient, on the other hand it may too easily lead the doctor to recommend operative intervention without an exact diagnosis – even in cases where this might be possible.

There have certainly been other factors of major importance in the development of American surgery, whose influence is even more apparent in other areas: The greatness of this land where a man is judged only by his accomplishments.

Just as in this country where it is possible for a factory to produce only one kind of machine for a gigantic market with no tariff barriers, always devoted to perfecting this machine, so can surgical specialization develop, focused on a narrow area, achieving extraordinary results, and supporting its practitioner.

For a patient choosing a surgeon, no importance is given to age, rank, or title of the operator, but only his successes. It might be expected that there will be many poor and numerous mediocre operators in a land where every doctor feels entitled to perform surgery. However, American self-confidence, which especially amazes a European, gives the right man an opportunity for development. Thus, many leading surgeons have started out as general practitioners, without spending years in specialized training.

Of course, we should not forget that competition is produced in particular by the worthlessness of titles. The doctor's office sign, which in many cities cannot exceed a certain size, carries only his name [1]. Advertising is for an American doctor – make no mistake – just as frowned upon as with us. And the reputation of European experts, who invited or uninvited come to this country to make money, is just as bad.

One can find several other reasons why an industrious surgeon here can accumulate an experience beyond the reach even of a metropolitan university clinic, and that the danger of an ignorant, knife-happy charlatan is not as great as might be expected. These reasons include the well-developed aseptic technique throughout America and the use of ether, a relatively harmless anesthetic. To these may be added the excellent nursing care and the construction of well-organized hospitals.

From the large list of hospitals that I visited, I will name only a few, and describe individual arrangements that find their explanation in American customs and practice. Above all, I have to mention the recently-completed Mount Sinai Hospital in New York, which was founded by its Jewish citizens for $5,000,000 (25,000,000 K).[2] With a capacity of 450 beds, the daily operation of this hospital will cost $1,000. The central location of the hospital in the part of New York containing the poor Jewish population (out of 5 million inhabitants there are 1 million Jews) explains why the outpatient department of this one hospital sees 1,500 patients every day, even though there are 42 hospitals in New York.

Another recently completed institution in New York, donated by Vanderbilt and constructed of marble, is St. Luke's Hospital near Columbia University (W. 113th Street).[3] The Lying-In Hospital (E. 2nd Avenue, 17th-18th Street),[4] is a self-contained women's hospital donated by P. Morgan and worth a visit.

In Philadelphia the Jefferson should be mentioned, and in Chicago the Michael Reese (29th Street and Groveland Avenue) and Mercy Hospital (26th Street and Calumet Avenue). Finally, there is the private clinic of Murphy.

The Johns Hopkins Hospital[5] in Baltimore accommodates the famous medical school of the same name, which began with the foundation of an institute for anatomic pathology still under the direction of the well-known anatomist Welch. Since the internist Osler was called away to Oxford, Welch has become the leader of American medicine, who functions wherever necessary as its spokesman and defender, for example against the recent anti-vivisection movement promoted by the New York *Herald*. The Johns Hopkins Hospital, with a large campus on a hill overlooking Baltimore, still has plenty of room for growth and its situation brings to mind the General Hospital in Vienna. In addition to Halsted, it has Kelly, Finney, Cushing, and Young, whose work I will describe later. Max Brödel, a German who came to America 14 years ago, is active as Professor of Art. He is the brilliant creator of those artistic drawings that distinguish the publications of the Johns Hopkins Hospital, to which students come from all parts of America. I had the opportunity to see the numerous illustrations that Brödel is preparing for Kelly's work on renal surgery.

The greatest thing to see, the "Mecca" for surgeons, is Rochester in Minnesota, a town established by Whites only 60 years ago, today with 8,000 inhabitants, where the Mayo brothers practice.

The sons of a general practitioner, who 30 years ago in the same town performed the first operations with the help of his children, now 46 and 42 years old, also started with a general practice, but achieved such success with their operations that patients came to them from all directions. Through their own efforts, they enlarged the practice from year to year, and now use as their private clinic the St. Mary's Hospital, administered by Catholic sisters, with 150 beds which will be increased by another 72 beds this year. The two brothers perform 25-30 operations per day; the older, Will, operates almost exclusively on the abdomen, while the younger, Charlie,[6] usually operates on the head, neck, and extremities. I myself watched 150 procedures in a week and can cite some numbers from the 1907 report which describe the activity: 5523 operations were performed, including 3215 laparotomies. For individual diseases and operations the report lists 245 thyroids, including 124 cases of toxic diffuse goiter,[7] 61 procedures for breast cancer, among 148 stomach operations 94 gastroenterostomies and 37 resections for gastric cancer (with the low mortality of 16%), 1135 operations for appendicitis, among which 432 were acute and 703 "à froid,"[8] 38 nephrectomies, 61 prostatectomies, etc.

The daily number of patients seeking the attention of the Mayo brothers comes to about 150 and can only be managed by the provision of specially-trained assistants, who take care of all the necessary examinations.

The Mayo brothers are currently considered the best-known and most skilled operators in America. They have refused numerous invitations from universities to be professors of surgery. They receive not only patients but also doctors from all parts of America, who in a short time can see a large number of operations and take part in a patient experience that no other clinic in the world could offer. In order to give the visiting doctors (generally 30 to 50) an opportunity for education and exchange of views, there is a club that has a two-hour session every afternoon. Based on the reports of the morning's operations, there are discussions which gain in value because doctors from various countries in Europe are often also present. While I was there, these included Professor Barbour, gynecologist from Edinburgh, and Dr. Waldenström, assistant in the surgical clinic of Stockholm.

In the structure of the new hospitals we notice the absence of pavilions. The reason is that in cities like New York, Chicago, and Philadelphia land is so expensive that it has to be used to its maximum by building multiple stories, the same reason why there are 16- to 20-story office buildings [2]. Thus, the hospitals in large cities do not have gardens or courtyards. In their place, the patients are provided with solariums or roof gardens, as suggested by W. P. Northrup. These facilities are extensively used for the management of surgical tuberculosis, as well as other suppurating cases.

In contrast to our hospitals, those in America have almost exclusively been created by foundations and donations from private individuals, whose names are displayed on plaques. In addition to American millionaires, even the well-off man is proud to give money to charitable and communal institutions during his lifetime, rather than leave it to his children. One result of this dependence upon private donations is that even the hospitals are feeling the effects of the recent financial crisis and the current recession, which affects everyone and is often mentioned. For the maintenance of these hospitals, it is important that they have numerous beds for private patients. These rooms, which are equipped with English comfort, private baths, etc. and cost $25-$100 per week, are kept occupied by many well-known surgeons, and can bear a large part of the overall costs of the hospital. Thus, the brothers A. and E. Ochsner in Chicago have a hospital that has developed from small beginnings, whose private patients support not only an entire floor with wards for indigent patients but also their mortgage payments.

The public hospitals obtain their patient populations partly from their "dispensaries" (multispecialty clinics) and partly from their "ambulances" (an arrangement comparable to our rescue societies). Depending on the locations of its hospitals, each city is divided into regions, and each hospital is responsible for emergency medical care in its region. This system is especially praised by Americans, but it does not measure up to our system – I have in mind the Vienna rescue society. The vehicles are mostly small open carriages with canvas walls, no protection in back, without rubber tires or suspension, etc. Only recently have some new hospitals, like the Lying-In Hospital, replaced the one-horse carriage with an automobile, which is surprising in view of the extraordinary proliferation of automobiles in America.

Neither on the wards nor in the clinic is it considered proper for one patient to be undressed and examined in view of another. The result is that the dispensaries have a series of small rooms used for examinations. As an example, I can describe the new dispensary of the German Hospital[9] in New York (Park Avenue and E. 77th Street). In the clinic, the partially uncovered patient is protected from general view by a large portable frame with white curtains on three sides, which surrounds the entire bed except for the head end. Also, a patient delivered by ambulance comes into a convenient space near the entrance, usually in the basement, which has its own bathroom and in the newer hospitals also its own observation ward with several beds. Not until the following day or after surgery is the patient admitted to one of the general rooms that are located on the upper floors. The isolation of children is especially strict. In Mount Sinai Hospital and in many other hospitals I was told that because of the extremely high prevalence of gonorrhea on the conjunctival and genital mucosa of newly admitted children bacteriologic tests are regularly performed.[10]

The business of the hospitals is completely centralized. In the basement of the modern hospitals, which for example at Mount Sinai Hospital is three levels deep, there are central heating, ice makers, electric systems, workshops for carpenters, painters, mechanics, etc., and a print shop for brochures, reports, and scientific publications. The patient rooms are not kept as austere as ours, and are made more habitable by colorful painting and flowers. There are a small number of beds for a given space. Medical equipment is not kept in the patient rooms, except for a glass cabinet containing medications, which in the children's ward at Mount Sinai Hospital sets off an alarm if it is opened. The new hospitals have good auxiliary rooms; in addition to excellent bathrooms for the patients, closets, a day room, and a dining room for ambulatory patients. There is a large visiting area at the Lying-In Hospital, where visitors are not permitted to enter the patient rooms, and also smaller isolation rooms, bandage room, laundry room, and kitchen. Despite the previously mentioned precautions, it is unthinkable by American standards that a dying patient would be left at a general nursing station. If there is no recovery room immediately adjacent to the operating room, a postoperative patient would also come first to an isolation room. Several different surgeons told me that they specifically avoid placing a patient waking up from anesthesia near to one on the first postoperative day, since the ether exhaled by the newly recovering patient might cause the other to start vomiting again.

The operating rooms in the new hospitals are located on the top floor. However, I was disappointed by the facilities even in the most modern hospitals, since by comparison to the rest of the hospital they have not been improved as much as might be expected. Nowhere did I find a distinct division between aseptic and septic areas. Auxiliary rooms for preparation, induction of anesthesia, instruments, etc. are either absent or inadequate. Sterilizers heated with gas, instrument cases, and storage areas for bandaging material and preparation of sutures are often kept in the operating room itself. The auditorium uses up so much space as an amphitheater that it leaves only a small space for the operating room, which loses more space to all the items of equipment. Although every operating room does not demonstrate these deficiencies, I had the general impression that operating room arrangements were inefficient. Although no operating room failed to have a skylight that admitted excellent natural light, artificial light as a rule was provided by a portable arm with numerous electric bulbs. Diffuse light in the operating room is not in use, only with Kelly at the Johns Hopkins

Hospital did I find the Siedentopf illumination apparatus.[11]

Among the operating room arrangements that are worth copying I should mention the pipes with sterilized water and sterilized saline solution that run over large porcelain sinks and can be opened with a foot pedal, making it unnecessary to have washbasins around the operating table. The operator can rinse his hands in running sterilized water.

The operating room is supervised by a graduate nurse. Orderlies are as a rule only used for transporting patients. However, it would be wrong to suppose that many more assistants are available in the operating room. It is amazing how a busy surgeon can go about his business in the operating room with calmness, order, and speed. As examples, I can cite the clinics of Deaver or Murphy, or the hospital of the Mayo brothers. Here one has the opportunity to admire the organizational talent of Americans.

There are different practices regarding the use of doctors or nurses for passing instruments or administering anesthesia, but in general the American surgeon is satisfied with little assistance. Deaver and Will Mayo operate with only one assistant. Only now and then will a second assistant be brought in to hold a retractor.

Attached to every hospital there is a nursing school. These recruit from the best families and a certain educational level is required for admission [3]. The incentive to choose this profession is to be found less in the desire to care for patients than in the fact that these women can earn 25 to 40 dollars per week after a 2-3 year training period. The demand is so great that despite the large number of nursing schools there is still a deficit of trained nurses.

These large differences compared to our conditions may be attributed to the fact that even a girl from a well-off family wants to be able to support herself. Positions as a teacher, in stores, the widespread use of women as telephone operators, as stenographers and typists, etc. do not enjoy the same status as the position of a nurse. The other jobs attract girls of the class which in Europe goes into household service. In America, housekeeping jobs are mostly for Blacks and Japanese. The lack of class-consciousness, the judgment of people by their accomplishments, the excellent means of transportation, and the general regard for women are additional factors that favor the choice of the nursing profession for American girls. Although men marry earlier and bachelors are less common than in Europe, the American girl does not depend upon marriage, which for her is a means of support in the truest sense, because she does not bring a dowry and the married woman – even the wife of a laborer – is not expected to work for pay. Americans have repeatedly told me of their amazement at seeing women in the streets of Europe carrying or pulling heavy loads, which for an American is inconceivable.

As a rule, the nurses live in a separate building attached to the hospital, or in smaller hospitals in a completely separate story of the building. They have to complete a two- to three-year course, during which their services exclusively benefit the hospital. They are involved not only in the operating room, the dispensary, and in the different wards, but also receive several months of obstetrical training at a women's hospital. The practical instruction is complemented with lectures and exercises held by the leading doctors and their assistants. During several weeks of experience in the "diet kitchen," the nurses learn about the preparation of special meals.

Upon arrival in New York, I was told by German surgeons (Willy Meyer, Kammerer, Kiliani) that I would find the same excellent asepsis everywhere in America. I can confirm this assertion and I think it must be characterized as an especially remarkable fact that gives credit to American surgery: Wherever operations are carried out, whether in the big hospitals with excellent facilities or by the many general practitioners who perform surgery in America, the best asepsis is used everywhere, and an observant visitor will find it difficult to find violations of sterile technique. This is true not only for the junior operators but also for the senior ones, who are often of an age where some European surgeons have not been able to adopt modern asepsis. American surgeons, who are accustomed to considering asepsis as a *sine qua non*, therefore may return home very disappointed when they visit European – especially German – clinics where men with famous names are practicing and find that the fundamentals of operative technique are lacking. A number of surgeons have told me they had this impression.

In any case, it is worth examining the reasons that have allowed asepsis to be introduced so rapidly and completely (for apparently the same is true in the West). The greater cleanliness of Americans is not without importance. Certainly, the method for teaching operative surgery plays a role, since our students learn using cadavers while Americans learn using live animals. Here I can cite Cushing, who told me that students in an operative course using cadavers learn exactly the opposite of what they need to know for operating on a living person. To explain the rapid and complete adoption of asepsis it is also important that older surgeons have willingly given up their positions, especially as teachers. Surgeons of good reputation like McBurney, Senn, Bull, and Tuttle, have thus voluntarily retired at the age of 55 to 60 years, still busy after years of industrious and stressful life. They have thereby secured the recognition and honor of younger generations. Above all, however, the unprejudiced criticism of Americans, who accept what is good wherever it comes from, has immediately and correctly identified the value and necessity of asepsis and has adopted it.

The sterilizers, which are set up next to the operating rooms, function without exception using high pressure. Dressing materials, operating gowns, sheets, and compresses are as a rule sterilized individually, carefully rolled up in a compress. These are opened just before use. Gauze is used for absorbent pads; only in the Presbyterian Hospital in New York (McCosh, Elliot) did I see the use of sponges, which were used only once after a 14-day preparation (washed in sublimate).[12] Instruments to be passed are first allowed to dry protected from airborne infection by covering them with sterile pads. In general, American operators are satisfied with a small set of instruments and indeed everyone throughout the land knows that surgeons like Deaver, Murphy, and Mayo manage with very few instruments.

Patients are usually prepped just before the operation. Only a few shave the patient on the previous day and prepare the operative field with an alcohol wrap. For the Mayo brothers, who – as I said before – perform 25 to 30 operations per day, the patients bathe on the day before surgery and are then shaved and washed on the operating table. Cleaning the operative field with soap takes no more than three minutes. Then the area is painted with alcohol and sublimate. Cushing emphasizes that the preparation of the operative area should be limited for his craniotomies. His excellent results can be taken as evidence that too much scrubbing does more harm to asepsis than it helps; also the preparation of the operator's hands is brief. Above all, however, every American surgeon uses rubber gloves, which are either sterilized dry in steam halfway, that is, turned inside out up to the base of the fingers so that steam can get inside the fingers of the glove with each pair separately wrapped in a pad, or like the Mayos by boiling them before and after the operation. For boiling gloves, one should not use the soda[13] solution that is used for sterilizing instruments, since soda damages rubber. Some surgeons use gloves whose outer surface has been roughened, so that the troublesome slipperiness of the rubber gloves is avoided. While the American rubber glove may itself be superior, further economy is achieved by patching small defects, tears, etc. with small pieces of rubber. In places where the gloves are donned while dry, the hands are first made slippery by thorough rubbing with sterile talc. It seems to be important for asepsis that the rubber gloves, which always cover the lower end of the sleeves, are often rinsed off during the operation. The running sterile water available in every operating room is especially useful for this purpose. In places where a basin of sterile water is used (Deaver), this is frequently replenished.

After completion of an operation, the operator peels off the rubber gloves, keeps his hands clean, and prepares them for the next operation only by a brief rinsing (two minutes) in flowing sterilized water, often without using soap.

Other practical aids in maintaining asepsis include covering the small adjustable-height instrument stand with a sterile sack, which thus covers its undersurface with a germ-free barrier to protect the drapes that cover the patient, or the small table with a concave edge placed in front of the operator when the lithotomy position is used, allowing him to stand close to the patient while still having a place to set down his instruments.

[p. 1130]

Anesthesia in America is almost exclusively ether with a preoperative morphine injection. I only saw chloroform used in the German Hospital in New York. Chloroform is so widely recognized as a dangerous anesthetic that surgeons have told me they cannot use chloroform because patients will refuse it. Ether is usually administered by the open-drop method; only a few times did I see the use of the Juillard mask (asphyxiating form).[14] Ether from the Squibb company (New York), which is most commonly used, comes in metal flasks of ¼ to ½ pounds. In places where anesthesia is always administered by the same hands, for example with the Mayos, the performance of the responsible nurses is outstanding. The Mayos' anesthetist, Miss A. Magaw, reported more than 14,000 anesthetics without a death;[15] since then the number is up to 17,000. A mask is used which is somewhat higher and larger than the Rosthorn modification of the Esmarch mask used in our clinic. The extremely simple way that a piece of stockinet can be stretched across this mask makes it possible to boil the mask and use a fresh piece of stockinet and gauze for each case. The height of the mask prevents it from touching the nose and causing a pressure sore. The ether is administered directly out of the metal flask in which it is supplied; after opening the flask with a knife, its neck is closed with an attached stopper that has a channel. A small rolled-up piece of gauze is inserted into this channel, which allows the ether to drip out.

The patient is anesthetized preoperatively on the operating table [4]. The eyes are protected with a piece of cotton wool. The anesthetic drip is begun slowly; when the patient's face becomes flushed, additional layers of gauze are placed on the mask and the drip rate is increased [5]. When the patient is asleep, which takes about three to five minutes, the drip rate is decreased and the operation immediately started. Conversing with the patient or asking him to take deep breaths is thought to be pointless, since these may cause him to cough or struggle. There is no reliable sign of the depth of anesthesia. Corneal and pupillary reflexes are not checked, but only the breathing and pulse are monitored. Ether anesthesia is not as demanding for young or anemic patients, who only require a small dose, as it is for strong people who take deep breaths and resist the anesthetic. If ether gets into the eye, a few drops of castor oil are instilled in the conjunctival sac to prevent conjunctivitis. The only contraindication to ether is an acute upper respiratory illness. Cases of pulmonary tuberculosis, as well as those with toxic goiter are anesthetized with ether. The latter get 0.55 mg of atropine 30 minutes before surgery along with an injection of morphine, and the ether is thought to make the heart rate slower and more regular.

The anesthetist records the duration and course of anesthesia, the amount of anesthetic given, and other observations which the surgeon includes in the postoperative dictation of the findings and procedures.

In the Roosevelt Hospital[16] (New York) I saw the rectal administration of ether used for an excision of an esophageal diverticulum by Brewer. The 67-year-old woman was anesthetized in 15 minutes. Brewer uses this method, which was worked out and made feasible by one of his assistants, for operations on the face and neck, so that a mask and anesthetist are not in the way. Brewer has had good results with this method, in which the ether is entrained by a flow of oxygen and directed into the rectum.

Regarding the technique of American surgeons in general, nowhere did I find that which our preconceptions about America might have expected: Operations performed for speed or spectators. On the contrary, it must be noted that American surgeons on average operate quite slowly and carefully, and do not lose sight of the patient's condition. Of course, there are some surgeons like Deaver, W. Mayo, Murphy and others whose excellent technique makes every operation look easy and accomplished in an unusually short time. Another characteristic that strengthens the American as an operator is his unfailing calmness. One never hears an impatient or angry word from the mouth of an American surgeon during an operation.

Operating slowly is especially the practice of Halsted and his school (Johns Hopkins Hospital in Baltimore). The intention of these surgeons is to avoid causing any tissue injury by rough handling. When possible, delicate forceps are used to hold the tissue; the finest silk is used for ligatures; knots that compress the tissue are avoided where possible; hemostasis is meticulous.

In general, there is a reluctance to make long incisions or divide muscles. The result is especially that abdominal incisions are short and in the direction of the muscle fibers, which are split bluntly. Thus appendectomies are usually performed through a McBurney incision (the zig-zag incision of Riedel).[17] American surgeons smile at Kehr's bayonet incision,[18] since due to the unusual frequency of gallstone disease they have ample opportunity to employ a short paramedian incision for procedures on the gallbladder or bile ducts, only in difficult cases extending it obliquely up to the xiphoid process. The same is true about trepanation for increased intracranial pressure through the temporalis muscle spread apart with retractors.

American surgeons are not concerned about touching the wound with their fingers. Even the assistant's hands can often be seen in the wound. The use of rubber gloves excuses this, but it does take something from the cleanliness of the operation and detracts from the operator's technique.

There are many kinds of suture material. In addition to white silk in different strengths, absorbable materials in the form of catgut and kangaroo tendon are most often used. Very different sterilization methods are employed. Most often I have seen chromic catgut used, which is reabsorbed only after a long time (20 days). The Lukens sterile catgut is manufactured by the C. DeWitt Lukens Company in St. Louis, Missouri, and delivered in sterile glass tubes, which are broken apart in the middle after the external surface has been sterilized in an antiseptic solution. It is marketed in different strengths and is used for suturing the abdominal muscles after laparotomy or in the Bassini repair of an inguinal hernia. For ligatures and buried sutures black machine twist [6] is used, which is produced using iron, thought by many (Halsted school) to have an antiseptic effect.[19] Cushing uses for the precise suturing of the scalp a thread of the thinnest machine twist. Two further materials in use, especially for skin sutures, are horsehair and silkworm.

American surgeons frequently use a running suture with a straight needle. Curved needles are held with locking needle holders, which are familiar to American surgeons who all perform gynecologic surgery. The method of Cushing[20] (which we call the intracutaneous Halsted suture) is widely used for running sutures. It has been applied to the bowel as well as the skin. During closure of laparotomies, particular care is given to the fascial closure, which is sutured such that the edges come to lie one on top of the other, not just apposed. For this purpose, either the fascia on both sides is sutured in the manner of Lembert or the edge of one side is laid on top the other side and sutured in place.

In order to prevent the formation of a hematoma in the dead space between the skin, subcutaneous space, and abdominal musculature, Deaver initially places two or three stitches through all the layers, which are tied over gauze strips laid over the suture line after closure is complete. The

Mayos use several looped mattress sutures for the same purpose: This suture begins on one side by including skin, subcutaneous fat, and fascia, while on the other side only subcutaneous tissue; the suture goes back to include only subcutaneous tissue on the first side, and then on the other side through fascia, subcutaneous tissue, and skin. In all operating rooms, the gauze pads used for packing the abdomen are counted before closure of the peritoneum.

For peritoneal drainage, Mikulicz tampons[21] or gauze wicks are no longer used. Instead, everyone has adopted the so-called cigarette drain, which causes no pain for the patient when it is removed, as I saw repeatedly. I have seen the cigarette drain used in three ways: Either a piece of silk is folded multiple times and placed into the wound (for example with thyroidectomies), or a piece of gauze (or better a wick) is wrapped in silk for its entire length. The silk thus creates a tube, in which the absorbent material lies. If copious secretions are expected, a small drainage tube is first rolled up in the gauze before it is wrapped with silk. This method has the advantages not only of painless removal and avoidance of adhesions and complications like bowel fistulas, but also fulfills its purpose of stronger suction.

The postoperative dressing is also in America a simple aseptic adhesive protective bandage. Halsted's school covers the wound with thin sterile sheets of silver (having the thickness of tissue paper), which are sterilized in steam, handled with sterile forceps, applied and pressed in place with alcohol swabs. The bacteriocidal action of silver is thought to prevent ingrowth of germs that can make the suture tracts more visible or even lead to stitch abscesses. The Ochsner brothers paint tincture of benzoin on the suture line after plastic surgery on the face, which – as I have seen for myself – leaves an almost invisible scar. Here too a bacteriocidal action preventing the growth of skin germs is thought to be a factor.

During the postoperative period, American surgeons frequently infuse saline solution, sometimes subcutaneously but usually intrarectal (Murphy, Ochsner, Mayo). Over 24 hours, the patients can be given large amounts (7 liters or more).

I should mention that the practical use of opsonin theory[22] has gained ground in many ways. Not only are cases of furunculosis managed with devitalized staphylococcus, but also cases of gonorrheal arthritis and chronic tuberculosis (bones and joints) have shown good success with opsonin treatment, as different surgeons have told me.

Having described some of the general methods of American surgeons, I thought it would be appropriate to focus on some of the special techniques for specific operations.

Harvey Cushing, who is Associate Professor of Surgery (comparable to our *Privat-Dozent*) at the Johns Hopkins Hospital in Baltimore and responsible for teaching operative medicine, limits his practice to brain- and neurosurgery. A student of Halsted, he also had the opportunity to work at the clinic of Kocher and at various physiologic institutes (Switzerland, England), which he says himself were of great value to his surgical education. His numerous publications have been fundamental for all of America, and the visitor who has gotten to know Cushing's principles will find his traces and hear his name everywhere. It was not only his kindness and the many new things that I saw and heard from him that made my stay in Baltimore so interesting, but above all the impression – perhaps especially complimentary to America -- of meeting a man with unusual gifts and a personality in the best sense of the word. Thanks to his specialization, Cushing unites the neurologic diagnostician and operator. He thinks it is wrong that so far brain- and neurosurgery have been carried out by surgical technicians dependent upon the diagnoses and indications specified by a neurologist. Cushing correctly objects that every surgeon would reject the impertinence of an internist who suggested that he did not understand gastric or gallbladder disease beyond the operative technique. Understanding what a surgeon can accomplish who works only in the area of brain surgery, Cushing has succeeded in enriching the field of indications and producing results that exceed all those previously attained.

I had the opportunity to see two trepanations by Cushing for excision of the Gasserian ganglion and to examine numerous patients on whom he had recently operated. Here also the reasons for the excellent results are asepsis and anesthesia, the details of which I will discuss next.[23]

Cushing thinks it is wrong to prepare the patient's scalp by shaving and application of an antiseptic on the day before surgery. This damages the skin and allows the surface bacteria to multiply in the abrasions and small nicks. Out of 400 craniotomies, Cushing has had no infections, so that he is no longer concerned about this complication. The patient's hair is cut just before the operation, and only shaved where absolutely necessary. Shaving the entire head is usually avoided. The operative area is washed with soap and a soft brush. Before beginning the anesthetic, the patient is placed in the position in which the operation will be performed. Ether is also used for craniotomies, without a previous injection of morphine. Cushing thinks chloroform is especially dangerous for craniotomies, because it decreases the blood pressure. The use of ether does not significantly increase bleeding. Prior to the operation the patient's pulse and blood pressure are measured.

Every five minutes during the entire time the patient is asleep, the anesthetist takes the pulse and plots it as a curve on a special chart. In order not to distract from the administration of the anesthetic, the bell of a stethoscope is placed over the cardiac region, and the stethoscope tubing leads to the ears of the anesthetist. The importance of this during a craniotomy (which was previously unknown to the operator), and the care the operator must have with all interventions involving the brain, can be demonstrated by how the gentle pressure of a retractor lifting the brain (for example during surgery on the Gasserian ganglion) can drop the pulse rate from 84 to 54, as I could see for myself. The operator can thus be constantly informed what the brain can tolerate without hurting the patient.

After the operative field has been washed again with alcohol and sublimate, the intended skin incision is marked by scratching with the tip of the knife. After that, a sublimate-soaked gauze is spread over the entire head and a tube stretched around the scalp to reduce bleeding. In order to make it easy to remove this after the operation, Cushing uses a sturdy drainage tube with a clamp, which is prevented from sliding down by a strip of cloth stretched in the midline from the glabella to the occiput. The tube is sterilized. Over this a narrow sublimate-soaked compress is wrapped around the head and finally the entire operative field is covered with a sterile drape, which also covers the anesthetist and only has a circular opening in the middle.

Regarding the technique of trepanation, Cushing is an opponent of electrical instruments and a supporter of those methods that open the skull from inside to outside and safely avoid injury to the dura. The first trepanation hole – whether for osteoplastic opening or craniectomy – is made with the crown trephine. With the Gigli saw, which has been passed from one hole to the other, the bone is cut obliquely, so that the bone flap will rest on bone and not only on the dura. The Dahlgren rongeur is used for tapering the base of the bone flap. Cushing places the trepanation for the relief of increased intracranial pressure under the temporal muscle. Its fibers are separated with retractors, so that the cranial defect will later be completely covered with muscle. Cushing has had such success with the precise suture of all layers in the area of the temporalis, namely the muscle, the fascia, and the galea aponeurotica, that he omits reconstruction of the bone in any area where there is good muscle coverage. Thus, the Gasserian ganglion or the cerebellum is exposed by creating a bony defect. Closure of the skin is extremely careful. The edges are first brought together with numerous threaded straight needles. Only then are the needles pulled through and the sutures tied. Cushing uses fine black machine twist for the skin sutures as well as the many buried knots.

Cushing opens the dura parallel to the edge of the bone. If the dura is stretched too tightly, in which case the vessels of the pia or arachnoid might be injured by the incision, a lumbar puncture is performed, which does not carry the usual risk with increased intracranial pressure since the skull is open. The lumbar drain can even be left in place during the entire operation without injury to the patient. Cushing will also do a lumbar puncture when there is difficulty reducing prolapsed brain and replacing the bone flap. Before splitting the cortex, Cushing suture ligates all the nearby arachnoid vessels with fine silk. He uses a sterile patty to control bleeding from the brain tissue.

The first dressing change is carried out 48 hours postoperatively, at which time the skin sutures are removed. Cushing has never seen a dehiscence. The scar is so soft that after a few weeks it is scarcely visible. The blood pressure is also frequently measured during the postoperative period, since the onset of a vagal reaction at any time may be considered an indication for reoperation.

For removal of the Gasserian ganglion, which I observed twice in Baltimore, Cushing does not use an omega-shaped incision, but in order to avoid cutting the superior branch of the facial nerve supplying the occipitofrontal muscle, he only makes a curved incision beginning in front of the ear, remains in the hair-bearing area above the edge of the temporal muscle, and ends about a fingerbreadth above the supraorbital ridge. After mobilizing the skin, the galea, the temporal muscle, and the periosteum forward, the zygomatic arch is divided in the depth of the wound with a bone-cutting instrument. Cushing has abandoned the osteoplastic method with this operation. A permanent defect is created behind the muscle, which does not seem to be a problem since the four layers are very carefully sutured. The opening is made with the crown trephine and enlarged, with the brain elevated using the Horsley retractor under the constant attention of the anesthetist.

With both the operations that I saw, Cushing used a new device that enabled him to place tiny silver rings around bleeding vessels and stop the bleeding by squeezing the ring flat. The middle meningeal artery is not ligated. Cushing has given up the total excision of the Gasserian ganglion, since complete mobilization in the region of the first and second branch usually leads to serious bleeding and operative complications. He limits himself to avulsion of the sensory root from the pons. The results are just as complete as after total excision. The operation requires 2½ to 3½ hours. The excellent results are shown by the following numbers: Up to 1908, Cushing has done 68 operations on the ganglion, of which two died; the deaths were early in the series, and in the last 40 cases he has not lost a patient.[24]

Cushing has extended the indications for decompressive craniotomy to cases of basilar skull fracture and uremia. It is often performed by him for unlocalized or inoperable tumors.

I saw one patient with basilar skull fracture on the fourth day after injury. She had undergone trepanation beneath the temporal muscle immediately after admission. The young woman was in excellent condition, active and alert. In this case there had been only local symptoms such as bleeding from the nose and ear, subconjunctival hematoma, and slight facial palsy, without generalized cerebral symptoms. Cushing says that these cases recover more rapidly after trepanation, and do not lie around dull and apathetic as we are used to seeing them.

In one case of severe uremia, Cushing had an excellent result, in which the woman regained consciousness after trepanation and left the hospital better than she had been months before, without headache or vomiting.

Cushing has managed numerous cases of hydrocephalus, both congenital and acquired. In one young man 16 or 17 years old with congenital hydrocephalus, Cushing first made a decompressive trepanation on the left side, and then drained the lateral ventricle on the right side with a silver tube. I saw the patient ten days after the second operation in excellent condition. Many times with hydrocephalus, Cushing has drained the spinal canal into the retroperitoneal tissues in the following way: The anterior surface of the spine is exposed through a laparotomy and a pencil-thick hole is drilled through a lumbar vertebra into the spinal canal, monitored from a posterior laminectomy. The silver tube comes to lie within the cauda equina. In the Johns Hopkins Hospital, I saw several cases of epidemic cerebrospinal meningitis successfully managed with the serum produced by Flexner, the head of the Rockefeller Institute. The serum is applied either by lumbar puncture or by injection into the lateral ventricle. I saw one child with hydrocephalus in whom the lumbar puncture produced fluid that was sterile and not excessive, while the fluid removed from the lateral ventricle was under high pressure and loaded with meningococci. In this case, the hydrocephalus was due to blockage of the foramen of Monro from chronic cerebrospinal meningitis. The hydrocephalus was significantly improved after multiple injections of Flexner's serum, leading to a rapid decrease in the bacteria, which Cushing explained by a gradual resolution of the fibrin plug blocking the foramen of Monro.

Out of five cases of serious hemorrhagic stroke that had progressed to paralysis and were referred by internists, Cushing succeeded in rescuing one by craniotomy and removal of the blood clot, which shimmered blue-red through the cerebral cortex and extruded from the incision like a loose body from a joint.

For exposure of the cerebellum and removal of tumors in this location, Cushing has worked out the following method: The patient is positioned so that he lies on his belly but the chest and face are exposed; while the belly and feet are lying on the operating table, the shoulders lie on elevated supports attached to the end of the table. The forehead rests on a separate stand. The patient is thus able to breathe without resistance and can be put to sleep by the anesthetist sitting below. Here also Cushing does not use an osteoplastic operation and thereby avoids the danger that breaking open the bone flap will impinge on the foramen magnum and injure the medulla. Two flaps of skin and muscle are created with a crossbow-shaped incision that follows a curve from one side of the occiput to the other and in the midline reaches to the first spinous process. After opening with the crown trephine, a large defect is created and the dura opened. Cushing has also used this method repeatedly for acoustic tumors; the access is apparently excellent after retracting the cerebellum. Cushing thinks that opening the inner ear is unnecessary and dangerous. I saw a case of acoustic tumor operated upon by this method by Willy Meyer at the German Hospital in New York, which demonstrated a remarkable improvement in vision postoperatively.

With Bevan, Professor of Surgery at Rush College in Chicago, I saw a craniotomy and excision of the thumb center[25] on one side for true epilepsy. This operation was also performed as proposed by Cushing, who has done something like 50 cases of this sort with good success.

I should also mention Cushing's animal experiments. For excision of the pituitary he makes use of the following experience: On the one side a wide decompression, on the other an osteoplastic closure. With careful retraction of the brain the pituitary is exposed on the latter side and removed. Cushing believes this organ is vital and that the animal cannot survive its removal. In Cushing's laboratory I saw an extremely difficult excision of the Gasserian ganglion performed on a dog. I should also not fail to mention Cushing's experiments involving the creation and treatment of heart valve defects. These experiments were stimulated by the observation of a dog with a cardiac abnormality *in vitam* and *post mortem*. Insufficiencies were created by cutting the valves inside the heart with a specially constructed knife ("valvulotome" according to MacCallum) and stenoses by a constricting ligature soaked in Vaseline. The dogs afterward have audible murmurs and are used for instruction in auscultation. Experimental operations to treat the valvular defects are ongoing and have no definite results. So far, it appears that mitral stenosis might be converted to a less dangerous insufficiency by incising the valve.

The Institute for Operative Medicine, which Cushing directs, is dedicated to instruction in addition to scientific work. Here the students of the Johns Hopkins University, whose number is restricted (currently 80) are given the opportunity to learn surgical technique, especially asepsis and anesthesia. For this purpose, the students are divided into groups of five. In conjunction with a clinical case, whose history is used as a template, there are detailed discussions of therapy, indications, and the technique of the operation to be performed. The students participate themselves, being assigned the roles of general practitioner, consulting surgeon, etc. The operation is then carried out on the animal with every precaution. The students have to be concerned with all the preparations such as sterilization of the linens, the dressing material, the instruments, and the suture material. A precise history of the case, ideally illustrated with numerous drawings, includes a detailed description of the postoperative course. The students verify the condition of the test animal every day, measure its temperature, and change the dressings. If the animal dies, a careful autopsy is performed and written up. The quality of this education has the result that Cushing uses only one graduate physician as an assistant for his craniotomies, and the other assistants are all students.

Because of its successful operations and the especially diligent care of the experimental animals, Cushing's Institute enjoys such a good reputation with the people of Baltimore that numerous animals with different problems are brought there for surgery. Not only does this make it possible for the students to work with truly diseased animals and for the instruction to include more natural conditions, but financial contributions after successful operations also allow them to increase their rather limited budget – the cost for animals is fairly limited anyway, a dog for example only costs $0.20 - $0.40.

[p. 1163]

The dental schools in America provide an excellent education. I visited the one in Philadelphia, which along with the one in Chicago is considered the best in the country, and which has 100 dental chairs in its great hall. Nevertheless, surgeons are completely ignorant of the immediate prosthesis for replacement of a resected or excised mandible, as we have utilized for several years with good success. With Murphy, I saw a case of unilateral mandibular resection four weeks postoperatively, where a heavy doubled silver wire was removed which had preserved the configuration of the jaw by attachment to the glenoid fossa [of the temporomandibular joint] and the residual bone. No provision had been made for the permanent replacement of this wire, and Murphy was scarcely aware of the experience with immediate prosthesis mentioned above.[26] In a session of the New York Surgical Society that I attended, another American surgeon presented a patient with hemimandibulectomy for carcinoma. Here also nothing had been done to avoid the well-known cosmetic and functional deformity. This surgeon told me he had recently operated on four similar cases.

Toxic goiter is widespread in America, as shown by the statistics from the Mayo brothers that I cited in the beginning (50% of all thyroidectomies are for toxic goiter). The management agrees with the principles of Kocher. Specifically, the first intervention for patients in serious condition is to ligate both superior thyroid arteries. I saw Halsted do this under local anesthesia and Mayo under ether anesthesia, in both cases with a small incision over the anterior border of the sternocleidomastoid muscle. With the Mayos, patients were sometimes treated preoperatively with radiation. Management with serum was only used in preparation. In order to prevent the absorption of thyroid hormones after removal of the goiter, which can lead to serious complications, patients at the Johns Hopkins Hospital with severe hyperthyroidism (tachycardia and arrythmia) have their postoperative wounds irrigated for 24 hours with sterile ice-cold water or an ice pack is applied. During the thyroidectomy, as I saw with Halsted and Ch. Mayo, there is careful attention to protecting the parathyroid glands. Halsted, who performed a difficult excision of a substernal thyroid lobe, preserved the sternocleidomastoid muscle and worked very slowly with painstaking hemostasis. (Operation lasted two hours.) The Halsted suture was used in multiple layers for closure of the operative wound. In cases of postoperative tetany, Halsted has had success with the subcutaneous injection of the parathyroid extract produced by Beebe at the Rockefeller Institute in New York.

After incision of an esophageal diverticulum in a 67-year-old woman, I watched Brewer close all layers exactly. Not only the esophagus, but also the soft tissues (fascia, muscle) were very carefully sutured and only at the inferior corner was a narrow cigarette drain placed.

The attitude of American surgeons toward radical mastectomy for carcinoma of the breast is not at all uniform, despite the many reports and the discussion at the American Surgical Association in 1907. Halsted's well-known opinion, which advocates an extensive lymph node dissection, seems to be shared by few surgeons. I was able to hear the viewpoint of several (Deaver, Murphy, Mayo) who oppose Halsted's methods. Murphy attributes the large number of long-term cures reported by Halsted (50%) to the fact that that most of his cases were those in which neither clinical nor microscopic metastases were detected in the axillary nodes and would have a good prognosis whatever method were chosen. With the one mastectomy that I saw Bevan perform for carcinoma, the axilla was indeed cleared out but the pectoralis minor muscle was not removed.

The majority of operations that I saw in America were laparotomies. The largest portion of these were related to the appendix and gallbladder.

The question of when to operate on appendicitis is also not unequivocally answered in America. As far as I can tell, they perform an early operation more frequently than we do, since even the internists here share the surgical point of view, the operation is popular, and Americans appreciate the principal advantage of being able to return to work more quickly. Drainage is not used after an early operation. With abscesses, the American surgeon does not wait for resorption or thickening to occur. If pus can be demonstrated clinically, it is drained. As a rule, when a pericecal abscess is initially opened, the appendix is not removed unless it is easy to do, otherwise it is removed at a second operation. Surgeons who always remove the appendix acutely seem to be in the minority. The Ochsner brothers wait until the eighth to the tenth day to perform surgery on appendicitis with abscess. They operate on cases that are improving, with no fever, no pains, and no ileus, but have characteristic findings of an abscess; our impression is that these cases should not be disturbed but allowed to pass into the harmless "à froid" condition. The Ochsner brothers base their opinion on the belief that at this time there are adhesions around the abscess that contain it adequately without being so thick that they are completely organized. The peritoneum at this stage is resistant to infection, so that there is little danger.

After the "à froid" operation through a small incision, the patients get out of bed on the fifth day and leave the hospital on the seventh day.

It seems to me that the extraordinarily widespread gallstone disease is also managed surgically more often than is the case in Europe. The Mayo brothers have an experience of over 2400 cases. I have seen an operation for cholelithiasis performed by most of the surgeons that I visited (especially in the West). In general, cholecystostomy is preferred to cholecystectomy. The reason given by the Mayo brothers is that in some cases after cholecystectomy they have seen progression of the disease and stones in the common bile duct requiring further surgery. The absence of a gallbladder makes the reoperation more difficult and makes it impossible to construct an anastomosis between the biliary system and the intestinal tract. On the other hand, I saw W. Mayo perform a cholecystectomy in the early stage of cholecystitis with otherwise negative findings (no stone). Cholecystostomy is always performed in one stage after emptying the gallbladder with the Ochsner aspiration trocar. If drainage of the common bile duct is required, a small rubber tube is introduced through the cystic duct, or a drain surrounded with gauze and silk is left in the gallbladder. This is inverted with a purse string suture in the serosa of the gallbladder.

It was especially interesting for me to learn about W. Mayo's operative indications and techniques for ulcers and stomach cancer. His experiences differ in one respect from all those reported before. Mayo has found that 40% of all ulcers are located in the duodenum, which is far more than previously thought (10%). Mayo determines the location of an ulcer according to the veins on the anterior surface of the stomach, including the pylorus, on the greater curvature as well as on the lesser curvature. Considering the frequent presentation of gallstone disease, it might be thought that there would be an etiologic relationship. Mayo rules this out by the following observation: Among 1700 gallstone cases there were 75% women and 25% men; among 209 cases of duodenal ulcer 73% men and 27% women. The incidence by sex is reversed.

In opposition to the autopsy findings that speak for a more frequent incidence of pyloric ulcers compared to duodenal ulcers, Mayo responds that the original site of the ulcer cannot be recognized. The duodenal ulcer that gradually enlarges may often reach to the pylorus and then mimic a pyloric ulcer.

The relationship between ulcer and carcinoma is very different depending whether it is in the duodenum or the pylorus. While the duodenal ulcer seldom degenerates – Mayo saw only three cases of primary duodenal carcinoma among the large number of duodenal ulcers previously mentioned – this is more frequent in gastric ulcers than previously appreciated. Among 134 gastrectomies, Mayo found that carcinoma originated in the base of an ulcer in 54%. Mayo's indications for surgery are based on this observation. Duodenal ulcer can be successfully treated with gastroenterostomy. Excision is not required. A pyloric ulcer should be resected in order to protect the patient from the danger of carcinoma that frequently arises in the base of the ulcer. Ulceration on the lesser curvature or in the region of the cardia is not affected by gastroenterostomy, so that this operation is not indicated. If Mayo finds an ulcer in this location, he definitely plans on a stomach operation [7].

Mayo has furthermore come to the following conclusions having looked at the outcomes of gastroenterostomy: Those cases that carried the diagnosis of gastric ulcer but had negative anatomic findings had the worst long-term results. He concludes that in these cases there was no ulcer but another disease that was not recognized. A stomach operation is not indicated without an anatomic finding.

Mayo does not consider pylorospasm seen intraoperatively to be a sign of ulcer. He has seen this occur with appendicitis, tuberculosis of the cecum, and biliary colic. If pylorospasm is seen, this symptom should point attention away from the stomach toward gallbladder and appendix.

During my stay in Rochester, W. Mayo performed two gastrectomies for cancer. Both cases were advanced and difficult. One patient had undergone exploratory laparotomy by another surgeon a few weeks before, and the tumor was judged to be inoperable; after clinical evaluation, W. Mayo thought the tumor of this 37-year-old patient was not necessarily inoperable and proposed to reoperate. An important consideration was the name of the first operator, who Mayo thought was not capable of a major resection. He found a pyloric cancer extending to the gallbladder and pancreas. After cholecystectomy the tumor was mobilized sufficiently that a resection was indeed possible. In the second case the carcinoma had extended to the mesocolon; a large piece of this was resected with protection of the vessels.

W. Mayo operates mostly according to Billroth II (retrocolic posterior gastroenterostomy). As much as possible of the lesser curvature is removed because of the extent of the lymph nodes, and a smaller part of the greater curvature.

I would like to describe the suturing for closure of the duodenum and stomach, because I think it is excellent: The duodenal stump is closed with a running Kürschner suture[27] that includes all layers; its beginning is not tied and like the closing thread only goes through the seromuscularis, and a little bundle is made as the beginning and end of the suture are tied. This bundle is inverted with two purse-string sutures. The running suture of Ch. Mayo is used for closure of the stomach. The first stitch goes through the seromuscularis of the greater curvature and is tied. Now on the first side, for example the anterior surface of the stomach, the straight needle is inserted from outside to inside and on the same side again from inside to outside, goes over to the other side (in this case the posterior surface of the stomach) from outside to inside and then from inside to outside. By traction on the suture and the assistant bringing the two sides together, it is possible to invert the mucosa completely and bring together the serosal surfaces.

One or two more layers can be placed above this suture. However, this single-layer closure is felt to be so good that W. Mayo is satisfied with this alone if the patient's condition requires a rapid completion of the operation.

The Murphy button seems to be seldom used in gastrointestinal surgery. The method of choice in America is also generally the retrocolic posterior gastroenterostomy. The afferent loop is made as short as possible, but as I saw with Deaver and W. Mayo is placed from right to left, that is, antiperistaltic. Mayo has observed that the first loop of the jejunum runs toward the left, not toward the right. To avoid a vicious circle, the loop should have the same orientation. Even when the loop is pulled to the right by a thicker duodenojejunal fold, it is mobilized by division of this fold so that the loop can be placed toward the left, as I have seen with both Deaver and Mayo. The Halsted suture can be used as a running seromuscular suture. The opening in the mesocolon is closed so that it lies on the surface of the gastroenterostomy suture and the wound edges are not free.

In the management of rectal carcinoma,[28] American surgeons prefer to place the stoma in the inguinal area rather than over the sacrum, since it is more comfortable for the patient. After the colostomy, the rectal cancer is removed through the sacral approach by resection or amputation. The combined method seems to be used more often than in Europe, which in the experience of several surgeons gives good results in women but bad results in men. W. Mayo has recently gone back to the perineal method for women.

I had the opportunity to speak with Murphy about the management of peritonitis, a subject on which he had addressed the American Surgical Association meeting this year. Murphy has operated on 48 cases of diffuse purulent peritonitis in recent years, of which only two died. He has given up on all the time-wasting interventions like irrigation or meticulous removal of debris, which actually damage the peritoneum, and is satisfied with controlling the source as quickly as possible and drainage. At first, he thought the success of this approach was accidental. However, the series of good results has convinced him that it is this method that has made them possible.

A quintessential American surgeon is Young, Associate Professor at the Johns Hopkins Hospital in Baltimore, who has especially developed perineal prostatectomy.[29] I had the good fortune to see two of his prostatectomies on the same day, of which one was atypical because of multiple previous operations on the bladder and ranked among the most difficult he had ever done, while the other provided an excellent example of his method, which proceeds in the following way: The patient, with a urethral sound inserted, is placed in the lithotomy position but suspended so that the lower back is clear of the table making an acute angle of about 30 degrees. The operator does not sit, but stands. Two symmetrical incisions are made in the perineum, beginning 3 or 3½ cm anterior to the anus and ½ cm lateral to the midline and proceeding obliquely in a posterolateral direction, so that the anus lies between the endpoints of the two diverging incisions. These incisions on each side of the rectum are carried into the deeper tissues. The scalpel is set aside, and with his index fingers Young dissects bluntly into the ischiorectal fossa on each side, thus mobilizing the rectum. A retractor is placed into these lateral incisions, the blade of which has an opening in the middle with a thick curved edge to avoid injuring the rectum. With this retractor, the rectum is displaced inferiorly. Now the anterior ends of the two original incisions are joined by cutting the small piece in the midline. Young continues this anterior incision into the deeper tissues and with a few strokes of the knife frees the rectum, already mobilized laterally, up to the urethra. This is identified in the posterior membranous portion along the length of the urethral sound, and the instrument is passed into the bladder by anterior displacement of the prostate. The rectum is protected by broad acutely-angled retractors. An incision in the prostatic capsule is made anteriorly on both sides of the urethra, and the gland is dissected out with a goiter sound.[30] On both sides, a parallel incision is made on both sides of the urethra to shell out the lateral lobes, which are pulled anteriorly with a strong clamp. On each side, in the upper corner next to the urethra a cut with the scissors is needed. The middle lobe is removed from one of the two sides.

In the first case, the prostatectomy resulted in a defect of the urethra, but not in the second. In the longitudinal urethral incision a double Nelaton catheter is inserted, through which the urinary bladder is continuously irrigated with sterile warm water, initially as a steady stream and later as a drip for the first 48 hours. The wound cavity is packed, and the gauze removed after 24 hours. The patients get out of bed on the third or fourth postoperative day.

Young has only a 2% mortality among 238 operated patients.

Not everywhere in America is the perineal approach elected for prostatectomy. There are surgeons who have used transvesical excision with good success in a large number of cases. Following Rovsing's suggestion, a suprapubic drainage fistula is frequently constructed using Witzel's principles, leaving a later intervention up to the patient.

I watched Kelly, the gynecologist at Johns Hopkins Hospital, perform a direct ureteral catheterization. In this 67-year-old woman, who barely tolerated the uncomfortable knee-elbow position and the painful traction of the ureters, it was indeed possible to visualize the ureteral orifices and surrounding mucosa in their natural state, but the catheterization was only successful on one side. Although very thick ureteral catheters were inserted, the flow of urine around them could not be completely prevented – as Kelly told me. I had the impression that in this woman catheterization of both ureters directed by the cystoscope would have succeeded in half the time without pain for the patient. Considering that Kelly has been working for years on this method, which is connected with his name in America, I can hardly recommend this procedure, which seems more difficult than cystoscopy.

Among operations on the extremities, I should mention the method of Charlie Mayo for removal of varices, which I saw performed by different surgeons. Instead of dissecting out the saphenous vein with an incision running the entire length of the leg, this is done with a small incision on the thigh, as for a Trendelenburg ligation, through which the vein is freed from its surroundings by subcutaneous passage of a ring-shaped instrument with a long handle. This tears off the side branches, but there is no significant bleeding. If the instrument is passed to its entire length, or if there is an obstruction, then another skin incision is made and the mobilized vein is pulled out. After the operation, the extremity is wrapped with strong flannel bandages. The patient stays at bedrest for 14 days.

Unfortunately, I did not have the opportunity during my one-week stay in Chicago to see one of Murphy's operations for construction of a new joint, which he has performed several times in recent years with good results.[31] Ankylosis is prevented by interposition of a musculofascial flap with adherent fatty tissue. Murphy has obtained the best results so far in the hip, and also on the shoulder, elbow, and knee. If tendon contractures have developed, the tendons must be lengthened with plastic surgery. Capsular deformities or scarring must be completely excised. The ankylosis is best released with a narrow chisel, then a sufficiently large flap is placed between the fresh ends of the joint and must be fixed in place. At the knee joint, after making either two longitudinal incisions or one horizontal incision through the patella, the flap is taken from the fascia lata with portions of the vastus. At the hip the joint is exposed by a large U-shaped incision sawing through the greater trochanter, the bones are cut to resemble a joint as much as possible, and a U-shaped flap of the fascia lata with subcutaneous fat is placed in the acetabulum with its edge fastened to the acetabular rim using mattress sutures of catgut. At the elbow, the olecranon is cut obliquely off the ulna and a flap of the triceps based on the olecranon is interposed.

Finally, I would like to mention a dressing for orthopedic purposes that I saw used by the Ochsner brothers: The gluten dressing, which is lighter and harder than plaster and is especially notable for its durability.

However, the most memorable operation that I saw was not on a human, but by A. Carrel on an animal.

It is well known that Carrel, initially with Guthrie and then by himself, has developed vascular suture to the point that results may be expected to reach the limit of what is possible. Carrel is French, studied in Lyon, later emigrated to America, and now works in the institute built by Rockefeller in New York, which is directed by Flexner and contains laboratory space for pathologic anatomy, bacteriology, physiologic chemistry, and experimental medicine. I spent an especially exciting morning here, during which I not only saw the entire institute and was most kindly welcomed by Flexner himself, but also had the good fortune to see Carrel perform a vascular transplantation.

On the top floor of the institute, next to the animal stalls open to the roof, there is a well-lit operating room, whose sterilization facility is as good as in the large hospitals. Carrel resected a portion of the vena cava of a cat under ether anesthesia and placed it into the divided aorta. Exemplary sterile technique was followed throughout the operation. To cover the completely eviscerated bowel, Carrel uses Japanese silk sterilized in Vaseline. This avoids creating adhesions, which had caused him initially to lose many animals. A thick pad is placed on top to prevent cooling. In order to make the fine silk sutures, sterilized in Vaseline, more visible, all gowns, compresses, and other linens are black. Carrel himself is enclosed up to the eyes, and works with rubber gloves. The vascular suture, whose technique is familiar from publications, is carried out by Carrel with complete precision. At the conclusion of the operation, the animals are carefully dressed with gauze and an abdominal binder.

At the Rockefeller Institute, I saw a series of animals in excellent condition who had undergone vascular transplantations with insertion of preserved vessels, and animals whose own kidneys had been removed and replaced with the kidneys of another animal along with attached segments of aorta and vena cava. Carrel also showed me a preparation of a successful transplantation of a lower extremity (at the level of the thigh) from one dog to another.

The plan is to affiliate the Rockefeller Institute with some hospital wings, exclusively for the admission of patients in whom practical therapeutic application could be made of these methods, which have been worked out in the institute and tried out on numerous animals. Flexner's serum for treatment of spinal meningitis has already been used in this way, with cases housed in a small barracks next to the institute. Eventually, for example, patients with aneurysms could be admitted so that they could undergo excision followed by vascular repair.

Above all, through the further extension of animal experiments for surgical purposes based on strict asepsis, the surgeons of America expect that the solution of new problems of technique and therapy will be possible.

I would not want to close this report without having mentioned the imposing newly established medical school in Boston, which like other medical schools in this country was built and maintained using only private donations. It belongs to the old Harvard University in Cambridge near Boston and consists of seven beautiful marble buildings built at a cost of five million dollars. Once the planned modern hospital is built in this area, for which the money has already been raised, it will be possible to teach the practical subjects right next to the theoretical ones and it will surpass any such institution in the entire world, which wonderfully illustrates the best characteristics of the American: Generosity for the common good, for the education of youth, and for scientific purposes.

Original Notes

1. Unfortunately, even in our own city we can still see large office signs with marketing language.
2. For example, one square meter of land in the center of New York (corner of 5th Avenue and Broadway), where the 20-story Flatiron Building stands, cost $8000.
3. As an example, I can quote from the annual report of St. Mary's Hospital for 1907: "It [the training school for nurses] is open to women of good English education and ability to undertake the study."
4. The following lines reflect the observations of Miss Magaw, whose skill in anesthesia is recognized throughout America. Even before my visit in Rochester, I was repeatedly advised to observe her anesthetic methods.
5. In the German literature, C. Hofmann (*Zentralblatt für Chirurgie* 1908, Number 22, Page 666) has made a similar suggestion for chloroform anesthesia.
6. Similar to our *Knopfzwirn* [button thread].
7. This viewpoint confirms the conclusions that I presented based on the experience of the First Surgical Clinic and that were discussed at the German Surgical Society Congress in 1906.

Original Illustration

[Not reproduced in this volume]
Diagram of continuous inverting bowel suture.

Biographical Source

Clark DE, "Paul Clairmont and his connections to American surgery," *Langenbeck's Archives of Surgery* 2023; 408:94.

Publication Source

The *Wiener Klinische Wochenschrift* (Vienna Clinical Weekly) now publishes articles mostly in English, and is subtitled *The Central European Journal of Medicine*. Historical issues can be obtained through the Internet Archive.

Translation Notes

1) *Privat-Dozent* is a European academic title approximately equivalent to Associate Professor, as the author explains later in this article.
2) The *Krone* (crown) was the monetary unit of the Austro-Hungarian Empire, with an exchange rate in 1908 of approximately 1 K = $0.20. Hereafter, only dollar amounts will be given.
3) Now the Mount Sinai Morningside Hospital.
4) The Lying-In Hospital (E. 2nd Avenue, 17th-18th Street), was an autonomous women's hospital donated by J. P. Morgan. It merged with New York Hospital in 1932, dropping the name, and has today been converted into condominiums called Rutherford Place.
5) The author makes the common error of calling it the "John Hopkins Hospital."
6) The author actually writes "Willy" and "Charley."
7) Like others on the European continent, the author calls toxic goiter "Basedow's disease"; in English-speaking countries it has often been called "Graves' disease."
8) Literally "cold," a term usually applied to a normal appendix in America, but "à froid" is apparently used in Europe to describe a previously inflamed appendix that has "cooled off." See Engkvist O, "Appendectomy à froid a superfluous routine operation?," *Acta Chir Scand* 1971; 137:797-800.
9) Now the Lenox Hill Hospital.
10) This problem was also described by Alice Hamilton, "Gonorrheal vulvo-vaginitis in children," *Journal of Infectious Diseases* 1908;

5:133-157.

11) Described in Krönig B, Siedentopf H, "*Neue Beleuchtungsvorrichtung für Operationssäle," Archiv für klinische Chirurgie* 1904; 74(2):373-378.

12) The author is referring to natural sponges. Sublimate was mercuric chloride, and is no longer used.

13) Sodium carbonate, no longer used. See Heller IM, *Journal of the American Medical Association* 1911; 57:733-734.

14) "First, the asphyxiating form. For this purpose a large mask is used, covering the whole face…so that very little, if any, air is admitted." *Surgical Technic: A Text-book on Operative Surgery*, by Esmarch Fv, Kowalzig E, translated by Grau LH, Sullivan WN, edited by Senn N, New York: MacMillan, 1903, Page 188 (with an illustration of the Juillard mask).

15) Alice Magaw, "A review of over fourteen thousand surgical anesthesias," *Surgery, Gynecology & Obstetrics* 1906; 3:795-799.

16) Now the Mount Sinai West Hospital.

17) McBurney C, "The incision made in the abdominal wall in cases of appendicitis, with a description of a new method of operating," *Annals of Surgery* 1894; 20:38-43. No acknowledgement of McBurney is given by Riedel, "Ueber den Zickzackschnitt bei der Appendicitisoperation," *Deutsche Medizinische Wochenschrift* 1905; 31:1457-1460,1500-1503.

18) "Kehr's incision, known as the *Wellenschnitt*, and the *Bayonet incision*, begins at the ensiform, passes down 3 to 4 centimetres in the mid-line, then cuts the right rectus as far as its outer third (parallel to the costal margin) between its linea transversa and the umbilicus, and then continues longitudinally downward as far as the umbilicus or lower." Deaver JB, *Surgery of the Upper Abdomen*, Philadelphia: P. Blakiston's Son & Co., 1909, Volume II, Pages 442-443.

19) "Machine twist" was a silk thread designed to be strong enough for use in sewing machines. Iron compounds were sometimes used to dye it black. Possible antimicrobial effects of topical iron are still being studied today.

20) Not Harvey Cushing, but Hayward W. Cushing of Boston, who first described a running suture for bowel anastomosis while Harvey was still a freshman at Yale. He eventually wrote it up for publication in the *Boston Medical and Surgical Journal* 1899; 141:57-59, incidentally noting the use of "machine twist" silk. William S. Halsted described intradermal suturing as part of his classic method of

inguinal herniorraphy (*Annals of Surgery* 1893; 17:542-556).

21) The Mikulicz tampon was a gauze packing inside a larger sleeve of gauze. An improvement less likely to cause bleeding on removal was reported by Gibson CL, "The rubber dam Mikulicz tampon," *Annals of Surgery* 1921; 73:470-472.

22) Opsonins were new and exciting in 1908, although in 1906 George Bernard Shaw had satirized them (and surgeons) in his play *The Doctor's Dilemma*. See Forsdyke DR, "Almroth Wright, opsonins, innate immunity and the lectin pathway of complement activation: a historical perspective," *Microbes and Infection* 2016; 18:450-459.

23) Most of the procedures and instruments mentioned by Clairmont had been recently described in Cushing's publication "Technical methods of performing certain cranial operations," *Surgery, Gynecology & Obstetrics* 1908; 6:227-246.

24) See Adams H, *et al*., "Harvey Cushing's case series of trigeminal neuralgia at the Johns Hopkins Hospital: a surgeon's quest to advance the treatment of the 'suicide disease'," *Acta Neurochir* (Wien) 2011; 153:1043-1050.

25) An obsolete term for the area of cerebral cortex controlling thumb movement. See Pendleton C *et al*, "Harvey Cushing's contributions to motor mapping: 1902-1912," *Cortex* 2012; 48:7-14.

26) Clairmont may not have understood the plan. Murphy described what sounds like this case from 1908, with a successful outcome after initial infection, in his 1912 *JAMA* presentation cited below (Pages 1184-1185). A dentist saw the same patient in 1959 and reported she was doing well except that the metal frame had broken during a recent tooth extraction – see Robinson M, "Silver implant in situ fifty-one years after resection of mandible," *Journal of the American Medical Association* 1959; 171:890.

27) "The Kürschner suture is a continuous one and … is made by tying the first stitch and then proceeding as with any continuous suture, puncturing the intestine from within outwards, and fastening the whole when completed with a seamstress's knot." Newell OR, "The intestinal suture," *Boston Medical and Surgical Journal* 1887; 116:1-7.

28) For a contemporary report see Mayo CH, "Cancer of the sigmoid and rectum," *Surgery, Gynecology & Obstetrics* 1906; 3:236-241.

29) With a 40-year perspective, Young extensively reviewed the history of this operation, his technique, his specially-devised retractor, his outcomes, and various controversies in the *Journal of Urology*

1945; 53:188-252.

30) A goiter sound (*Kropfsonde*) was a blunt dissecting instrument developed by Kocher.

31) In 1912, Murphy (who was President of the AMA that year) published a six-part “Contribution to the surgery of bones, joints, and tendons” in *Journal of the American Medical Association* 58:985-990,1094-1104,1178-1189,1254-1265,1345-1352,1428-1431. The last two sections discuss his procedures for ankyloses.

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Cesare Ghillini (1908)

Cesare Ghillini was born in Bologna in 1863, where he received his medical degree in 1889. He continued there as a surgical assistant and developed an interest in orthopedic surgery, receiving a fellowship to study orthopedic clinics throughout Europe. In 1896, he was appointed assistant director of a new orthopedic institute in Bologna, but subsequently left the institute due to political difficulties and became chief surgeon at the *Ospedale dell'Addolorata* (Hospital of Our Lady of Sorrows).

He traveled to America in 1908, at the age of 45, and published the following report three years later.

During the First World War, Ghillini was surgical director at a military hospital. He retired in 1918, but continued his experimental studies on fractures and lower limb prostheses. Apparently suffering from a tumor in his leg, he committed suicide in 1926.

Operazioni eseguite negli Stati Uniti: Chirurgia e ortopedia in America
Bulletino delle Scienze Mediche 1911; 82:65-76

Operations performed in the United States: Surgery and orthopedics in America

Prof. Cesare Ghillini
Chief Surgeon at the Ospedale dell'Addolorata in Bologna

Presented at the Scientific Session of the Medical-Surgical Society of Bologna, 10 June 1910

I would have liked to present my surgical-orthopedic work in North America, together with my impressions of Surgery and Orthopedics in that country, soon after my return, if I could have described the operative results. But a longer time must pass to confirm that a deformity has healed after surgical treatment. Thus, I am only now making my report.

On 28 May 1908, at the Denver County Hospital, I operated upon a case of congenital club foot before numerous doctors and professors from the University of Colorado, who packed the surgical amphitheater [1].[1]

The patient was a 9-year-old newspaper boy, a Russian Jew named Nathan Siegel, whose parents and two brothers were healthy and well-developed, and who had been in Denver for five months.

I will speak about the operative technique later; I first want to emphasize that all the personnel in the operating room knew their duties perfectly, including the anesthetist, the assistants, and the *nurses*; everything proceeded very smoothly. In the Denver Hospital, which contains 400 patients, there is an operating room for all the primary surgeons in the city, who can always operate on their patients with an appropriate, excellently trained staff.

At 9 in the morning, I began disinfecting my hands with my usual method, that is: First, washing with ordinary soap and running water, then with very hot boiled soap, then with alcohol, then immersion in a solution of corrosive sublimate.[2] This occupied approximately one hour.

American surgeons, and so all those involved in direct surgical assistance (doctors and *nurses*) use boiled soap and running water, alcohol, and sublimate, for 20 minutes, then apply rubber gloves.

After administration of chloroform (I also had the child ingest coffee and milk, half an hour earlier) and disinfecting the limb with common soap, boiled soap, alcohol, and sublimate, I performed an open division of the Achilles tendon, then the operation of Phelps [2].[3] I wrapped the wounds with sterile iodoform gauze, and applied a containment device with stirrup splints and a plaster bandage. After the operative procedure, I had Dr. Hillkowitz,[4] also Russian, read my review of club foot, taken from my report on the subject at the International Medical Congress of 1903; then Dr. Tosti, an Italian physician and consul in Colorado, thanked those present on behalf of Italy for their kindness in enabling this demonstration.

Allow me to tell a rather curious anecdote. There were many journalist photographers during and after the operation. A journalist asked to take my picture, but I was rather nervous, just happy have successfully completed my surgical work, and I asked him to leave me alone. About an hour later the newspaper came out in red type, with photographs taken during the operation, and at the top of the page was a picture of some other person, with my name. For those who had not seen me, that person was Ghillini. All the newspapers in the United States covered the story of the Italian surgeon, and my colleagues showered me with courtesies. I was called in for consultations, and – for a $25 fee – the Board of Medicine granted me a temporary license to practice.

The postoperative course of the little patient was excellent. After four days (May 30th), I did the first dressing change, and found the wounds over the Achilles tendons already healed.

After ten days (June 8) I did the second dressing change and replaced the splints with plaster casts, making two windows over the plantar wounds; on June 13 I did the third dressing change, and on June 20, that is twenty-five days after the operation, I did the fourth dressing change and the child began to walk. On July 29 (about a month and a half after the operative procedure) I changed the plaster appliances, which were kept for another three months. The plantar wounds had completely healed.

After ten months, *The Denver Post* newspaper photographed the little paper boy perfectly corrected of his deformity, and now I can present the child before and after the operation (Figures 1, 2, 3) as healed. The severity of the original foot deformation is demonstrated by Figures 1 and 2.

On 29 June 1908, I performed a *laminectomy of the second lumbar vertebra* for paraplegia.

The patient was a 30-year-old Italian miner R. B. from Asiago (province of Vicenza).

History — Parents alive and well. He had suffered from intestinal catarrh. He had a son who had died of meningitis at the age of 2 months.

On 6 January 1908, a rock fell on his shoulders and head, throwing him to the ground with his trunk flexed and legs crossed. He had instantaneous but temporary loss of consciousness. After recovering consciousness, he noticed the loss of motility and sensitivity of the lower limbs.

He was taken home and examined, and next day a plaster cast was applied which reached from the axillas to the pelvis, keeping him in a horizontal position. He could not move his lower extremities; he could not urinate or defecate, which required catheterization and digital extraction of feces.

After 23 days the appliance was removed at the patient's request and electrical treatment was undertaken.

There was bleeding with the first catheterization, which the patient attributed to the catheter being too large. However, he gradually felt a slight improvement in sensation and some movement in his toes; he noticed that by touching the scrotum he could feel the flexion of the 2nd and 3rd toes of the left foot, and sometimes also of the right.

Physical examination [3] — With the patient in the supine position, atrophy was especially noticeable in the lower part of the left leg and in the right thigh.

The right lower limb was rotated externally, both feet were in plantar flexion, and the toes were maximally flexed.

When asked to rotate the right limb, he managed to bring the knee to an anterior position, but then it fell back into external rotation.

He was able to flex the thighs at the pelvis to a right angle, and to extend the legs on the thighs, but oscillations were felt in these movements.

He was not able to dorsiflex either foot; after passive dorsiflexion, they immediately returned to the original position of plantar flexion.

With the patient in a prone position, he could flex his legs slightly on his thighs.

In the lumbar region there was a depression at the 4th and 5th vertebrae, while the apophyses of the 1st and 2nd lumbar were protruding.

When palpated, he noticed lateral pain in the 1st, 2nd, and 3rd lumbar region.

Tendon reflexes absent in knees and feet. Absence of the Babinski phenomenon. Absence of skin reflexes in the feet, legs, and thighs. Lost tactile sensitivity in the dorsal region of the feet. Pain as described above. He could not distinguish heat from cold in the feet, in the legs, in the back of the thighs, or in the buttocks; however, in the front of the thighs he could feel this distinctly.

On the X-ray performed by Dr. G. H. Stover a few days before the operation, there was an enlargement and slight displacement of the vertebral arch of the 2nd lumbar vertebra.

Operation 28 June 1908 — Dr. Hillkowitz administered chloroform anesthesia; I was assisted by Prof. Lyman, the director of the Surgical Clinic at the University; Prof. Hopkins was also present. I made an incision from the 12th dorsal vertebra to the 4th lumbar vertebra, with convexity to the left. After identifying the spinous process of the 2nd lumbar vertebra and dissecting off the periosteum, I removed the process itself with a scalpel. Having denuded the posterior arch of the neck and detached the periosteum, I then removed the lamina of the 2nd lumbar.

Examining the cord with a curved probe, an elastic resistance was felt: on the right, however, it was slightly adherent, and using the Langenbeck lever I divided some fibrous attachments. Once the operating field was cleaned, I sutured the muscles with catgut and the skin with silk, and applied a dressing with sterile iodoform gauze. After four days I removed the sutures and the wound was primarily healed.

I left Denver after 15 days, and the patient had improved in his motility, as confirmed by Prof. Hopkins.

The permission granted to me by the Board of Medicine in Denver to practice the profession for a month gave me the opportunity to know in depth how the medical profession is organized, and the advantages of practicing in North America.

I will now mention the impressions I had of surgery and orthopedics in the United States.

Colleagues in recent times have dealt with the subject in the popular press, in medical journals, or in lectures. Maiocchi of Milan [4] wrote extensively both in the *Corriere della Sera*[5] and in *La Clinica Chirurgica*.

In Paris, Prof. Pozzi held a conference on the American surgical profession. [5]

Even the Medical Inspector General Dr. Claudio Sforza [6] has published a "Summary of reports on two ministerial missions carried out in the United States of North America in the autumn of 1909."

All of them acknowledge the excellent technique of American surgeons. However, their great operative ability is accompanied by a scientific deficiency, resulting from the brevity of their studies.

I will talk about the methods in use. With regard to anesthesia, almost everyone uses ether and has one person – usually a doctor – in charge of its administration. However, I used chloroform there, because during my long surgical experience it has given me no problems.

The two Mayo brothers of Rochester, Minnesota, Dr. William and Dr. Charles, very famous surgeons who perform over 6,000 operations a year, have appointed young women to administer anesthesia, and one of these has performed 17,000 anesthetics.

Their operative technique is as follows:

Hand washing, with boiled soap and warm running water, then alcohol, then corrosive sublimate. This occupies is about half an hour. Application of rubber gloves for operators, assistants, and nurses.

Washing of the operative field with boiled soap and alcohol for the same amount of time. Everyone wears sterile gowns, caps, and gloves (and some surgeons also wear a mask). The instruments are boiled in sodium carbonate; the dressing materials with steam at a pressure of 1-2 atmospheres. The assistants take part directly in the operation, the nurses give the instruments and the dressings.

Among the most important General Hospitals which I visited, I will describe Mount Sinai which is the most modern, and where there is a celebrated surgeon, Dr. Arpad G. Gerster.

I saw him operate on a gastric fistula for carcinoma, and he was my guide for the very detailed examination I carried out in the hospital itself.

Mount Sinai Hospital has 400 beds and was established in 1904 at a cost of 35 million. It has two surgical sections, ophthalmology, pediatrics, gynecology, two medicine, and one isolation. I quote Maiocchi's exact description [7].

"The entire 5th floor is used for operating rooms: There are 5 of them all in a row, of which the central one is marvelous; each of them opens into an atrium, which also overlooks two *anesthesia rooms*, three disinfection rooms with individual autoclaves, a darkroom, an X-ray room, two rooms for examining preoperative patients, a lounge for doctors and another for *nurses*; around the central hall are toilets for the operator and his assistants, and other rooms for equipment. But these furnishings seem even more luxurious when one considers that Mount Sinai contains fewer than two hundred surgical patients.

"The visitor who wishes to get a precise concept of a hospital of this kind must not fail to take a look at the *basements*, the *nurses' home*, the *private rooms*, and the *outpatient department*.

"The *basement* consists of two or three floors located below ground level and is entirely used for service areas: These include the kitchens, the steam laundries, the electric ironing rooms, the boilers, the engines, the dynamos. In Mount Sinai and I believe also in St. Luke's and the Presbyterian Hospital, the basements also contain factories for artificial ice, soda water, mechanical workshops, and even a print shop, and everything is intended for the exclusive use of the institution.

"The *nurses' home* is located in one of the adjacent buildings, but communicates directly with the hospital: It is also luxuriously furnished and has as many rooms as there are *nurses*. The ground floor and sometimes also the first floor is occupied by the classrooms, very elegant living rooms, a library, and a *waiting room* or reception hall where the nurses welcome their acquaintances and where once a year they give their friends a dance party. What more could you want?

"The *private rooms* also occupy a small adjacent building: I will note here that these private rooms are the source of extra income for the hospital. These rooms for paying patients are equipped with every comfort, bathrooms, toilets, etc. and are obtained at the price of $25 to $100 per week (125 to 500 Italian *lire*[6]).

"The outpatient department or *dispensary* corresponds to our *ambulatorio*: It consists of a central waiting room, and side rooms for each medical-surgical specialty; there is also a pharmacy for the distribution of free medicines. Here the visits and outpatient treatments are carried out; if the case requires it, the patients are admitted to the hospital, but before definitively entering the wards, they stay for some time in special observation rooms. Here there is a permanent body of doctors on duty for emergencies, and I would also note that the hospital also carries out emergency home service in its district or neighborhood. Such is general practice of all hospitals in New York."

Among the most important hospitals I saw was Saint Luke's Hospital,[7] which has 400 beds and cost 20 million. I visited there at the kind invitation of Prof. Abbe, the chief of surgery, and saw him perform a radical hernia repair following the method of Bassini, and the application of radium to the thyroid in a case of toxic goiter.[8] He is an enthusiast of radium treatment, and to date has published seven papers on this method [8].

Besides these general hospitals there are a number of private hospitals, distinguished either by nationality or by religion. The Italian hospital has not yet been opened.[9] I visited the French Hospital[10] – built in 1904 – with the guidance of Dr. Antonio Stella, who is one of the surgeons.

Orthopedic institutes in America are very modest, and certainly do not present the grandeur of the general hospitals, because this branch of general surgery itself is modest. In addition to congenital and acquired deformities of the musculoskeletal system, most orthopedic institutes also include hernias. And the foremost of these institutes is the New York Hospital for the Relief of the Ruptured and Crippled, 135 East 42nd Street;[11] it contains 100 beds, and Prof. Virgil P. Gibney is the chief surgeon. I was disturbed to see Gibney perform a tenotomy of the adductors of both upper limbs by retraction while in shirt sleeves, and without even the standard washing of hands and the operating field. Gibney lacks the ring and little fingers of his right hand. Many thousands of radical hernia treatments have been performed in this hospital with the Bassini method. I also saw the reduction of a fracture of the lower epiphysis of the right humerus. I observed many cases of coxitis immobilized by casts.

Another 50-bed orthopedic institution is the New York Orthopedic Hospital.[12] I saw the chief of surgery, Russell A. Hibbs, operate on cases of hip dislocation using his method. An important mechanical workshop is located in the institute. This hospital accepts patients of any nationality, and I found an Italian there.

Another 30-bed institution is the Hospital for Deformities and Joint Diseases,[13] where Dr. Hermann C. Frauental is the chief surgeon with three assistants. In this institute there are two orthopedic consultants, Sayre and Shaffer, four surgical consultants, four physicians, and eight consultants in other specialties.

I also visited institutions in other cities, which I omit from describing due to their lesser importance.

The *New York Post-Graduate Medical School and Hospital* is an institution of notable interest, which demonstrates the practicality of the American people given their need to improve medical culture and especially to keep practicing physicians abreast of scientific advances. The idea was born in 1875 and expanded to establish a hospital-school which was founded in 1882. It has 225 beds, of which 59 are for pediatrics, 27 for orthopedics, 40 for obstetrics, and the others for medicine and general surgery. There are no beds for chronic patients.

The course is divided into three periods, spring, autumn and winter. The fees are determined as follows:

For 12 months	…	\$450
For 8 months	…	\$350
For 6 months	…	\$275
For 12 weeks	…	\$150
For 6 weeks	…	\$100

At the end of the course, there are oral and written examinations on patients and cadavers. A certificate of completion is then issued for a \$5 fee.

Doctors have their own conference room, reading room, and library.

In one year, 1,900 operations were performed and 24,337 patients treated in the clinics.

Doctors from all over the United States come to attend these courses, and they have graduated

1882-1883	100
1883-1884	118
1884-1885	129
1885-1886	160
1886-1887	209
1887-1888	337
1888-1889	415
1889-1890	410
1890-1891	469
1891-1892	502
1892-1893	527
1893-1894	453
1894-1895	550
1895-1896	542
1896-1897	543
1897-1898	523
1898-1899	523
1899-1900	609
1900-1901	609
1901-1902	653
1902-1903	639
1903-1904	575
1904-1905	540
1905-1906	564
1906-1907	572
Total	**11,238**

I will transcribe the program of the 1908 summer course, of which I attended some lectures and surgical and orthopedic procedures.

Intubation and tracheotomy: Dr. Maier.

Diseases of women: Profs. Graber, Brothers, Pinkham, Mallet, Dorman, Bandler.

Medical clinic: Drs. Emans, Welzmiller, Chace, Kast, Profs. Abrahams and Halsey.

Pediatrics: Drs. Dennett, Maier, Prof. Pisek, and Dr. Putnam.

Obstetrics: Dr Knipe, Prof. Brodhead.

Genitourinary diseases: Dr. Warren.

Surgery: Profs. Cole, MacAuliffe, Judd, Peterson, Beck.

Orthopedic surgery. Hernias: Dr. Mountain, Profs. Doty, Ogilvy, Dr. Albee.

Diseases of the nose and throat: Drs. Ferguson, Sheedy, Prof. Harris and Dr. Thum.

Ear diseases: Prof. Bryant, Drs. MacFarland, O'Connell, MacPherson.

Skin diseases: Profs. Lusk, Brown, Pollitzer, Dr. Dittrich.

Nervous diseases: Profs. Zabriskie, Combes, Dr. Lawrence.

Diseases of the rectum: Prof. Gant.

Eye diseases: Dr. Alger, Prof. Opdyke, Dr. Widen.

Electrotherapy and radiotherapy: Drs. Sturges, Wooster.

Histology, pathology, microscopy, bacteriology, surgical pathology: Profs. Brooks, Cline, Dr. Coflin.

A journal is also published which reports a summary of the work being carried out and is 23 years old.

No one has spoken of this institution which has been in place for 27 years, and I am pleased to draw attention to it, because now Italy is trying to establish something similar, and with enormous flaws.

In Colorado I observed a regulation in the city hospital that corresponds to a concept of great practicality and modernity, worthy of a very young population and of a recently founded capital such as Denver.

In the City and County Hospital all primary doctors can treat their patients. The emergency service is performed in three-month shifts, but any physician or surgeon can provide his services to a patient who requests them. The operating room has a dedicated staff which consists of an anesthesiologist, an assistant operator, and various nurses, one of whom is assigned to the instruments and one to the medications. These personnel serve all the operators, and so served me as well, very admirably. The operator establishes the precise day and hour of his work, both for the theater and for the treatment room. In fact, patients operated on by various surgeons can be seen on the wards.

This results in cost savings, because there is only one room, and only one staff; tranquility and satisfaction for the patients, who can choose their doctors even in the hospital; and a means for doctors to establish themselves according to their ability. This regulation, worthy of imitation, would be difficult to adopt in old Europe, and no one has yet advocated for it.

For some time in Italy, there has been talk in the newspapers, and in the Chamber of Deputies, to revise our health regulations to prevent foreign doctors from practicing in Italy. It is true that in Italy foreign doctors can exercise their profession on their compatriots even without an Italian degree; while in America, for example, Italians cannot even practice medicine on their compatriots without being subjected to a state exam.

But this state exam must be taken by all American doctors regardless of the university from which they graduated.

However, I observe that in America (especially in Colorado) a provisional license to practice is granted to all doctors with a degree, even foreign ones, for patients of any nationality. And such a license is not granted in Italy.

In fact, I obtained this temporary license, upon presentation of my degree and the payment of a fee of 25 dollars, and thus I was able to operate and hold consultations in Colorado for a month.

After the deadline, I would have to submit to written and oral exams, as required by law. However, in many cases these tests are a formality. It was said that Lorenz of Vienna, in this examination, was simply asked about his impressions of America.

Before concluding, I would like to emphasize three concepts that aroused my admiration, and which also place Americans in the vanguard of scientific progress and social reforms in the health field, namely:

the provisional license for professional practice for foreigners;

permission for all physicians of the city to treat their patients in the hospital;

the Post-Graduate School-Hospital, which has been in operation for 28 years.

Original Notes

1. "Never in the history of Denver has so large and so representative a clinic been held over a patient. The street in front of the county hospital was congested with automobiles of prominent surgeons and the gallery and floor of the operating room was crowded." (*The Denver Post,* 26 May 1908).
2. My thanks to Dr. Percy S. Rowls, who was the anesthetist, and to Dr. Will. B. Lutes, assistant surgeon.
3. Done in conjunction with Samuel Hopkins, Professor of Neuro-pathology.
4. Dr. Andrea Maiocchi, "Dalle cliniche estere: Note ed appunti," *La Clinica Chirurgica*. Milan, Vallardi, 1909, No. 4, 5, 6, 7, 8.
5. *Il Policlinico*, Rome 1910. Vol. 22.

6. *Giornale di Medicina Militare*, August-November 1910.
7. Andrea Maiocchi. *La Clinica Chirurgica*, 1909, p. 1036.
8. Robert Abbe of Columbia University, Surgeon at St. Luke's Hospital: "Radium and radioactivity," 1904. – "The subtle power of radium," 1904. – "Exophthalmic goitre reduced by radium," 1905. – "Radium in surgery," 1906. – "Explosion of a radium tube," 1906. – "The specific action of radium as a unique force in therapeutics," 1907. – "Illustrating the penetrating power of radium," 1907.

Original Illustrations

[Not reproduced in this volume]

Fig. 1: The patient preoperatively, completely dressed.

Fig. 2: The patient preoperatively, legs and feet exposed.

Fig. 3: The patient postoperatively, completely dressed and selling newspapers.

Biographical Sources

Villa A, Arieti S, "Engineering and medicine in static of the femur: Considerations on the contributions made by Silvio Canevazzi and Cesare Ghillini," *Chirurgia degli Organi di Movimento* 1991; 76:93-96.

Dizionario Biografico degli Italiani, Vol. 53 (2000). Accessed at treccani.it.

Publication Source

Bulletino delle Scienze Mediche (Bulletin of the Medical Sciences) ceased publication in 1991. Historical issues can be obtained through the Hathi Trust.

Translation Notes

1) The author does not mention that the newspaper misspelled his name "Chillini."
2) Mercuric chloride, no longer used.
3) Abel Mix Phelps of New York had described release or elongation of

several tendons in addition to the Achilles. See Hernigou P, “History of clubfoot treatment; part III (twentieth century): back to the future,” *International Orthopedics* 2017; 41:2407-2414.

4) See Wright JR Jr, Abrams J, “Philip Hillkowitz – The ‘granddaddy of medical technologists’ and cofounder of the American Society for Clinical Pathologists and the Jewish Consumptives’ Relief Society,” *Archives of Pathology and Laboratory Medicine* 2018; 142:127-138.
5) *Corriere della Sera* (The Evening Courier), published in Milan, was then and is now the most widely-read newspaper in Italy.
6) The *lira* (plural *lire*) was the monetary unit of Italy, at that time worth about $0.20.
7) Now the Mount Sinai Morningside Hospital.
8) Like others on the European continent, the author calls toxic goiter “Basedow’s disease”; in English-speaking countries it has often been called “Graves’ disease.”
9) The Italian Hospital in New York did not open until 1937. In 1973 it merged with the Columbus Hospital to form the Cabrini Hospital, which then closed in 2008.
10) The French Hospital moved to a new building on West 30th Street in 1928 and closed in 1977. It is depicted in the movie *The Godfather*.
11) Now called the Hospital for Special Surgery, located at 535 East 70th Street.
12) Now the Department of Orthopedic Surgery at the New York Presbyterian Columbia University Irving Medical Center.
13) Now the New York University Langone Orthopedic Hospital.

16

Pavel K. Levonevsky (1908)

Pavel Kaetanovich Levonevsky (Павел Каэтанович Левоневский) was born in 1863 in the region of Kovno (at that time part of the Russian Empire, now Kaunas, Lithuania). He studied medicine at the University of Dorpat (at that time a German-speaking institution in the Russian Empire, today the University of Tartu, Estonia), and trained as a surgeon at the Omsk Military Hospital. He was active in the Omsk medical society, published numerous clinical articles, and traveled frequently to surgical centers and meetings in other European countries.

In the fall of 1908, at the age of 45, he spent three months in America, and published the following report in 1909.

He returned to his active surgical practice at the Omsk Military Hospital. At the beginning of the First World War he contracted a fatal case of typhus while supervising the evacuation of wounded and sick patients.

Khirurgicheskia nabliudenia v Severnoi Amerike
[Хирургическія наблюденія въ Северной Америкѣ]
Voenno-meditsinskii Zhurnal
[*Военно-медицинскій Журналъ*] 1909; 226:179-224,733-752

Surgical observations in North America

(From a report on a visit to the United States of North America in the autumn of 1908)

P. K. Levonevsky, Senior Ordinator[1] of the Omsk Military Hospital

Having heard repeatedly about the colossal accomplishments of the Americans in all areas of engineering science, about their efficiency, originality, and enterprise, I have long been interested in their medicine, and especially in their surgery. However, I have heard such contradictory and vague, although at the same time very interesting reports and reviews, that I decided to travel there and see for myself. Not having much time at my disposal (only three months), I managed to visit only four states: New York, Michigan, Illinois, and Minnesota.

I will begin my account of what I saw there with a description of the private surgical hospital of the Mayo brothers. Although this hospital is located in the small town of Rochester (Minnesota), far from the most populated centers, it is one of the best I have ever seen, and is of great interest to the surgeon. I consider it the most remarkable of all the hospitals that I have been able to see in the United States.

Furthermore, I will describe it at the beginning of my report because the Mayo brothers, as undeniably brilliant and original surgeons, enjoy great authority and popularity in America, and therefore all the most remarkable methods and principles that I describe in connection with their names are very common among American surgeons. By starting with the Mayo brothers, I will thus be able to stay in focus and avoid repetition, while paying tribute to their scientific merit.

St. Mary's Hospital, Rochester, Minnesota

This hospital is one of the most interesting institutions of its kind that I saw in the United States. I had heard about it back in Europe, in Vienna. When I arrived in the United States and asked what is worth seeing, all the doctors, including the most famous ones, invariably pointed to this hospital and to the surgeons who lead it, the Mayo brothers.

Rochester is a small town, only recently growing to have 6,000 to 7,000 inhabitants; it is 12 hours by railroad northwest of Chicago. On the very edge of the city, on a somewhat elevated area, there is a hospital building consisting of three four-story pavilions. Around it are fields, gardens, and woods in a picturesque valley. The air could not be fresher. Inside, everything is very clean, cozy, and comfortable, but without excessive luxury. Patients are placed either in separate rooms, or in pairs, or in small wards with 4-8 beds, depending on how much they have paid, ranging from 7 to 70 dollars a week; for an operation, a separate fee is agreed upon. The entire hospital is designed for 180-200 people, and patients are usually admitted the day before the operation. This hospital is run by the two Mayo brothers; they founded it and are the sole owners of it. The hospital employs about 30 doctors. The outpatient clinic, which attracts patients from all over the New World, is a completely separate building in the center of the city. The clinic sees 100 - 130 people a day and is run diligently by sixteen specialists; all kinds of modern clinical research are being carried out here. Some of these specialists receive a salary of as much as 12,000 rubles per year.[2] It is apparent that the clinical material is very carefully selected, and only 20-22% of the above number of outpatients undergo an operation, thus about 20-25 operations are performed daily from 8:00 A.M. until 2:00 P.M. This number has been fairly constant during recent years. From the first day of January, 1908, until the time I visited the hospital at the end of October, about 6,000 operations had been performed. The operations are performed almost exclusively by the Mayo brothers, in two operating rooms at once. Their technique is brilliant, their work is unrushed and full of self-confidence; it is a great experience to watch them. Abdominal surgery accounts for about three quarters of all cases. The operating rooms are quite spacious and utilitarian, but without the degree of comfort one can find in Europe. Each has a room for inducing anesthesia and preoperative preparation of patients. While these are underway, outside doctors are usually not allowed in the room.

The rules on access to the patients are very strict, and only as an exception was I allowed to examine a patient. Visiting doctors, who come from all over America, are generally not permitted to see the patients; they can only be present during operations, and then every day they gather at 4:30 P.M. in a special club for doctors. In the club, the cases operated on that day are discussed, and local doctors also attend and report on the postoperative course of patients operated upon earlier. I found these meetings rather tedious and not very animated.

During my stay here, the number of visiting doctors ranged from 25 to 30; many stay for several months. The majority of them enroll in the club for doctors.

They are set up very well for anatomical-pathological and microscopic investigation.

As soon as any part of the tissue is removed during the operation, it is immediately taken by a pathology specialist, who examines it both macroscopically and microscopically, and the latter (using a freezing microtome with condensed carbonic acid) takes no more than 4-5 minutes. So, while the surgeon sutures the vessels and tidies up the wound, the diagnosis is checked microscopically; I saw one case where a supracervical hysterectomy for uterine carcinoma was extended to complete removal of the cervix and fornix, based on microscopic examination of the stump section.

All removed parts are carefully preserved postoperatively, re-examined, and, if indicated, photographed in a glass box filled with liquid, in which the preparation is carefully placed and straightened. This achieves remarkable relief and clarity of images. The photographic laboratory is very well organized with all the latest equipment, but unfortunately I could not obtain details about the methods of artificial lighting used in photographing preparations, for which the laboratory has sophisticated devices. The most interesting patients are photographed several times here, and I saw very good albums kept in excellent order.

It is very difficult for a European to understand how such a huge surgical institution could develop far from the main centers of the country, in a relatively sparsely populated area, and become famous, not only in America, but also in Europe, Egypt, and even India. People come from all these places, attracted by its reputation, and the fame and authority of its surgeons. The prosperity of the inhabitants of Rochester, and its healthy environment, are largely due to the Mayo brothers, and residents rightly fear that the loss of the Mayos would greatly affect the welfare and further development of Rochester, which has benefited so much from the influx of patients from the wealthiest sections of American society.

Before proceeding to describe the operating technique of the Mayo brothers and their methods of operating in individual cases, I will touch on some features of their physical examination of patients.

Despite the very well-equipped chemical, anatomical-pathological, and other research laboratories with the latest scientific methods, the Mayo brothers also pay serious attention to the simplest methods of investigation, and often consider these results more important than the most accurate laboratory data. For example, this applies to the rectal examination, which they feel should be performed more frequently than is done by some physicians. This examination is especially important in men and virginal women; in both of these cases, it should be done bimanually and in the supine position with extended hips, since it has been found that small tumors may be well defined in this position that are not palpable at all in the knee-elbow position.

If the patient is particularly sensitive or has rigidity of the abdominal muscles, making it impossible to examine the abdomen adequately, the Mayos resort to examining the patient in a warm bath. This method makes the examination much easier and is most often used when palpating questionable cases of gastric cancer. In strong and muscular subjects, it is also useful to give a laxative the day before the examination. This is especially important in cases where the tumor is located in the pelvis.

In diseases of the stomach, especially in gastric ulcers, much attention is also directed to the possibility of nervous diseases, such as tabes dorsalis, which can cause "gastric crises," simulating an ulcer to some extent. In this regard, the state of the patellar reflexes and the ophthalmoscopic picture of the fundus are obviously of great importance.

In women, the physical examination definitely includes the mammary gland, even if the patient does not complain at all about this organ. Experience has shown that this often leads to the discovery of an unsuspected mass, and several times after removal of such a small tumor, microscopic examination has confirmed the diagnosis of cancer. Considering the duties of a doctor and the tasks of prevention, such a thorough examination of patients is noteworthy.

In the diagnosis of appendicitis, the Mayos attach great importance to the urinalysis and especially blood in the urine, since they have seen quite a few cases in which the appendix was removed, while the cause of the disease was actually kidney or ureteral stones with pain radiating to the right iliac region. Intermittent hydronephrosis should also be considered.

Finally, the Mayos insist on the need to pay attention to the condition of the nasal passages, since their experience has shown a relationship between purulent processes in the *antrum Highmori* or *sinus frontalis*[3] and the presence of a severe secondary anemia leading the patient to see a doctor. This association should be suspected in all those cases where pernicious anemia has been excluded and no other septic condition has been discovered. As a result, the nasal cavity is frequently examined here.

In general, every patient is subjected to the most thorough and comprehensive study, and each individual case is examined by specialists. When there is any doubt, the patient is seen by several doctors until the diagnosis is established with a sufficient degree of accuracy or probability.

Preoperative preparation[4]

As a rule, the patient enters the hospital the day before the operation and receives a regular diet. Only in cases of gastric diseases are they limited to eggnog, toast, tea, and fruit. On the evening before the operation, the patient is bathed, shaved, and receives 60 ml castor oil in a small amount of beer. On the morning before the operation, the patient does not receive any food or drink. In gastric patients, the stomach is lavaged with warm water and the patient receives 10 mg of morphine hydrochloride a half hour before going to the operating room.

With goiters, the patient is given 10 mg of morphine hydrochloride and 0.5 mg of atropine sulfate subcutaneously a half hour before anesthesia.

While the patient is already lying on the operating table, he is washed with warm water and “Jumbo” soap [1] using a soft gauze pad instead of a brush that might scratch the skin. This is followed by washing with sublimate (1:2000),[5] after which the site is treated for 30 seconds with a wet compress of Harrington’s solution [2][6] which, according to the Mayo brothers, has very good and strong disinfecting properties. Finally, the site is washed with 70% alcohol and covered with a sterile towel, and the patient is ready for surgery.

Preoperative preparation of the surgeon and assistants

Hands and forearms up to the elbow are first thoroughly washed with brushes and “Jumbo” soap in running warm water and the fingernails are cleaned. The hands are then immersed for half a minute in the Harrington’s solution mentioned above. Finally, they are rinsed in sublimate (1:5000) and smooth rubber gloves are put on, having been immersed in the same solution. Gauze caps and face masks are put on before hand disinfection. After all this, the operator puts on sterile oversleeves and a sterile wide towel is pinned to his chest over the operating gown. Towel, sleeves, and gloves are changed after each operation.

Rubber gloves are sterilized by boiling for at least three minutes after aseptic operations and at least ten minutes after septic ones. As a rule, gloves are not used during operations on the vagina, rectum, prostate, or face. Hand sterilization is the same as described above.

Sterilization of instruments

Instruments are sterilized by boiling in water alkalinized with soda[7] for a minimum of three minutes. All items brought into the operating room, such as plates, bowls, glassware, or bottles, are boiled in the same way.

Drainage tubes are also sterilized by boiling, while rubberized fabrics are soaked in a 1:1000 sublimate solution and washed in sterile water. Clothes, aprons, bathrobes, towels, napkins, caps, gauze packs, etc. are steam sterilized for two hours in a Scanlan-Morris apparatus.

Drains

The Mayos most often use the following types of drainage:[8]

1) Spiral drainage. The rubber tube is cut in a spiral fashion and wrapped around a folded piece of soft iodoform gauze. This drainage is effective in that the cavity of the tube has good communication with the cavity of the wound. It is used for large tissue cavities, for example, after excision of glands in the neck, mastectomy, etc.

2) Split rubber drain. A strip of iodoform gauze folded several times is inserted into a rubber tube split on one side, so that its ends protrude somewhat from both ends of the tube. It is used for drainage of cavities and in cases of profuse suppuration. The gauze wick is usually removed earlier, but the tube is left for a few more days as needed. For example, during thyroid surgery (the Mayos always use this type of drainage in these cases), the wick is removed from the tube on the fourth or fifth day. After cholecystectomy they try to keep the split side of the tube facing the liver. At the same time, the tube is held in place against the stump of the cystic duct by the end of the same ligature that closes the duct.

3) "Cigarette" drain. This is made from iodoform gauze wrapped in thin rubberized cloth. It is used for small purulent cavities.

4) Glass drains. Glass tubes are used when very free drainage is indicated, and are usually combined with some other kind of drainage described above. The tubing diameter ranges from ¼ to ½ inch. They are rarely left in the wound for more than 24 hours and are usually replaced with a rubber tube or gauze wick when removed.

5) After cholecystostomy, the following type of drainage is also used. Gauze is coiled around a small rubber tube and it is wrapped in a rubberized cloth. This drain is inserted into the gallbladder, at the mouth of which a purse-string suture of catgut is placed about ½ inch from the edge. The edges of the gallbladder wound are invaginated, after which the suture is tightened and tied. The tube itself is held with a single suture, the end of which is brought out through the wound and attached to one of the skin sutures.

Dressings after abdominal surgery

Dr. C. H. Mayo uses dry gauze dressings on clean cases, over which he lays a non-absorbent sheet of cotton, on top of which is another layer of gauze covering the entire first two layers. All this is attached with strips of adhesive tape. In children, in clean cases, tincture of Benzoin is sometimes used to strengthen the first layers of gauze, on top of which the sheet of cotton and gauze are applied as usual, attached with an adhesive rubber plaster.

Dr. W. J. Mayo usually puts gauze soaked in a solution of tincture of iodine (1:500) on the wound (the preparation should be the color of port wine). In contaminated cases, when a drain is inserted into the lower end of the wound, the edges of the wound are treated before closure with the previously mentioned Harrington's solution and then alcohol.

Gauze packs

The Mayo brothers use three types of gauze pads during surgery:

1) To blot the surgical field – small pads of gauze, folded in such a way that the edges are turned inward, so that threads do not fall into the wound from the unfolded edges.

2) To cover the edges of the surgical field – gauze folded eight times, sheathed on all sides, 4x8 inches in size, with a ribbon 6 inches long attached to one corner.

3) Large packs for moving, retracting, and holding the intestines or other organs of the abdominal cavity, made of pieces of gauze about 2½ arshins [70 inches][9] long and folded four times so that their width varies from 4 to 5 inches. A ribbon with a wooden ball is tied to one of the corners. These packs are always kept in sterile wrappers and removed as needed during the operation, and not left lying openly on the table. These large absorbent packs for the abdominal cavity are always prepared before the operation in groups of eleven, with more available if necessary – they are only rinsed again during the operation itself in a warm physiological saline solution. They are counted again at the time of abdominal closure.

Sutures and ligatures

For sutures the Mayo brothers use catgut (plain and chromic), "silk-worm gut," linen, and horsehair (silk is rarely used).

1) Ordinary catgut is used as Numbers 1, 2, 4, 5 and 6. Number 1 is used for ligatures of vessels, but sometimes also for intestinal sutures when there is an infection, for example, with appendicitis. Number 2 is used most often for ordinary sutures, and Number 4 for sutures where great strength

is required, for example, with hernias. Catgut is sterilized by the method of Willard Bartlett (see below)[10] and preserved after sterilization in glass bottles, in a solution of one part iodine per 100 parts of deodorized methyl spirit (Columbian spirit).[11]

2) Chromic catgut is used in intestinal work, when suturing the mucosa, that is, in places where a longer apposition of the sutured surfaces is required than can be obtained with regular catgut. This variety of catgut is bought ready for use in glass tubes, in a 1:1000 sublimate solution.

3) "Silkworm gut" is a special kind of thread made from the intestines of the silkworm. It is used where strong tension is required; sterilized by boiling for eight minutes, after which it is immersed in a solution consisting of one part of crystalline iodine, forty parts of water, and six parts of ethyl alcohol. Silkworm gut is distinguished by its great strength, and also by the fact that it is very well sterilized, representing in this respect a completely reliable material. It is especially recommended by the European surgeons I have visited. Prof. Horsley in London, who uses only silkworm gut in all his operations, including those on the brain, never sews with catgut because he considers its sterility always doubtful.

4) Linen "celluloid Pagenstecher"[12] Number 1. This is used along with catgut for intestinal sutures, including mucosa. These threads are very strong, according to American surgeons, and are much stronger than silk when wet. They can be ordered from London from the company "Medical Supply Association" at Gray's Inn Road No. 228-230. You can get them in different thicknesses in the following packages: 1) A box containing 10 skeins (280 inches in each skein) costing about 1 ruble and 50 kopecks; 2) A small box containing 5 skeins of sterilized, wrapped in wax paper for 50 kopecks; 3) A small box containing one card for 12 kopecks. These threads are sterilized in a mixture of ether and alcohol, but before use it is recommended to boil them for 15 minutes in a 1% sublimate solution. These threads are a non-absorbent material and replace the less reliable silk, which is therefore used very rarely by the Mayo brothers.

5) Horsehair, which I first encountered in America, has been used here by all surgeons for about 20 years as the best material for skin sutures, due to its elasticity and non-absorbability. It is sterilized by washing for five or six days in frequently changed hot water and soap. After that, the hair is soaked in 1% sublimate and boiled for three minutes before use. It is preserved in a solution of one part of crystalline iodine to 40 parts of water and 6 parts of alcohol. Frequent boiling damages the hair, making it brittle.

Sterilization of catgut – Method of Willard Bartlett:

The catgut, rolled into coils, is placed on asbestos cardboard or better in a cup of the same material in a hot air thermostat and dried at a temperature very slowly and gradually raised to 220° F. (104° C.) This last temperature is maintained for 30 minutes. A higher temperature causes the catgut to become fragile. Care should also be taken that the coils do not come into contact with the metal walls of the cabinet at any point.

It is soaked for 24 hours in liquid albolin (Albolin - parolein, a derivative of petroleum oil).

Then the coils in an asbestos crucible are placed in a sand bath and the temperature is gradually brought to 320 ° F (160 ° C) and maintained at that level for an hour. You should never raise the temperature above this level.

Finally, the catgut is placed in a solution of one part of iodine per 100 parts of deodorized methyl alcohol. If a lot of albolin remains on the threads after the third step, it is better to let it drip before placing it in the iodine solution.

Postoperative treatment

An overview of postoperative treatment, of course, can only be given in the most general terms, because each individual case is different to some extent.

1) Acute appendicitis. (What is said here applies and pertains to all other cases of abdominal surgery that do not require drainage). The bandage is not touched until the time of the patient's discharge has arrived, that is until the 8th or 9th day; only if horsehair skin sutures have been applied, the bandage is changed earlier. Patients remain in bed for about 5 days, with a slow and gradual increase in diet.

On the first day after the operation, nothing is given by mouth except very small amounts of warm water. On the second day, patients receive every 2-4 hours 30-50 ml beer, alternating with the same amount of buttermilk. Third day: Toast, soft-boiled egg, tea, beer in the quantity indicated above, buttermilk. Fourth day: If the bowels have not moved, they give 45-60 ml castor oil. Fifth day: The patient is usually allowed to get up and leaves the hospital by the 8-9th day.

2) Cases of appendectomy with drainage. Acute cases with significant abscess are usually drained using a rubber tube split along its length with a wick of folded gauze; this drainage is inserted through the main operative incision; in addition, a glass tube wrapped in gauze is inserted through a small hole in the abdominal wall. The glass tube is usually removed after 24

hours and an ordinary gauze wick is inserted in its place. The gauze wick from the rubber tube is removed on the 4th day, and the tube itself on the 6th day. In extreme cases, if on the 6th day there is still a copious discharge, the tube is left for another day or even longer. As a rule, such patients get up on the 7th or 8th day and are discharged after another 4 or 5 days.

The diet in these cases is the same as in the previous case, but the bowels are not emptied until the drainage tubes have been removed.

Regarding when to operate and when not to operate on appendicitis, the Mayos adhere to the following rules: If the patient is admitted within the first 36 hours of the onset of symptoms, he is usually operated on. If the patient enters the hospital later, then either the cessation of acute inflammation or the formation of an abscess is awaited. Perforations, which usually occur within the first 48 hours, are operated on no later than 6 hours after the perforation, but only if the temperature is elevated. If the temperature falls after perforation, these cases are never operated on. The course of such cases is entirely left to the forces of nature and strict observance of Fowler's position[13] and "nothing by mouth."

In case of vomiting, gastric lavage is performed with warm saline. Warm saline is also continuously administered per rectum, or subcutaneously if the rectal fluids are not retained. Hot water bags are placed on the limbs and an ice bag on the right side of the abdomen. Within a week, by this method, it is usually possible to produce a contained abscess, which can be opened and drained, and five or six weeks later the appendix can be removed after the abscess cavity has resolved.

3) Cholecystostomy. In these cases, the drainage tube is sutured to the gallbladder with catgut and removed on the 7th or 8th day, when the catgut has already been absorbed. To prevent the dressing from getting soiled, a long thin rubber tube connected to a glass bottle is attached to the drainage by means of a glass tube.

The diet is stricter than after appendectomy, and no solid food is given until the drainage tube has been removed and the intestines have been cleaned, which is achieved by prescribing on the 7th or 8th day some laxative salts (such as Rochelle salts or Seidlitz powders). Patients get out of bed on the 9th day and are discharged on the 11th to 14th day. A dry aseptic bandage is changed daily until healing.

4) Cholecystectomy. The drainage tube is rubber, slit lengthwise, and is removed on the 7th day. Cholestasis may occur on the second postoperative day, accompanied by blanching and an anxious expression on the patient's face, nausea and vomiting. If so, the stomach is immediately lavaged with warm water.

5) Choledochotomy. The drain is removed on the 7th day. If there is a tendency to constipation with an urge to vomit, Calomel 15mg is given from time to time. If jaundice appears on the first day, a physiologic saline solution is given per rectum (Murphy's method).[14]

6) Gastroenterostomy. The first day: Absolutely nothing is given by mouth. 2nd day: 30-50 ml warm water, every few hours. 3rd day: 30-50 ml warm water alternating with the same amount of beer. 4th day: Buttermilk, beer, tea. 5th day: The same, as well as a broth of rice or barley. 6th day: Same. 7th day: Toast, soft-boiled egg, potatoes.

Bowel emptying after gastroenterostomy is avoided until the 10th day, but then a laxative is prescribed for this purpose, usually cascara sagrada. In cases with a tendency to constipation, an enema of soapy water is tried; if soapy water does not work, then an enema of a solution of magnesium sulfate with glycerin.

On the 12th day, the patient is allowed to stand up, and on the 14th – 15th day the patient is discharged. Very often, a physiological saline solution is administered per rectum during the first 24 hours, especially if shock is a concern. However, great care is given that the liquid is introduced with very low pressure. In case of vomiting after surgery, gentle gastric lavage with warm saline is highly recommended by the Mayo brothers and is very often used by them in practice.

7) Prostatectomy. Having put the patient to bed after the operation, they give 10 mg morphine hydrochloride and 250 ml saline per rectum. The latter is repeated every 6 hours. If there is severe soreness, tenesmus, or if the drainage tubes do not work satisfactorily, the patient is relieved by flushing the bladder. The drain is removed on the 4th day and the patient is allowed to stand up. A bandage with a very large amount of cotton is supported by special pants. Then the patient is prescribed sitz baths. On the first day out of bed, he receives 4 baths, and on the following days 2 baths daily. In case of urinary retention, 50-100 mg of sparteine sulfate is administered every 4 hours. Urinary leakage is treated with electrocautery (without anesthesia).

8) Excision of glands in the neck. For drainage in these cases, a spirally cut rubber tube is used with a wick, which is removed on the 4th day, and the tube itself is left until the 6th day. The patient is discharged approximately on the 8th day. With salivation after excision of the submaxillary gland, they often make use of atropine.

9) Mastectomy. Drain with a spirally cut rubber tube with a wick. The wick is taken out on the fourth, the tube itself on the sixth day. Two or more drains are used, of which one is inserted into the axilla, and the other into the opposite part of the surgical field. In the axilla, when applying

a bandage, a small pad is inserted; care is taken that the forearm always remains free, and the patients are encouraged to use the hand very early, so that they feed themselves on the first postoperative day. Passive movements with the hand are also started as early as possible, and on the 10th day the patient usually combs her hair herself.

10) Goiter. As already mentioned, before the operation, the patient is given 10 mg morphine hydrochloride and 0.5 mg atropine sulfate. In some cases, the thyroid gland is irradiated for several weeks before surgery, which reduces the symptoms of the disease; in addition, this makes the connective tissue capsule of the gland become thicker and tougher, which facilitates the operation itself. By the second postoperative day, the patient is usually allowed to stand up, but with severe exophthalmia only on the 3rd-4th day. In the first 24 hours, a physiological saline solution is administered per rectum. Insomnia and palpitations are treated with an ice bag. Drainage consists of a split rubber tube with a wick, removed on the 4th day.

Dressing changes are generally done with forceps. The tools needed for bandaging are brought to the patient's bed in an antiseptic solution, while the dressing material is in bags wrapped in two sterilized towels and two pieces of newsprint. During dressing changes the hands do not touch the wound. After clean cases, the bandages are washed, sterilized, and reused, but after septic cases they are discarded. For vaginal and perineal operations, silk sutures are removed on the 12-14th day. The diet is liquid for three days, semi-liquid until the end of the week and then unrestricted.

In all cases with prolonged nausea and vomiting they use nutritional enemas per rectum, consisting of milk or thick broth up to 60 ml and administered every 6 hours. Every day they also administer 500 ml physiological saline solution.

Anesthesia

With regard to anesthesia, it should first of all be noted that at St. Mary's Hospital there is a specialist doctor under whose supervision anesthesia is administered. Ether is most often used, such that among 3,080 cases of general anesthesia during 1905, ether was used in 2,847. In the last 14,000 cases of general anesthesia in the Mayo practice, there were no deaths directly from anesthesia; artificial respiration was used only in a few cases.[15] In about 1000 cases nitrous oxide was used before ether and in 73 cases scopolamine with morphine. At present, attempts to combine ether with any other substances have been abandoned, since they are safe in themselves but give unsatisfactory results. Etherization is carried out as follows. The anesthetist has two bottles of ether, 120 ml each, with ordinary stoppers having a groove on opposite sides, into one of which a cotton wick is inserted. One bottle has a cork with smaller grooves, the other with wider ones. If possible, the patient usually enters the operating room himself and lies down on the table. All foreign bodies are removed, such as artificial teeth, chewing gum, etc., and the hands are tied loosely on the chest with a gauze bandage so that they do not roll down and hang off the table, which is known to cause "radial palsy" from pressure on the edge of the table. The eyes are closed with a moist cotton cloth. If ether does come in contact with the eyes, they immediately instill a few drops of castor oil to prevent conjunctivitis. The head is positioned so that the neck muscles are not tense. An Esmarch mask is used for etherization with two layers of gauze; all this is sterilized after each patient. They begin to etherize from the bottle with smaller grooves, dripping slowly and regularly, somewhat faster than it is done with chloroform anesthesia, until the patient's face turns red. Then they put a few more layers of ordinary gauze on top of the mask, take another bottle with large grooves and drip ether much faster until complete anesthesia is obtained, which should be especially deep at the beginning of the operation. When the skin incision is made, the first bottle is used again and anesthesia is maintained until the end of the operation, trying not to give more ether than necessary. The patient's condition is judged not only by the conjunctival reflex and the state of the pulse, but by breathing, complexion, and muscle tone. They never ask the patient to count, do not talk to him, do not force him to breathe deeper, since all these strongly affect the subsequent anesthetic course, and the patient becomes restless and noisy. Deep breathing at the beginning of anesthesia may produce a feeling of suffocation. During operations on the gallbladder and generally in the upper abdomen, irritation of the diaphragm can cause respiratory disorders during deep anesthesia, and therefore in these cases the Mayos do not flood the patient with even more ether, but actually remove the mask and let them breathe fresh air. The same thing is done during operations on the sphincters.

If the tongue retracts, they never use forceps, but try to catch the tongue and pull it out with a strip of gauze. When operating on the stomach, they operate very carefully and try to give as little ether as possible in order to avoid nausea. Half an hour before general anesthesia, patients about to have a stomach operation are given about 10-50 mg of morphine hydrochloride subcutaneously, but they give a large amount of ether only at the beginning of the operation, after which they maintain a semi-conscious state, which is considered quite sufficient because the stomach is so insensitive. Indications for increasing the dose of ether are eye movements, swallowing, and rigidity of the lower jaw. But despite such ingenious anesthetic management, these cases are still complicated by pneumonia more often than others. Since pneumonia is also observed with local anesthesia, the Mayo brothers tend to think it is not caused by the anesthetic agent, but by embolism and sepsis. However, ether pneumonia must be distinguished from the usual pulmonary edema; the latter is seen most often at a time before pneumonia can be anticipated. The danger of anesthesia results mostly from inexperienced anesthetists. In cases of acute upper respiratory infections, they etherize only in exceptional cases, and usually wait until the infection has resolved or until acute symptoms have subsided.

Chloroform anesthesia is considered more dangerous and is used less frequently. During chloroform anesthesia, the corneal reflexes and the pulse are monitored, and anesthesia is administered very slowly and carefully. Respiratory disorders are always considered serious. Almost all of the complications during anesthesia observed in these 14,000 cases were due to the use of chloroform alone or combined with other anesthetic substances, or in young patients receiving chloroform.

They always anesthetize on the operating table, since moving a sleeping patient has unfavorable effects on the course of anesthesia. They begin to wash the operative site during anesthetic induction; this distracts the patient, and he soon loses consciousness. If the operation requires the Trendelenburg position, they induce the anesthetic in this position. The Mayos have noticed that when this position is given at the onset of anesthesia, the pelvis is better emptied and the bowel loops are less in the way than when the fully-anesthetized patient is placed into the Trendelenburg position.

The Mayos incidentally believe that the anesthetist should not be concerned about what the surgeon is doing, and that the best anesthetist is one who is not interested in being a surgeon or assistant. This characteristic is best met by a nurse who has received appropriate training and can completely replace a doctor during anesthesia, especially since even the most profound knowledge of theory cannot replace skill and practical training in this area, which are so necessary both for the good of patients and for the equanimity of the surgeon during the operation.

I will now describe some of the more interesting methods of operating on specific cases.

Ulcers of the stomach and duodenum [16]

As the methods for studying these patients improve, American surgeons, especially the Mayo brothers, who have operated on about 300 cases with ulcers, are increasingly convinced that duodenal ulcers are much more common than gastric ulcers, constituting about 61% of all cases. They believe that they themselves have spoken about stomach ulcers before, treated them as such, and even operated on them, when they were actually in the duodenum. According to the statistics of the St. Mary's Hospital for 1906 and 1907, out of 119 operated cases, with a thorough study both before surgery and on the operating table, ulcers were located as follows: In the duodenum 61.7%, in the stomach 31.0%, and in both locations simultaneously in 7.3%.

A fact that has further contributed to diagnostic errors is that most duodenal ulcers are located within 1½ inches of the pylorus, and of these about half extended ½ inch higher into the pyloric part of the stomach. The Mayo brothers relate the formation of ulcers in this first portion of the duodenum, as well as the fact that ulcers occur four times more often in men than in women, to the difference in the anatomical position and shape of the duodenal curve in men and women. In the former, the ascending portion of the duodenum is larger and rises more steeply upward, as a result of which the neutralization of the acidic contents of the stomach entering the intestine, which plays a large role in the formation of ulcers, is not as rapid and complete as in women, whose more gradual ascending portion allows alkaline secretions (bile, pancreatic juice) to enter this segment more easily. The Mayos also relate this to the fact that in women duodenal ulcer occurs almost always in conjunction with biliary tract disease, namely cholelithiasis – 80% of the time according to their statistics.

Regarding perforated duodenal ulcers, the Mayo brothers consider them to be fairly common, but a fairly benign process, since the contents of the duodenum are to some extent sterile, and the volume of food contained in it is not large. There is reason to believe that in many cases of purulent peritonitis attributed to appendicitis, the duodenum is actually the starting point, and the appendix is only secondarily involved in the process; thus, the diagnosis can be missed even on the operating table.

With regard to the diagnosis of duodenal ulcers, the Mayo brothers pay careful attention to the periodicity of attacks of pain, which always begin in adulthood. The attacks have the character of acute gastric disturbances in which hyperacidity always plays an important part. After a few days or weeks there is an improvement, during which the patient feels almost well, but the attacks soon reappear and recur more and more often, and a strict diet helps very little. Finally, signs of mechanical obstruction appear, which happens quite often. Bleeding occurs in about half of all cases. On physical examination, they are guided by the fact that pain and sensitivity when palpating are noticed and spread from the midline to the right. Pain occurs only a few hours after eating.

In contrast to gastric ulcers, duodenal ulcers are rarely complicated by cancer.

In the treatment of ulcers, the most radical remedy in most cases is gastrojejunostomy. Among 312 gastroenterostomies, the Mayo brothers did 311 gastrojejunostomies and only one gastroduodenostomy. In several cases, they had previously tried to do a complete excision of the ulcer along with its thickened and hardened edges, repairing the resulting defect, but the results were not very good, and half the cases eventually underwent gastrojejunostomy. Currently, they excise only the base of the ulcer, followed by simple plication and suturing of the defect; the results are favorable and the operation itself is simpler, but since there has not been time for enough observations, they do not feel they can make any specific recommendation.

In cases of bleeding, if the base of the ulcer is not excised, then the vessels leading to the ulcer are ligated and a number of sutures are also applied from the peritoneal side, incorporating healthy tissue along with both sides of the ulcer. By tightening these sutures, the base of the ulcer is plicated to prevent possible perforation.

During the operation, care should be taken not to mistake the frequently observed anemic spots for a duodenal ulcer located on the ascending part of the duodenum in the immediate vicinity of the pylorus.[17] These spots are a simple phenomenon of mechanical anemia, due to kinking the vessels while lifting the stomach to better examine it; if this inflection between the pyloric part of the stomach and duodenum is straightened, such a spot initially simulating an ulcer gradually disappears. How deceptive these spots are is proven by the fact that even such experienced surgeons as the Mayo brothers several times thought they were ulcers and opened them only to find that they were simple anemic spots.

According to the latest statistics (1906-1907), covering 99 cases, about 82% of those operated on completely recovered, 9.5% underwent significant improvement, 5.7% did not improve, and 2.8% died.

Regarding upper gastrointestinal hemorrhage in general, the Mayo brothers believe that it is not caused by ulcers as frequently as is commonly believed, and that bleeding is relatively much more common in cancer. Even the profuse and frequent hemorrhage characteristic of ulcers does not prove the diagnosis if there are no other indications of the existence of an ulcer in the history. In 90-96% of all cases, bleeding occurs suddenly, with no apparent reason. Major bleeding was observed in only 4-10% and in about a fifth of these it was so strong and fast that it was impossible to keep up with the operation. Sources of bleeding can be acute, usually having the form of tears, erosions, toxins, or infections (especially common in young women), and, finally, chronic ulcers, which are of greatest interest to the surgeon. Any bleeding ulcer with a clear history should be operated on, and one can expect that the operation will not only stop the bleeding, but also eliminate other symptoms of the underlying disease. If there is bleeding but the history does not indicate the existence of an ulcer, an operation is done only if there are special indications for it. For small to moderate hemorrhages, especially in the case of ulcers lying close to the pylorus and in the duodenum, it is usually sufficient to perform a gastrojejunostomy, although occasionally the bleeding may not stop. But if the stomach ulcer is located away from the pylorus, gastrojejunostomy does not help at all, and the only remedy left is to cut out the base of the ulcer and sew up the defect that has formed, having first tied up the vessels leading to the ulcer. However, excising the base of the ulcer is also useful for any other ulcer, especially if there has been heavy bleeding. If for some reason this cannot be done, then it is necessary at least to tie up the vessels and close the peritoneal layer along with the muscles over the ulcer from the outside with several sutures. Excision of stomach ulcers is done to avoid the possibility of future development of a cancerous tumor. For duodenal ulcers, gastroenterostomy, ligation of the vessels and plication of the peritoneal integuments of the bottom of the ulcer are usually sufficient. If the bleeding is very strong, but it is impossible to determine the location of the ulcer from the outside, then the Mayo brothers open the stomach, making a longitudinal incision along the anterior wall, and, if they find an ulcer, close its edges from the mucosal side with a number of chromic catgut sutures. Externally, they plicate the peritoneum and muscle layer, and the longitudinal incision of the stomach is sutured as usual.

As for the technique of gastrojejunostomy itself, the Mayo brothers use the very first portion of the small intestine at its transition from the duodenum ("no loop" method).[18] There is usually a small fold of the peritoneum passing from the mesocolon to the uppermost segment of the small intestine (ligament of Treitz); this fold is in some cases greatly enlarged, and its attachment to the small intestine is 2-5 inches long, with the uppermost loop of the intestine drawn to the right by this ligament, and not to the left, as is normal. If this is considered to be the ligament of Treitz and the jejunum is considered to begin after this attachment, then the loop will wind up above the anastomosis, which the Mayo brothers think should be avoided. In such cases, they always separate the jejunum from the mesocolon itself, and going as far up as necessary to reach the avascular part of the mesocolon, they perform a posterior gastrojejunostomy so that the anastomosis is located just at the stump of the separated ligament of Treitz. Thus, the first loop of jejunum always goes to the left, as is normal. When choosing a place to open the mesocolon, the Mayo brothers are guided by the consideration that the large vessels of the mesentery always pass below and to the right of the duodenum, or the upper end of the jejunum, and on the left side there is usually a fairly extensive mesocolonic space that does not contain large vessels.

Among 300 gastrojejunostomies performed using this method, the Mayo brothers have had only three deaths. They consider anterior gastroenterostomy inconvenient in view of the formation of a long and steep loop and use it only in exceptional cases. From what I have seen, European, especially Viennese surgeons (Hoheneck, Eiselsberg, Axner) do not use the "no loop" method described above. They always take a loop of jejunum relatively far from the duodenum, and connect it to the stomach, and to avoid a "vicious circle" they make a second anastomosis between the afferent and efferent loops. Thus, they create two fistulas; this complicates and lengthens the operation and is highly undesirable, all the more so if the disorders can be avoided by resorting to the "no loop" method described above and can be done with a single gastroenterostomy.

Finally, it should be noted that during excisions of saddle ulcers located at the pylorus[19] and lesser curvature, the Mayo brothers close the edges of the resulting defect so that the suture line runs transverse to the axis of the stomach, which does not narrow the lumen of the stomach but actually enlarges it. The best American surgeons have come to agree with this. These principles, in my opinion, are very rational.

Goiter

The Mayo brothers have operated on about 400 cases of goiter. At the present time they use Kocher's transverse incision, since it gives the best access to the gland and has fewer disadvantages when compared to other incisions. The platysma muscle is reflected up and down along with the skin. If the strap muscles (sternohyoid and sternothyroid) need to be divided, they are cut between forceps near their superior attachment. When removing the gland itself the Mayo brothers are very careful to preserve the posterior capsule, which contains small "parathyroid glands," the removal of which has some connection with the appearance of tetany and other disorders.[20] With diffuse adenomas, they prefer either to remove one lobe, or to perform a subtotal excision like Mikulicz, often on both sides. The same is true for normal hypertrophy. The gland is drawn out and raised; all vessels are grasped with forceps and large ones are immediately ligated.

The capsule is cut along the edge of the gland and then dissected back with gauze. All the little so-called "parathyroid glands" around the goiter must be carefully spared, especially if they are behind the thyroid gland. They do not drain the wound after removal of small portions of the thyroid, but with more extensive excisions and in all cases of hyperthyroidism drains are inserted for 1-3 days through a separate small incision especially made for this purpose. Among 375 cases operated in accordance with the principle of sparing the posterior capsule and the glands contained in it the Mayo brothers have had only one case of tetany, and that was very mild. The Mayo brothers prefer to do this operation under general anesthesia, and 20-30 minutes before induction of anesthesia, 15 mg of morphine hydrochloride and 0.6 mg of atropine sulfate are given subcutaneously. Local anesthesia is used only in exceptional cases when general anesthesia is contraindicated. But the most important principle of the Mayo brothers is to be very careful with the posterior capsule due to the aforementioned "parathyroid glands." Adherence to this principle makes it possible to avoid many complications and failures.

Relationship between gallstones and pancreatic diseases[21]

The Mayos, having operated on about 2000 cases of biliary tract disease, have found that in 6-7% of all these cases there were diseases of the pancreas and that 80% of pancreatic diseases were combined with gallstones; a particular effect of gallstones on the incidence of pancreatitis was found when the stones were in the hepatic duct or common bile duct. This influence is explained by the anatomical relationship of the common duct and pancreatitis. According to the statistics of the Mayo brothers the lower third of the common duct passes through the pancreatic head in 62% of cases and only in 38% does it lie in the groove between the pancreas and duodenum. As a result of this, any inflammatory process that develops in the biliary tract can easily pass to the pancreas. A stone located in the lower third of the common duct, by pressure on the pancreatic ducts, can also cause disorders of its secretion. Conversely, the inflammatory processes of pancreatitis, especially in those cases where the common duct passes through its tissue, may lead to a narrowing of the common duct and even to its obstruction. An example of such inflammation of the pancreas leading to obstruction of the common duct is epidemic pancreatitis, similar to epidemic mumps, which often causes what is called catarrhal jaundice.[22] Referring to the aforementioned relationship with the common duct, American surgeons call the portion of the pancreas lying between the duodenum (right), duct of Wirsung (bottom), and duct of Santorini (top) as the "triangle of pancreatic inflammation."[23] But for the surgeon, chronic cases are of particular interest. The Mayo brothers try not to operate during the acute period. They do not consider the necrosis of fatty tissues that develops in diseases of the pancreas to be very dangerous, since serious complications on this basis rarely develop, and they calmly wait until the acute process subsides, operating in acute cases only if there are particular indications.

During operations for diseases of the pancreas, the bile ducts and especially the common duct are first examined for the presence of stones. At the same time, experience has shown that if the pancreatic head is greatly enlarged, then gallstones often lodge at the bend of the common duct and in this position they cannot be felt with a probe. Therefore, the Mayos open the common duct widely and try to examine it thoroughly, inserting a finger into its lumen if possible. Having cleared the duct of stones, it is expanded with a metal flexible probe up to the duodenum, in case there were still stones in the hepatic duct; these stones are usually small and can themselves pass through the dilated common duct. Removal of stones from the common duct with temporary external drainage is usually sufficient to eliminate the symptoms of pancreatitis. If there are no stones either in the ducts or in the gallbladder, the cause of the obstruction lies in the swelling of the parts of the gland that lie around the duct and compress it; in such cases, the Mayo brothers have performed cholecystoenterostomy, preferring cholecystoduodenostomy when possible.

Transperitoneal removal of bladder tumors [24]

The Mayo brothers believe that cancer of the bladder is curable by surgery, because the bladder has relatively few lymphatic channels, which are relatively inactive. This tends to retard the appearance of metastases, so that cancer or other malignant tumors of the bladder can be considered local for a very long time. But conventional methods do not give good access to the bladder, making complete removal of the tumors difficult, by which the Mayos explain their two unsuccessful cases, as well as the failures of others, where the operation not only did not stop the development of the tumor, but even contributed to its spread to the abdominal walls and space of Retzius. It is known that if the cancerous tumor is not completely removed, then it soon recurs, and starts growing faster than before the operation. For this reason, laparotomy is preferable. An incision of about 6 inches is made in the midline, starting at the symphysis pubis. The empty bladder is delivered into the wound and opened along the midline, as needed. If the tumor has not spread into the walls of the bladder and is freely mobile, it is cut off with scissors, and the raw surface is cauterized with a red-hot iron. This surface should be allowed to heal by secondary intention, without suturing. If it is necessary to remove large sections of the bladder wall (up to 2/3), which the Mayos do not hesitate to do, then they try to spare the area around the internal opening of the urethra, staying 1/3-1/2 inches away from it. If the bladder is also affected in the region of the urethral orifice, then the urethra is divided close to the bladder, passed through a specially made opening into the peritoneal cavity, transplanted into the wall of the bladder, covered with peritoneum, and attached with catgut sutures to the inner wall of the bladder. The exposed part of the urethra, now lying inside the abdominal cavity, is closed by a fold of peritoneum, which allows very rapid healing. The remainder of the bladder is sewn together; even if its volume is greatly reduced, it stretches significantly over time and functions as a fully satisfactory organ. The bladder wound, regardless of its position, is sutured with a continuous catgut suture using the method of Connell. First, a mattress suture is applied, penetrating through the entire thickness of the bladder wall, with all loops located on the inner surface of the bladder; when this suture line is tightened, no suture material is visible from the outside. The Mayos consider it airtight and watertight. This is followed externally by a continuous peritoneal suture, the first stitch of which is usually tied, and continued parallel to the incision line on both sides. This method is used for all types of incisions and resections of the bladder, regardless of the size of the removed parts. The abdomen is usually closed without drainage, but if the abdominal cavity has been contaminated, temporary drains are inserted through an opening made for this purpose. Postoperatively, the bladder is catheterized during the first few days at regular intervals as necessary, but usually the patients themselves feel the need to urinate and urinate quite often. This method of operation has been used in five cases without a fatal outcome: in three for cancer and in two for extensive papillomas.

Inguinal herniorraphy

During the last ten years, the Mayos have operated on about 1,700 cases of inguinal hernia. Of these, only about 120 were in women. The youngest operative patient was 3 weeks of age, and the oldest 90 years. Most of the patients (about 1000 cases) were between the ages of 20 and 50 years. The hernia was on the right side in 730 cases, on the left side in 426 cases, and bilateral in 230 cases. Anatomically, the statistics are as follows: 1451 indirect hernias and 183 direct hernias, among which there were 14 with involvement of the bladder. Interstitial hernias were observed five times, with one between the internal oblique and external oblique muscles. There were eight cases with sigmoid prolapse and six with cecal prolapse.

According to the Mayos, true congenital hernias are very rare. In their 1700 cases, they did not see a single well-documented case; however, 112 cases a direct communication between the *tunica vaginalis* and the peritoneum was found during the operation.

The Mayos incidentally draw attention to the frequency of right-sided inguinal hernia formation 3-12 months after appendectomy. In the past two years, they have operated on 12 cases of hernia after appendectomies by various surgeons; but all these operations were done using a "gridiron incision," that is, splitting the fibers of each muscle layer. The Mayos think that this association can be attributed to atrophy of the internal oblique muscle as a result of nerve injury during the appendectomy, since this muscle plays such an important role in the formation of inguinal hernias.

There were only three deaths, of which one was due to pneumonia, the second to pulmonary embolism, and the third to sepsis. Of the 49 cases of strangulated hernias, three ended in death; in these three cases very extensive bowel resections had to be made in very old and malnourished patients. Recurrence was observed only in 25 cases, and in two cases it was necessary to operate a third time.

In 1241 cases, a simple operation was performed without relocation of the spermatic cord, and among these 1241 cases there were 21 recurrences. In 411 cases where the cord was relocated, recurrences were observed only four times. Since the results with cord relocation are much better, the Mayo brothers have concluded this should always be done, especially if there is a weakening and thinning of the internal oblique muscle for any reason, since this muscle plays the most important role in herniorraphy especially in the obese.

The Mayo procedure is as follows: The skin at the site of the proposed incision, as in any other operation, is painted with iodine tincture; the skin incision starts about 3 cm. above the internal inguinal ring and continues only to the external inguinal opening, without continuing onto the scrotum. Then the external ring is palpated. The external oblique aponeurosis is cut along its fibers from the inner edge of the outer ring to the uppermost corner of the skin incision, but the external inguinal ring itself is not opened except in cases of large irreducible hernias. The inguinal ligament is exposed with a piece of gauze or some blunt instrument. Then the weakest point near the inner ring is palpated and the cremaster muscle is separated along with fibers of the transverse muscle. The neck of the hernia sac is grasped, and a small hole is made, through which a finger is inserted, and the contents of the sac are reduced into the abdominal cavity; the testicle is protected as much as possible. In some cases, when emptying the sac, it helps to twist it, starting from the top. After reducing the contents, the neck of the sac is crushed with a clamp before ligation, which results in crinkling the intima of the vessels. In order to avoid slippage, the neck of the sack is always suture-ligated. After excising the hernia sac, the internal oblique muscle is examined to decide whether or not to do a cord relocation. In the case of a simple operation, that is if the cord is not relocated, a series of deep sutures of thick catgut are applied, starting from the bottom of the wound incorporating the inner edge of the aponeurosis of the internal oblique and transverse muscles; on the other side, the sutures incorporate the shelving edge of the inguinal ligament, leaving free the outer edge of the external oblique muscle. In most cases, 3-4 such sutures are enough. The lowest suture should be placed below the internal ring, but in such a way that it does not compress the cord, running deep to the cord as it emerges from the internal ring. Nerves are spared as much as possible, and the sutures are tied only as tightly as necessary for sufficient apposition of the sutured tissues. The inner edge of the aponeurosis of the external oblique muscle, captured in this suture, participates in these sutures only insofar as it prepares the field for the next part of the operation, which the Mayo brothers have borrowed from Lucas-Championnière and Andrews, consisting of sewing the outer edge of the external oblique aponeurosis to the outer surface of its inner edge, covering the incision line and the first row of sutures with this flap. This flap of superficial fascia is sutured with 2 or 3 sutures of strong catgut and is closed with a continuous catgut mattress suture, each stitch of which also captures the formed both floors of the external oblique aponeurosis. The skin wound is also sutured with catgut, and the needle is not brought out, but continued in the subcuticular layer, after which it is inserted on the other side somewhat ahead of the previous stitch. This results in a very elegant scar. Thus, in the case of a simple inguinal herniorraphy, the cord is not only retained in the inguinal canal, but is even completely unexposed during many portions of the operation.

For operations with relocation of the spermatic cord, for example using the methods of Bassini or Coley,[25] the sutures are placed in the same way as just described, but one row of sutures is placed behind the cord while it is elevated with a piece of gauze, and another row is added above the cord. In many cases, with this method, it is also necessary to open the rectus muscle sheath and include this muscle in the deeper row of sutures, in order to better close the lower corner of the wound. It is very important that the deep sutures be placed as close as possible to the pubic bone. When suturing the external flap of the aponeurosis of the external oblique muscle, care should be taken not to include the cord, which now lies more superficially than during a simple operation. In women, the Mayos generally do not relocate the round ligament, and when applying deep sutures they place one of them through the ligament. The rest of the details are the same as in men. After the operation, patients stay in bed for about 8-9 days, or 10-12 days for obese patients or direct hernias. Wearing a truss after surgery is not recommended, but very obese patients with a sagging abdomen are advised to wear a wide abdominal belt.

Resections for intestinal obstruction

Preoperatively, the Mayos decompress the stomach thoroughly to avoid intraoperative vomiting, which can otherwise be extremely profuse. Exploration of obstruction always begins from below the region of the cecum, first identifying collapsed loops of bowel, and working up to the point of obstruction. If the site of abdominal incision has been chosen poorly, so that it is not possible to expose the desired loop through it without traction on the mesentery, then they prefer to make a second more appropriate incision. This is especially done with strangulated femoral hernias. In these cases, the abdominal cavity is opened above the inguinal ligament, the gangrenous loop is reduced back into the abdominal cavity and brought out through this incision, and then resected.

Before resection, the contents of the intestine above the blockage are emptied with a small hole through which a long drainage tube or a blunt ovariotomy trocar is inserted. The Mayos never push the obstructed bowel contents into healthy sections of the intestine below the obstruction, because this significantly worsens the course of the postoperative period and the prognosis due to the absorption of toxins. The resection itself is done without trying to preserve damaged portions of intestine, so that the parts to be joined are completely healthy. A significant percentage of the mortality after bowel resections is due to perforation caused by thrombosis of the vessels of residual parts of the intestine whose walls have been maximally distended.

Resections of the small intestines

In acute cases of small bowel obstruction, the Mayo brothers perform a side-to-side anastomosis with a two-layer closure. They advise choosing the most healthy pieces of the intestine while staying on the antimesenteric wall. The resection itself is done as follows.

The intestine is crushed with a heavy clamp at the site selected for transection, sutured with catgut in the groove that is formed, and cut; the stump is inverted and closed with a purse-string suture of linen. The bowel is resected for a length slightly greater than the corresponding mesentery to ensure the viability of the remaining bowel. The opening for anastomosis is made at least three inches in length. To avoid intussusception of the proximal blind end of the intestine, it should be as short as possible and its stump is sutured to the wall of the adjacent intestine.

In chronic cases, the Mayo perform either side-to-side or end-to-end anastomoses. They often use the Murphy button, but always verify that there is no narrowing anywhere below the anastomosis that would obstruct passage of the button. The anastomosis is protected by four rows of linen or silk mattress sutures. In the immediate postoperative period, end-to-end anastomoses function better than side-to-side anastomoses, but as time goes on a side-to-side anastomosis functions quite well.

Resections of the ascending colon [26]

The ileocecal region is considered a favorable operative site because of its individual arterial supply, its liquid contents, and its relatively inactive lymphatics. The last explains why half of the cancer patients dying of obstruction still do not have metastases in the regional lymph nodes. The Mayos advise resecting as widely as possible, and always removing both cecum and ascending colon regardless of the point of obstruction. The anastomosis is always done side-to-side near the hepatic flexure beneath the omentum, using the same methods as described for the small intestine.

Resection of the transverse [and descending] colon

Particular attention is paid to the fact that normally (in 4/5 of all cases) the entire transverse colon is supplied by a single artery (the middle colic). Anastomosis is either side-to-side or end-to-end, but Murphy buttons are not used since the contents of this section of the intestine are semi-solid. In cases of obstruction involving the splenic flexure, descending colon, or sigmoid, a colostomy is preferred. But when there is no obstruction, a single-stage resection is sometimes performed in these areas. Finally, in cases of rectal obstruction, for example due to cancer, they do a resection and colostomy in one step, leaving the end of the intestine approximately three fingerbreadths under the skin over the muscles. This is done so they can subsequently, with the help of a special device, contain the contents flowing out of the colostomy opening. I saw others (Drs. Ochsner in Chicago and Panzner in Detroit) perform colostomy in two steps with transplantation of the skin flap under the outstretched intestine. The operating incision is made as usual; along the outer edges of the wound, a skin flap with a width of about a fingerbreadth and a length of 4-5 cm.; the upper end of this flap is bent inward, brought under the intestine and carefully attached circumferentially with sutures to the inner edge of the skin wound.

In the postoperative period after bowel resections, attention is paid to the following: 1) The patient is placed for many days in a semi-upright position in order to avoid the spread of infection upwards toward the diaphragm. 2) In the first 24 hours after small bowel resection, a total of 1000-1200 saline is administered per rectum. 3) If there is an urge to vomit, the stomach is thoroughly irrigated with warm water.

Cardiospasm[27]

During the past 2½ years at St. Mary's Hospital, they have had 40 cases of cardiospasm, which all belonged to the 2nd or 3rd phases. In the first phase of the disease, when the peristaltic contractions of the esophagus are still strong enough in comparison with the muscles of the cardia that food is pushed into the stomach, the symptoms are so insignificant that the patient is not concerned and very rarely comes to the surgeon. The symptoms are sensitivity when swallowing, with discomfort and pain localized in the epigastrium, back, neck, and upper esophagus. The second phase is characterized by sudden regurgitation of food, which is generally recurrent, especially in fresh cases; the patient will regurgitate food for 3-7 days, but then for a few days or weeks he feels healthy and he seems to tolerate food quite well. The third phase begins when the lower esophagus has already stretched so much that it is able to retain food in itself, especially its first portions. The regurgitation begins to occur less regularly and a long time after eating. Patients can smell the food constantly, and sometimes at night they find pieces of it in the mouth or nasopharynx. The esophageal dilation can be so great that it holds up to half a liter of food; some solid foods, especially meat, can remain in the esophagus for several days. Patients often lose weight. Belching is characterized by the general absence of nausea or pain; the regurgitated contents are slightly alkaline or neutral. Of the 40 patients, 7 were in the 2nd phase and 33 in the third.

With cardiospasm, the Mayos try to answer the following questions:

1) Does the food come from the esophagus or from the stomach?

2) What is the nature of the constriction?

3) Is the esophagus enlarged?

4) Has there been any major damage to the esophagus or neighboring organs?

The following methods of examination are used: Various probes, esophageal radiography with a bismuth mixture, and esophagoscopy. First, they give a trial lunch; one part of it is injected through a tube into the stomach and the other is given to the patient to swallow himself. An hour later, the contents of the stomach and esophagus are removed separately, and both portions are analyzed. In many cases, the acidity of the gastric contents is increased.

In those cases where it is not possible to insert a gastric probe in the usual way, they use a probe with a wire rod, or a whalebone with an olive. If this is not successful, they try to insert a whalebone probe with a silk thread instead of a conductor, or a probe with a spiral-spring steel end. Olives up to 15 mm in diameter are used. If the olive does not go through with ordinary effort, then they use silk thread. The patient swallows about seven feet of strong silk thread the day before the examination, and another seven feet the next morning. The first portion passes through the esophagus in a ball into the stomach and small intestines, while the second does not roll up in the esophagus. The external end of the silk is threaded through an olive, which has a somewhat oblique channel drilled through it, and a probe is inserted along this thread. In this way, a 15 mm olive will usually pass easily. If even the smallest (3 mm) olives do not pass, this means that there is a bend in the esophagus, since such an extreme narrowing is impossible from spasm alone. In these cases, a probe with a spiral-spring steel end is used, which is very resilient and flexible. With the help of this probe and the silk thread, it is almost always possible to pass the 15 mm. olive even when the 3 mm. olive did not originally pass.

In addition to ordinary probes, the Mayos also evaluate dilatations with a special probe, the end of which has a rubber balloon within in a silk bag of a certain size, shaped like a flask. The probe tube passes into this balloon, connected with end and side holes. One starts with a bag having a diameter of 22 mm. The probe is inserted with an empty balloon into the stomach and the balloon is then filled with water under slight pressure. If the probe is now removed, the balloon is compressed as it passes through the cardia, and water is squeezed out through the lumen of the probe, but when it passes through the cardia into a dilated esophagus it can again be filled with water under low pressure. If it moves freely up and down in the esophagus, it is removed and the silk bag is replaced with another larger one. Thus, trying bags of different sizes, you can determine the size of the expansion, and also get an indication of the type of dilatation, especially whether it is an esophageal diverticulum. If the bag is introduced into the esophagus from the stomach as described above, it cannot enter the diverticulum. To determine the size of the expansion of the esophagus, especially in the period of recovery after surgery, the method of Strauss is always used, using a probe with an air-filled balloon.

On radiographic examination they give the patient about 60 ml of a bismuth mixture with mucilage or starchy foods. However, the best results are obtained if a rubber bag is inserted into the esophagus and filled with a bismuth mixture. The clearest pictures come out when the plate and the lamp are positioned so that the rays penetrate in an oblique direction from front and right to left and back, thus bypassing the spine. Using this method, it was found that in 18 cases the dilations were spindle-shaped, in 12 cases cylindrical, and in 3 cases pear-shaped. Spindle-shaped dilations are also shaped like an S. Most dilations extend up to the third thoracic vertebra. In 5 cases, they reached the upper edge of the sternum and were up to 2½ inches wide.

The diagnosis is finally supplemented and established by esophagoscopy. Attention is drawn to presence of catarrh, hypertrophy, ulceration, scars, papillary proliferation, etc. Ulcers and fissures of the cardia are of serious importance and require treatment either before or after dilatation of the cardia, since they often cause the underlying disease, so it is imperative to examine the cardia. If an obstruction is encountered during the passage of the instrument through it, this depends not so much on the spasm, but on the impossibility of aligning the instrument with the direction of the cardia. In such cases, it is necessary either to use an obturator, or to lubricate the cardia with cocaine.

The instrument used for forcible dilatation of the cardia is a probe made of a non-elastic rubber tube, with a strong elastic rubber balloon at its end. The probe passes through the entire balloon, opening into it with side holes, and ends with a metal thread for screwing in the appropriate olives. The balloon is contained within a silk flask-shaped bag about 10 cm long and 20-40 mm in diameter, and this is contained within another thin rubber balloon so that the instrument can slide more easily through the esophagus. If none of the olives is able to pass into the stomach, a very flexible spiral-spring steel end is screwed on. The cavity of the probe-dilator is connected by means of one of the sleeves of a T-shaped rubber tube to a water supply tap and connected to a pressure gauge, while the other sleeve of the T-shaped tube is open and serves to regulate the pressure in the device. Having initially determined the position of the cardia, the probe is inserted with the right hand to the appropriate depth, with the index finger resting on the patient's teeth and firmly holding the probe so that the end of the device does not completely slip into the stomach. When the probe is positioned so that the middle third of the silk bag is exactly at the cardia, the water tap is unlocked, monitoring and adjusting the pressure by pinching or opening the other free end of the T-tube held at all times in the left hand. The sensitivity and amount of discomfort experienced by the patient during dilatation is also monitored. Of course, the pressure must be sufficient to cause paralysis of the sphincter, but not so strong as to rupture the cardia. If the patient feels severe pain, and a pressure of 500 mm has failed to induce paralysis, it is necessary to perform the dilatation gradually using several bags; but care must be taken that each bag expands while letting the water flow through it from the very beginning, giving it an open outflow through the free sleeve of the tube held in the left hand. Thus, the doctor feels the instrument better in his hands and can more easily navigate. A pressure of 50 to 100 mm is usually sufficient. The number of sessions needed for this generally ranges from one to five, although in two cases 7 and 11 sessions were required. In these two cases, dilatation of the esophagus was incomplete. Cases with a flexed cardia usually require more pressure and more sessions. During the first 4-5 days after the first dilatation, food is usually still retained in the esophagus. The first 2-3 sessions are repeated at intervals of 3 to 4 days. When the food is no longer retained, the patient is observed for at least 10 days, and the dilatation is repeated as soon as symptoms of stenosis recur. They do not use high pressures or try to make the final dilatation in one step in the following cases: 1) when there is obviously a fissure in the cardia; 2) if the patient is severely emaciated; or 3) if the patient has very strong pain during dilatation.

If the olive passes through the cardia, then the dilator usually also passes without difficulty. If the olive does not pass either by itself or along a silk thread, then they use a spiral-spring end, which is also inserted along a silk thread. Sometimes it happens that the lower part of the bag expands in the stomach, while the upper part, lodged in the cardia, does not expand; in these cases, the instrument tends to slip into the stomach. But if you hold it firmly in your hand, resting your index finger on the patient's incisors, then ultimately the entire bag will be evenly filled. The results obtained immediately after expansion are striking and the patient is almost always able to swallow any kind of food immediately. During the first 24 hours, patients do often complain of an unpleasant sensation. Soon, however, the patient begins to gain weight. There was no recurrence in 29 cases out of 40. According to the Mayos, recurrence is unusual after the patient has remained free of symptoms for about two years. After eliminating spasm of the cardia, esophageal dilation tends to decrease and the width of the esophagus may return to normal.

This concludes my description of what I saw in Rochester. Compared to the procedures of European clinics, I was impressed by the very thorough program of comprehensively studying each patient by different specialists, using all sorts of the finest laboratory methods and with very careful recording of observations. This gives the Mayo brothers excellent detailed statistics and makes their observations and conclusions very valuable and scientifically sound. Among other things, this approach to patients accounts for the continuing existence and development of this private surgical hospital, located far from the large population centers of the country. I should emphasize that seriously ill patients with complex illnesses often come here having previously been seen by others, including European professors, and not infrequently having already undergone many treatments and even operations.

Chicago

When visiting Chicago, I had planned among other things to become more familiar with the work and methods of Prof. Murphy, but, unfortunately, during my stay in Chicago he operated very little (once a week, on Saturdays), since he was busy making arrangements for the Clinical Congress of American Surgeons, which aims to demonstrate the latest operations in various cities of the United States. In addition to Murphy, the best surgeons in Chicago are undoubtedly the Ochsner brothers, who work at the private Swedish Augustana Hospital.[28] I was able to see a lot of interesting things with them. Their methods of operating are generally similar to those of the Mayo brothers.

Among other things, they introduced me to a new method for the treatment of purulent tuberculous lesions of the joints with profuse suppuration, which could also be used for empyema or any other chronically suppurating cavity.[29] This method was first applied by Dr. Emil Beck in Chicago and within a year has spread widely among American doctors. It consists of every 2-4 days injecting into purulent cavities a sterilized bismuth paste, consisting of three parts bismuth subnitrate and six parts Vaseline. The paste is heated to 40° C. The treatment is repeated 3 or 4 times at the intervals just mentioned. If the abscess does not begin to heal after this course of treatment, then they proceed with the injection of another paste of the following composition: Bismuth subnitrate 30 mL, soft paraffin 5 mL, Vaseline 60 mL, 40% formalin 10 mL.

At the Ochsners' hospital I saw very good results even after one or two injections. They are not hesitant to inject a large amount of paste, and in some cases it was as much as 200-300 mL without any side effects. The Ochsners especially advocate this method for empyema. Several times they have achieved a cure after other surgeons had unsuccessfully tried plastic surgery. These injections are usually administered after a preliminary resection of the rib. Patients feel better even after one or two injections: the feeling of tightness disappears, pain subsides, skin eczema resolves, etc.

In the treatment of tuberculous lesions of the joints, American surgeons try to immobilize the joint as soon as possible, and then for as long as possible. They believe that a well-applied immobilizing bandage worn for a sufficiently long will not result in ankylosis. With surgical tuberculous diseases they also pay careful attention to hygienic conditions, especially providing an abundant supply of fresh air, based especially on a fact proven experimentally by Prof. Mörner in Uppsala that the development of pulmonary tuberculosis is promoted not so much by the heat contained in poorly ventilated rooms, but by the presence of free ammonia in such an atmosphere. Another important consideration for the Ochsner brothers in the treatment of surgical cases of tuberculosis is a good diet; they are skeptical about the value of giving the patients such bad-tasting fats as cod liver oil. They have successfully replaced it by prescribing a diet with various kinds of nuts containing a lot of easily digestible fats, as well as ripe olives.

Plaster dressings are made very carefully and are lightweight. In the manufacture of them, and especially corsets, they insert whole rows of wooden plastics (plywood) which have been steamed in boiling water. The bandage is applied over a jersey, and narrow strips are used, impregnated with a very good grade of gypsum called "White Dental Plaster," which makes it possible to make a bandage (for example, when fixing a knee joint or foot) no thicker than 3 mm. A dressing such as this is covered with several more rows of gluten gauze (soaked in gluten instead of starch), which is sticky in boiling water but gives a very dense, strong layer when dried.

Places at risk for pressure sores are covered with pieces of white, very delicate felt before applying the bandage. With casts for the ankle joint, the entire plantar part of the bandage is broken with a blunt chisel and a hammer when the plaster begins to harden. This allows the plaster bandage to be soft in the appropriate places, for example in the heel, which eliminates pain while retaining the strength and immobility of the bandage as a whole. When using plaster bandages in cases with an open wound, or when it is necessary to perform dressing changes through a window in the cast, the gaps between the skin and the edges of the cast are filled with a special elastic substance of the following composition: Alcohol 70 mL, sulfuric ether 30 mL, and celluloid as needed to make a sufficiently thick liniment. To this mixture, lamb's wool is added and pounded until a homogeneous mass is obtained.

Orthopedic surgery in America is well established and receives serious attention. Many doctors specialize in this area, and travel in large numbers to visit the famous orthopedists of Europe.

Skin grafts

The Ochsner brothers prepare the surface of the wound intended for skin grafting by painting it the day before with iodine tincture. Granulation tissue is not scraped off prior to grafting, but only wiped carefully with a swab. The pieces of skin for transplantation are obtained with a razor, carefully straightened, and placed dry on the wound. The grafts are covered for nine days with a protective dry bandage. The Ochsners have been performing skin grafts this way for two years now and are very pleased with the results. Here I recall that the Mayo brothers carry out immediate grafting in an even simpler way, for example when there is a very large skin defect as after mastectomy for cancer; they do not use any protective bandage, but cover the defect immediately with transplanted flaps and a dry bandage.

American operation for umbilical hernias

Convinced that conventional methods for umbilical herniorraphy are unreliable, American surgeons have been operating on these hernias since 1900 using the Mayo method with a transverse incision and with the formation of a large tendinous upper vertical flap.[30] This flap is superimposed on the lower wall of the incisional opening and is securely sutured in three rows, obtaining a large surface for wound healing. This approach is based on the fact that patients with umbilical hernias are usually very obese, with a large panniculus and thinned abdominal muscles.

All these circumstances, which are very unfavorable for conventional methods, have led to the formation of a larger vertical flap. The Ochsners have operated on about 100 cases using this method and have not had a single recurrence (whereas previously, using conventional methods, they had about a 6% incidence of recurrence).

The method originally proposed by the Mayo brothers is as follows: 1) The skin incision is made in the transverse direction and has an elliptical shape, surrounding the umbilicus and the base of the hernia itself; it penetrates deeply in a funnel shape to the base of the hernia sac. 2) The surface of the muscular aponeuroses is carefully dissected 2½-3 inches in all directions from the hernia sac. 3) The fascia and the peritoneal covering of the hernia are cut at the base of the neck of the hernial sac and the contents of the hernia are exposed. Any adhesions to the abdominal organs are divided and the intestinal loops are reduced, but portions of the omentum contained in the sac are ligated and removed along with the sac, without going to the trouble of separating omental adhesions to the sac. 4) The hernia defect is enlarged laterally for an inch in each direction, after which the peritoneum of the upper flap is separated to form a pocket. 5) Suturing of the wound begins with 3-4 strong mattress sutures of silk or some other non-absorbable material applied in such a way that the needle is first inserted on the upper flap, about 2-2½ inches from its edge, then, without including the peritoneum anywhere, the needle is inserted from below into the edge of the lower flap, then proceeding in reverse order. After applying 3-4 such sutures, they are pulled together so as to bring the edges of the peritoneum closer together and be able to close them with a continuous catgut suture. Having done this, the mattress seams are finally pulled together, and the lower edge of the incision is drawn into the pocket of the upper edge of the incision that was formed by separating the peritoneum. 6) The upper flap is now sewn with catgut to the lower one, and the superficial incision is sutured in the usual way. In very large hernias, the sac is opened not at the base of the neck, but somewhat higher, so that as much tissue as possible is brought into contact when the flaps are sutured.

The Ochsner brothers have slightly modified and simplified this operation. After reducing the omentum and removing the hernia sac, they do not separate the peritoneum from the upper edge of the wound, but simply suture the upper edge (with its peritoneum) directly to the lower edge. They have the same low incidence of recurrence as with the original Mayo method. Postoperatively, the patients remain in bed for about three weeks on a strict diet. When they do get out of bed, they are advised not to wear any bandage or dressing.

Appendicitis

The Ochsner brothers perform appendectomy as follows: The appendix and its mesentery are clamped together at their base and cut off over the clamp. A purse-string suture is placed around the clamp, the stump of the appendix is inverted, and the suture is tied.

Finally, another continuous peritoneal suture is placed, which also covers the mesoappendiceal stump. During the postoperative period, a very restricted diet is prescribed, almost to the point of starvation, based on the consideration that excessive fasting does no harm, but dietary complications are very common. High enemas and laxatives are not given at all, since the increased peristalsis caused by these measures contributes to the spread of infection. Only rectal enemas are used, if any.

Laparotomy closure

Before removing packs from the peritoneal cavity, 3-5 (as needed) sutures of "silkworm gut" are placed through the entire thickness of the skin, muscle, and fascia. On one side of the wound, the needle is inserted through the skin at a distance lateral to the edge of the wound and brought out inside the wound at the border between the peritoneum and deep fascia, and then on the other side of the wound this is done in reverse order. Without being tied, the ends of these sutures from each side clamped together. Then the peritoneum is sutured with catgut, with a continuous suture, starting from the lower edge of the wound, gradually removing the packs from the peritoneal cavity, then the muscles and fascia are sutured with a continuous catgut suture. Finally, the skin is closed with a continuous suture of horsehair, staying very close to the edge of the incision and slightly everting it, avoiding any tension. Only after these four layers of sutures have been applied, the ends of the strong retention sutures are tied, with a pair of scissors placed under them so that they do not compress the skin. Thus, at the time of closure, the wound appears to be poorly sutured and the skin edges between the sutures are separated by about ¾ mm. However, this ultimately results in a more elegant scar, since the skin edema that usually occurs by the second postoperative day brings the edges of the wound close together.

Relationship between gallstones and gynecologic disorders

Based on their observations, American surgeons have concluded that there is a relationship between diseases of the female reproductive organs, especially the uterus, and the formation of gallstones. Whenever operating on gynecologic disorders, they palpate for gallstones by inserting a hand deeply into the abdominal cavity. If they find a stone, they may make a small incision over the gallbladder and remove the stone.

According to the Ochsner brothers, Prof. Petersen (Ann Arbor), Panzner (Detroit), and other surgeons, stones can be detected in 16-20% of women operated on for gynecologic disease.

[p. 733]

Cook County Hospital in Chicago[31]

This district hospital was built according to the pavilion system and consists of separate 3-story buildings. It is designed for 1350 people. All patients are admitted free of charge, and generally no one is denied admission if there is space, even if the patient lives outside the district and is theoretically ineligible. According to the rules, this hospital is only supposed to admit residents of Chicago and the surrounding area who have lived here for at least 6 months. The hospital employs 48 doctors, but none of them is paid. They must eat and sleep in their hospital quarters, and be on call for the patients day and night.

Every young doctor entering the hospital must follow a course of 12 months assisting a more experienced doctor and then taking an independent position for the last 6 months. Rotations are distributed as follows: 3 months internal medicine, 3 months surgery, 1 month anesthesia, 1 month infectious diseases, 1 month obstetrics, 2 months neurology, and 1 month pediatrics, for a total of 12 months.

Everyone works as an independent doctor 3 months in the Department of Surgery and 3 months in the Department of Internal Medicine. If a doctor wishes to remain at the hospital longer than 1½ years, he must go through a competition, since there are always many applicants.

On inspection of the hospital, the following features attract particular attention:

In the pediatric department, which has only 150 beds, there is a special unit with 8 beds, where each girl entering the hospital must stay for 4 days. Every day, a microscopic examination of the vaginal mucus for the presence of gonococci is performed in each patient, since it has been noticed that gonorrhea occurs in girls much more often than is usually supposed, and indeed epidemics of gonorrhea have occurred several times in the hospital among girls, with infection spread through baths, toilets, when using towels, sponges, etc. This department has existed at the hospital for about a year. Experience has shown that gonorrhea is present in about 2% of girls on admission.[32] It is not so easy to detect it and very often it is possible only on the 3rd or 4th day. Upon diagnosis, girls with gonorrhea are isolated and kept until the final disappearance of gonococci from the vaginal region.

For tuberculosis patients, especially those with bone or joint damage, there are special tents in the open air; the walls of these tents are made of fine wire mesh (to protect against insects in the summer), and the ceiling is made of a tarpaulin. Beds are placed inside and the patients stay here appropriately dressed day and night, regardless of the weather or season. These tents were set up only 3 months ago for 20 people.

Treatment of pneumonia. Recently, in the treatment of this disease, American doctors have begun to use phlebotomy, whereby the vein is not divided or ligated, but is directly pierced with a lancet through the skin. The amount of blood released ranges from 16 to 30 ounces (480-900 mL) (?) [3]. The indications for phlebotomy are considered to be rapid pulse or pulmonary edema. They ensure that the room for a patient with pneumonia is very well ventilated, and that the windows are kept open both day and night. Digitalis is rarely given, unless there is weakness of the heart activity, in which case either an intravenous infusion of digalen or a subcutaneous injection of strychnine (0.002 mg) is given. At the very beginning, calomel is given (5 times 60 mL every ½ hour, followed by a laxative dose of castor oil.)

Military hospital in Detroit [33]

Detroit, with a population of half a million, has only about 600 soldiers, and therefore the military hospital of this city impresses a European by how tiny it is. Located among the barracks, near the old fortress, it is set up for only 25 beds, of which 1/3 were not occupied when I visited. The hospital has 4 doctors.

There are only three departments: 1) surgical, with two small operating rooms - clean and septic (the number of operations per year is only 20-30); 2) internal medicine; 3) venereal disease - the largest. Venereal disease is very common in the major cities of America and most of the patients passing through this hospital have venereal disease.

Patients with syphilis and gonorrhea are housed together, but baths and even toilets are separate.

Like all American hospitals, this tiny hospital is remarkable for its complete and extensive facilities. There is a fairly large kitchen with a good icebox, a laundry room, spacious quarters for staff, and two dining rooms (one for patients and one for staff). The hospital also stores stocks of medicines, travel boxes and kits, beds, dishes, etc. Of all these I was most interested in some boxes about 28x28x42 inches in size with already sterilized instruments, gauze, cotton wool and other accessories for an operation. However, for various reasons they did not want to open these boxes to show me the method of packaging. I had once been able to inspect the equipment of the Austrian field hospitals, which included no such boxes with accessories already sterilized and ready for an operation; the tools there are only packed in special crates that can be used for boiling instead of a basin.

Doctors entering service here must have a diploma from one of the American universities and must also pass additional tests. The most junior doctors, upon entering military service, receive the equivalent of at least 4,000 rubles in our money, with a furnished apartment, heating and lighting, but nevertheless there are very few applicants and at present there are about 30 unfilled vacancies in the United States. Doctors have state-owned apartments near the hospital in the barracks and can have an orderly, but such a voluntary soldier receives a rather high salary (up to 40 rubles in our money per month) and is not exempted from regular daily military exercises during his service with a doctor (or officer). Such a soldier may leave the service of the doctor whenever he pleases, and many officers maintain private servants; this arrangement thus does not correspond to the service of our orderlies.

For certain hours, doctors must be in the hospital or apartment, but the rest of the time they are completely free and can engage in private practice. It is not customary to take a fee from the families of officers, even in the form of gifts.

Factory of "Parke, Davis and Co."

One of the attractions of the State of Michigan is the pharmaceutical factory "Parke, Davis and Co.," one of the largest of its kind in the world, located in Detroit.[34] On closer inspection, it is impressive not only for its size, but also for its strictly scientific foundation. A huge three-story pavilion is devoted to scientific research, where a number of well-educated specialists conduct research and study various issues of pharmacology, especially serodiagnostics and serotherapy. For this purpose, there are well-equipped laboratories with all the necessary equipment. The administration very graciously agreed with my desire to become familiar with their current research, and I was able to learn about a whole series of interesting studies, although some were still in progress.

I was most interested in the experiments on the preparation of antigonococcal serum, which have been going on here continuously for three years now. I will not dwell on the failures and difficulties that have been repeatedly encountered, but will confine myself to reporting the results that have been achieved at the present time. Various types of this serum have already been repeatedly tried clinically with good success in Detroit hospitals, but the best results have been obtained with the latest type of polyvalent serum, with which the factory soon intends to familiarize American doctors.

Sheep turned out to be the most suitable animals for the preparation of such a serum, since other sera, from goats and rabbits for example, may have been effective but had major side effects. Immunization is carried out as follows: An adult non-castrated ram is injected intraperitoneally with an emulsion of a 24-hour culture of gonococci, dissolved in 30 mL of physiological saline solution from 8 square inches of dense culture surface. This emulsion is heated for ½ hour to 65° C. before injection. The second injection is done a week later and consists of 30 square inches of culture heated to the same temperature. The third injection is done after another week and consists of 18 square inches, but is not heated. Then cultures (in emulsions) are injected at 35 and 45 sq. inches, etc. Usually, after 9-10 injections, an agglutination test is done. When this test indicates a strong degree of immunization, all the blood of the animal is obtained, filtered, and tested for sterility. The serum thus obtained, which agglutinates gonococci at a dilution of 1:20,000 to 1:50,000, is considered sufficiently strong, and observation has shown that the agglutination test is quite suitable for determining the therapeutic value of this serum.

Since there are many varieties of gonococci, serum is currently prepared as polyvalent as possible. Usually, animals are immunized against the three main types of gonococci. For the first inoculations, the least toxic species is used.

Experience has shown that the clinical use of the serum is least effective in acute cases: urethritis, vaginitis, and conjunctivitis. In all likelihood, the microorganisms located very superficially are not reached by the serum circulating in the blood and lymph. Nevertheless, after administering serum in these cases, the course of the disease becomes easier and the frequency of exacerbations is significantly reduced. Serum is much more valuable for the complications of gonorrhea, when the infection has penetrated more deeply into the body, such as with various forms of prostatitis, epididymitis, orchitis, cystitis, salpingitis, arthritis, iritis, endocarditis, or pleuritis.

Most of the experimentation at the bedside relates to the treatment of gonorrheal inflammation of the joints. Most of these experiments were done in the hospitals in the city of Detroit, and about 22% of all experiments were made by Dr. Rogers[35] (90 cases), one of the investigators in this field. There were a wide variety of cases both in duration and in severity and intensity. In 47 cases, one joint was affected, and in 43 several. By administration of the serum, 80% were cured or significantly improved. Only 20% saw no improvement, which may be explained either by a mixed infection, or by a mismatch between the serum and the type of gonococci present in this case, or even by a mistake in diagnosis.

Approximately 57 cases had previously been managed unsuccessfully for various periods of time using conventional methods. Cases that are not very protracted (up to 6 months) lend themselves especially well to serum. Of these, about 85% recovered completely and about 15% were significantly improved. For cases 2-8 weeks old, 5 injections were usually sufficient, sometimes only 2-3, and in one case a single injection was successful.

Small doses are always used, about 2 mL, and are injected subcutaneously into the back of the shoulder or into the gluteal region. The injections are repeated every two days. Usually, the second injection is given only when the traces of the reaction after the previous injection have completely disappeared, and sometimes a break of 4 to 6 days is needed. The reaction is only local and consists only of swelling, redness, and soreness at the injection site. However, it does not happen in every case and is caused not by the properties of serum antibodies, but by the local toxic effect of the serum itself and the idiosyncrasy of the patient. The first injection often causes a transient increase in joint tenderness and sometimes a slight increase in temperature. After the second or third injection, the soreness first disappears, then the swelling, and soon the condition of the joint improves so much that massage can already be prescribed.

In very protracted cases, serum also sometimes brings great benefit, primarily reducing the pain and progression of the inflammatory process. In such cases, the serum is given twice a week for a month, and then given at intervals of one to three weeks, depending on the symptoms. If after four injections no improvement is seen either subjectively or objectively, experience has shown that further administration of the serum is useless.

Serum works in a similar way with other complications of gonorrhea. It is interesting that with conjunctivitis the gonococcal serum has been completely useless either when applied subcutaneously or when applied topically, however its action is very good for gonorrheal iritis. The first three injections usually increase the symptoms of inflammation and cause the formation of a fibrinous exudate in the anterior chamber of the eye, but with the following injections, all these phenomena disappear completely and the eye recovers.

Of course, all of this still requires careful verification and the results of the experiments described here must be treated very carefully, but the availability of this serum would certainly be welcome in view of the prevalence of gonorrhea and the seriousness of its complications.

Further research is planned on anti-typhoid, anti-streptococcal, and anti-tetanic serums, lactic acid fermentation bacilli, and antiseptic properties of various substances.

Much attention is given to organotherapeutic preparations. In this area, there is particular interest in pituitary extract, which has a strong effect on the heart by increasing cardiac activity and blood pressure. All these studies are generously funded. All preparations are tested on animals to evaluate the quality and strength of their action before being marketed.

Anti-diphtheria and anti-gonococcal serums are sold in special glass tubes with a narrow end with a small stopper, into which you can insert the needle of a syringe. Instead of a large cork plugging the thick end of a tube, the needle is inserted and thus a filled syringe is obtained, ready for use. A needle and syringe, sterilized and carefully stoppered, are enclosed with each such vial containing about 10 mL serum. It goes without saying that such a system is very convenient for the doctor, and how useful it would be in

Russia.

I looked closely at their methods for preparing aseptic tablets for aseptic solutions for injection, and began to doubt whether they could be completely trusted due to insufficient asepsis. They are prepared manually. According to their rules the worker must wash his hands, but no one supervises this; they do not monitor the cleanliness of the table and tools (mold, knives, plates, etc.). Thus, although the substance from which the tablets (for example, morphine) are prepared is antiseptic, since it contains alcohol or ether, there are many potential sources of contamination after it is taken out of the mold and placed in glass tubes; when tubes are clogged, there are many opportunities for contamination, so one should not rely on such tablets completely. Of course, as a non-specialist, I cannot comment on the machines that are used to prepare a variety of products in a wide variety of prescription forms, but I have never seen such complex and diverse machines anywhere, or such fast, accurate, and precise work.

At the factory, in the research pavilion, there is a laboratory designed to employ young American doctors who want to work here. During my visit, the places in this laboratory were not occupied.

Women work as assistants in all the laboratories, as well as in the rest of the factory. Women in America are highly valued as assistants because of their precision, accuracy, and diligence, but they are not allowed to undertake independent studies that require initiative. Therefore, here all the specialists in charge of experimental work are men. The factory previously admitted women to these positions, but found that they do not have the appropriate qualities necessary for conducting independent scientific work, and cannot replace men in this respect.

Finally, I will mention the original method of disposing the corpses of animals used for experiments. These corpses are simply boiled for a long time and then thrown into Lake St. Clair, on the shore of which the factory is located.

Psychiatric Hospital in Pontiac

In Pontiac, a 2-hour streetcar ride from Detroit, is one of the largest hospitals for the mentally ill in the United States, with a capacity of 1,200 and about 270-300 admissions annually. It was built following the pavilion system; the older buildings have three floors, the newer ones have two. First of all, the harmonious arrangement of all auxiliary and utility parts is striking. This is a city unto itself, with all household appliances, automatic fire engines, water pipes, its own electric station, huge kitchens, laundries, and farms.

All pavilions are interconnected by corridors or tunnels, and all have very complex ventilation with heated air.

Patients first enter a special department for newcomers, divided into two subdivisions, one for agitated patients and one for non-agitated patients. Only after a fairly prolonged period of observation and after a diagnosis is established are they are transferred to the appropriate department. Patients are placed in separate rooms, if they are agitated, then several patients are in a small room. Only in the newest buildings, built in the last 2-3 years according to the plan of the head physician Dr. Christian,[36] are there large common wards for 50 people each, for non-agitated patients, especially the elderly, in order to have easier supervision and better air. The ventilation in these wards is arranged in such a way that warm, fresh air enters from above, and stale air exits from below (in winter).

Wonderful order and cleanliness are evident everywhere. Snow-white linen, parquet floors everywhere. There is a well-equipped operating room, an autopsy room, and a department for tuberculosis patients.

There are no isolation rooms. Violent patients are either tied to a bed or restrained manually.

The attendants are male in the male departments and female in the female departments.

There are seven doctors. They all receive full maintenance and an apartment, including their families.

The hospital has a large hall for lunch, a concert hall, and a church. The buildings and farms do not have any fences, so escapes happen quite often. An engineer lives at the hospital and is responsible to the chief physician. The ventilation in most pavilions is arranged in such a way that under each building there is a basement corridor equipped with numerous windows, in which special heating fans are arranged on both sides, which heat the fresh air passing upward between them; this heated air passes from below through the holes in the floor to the wards and rooms, while the stale air is discharged upwards by special pipes. The same basement corridors connect separate buildings and have special tracks for transporting food in special small insulated cars from the kitchen to all pavilions.

The cellar is very well designed, and artificially cooled to -1° C. The meat stored in it does not deteriorate at this temperature for up to 6 months, but with insufficient supervision, the temperature in it may be 0° C, and the meat at this temperature is preserved only for about two weeks.

Prison Hospital in Jackson[37]

Near the city of Detroit, three hours away by electric railway, is the well-known Jackson prison, one of the best in the United States, established about two years ago in accordance with the latest views and requirements.

I took the opportunity to visit here and toured the prison hospital. Nowhere else have I seen such cleanliness and such landscaping. Shiny parquet floors, snow-white excellent quality linen, curtains, gave the impression not of a hospital, especially a prison hospital, but of the private apartment of a millionaire. The hygienic conditions of the prison itself also leave nothing to be desired; each prisoner sleeps in a separate small room with a barred door that opens into a huge side corridor, with three lights and huge windows on the sunny side. Ventilation is artificial with the venting of stale air and the infusion of fresh, heated air.

New York

Of the several hospitals I visited in New York, the Presbyterian Hospital and the new part of Bellevue Hospital were most notable, although both are much inferior to the Augustana Hospital and Cook County Hospital that I saw in Chicago. As with all the American hospitals I have seen, one is impressed by the excellent supporting services and careful ventilation, especially in the new pavilions, with the help of apparatus that vents stale air and infuses fresh heated air. There is great order and cleanliness everywhere. In Bellevue Hospital, I saw an excellent device for cleaning floors, sharply recessed corners, walls, etc. A wide variety of brushes, of different sizes and shapes, are connected by a strong rubber tube to a suction device with a vacuum chamber. When cleaning, not only dust, but also larger litter particles are aspirated with great force – which is an ideal way to clean and sweep.[38]

In the surgical departments, especially in Bellevue Hospital, it was interesting to see a large number of small operating rooms. Each ward for 20-30 people has a special small operating room, which is used not only for dressing changes but also for minor operations. As in other hospitals I have seen in America, the modesty of operating rooms and laboratories is striking in comparison with the luxury of the commercial part. To describe separately and in detail the organization of these hospitals would repeat well-known things, and therefore I will confine myself in this place to mentioning the treatment of alcoholics here and also describing the exemplary "nursing school" affiliated with the Presbyterian Hospital, which has a recently organized department of home visits by students of seriously ill patients.

There is a special department for alcoholic patients at Bellevue Hospital. It is rather poorly arranged, in a cramped room. From 20 to 30 patients are admitted daily and kept here only until the restoration of relative health from 3 to 20 days, depending on whether the patient wishes to stay or be discharged. But if a mental abnormality is suspected, which of course happens quite often, the patient is generally transferred to the psychiatric department for five days of testing, and, depending on the assessment of the psychiatrists, is either discharged or transferred to a psychiatric hospital.

"Nursing school"

As part of the Presbyterian Hospital there is also a school for "nurses," which prepares auxiliary medical personnel able to care for patients and fulfill the doctor's orders at the bedside, who are familiar theoretically and practically with the hospital administration and especially the basics of culinary art and the hospital kitchen. During the 15 years of its existence, this school has produced about 280 nurses, of whom, according to statistics, about 2/3 are in the service of various hospitals. Only unmarried women or widows aged 22-35 are admitted to the school, provided they are in good health, including assessment of their weight and height. Applicants must have a diploma from a "high school," which is comparable to our *Gymnasium*.[39] This qualification is actually higher than that required by some private colleges that train physicians (almost all American medical societies are strenuously fighting against the existence of these colleges). The course at the nursing school lasts 3 years (in colleges 4 years) and the time spent is distributed as follows:

First year: 6 months for an introductory course, 6 months for the junior course itself. During the first half of the year, students take classes in anatomy, physiology, hygiene, sanitation, pharmacy, and bacteriology, plus a course of hospital economics including the following: 1) the composition and nutritional value of various kinds of food; 2) the principles of culinary art in general and hospital cuisine in particular; 3) preparation of complex dishes; 4) designing forms for a hospital lunch; 5) practical housekeeping. In the second half of the year, the students get acquainted with the clinics of internal medicine and surgery, urinalysis, pediatric infectious diseases, and bandaging.

Second year: Internal medicine and surgery, emergency care, massage, obstetrics.

Third year: Operating room technique, nursing in private practice, visiting private patients, contagious diseases. In addition, the students are introduced to the care of patients with skin, eye, ear, nose, throat, nervous, psychiatric, and typhoid diseases, surgical care in emergency cases, gynecology, and hospital economy and become familiar with current cases.

All students have a permanent apartment at the school; each has her own special room, food, and uniform; it is only in the first semester that students must provide their own clothing. They receive books, instructional materials, and equipment from the school. Senior students provide their own gymnastic dress and shoes. They do not pay anything for their education. When I visited the school, there were 65 students. Over 15 years, there were 905 people who wanted to enter this school and in addition 66 people who wanted to work for free after graduation. Recognizing the unpreparedness of our own hospital sisters, I consider it necessary that we pay attention to the program of these schools in America, which give students very good training, as all American doctors unanimously agree.

In order to give students the most practical training possible, to accustom them to independent work, to quick assessment at the patient's bedside, to ingenuity, adaptability to working conditions and to economy, since 1904 a special department for visiting patients at home has been set up at this school, with particular attention to the visitation of tuberculosis patients. Each student must stay in this department for at least two months, visiting her patients daily and making regular notes about them, which are checked daily by the "instructor," and if necessary, by the doctor at the patient's bedside. Before visiting tuberculosis patients, nursing students must take a course on caring for these patients, on sputum disinfection, on the prophylaxis of others, etc., so that at the bedside of such a patient, the student does not see a monotonous repetition of the phenomena of any chronic disease, but meets with many tasks and questions which are of great practical importance. The rules for students in the visiting nurse department are as follows: 1) visitations take place from 8 A.M. to 5 P.M.; 2) the district of the city for visiting patients at home is indicated very carefully; 3) requests received from 9:00 to 2:00 are carried out after 2:00; 4) requests received after 2:00 are visited the next morning, except in emergencies; 5) students do not give any medicines except as directed by the "instructor"; 6) the instructor is immediately notified about cases of poverty; 7) the student should not accept any remuneration for herself, but 20 to 30 kopecks (in our money) is requested from each patient who is able to pay, which is used by the department to provide food for poor patients; 8) obstetric cases are visited only as a last resort; students with a contagious disease do not visit; 9) each invitation is carefully recorded, as well as all items temporarily left with the patient.

When visiting a patient, the student carries a bag with the following items: 1) an apron, 2) a towel, 3) a basin, 4) a brush for washing hands, 5) a bag with sterilized dressings, 6) a bag with unsterilized dressings, 7) a bag with bandages, 8) a set with scissors, tweezers, syringe, probe and rubber catheter, 9) six bottles of alcohol (95% and 50%), green soap, hydrogen peroxide, 10) sublimate tablets, 11) boric ointment, 12) boric acid powder, 13) talcum powder, 14) a bag containing 2 thermometers, dressing scissors, spatula, sticky plaster, and pins, 15) a table with formulas for feeding children.

Finally, in order to illustrate in more detail and more clearly the activities of this department, I will give a characteristic excerpt from the expenses for this department in 1907:

Milk and eggs were distributed to poor patients in the amount of about	… 5000 rubles.
Bought various food for	… 100 rubles.
Distributed in cash about	… 100 rubles.
For travel to earn money, about	… 40 rubles.
For clothes for patients	… 700 rubles.
For an apartment, transportation of things, heating	… 200 rubles.
For the passage of patients to the hospital and back by electric city railway	… 60 rubles.
In total, about	… 6200 rubles

This department is a completely new idea; its important practical and educational value for the auxiliary medical personnel, who can work at school only in exceptionally favorable conditions, is beyond any doubt.

Battle Creek [Michigan]

The Battle Creek Vegetarian Sanitarium, founded by Dr. Kellogg in 1878, is one of the largest medical institutions in North America.[40] This "Sanitarium" is designed for 1000 patients and has the grandeur characteristic of American institutions, but together with that luxury and comfort. It employs about 30 doctors and up to 350 nurses, with 400 additional staff.

The main pavilion is a huge, elegant building with six floors, which is adjacent to three pavilions with devices for hydrotherapy, massage, and gymnastics. Everything available in the field of technical devices for the application of physical methods of treatment is lavishly applied here, such as hydrotherapy, electrotherapy, massage, gymnastics, thermotherapy, and light therapy. But the thing that interested me most is that Dr. Kellogg is also well-known as a surgeon in America, and his Sanitarium has a rather large surgical department where he performs up to 400 major operations annually, using a strictly vegetarian diet with good results in the pre- and postoperative period. Since the principles of vegetarian cuisine are spreading more and more every year both in Europe and in America, and since the scientific confirmation of these carefully developed principles is becoming more and more indisputable every year, I consider this experience of Dr. Kellogg to be very important and worth special attention. In the past year I have already visited several institutions of this kind, but here for the first time I found the perfectly rational application of these principles to surgical patients, especially in the postoperative period, where obviously diet plays such an important role, especially after operations on the abdominal organs. If it is possible, with the help of an appropriate diet, to correct the most severe chronic digestive disorders, without introducing any extraneous substances for this, then it is not only expedient, but also desirable to apply these principles at the bedside of a surgical patient. At present, I will not spend much time on this question but will address it later, after having seen other sanatoriums and collected more material.

The surgical department is extensive and very well arranged; cleanliness and order are very strict. No one enters the operating room without being dressed in a sterile gown, cap, and sterile canvas booties over ordinary shoes.

Patients are anesthetized with a mixture of ether and chloroform, or with ether alone, using a special automatic machine with compressed oxygen, invented by Dr. Kellogg's assistant, Dr. J. F. Morse. During the operation, the patient's condition, especially in doubtful cases, is monitored by measuring the blood pressure from time to time, which is measured (as a rule every 10 minutes) using a special apparatus (Stanton).

Determining the pressure with this apparatus is very simple, but seems to require great skill and raises doubts about the accuracy of the data obtained in inexperienced hands.[41]

In addition to surgical and gynecologic patients, those admitted here are mainly patients with diseases of the digestive and neurologic organs. Patients with epilepsy, psychiatric disease, or tuberculosis are not accepted.

Last year, the total number of patients who underwent a full course of treatment here reached 3,000.

As I have already mentioned, nowhere in Europe have I seen such a wide application of electrotherapy and hydrotherapy with all the most complex available devices. Electricity is used here for therapeutic purposes, most often in the form of sinusoidal currents. These currents were discovered and first investigated here by Dr. Kellogg about 20 years ago. He described them in American medical journals and also reported on them at a meeting of the American Medical Association.[42] Only a few years later, these currents of Dr.

Kellogg were discovered by Dr. D'Arsonval (in Paris), who carefully studied them and popularized them. These currents have the peculiarity of being painless even when they cause the strongest contraction of the muscles, and are used by Dr. Kellogg as a means of passive exercise of the muscles, especially the muscles of the back and abdominals (in enteroptosis),[43] in paralysis, instead of increased physical exercises in the treatment of obesity, etc. As regards direct current, the machine set up in this sanatorium is one of the largest ever made.

The laboratories and the diagnostic part are also very well set up, and blood (including blood pressure), stool, and urine are examined in each individual case, both qualitatively and quantitatively.

If necessary, a bacteriological examination is also performed.

In order to have adequately trained medical personnel always at hand and in sufficient numbers, the "Sanitarium" has a college for training doctors and a nursing school.

The course in this college lasts 3 years, after which students go to Chicago for another year and finish the course there. The training is very practical, and students have the opportunity to become very familiar with both the laboratories and the clinical side, having a huge amount of material at hand, especially since the college also has a polyclinic for poor patients. The means of material support of students at the Sanitarium is interesting. Students at the College receive a room and a full allowance at the Sanitarium, and not only do they not pay anything, but they can still earn money by simple physical labor at first, and then, after receiving some training, can work in laboratories, massage, electrification, hydrotherapeutic manipulations, etc. Physical work is assigned to them at a very precise time, in such a way that it does not distract them from their work at the college. For washing floors, dishes, cleaning rooms, yards, streets, they receive about 40 rubles. Female students receive about 30 rubles (in our money) for three hours serving during lunch. At the end of the work hours the student changes into a regular citizen like any of the sick American millionaires, and one often sees them talking at ease and freely as equals, although a half hour ago during lunch or dinner this student stood behind the chair of the other in an obliging and in a respectful pose, with a stern face, performing the duties of a simple waiter.

The cuisine in the "Sanitarium" is quite varied and tasty. All food products used are well researched and studied; individual portions are carefully weighed and each patient receives a special list of portions indicating how many calories each dish is able to provide in the amount contained in the portion issued. The Sanitarium has 26 separate diets in its kitchen, the establishment of which is based on the research of such authoritative scientists as Pavlov, Mechnikov, Tissier, and Combe. (The name of I. I. Pavlov is well-known among American scientists, and in the Sanitarium a life-size portrait of him hangs in the main place in the reception room).

The diets distinguished and prescribed by Dr. Kellogg are as follows: 1) lacto-cereal;[44] 2) fruit; 3) fruit and nut; 4) fruit-cereal; 5) chloride-free; 6) uncooked food; 7) blood-building; 8) dairy; 9) lean; 10) anti-obesity; 11) fattening; 12) dry; 13) liquid; 14) anti-diarrhea; 15) cleansing; 16) diabetic; 17) with hyperhydrochloria; 18) with hypohydrochloria; 19) bread and vegetables; 20) anti-fever; 21) pre-laparotomy; 22) pre-operative for procedures on the stomach and intestines; 23) special antitoxic; 24), 25), 26) Antitoxic Nos. 1, 2, 3. I will not go further into these diets here, since I plan to do so in a future publication.

In concluding my report, I cannot fail to mention the politeness of Americans, especially doctors, who willingly and courteously show the European visitor everything that they think might interest him and explain everything in detail. As for social life itself, although this is not the place to talk about it, as a doctor I have to note that it has many innovations worthy of imitation. I would especially mention the limited use of alcoholic beverages. Usually in American (United States) restaurants and so-called "lunchrooms" there is no beer or wine, and spirits are sold in specially designed establishments, most often called "saloons." Thus, the sober public is not forcibly accustomed to the use of wine, as is the case in almost all restaurants in France and Germany, where "*Weinzwang*" encourages even non-drinkers to drink wine and beer.

Finally, the high respect Americans have for any kind of work should be mentioned; many American students earn their money during the holidays by doing the roughest physical labor, and even the wealthy landlord with a home like a small palace does not hesitate to sweep the street himself in front of his house every day.

In view of the difficulty of combining everything I saw into one harmonious whole, without going beyond the bounds of this report, I have limited myself to describing what I found most important and interesting. In any case, I am pleased to have visited America, because here I managed to resolve many questions that often worried me during my long medical practice (21 years) and which I could not resolve by frequent visits to various European clinics (in 1894, 1897, 1903, 1906, 1907, and 1908).

Original Notes

1. Jumbo soap is a special kind of mild soap, strongly alkaline, with an admixture of powdered pumice. Prepared in Chicago (Chicago 1, Graham Bros.)
2. Harrington's Solution has the following composition: Corrosive sublimate 3.3, Hydrochloric acid 240, Distilled water 1200, 95% Alcohol 2560 MD.
3. According to the doctor who showed me the hospital.

Biographical Source

Dmitrenko NN, *et al*, "Знаменательные и памятные даты Омского Прииритышья, 2013," https://omsklib.ru. In current sources his name is spelled Levanevsky [Леваневский].

Publication Source

Voenno-meditsinskii Zhurnal [Military-medical Journal] had several interruptions in its publication history starting with the Russian Revolution, but is still active and recently celebrated its 200th anniversary. See Trishkin DV, Kuandykov MF, Poddubny MV, "Достояние российской военной медицины (*Военно-медицинскому Журналу* – 200 лет)," *Voenno-meditsinskii Zhurnal* 2022; 343:4-11.

Translation Notes

1) In Russia, an ordinator is a doctor undergoing specialty training, but not in the highest academic track. See Gass H, "Glimpses of Neurosurgery in Russia," *Journal of Neurosurgery* 1960; 17:122-154.
2) The ruble (containing 100 kopecks) was and is today the monetary unit of Russia. In 1908, it was worth about half of a U.S. dollar.
3) The antrum of Highmore (maxillary sinus) and frontal sinus. The author often uses Latin words or abbreviations for scientific terms. Hereafter, these will all be translated into English, unless the Latin

term is still in common use.

4) The following discussions about preoperative care, drains, and postoperative care are almost identical to those in Gradwohl RBH, "The Mayo surgical clinic at Rochester," *The Medical Brief* 1908; 36:475-504. Gradwohl puts these sections within quotation marks and credits "a publication of Dr. Robert Smart, of Washington, D.C., who issued a small pamphlet setting forth this phase of the work at Rochester."

5) Mercuric chloride, no longer used.

6) See Harrington C, "Some studies in asepsis," *Annals of Surgery* 1904; 40:475-485. The "MD" in the prescription in Original Note [2] stands for *modo dicto*, "use as directed."

7) Sodium carbonate, no longer used. See Heller IM, *Journal of the American Medical Association* 1911; 57:733-734.

8) See Mayo CH, "Principles in drainage," *The Medical Herald* 1903; 22:433-437.

9) The arshin was a Russian unit of measurement equal to 28 inches. Hereafter, measurements will only be given in inches or feet.

10) Described by Bartlett in the *Journal of the American Medical Association* 1906; 46:1168-1169.

11) Methyl alcohol, no longer used for this purpose.

12) Pagenstecher [F], "Celluloidzwirn, ein neues Näh- und Unterbindungsmaterial," *Deutsche Medicinische Wochenschrift* 1899; 25: Therapeutische Beilage 4:V, 26.

13) Fowler GR, "Diffuse septic peritonitis, with special reference to a new method of treatment, namely, the elevated head and trunk posture, to facilitate drainage into the pelvis," *Medical Record* 1900; 57:617-623.

14) Murphy described his method in the *Journal of the American Medical Association* 1909; 52:1248-1250.

15) Alice Magaw, "A review of over fourteen thousand surgical anesthesias," *Surgery, Gynecology & Obstetrics* 1906; 3:795-799.

16) Much of the following discussion was apparently obtained from the many published articles on this subject by WJ Mayo, especially in the *Annals of Surgery* 1907; 45:810-817, *Annals of Surgery* 1908; 47:885-893, and *Journal of the American Medical Association* 1908; 51:556-558.

17) See Mayo WJ, "Anemic spot on the duodenum, which may be mistaken for ulcer," *Surgery, Gynecology & Obstetrics* 1908; 6:600-601.

18) See Mayo WJ, "The technique of gastrojejunostomy," *Annals of Surgery* 1906; 43:537-542 and Mayo WJ "The relation of the mesocolic band to gastroenterostomy," *Annals of Surgery* 1908; 47:1-3.
19) The Russian word for "pylorus" is привратник, meaning "gate-keeper," which is in fact the literal meaning of the Greek word πυλωρος, from which we get "pylorus."
20) See Mayo CH, "The parathyroid question," *Annals of Surgery* 1909; 50:79-83.
21) Much of the following discussion was apparently obtained from the many published articles on this subject by WJ Mayo, especially in the *Annals of Surgery* 1906; 44:209-216, *Surgery, Gynecology & Obstetrics* 1908; 7:607-613, and *New York State Journal of Medicine* 1908; 8:169-172.
22) The term "catarrhal jaundice" was applied to the disease we now know as viral hepatitis. See Editorial, "Epidemic hepatitis, or catarrhal jaundice," *Journal of the American Medical Association* 1943; 123:636-637.
23) The term "triangle of pancreatic inflammation" is used by WJ Mayo in the *New York State Journal of Medicine* article cited above.
24) Much of the following discussion was apparently obtained from CH Mayo, "Transperitoneal removal of tumors of the bladder," *Annals of Surgery* 1908; 48:105-109.
25) See Coley WB, Hoguet JP, "Operative treatment of hernia," *Annals of Surgery* 1918; 68:255-268.
26) Mayo CH, "Cancer of the sigmoid and rectum," *Surgery, Gynecology & Obstetrics* 1906; 3:236-241 and Mayo WJ, "Surgery of the large intestine," *Annals of Surgery* 1909; 50:200-228.
27) Much of the following discussion was apparently obtained from Plummer HS, "Cardiospasm," *Journal of the American Medical Association* 1908; 51:549-554.
28) Augustana Hospital was later called the Lutheran General Hospital, and closed in 1989. The name Augustana refers to the Augsburg Confession (*Confessio Augustana*), the fundamental document of the Lutheran Church.
29) See Ochsner AJ, "The treatment of fistulae and abscesses following operations for empyema of the thorax," *Annals of Surgery* 1909; 50:151-157.
30) Mayo WJ, "An operation for the radical cure of umbilical hernia," *Annals of Surgery* 1901; 34:276-288.

31) Cook County Hospital was renamed the John H. Stroger Hospital and moved to a new location in 2001. The old site is now a Hyatt Hotel.

32) This problem was also described by Alice Hamilton, “Gonorrheal vulvo-vaginitis in children,” *Journal of Infectious Diseases* 1908; 5:133-157.

33) The hospital was part of Fort Wayne in Detroit, which has long since been abandoned. Efforts are underway to preserve what is left as a historical site.

34) Parke-Davis is now part of the Pfizer Company. In July 1910, *Therapeutic Notes*, a journal published by Parke-Davis, included a summary of this segment as “Report of a visit to the United States by Dr. P. K. Levonevski” (17:64-65).

35) See Rogers J, Torrey JC, “The treatment of gonorrheal infections by a specific antiserum,” *Journal of the American Medical Association* 1907; 49:918-924.

36) See Inch GF, “Edmund A. Christian,” *American Journal of Psychiatry* 1935; 91:1465-1466.

37) It is difficult to reconcile this impression with any other historical description of the Michigan State Prison in Jackson, which experienced a major riot in 1912. Perhaps it only seemed luxurious compared to the military hospital and prison in Omsk, made famous by Dostoevsky’s semi-autobiographical *House of the Dead*.

38) James Murray Spangler of Ohio had invented an electric vacuum cleaner in 1907 and sold the patent to his cousin William Henry Hoover in 1908.

39) The *Gymnasium* (гимназия) is the secondary school in most European countries that prepares a student for study at a university.

40) See Kellogg JH, *The Battle Creek Sanitarium*, Battle Creek MI, 1913. The Sanitarium went out of business in the 1930’s, and the building became first an army hospital and then a federal services building.

41) The Stanton blood pressure apparatus needed some improvements, but was the basic arm cuff and mercury manometer still in use a century later. See Goodman EH, “A suggestion in the use of the Stanton sphygomomanometer,” *Journal of the American Medical Association* 1911; 56:113-114.

42) See Kellogg JH, “The physiologic and therapeutic effects of the sinusoidal current,” *Transactions of the American Electro-Therapeutic Association* 1894; 4:331-341. He clearly gives priority

to D'Arsonval.

43) Enteroptosis is now an outmoded concept, but the *Journal of the American Medical Association* devoted a series of articles to it in 1910 including Ochsner AJ, "Surgical aspects of enteroptosis" (55:1865-1867).

44) This cereal and milk diet became immensely popular after the Sanitarium developed toasted corn flakes. Dr. Kellogg's brother Will, who had worked there as a bookkeeper, began marketing them to the general public, with results that are well known to every American.

17

Andrea Majocchi (1909)

Andrea Majocchi (sometimes written Maiocchi) was born in 1876 in Bascapè in the Pavia region of northwestern Italy. When he was three years old, his physician father died of sepsis acquired during performance of an autopsy; the father's last words were that he would rather have his children be peasants than doctors. Nevertheless, Andrea went on to study medicine at the University of Pavia. After graduation, he became an obstetrical assistant and then a surgical assistant at the *Ospedale Maggiore* (Central Hospital) in Milan.

In 1908, he won a competition for the Parravicini Prize, a year-long scholarship for study abroad. This included a visit to America from March to May of 1909, at the age of 32, which is described in the following pages.

After returning to Italy, his general surgical career advanced and he became a deputy chief surgeon at the *Ospedale Maggiore*. During the First World War, he served as a medical officer in Red Cross hospitals at the front and in reserve.

After the war he was named Chief of Surgery at the *Ospedale Maggiore* and became one of the leading surgeons in Italy. He retired in 1942 and died in 1965.

Dalle cliniche estere: Note ed appunti del Dottor Andrea Maiocchi
La Clinica Chirurgica 1909; 17: 883, 1028-1037, 1256-1267, 1413-1424, 1571-1581

From foreign clinics: Notes and remarks
by Dr. Andrea Maiocchi

Having received my recent reports from Swiss clinics,[1] the reader will be surprised to know that I have arrived on American soil. From the cheerful resorts of nearby Switzerland to the huge cities of the United States is a long way in distance and even more in quality: The connection between these two stations on my scientific journey lies in a simple opportunity.

The scholar who has traveled abroad will recall that in most European universities the academic year is divided into two distinct semesters, separated by a certain amount of vacation time. Between the first semester which ends in February and the second which begins in April there is a period when studies and work take a pause: During this period the director of the clinic is distracted from his usual occupations first by the exams and then by the holidays; the lectures, the conferences, and the clinical exercises are closed, and the operations are not performed by the professor, but rather by the assistants and by the surgical staff. In short, the scientific activity rests for a couple of months, and then resumes its course with renewed eagerness.

I was in Lausanne at the end of the winter semester: Exams were scheduled at the beginning of March, the attention of teachers, assistants, and students was focused on the tests, and these would be followed by a month-long vacation, so for some time I would no longer find the usual scientific activity in the university environment. I thought of using this moment to travel to America.[2]

Professor Roux strongly supported my idea, and he gave me warm words of encouragement. “If you are involved in visceral surgery,” he said, “you absolutely must not neglect going to the United States. We do not really know America; we are accustomed to receiving a number of American doctors in our clinics and laboratories, but we do not know what use and what application they have made of the fruits of our experience and our studies. We are accustomed to receiving with a certain diffidence and incredulity any news that comes to us from across the ocean, and we have never bothered to verify in person what is good and what is bad in their work, what is true and what is exaggerated. On the contrary, I think it would be worthwhile. Surgery is mechanical and eminently practical; the Americans have an ingenuity suitable for everything having to do with mechanics, and they take an absolutely practical direction, so they have what it takes to be good surgeons."

Moreover, I knew that North America had made notable surgical contributions: The works published in the field of visceral surgery are numerous and the study of appendicitis, floating kidney,[3] and gallstones have perhaps occupied American surgeons more than Europeans; we have seen the impressive, sometimes almost improbable statistics of the Mayo brothers, of Murphy, of Deaver, of Finney, but we have to admit that they have produced the same impression on our minds as the sensational news which we often read in the popular press concerning outlandish, monstrous operations: Disbelief and distrust.

My purpose in crossing the ocean was therefore to observe calmly and without prejudice, to determine how much was real and how much was legend, and finally, to gather everything new and good that I could find, especially in the fruitful field of gastrointestinal surgery.

In my subsequent correspondence, I will tell you all about it.

New York, 20 March 1909

The traveler who comes from Europe to an American city for the first time is stupefied; everything seems strange, everything seems different from what he is used to seeing. The same impression is felt by the scholar visiting American universities, hospitals, and other institutions for the first time: Medical education is delivered in an entirely original way; the arrangement and functioning of clinics, hospitals, and scientific institutes are also different. This diversity of environment and education results in the special characteristics of the American surgeon.

It will therefore be useful for the reader to learn about these educational methods. Only in this way is it possible to understand the American surgeon, appreciate his talents, and justify or at least explain his deficiencies.

In North America, medical-surgical teaching is imparted in *medical colleges*, which may or may not be part of a *university*: It should be recalled that colleges and universities do not depend on the government, but are separate entities, independent and private institutions. The state does not exercise any direct control over the functioning of these schools, but only reserves the right to examine candidates who have graduated and want a *license to practice medicine*.

From this absolute autonomy of the universities, it follows that both in the United States and in Canada there are a large number of medical schools, of greater or lesser reputation.

In the state of New York alone I was able to count twelve, in all of North America (Canada, the United States, and Cuba) there are 162!

It is difficult to judge the value of these medical colleges: There are mediocre ones, less than mediocre ones, good ones, excellent ones; everything depends on the center in which they arise, their finances, the number of students and teachers. The more modest survive solely on the tuition paid by the young men; the grandest have their own funds derived from bequests or gifts from private individuals. Thus, the Columbia University of New York has been largely endowed by the Vanderbilts, and therefore has an active capital of 23 million dollars, equal to 115 million *lire*,[4] has about 500 teachers, and serves an average of 3700 students; the University of Chicago was founded and has been continually subsidized by Rockefeller, that of Baltimore by Johns Hopkins,[5] and so on.

The independence and private nature of these colleges or medical schools mean that the programs also vary from institution to institution. Generalizations cannot be made, so it is necessary to consider individual institutions.

I will say a word about admission requirements. With us, applicants to the faculty of medicine must possess the baccalaureate: That is, they must have completed a total of 13 years of study in addition to the elementary courses, the *ginnasio* and *liceo*.[6] Here, it is enough to have attended *grammar school* and *high school*: The first consists of eight or nine years, the second lasts four years and would be comparable to our *ginnasio*. I do not have a very great impression of the value of this preparatory instruction: The *scientific* part and especially chemistry are covered well; the literary, artistic, and philosophical parts leave much to be desired. The young American may finish *high school* at 16 or 17, and at this age go off to college.

The reader should keep this deficiency in secondary education in mind: He will then see the effects [1]. Medical-surgical education is imparted during four years of study, instead of six as in Italy: The teaching methods tend to focus on practicality; the student is carefully supervised by the professor, assistant, or *instructor*, so that he is continuously advised and guided.

The practical part is better developed than the theoretical one; laboratory exercises, anatomical and physiological demonstrations, and clinical demonstrations in amphitheaters or *dispensaries* predominate over *lectures*. During the school year there are only two or three days of vacation in addition to Sundays, and the student is only allowed to be absent from school for very serious reasons. Promotion requires passing all the exams for the year, which include practical demonstrations as well as theoretical tests.

Anyone interested in didactic questions will appreciate knowing about the courses at Columbia University, which are generally the same as those of many other medical schools in the United States.

The first year is largely dedicated to Anatomy, Biochemistry, and Physiology: Each of these subjects is taught in a series of lectures, but even more in laboratory exercises. I was impressed by the appearance of the *dissecting rooms*: These are enormous rooms provided with as many tables as there are students, each of whom receives a cadaver every two or three months, and must make the most accurate preparations during this time. The cadavers can be preserved for a long time using large refrigeration chambers, where the student must store them as soon as he has finished his daily activities. Through the generosity of means, and thanks to the careful surveillance of the *assistants* and *instructors*, the student has ideal conditions to learn anatomy: Visiting and observing these *dissecting rooms* of the Medical College of Columbia University, I was able to observe magnificent anatomical preparations made by first-year students; I was convinced that the teaching of this very important branch for the surgeon could not be done any better.

The second year is especially dedicated to general pathology and pathological anatomy; pharmacology, bacteriology, and hygiene are also taught during this time, but more through demonstrations and laboratory exercises than in theoretical lectures.

In the third year, courses in special medical and surgical pathology, obstetrics and gynecology, neurology, pediatrics, otorhinology, and ophthalmology begin.

The fourth year is spent by the student almost entirely in clinics and hospitals: His work becomes completely practical. Divided into small groups, the graduating students keep in continuous contact with patients, always guided and supervised by the *instructors*.

In this way they have the opportunity to learn very well the course of individual cases, to practice objective examination, diagnosis, and therapy. In surgery, continuous observation of a large number of operative procedures and daily exercises on the cadaver, provide the basis for correct and precise technique.

For obstetrics, the material supplied in New York by the *Sloane Maternity Hospital*[7] and the *Outpatient Obstetrical Department* is of great advantage. The student must spend at least four weeks in obstetrics and personally attend a large number of deliveries. Special courses teach the use of surgical and obstetrical instruments, with which he cannot fail to become very familiar.

At St. Luke's Hospital[8] there is a special two-month course in which the student is required to carry out the duties of a nurse. This may seem undignified to a European, but for an American it is not: "If I will be giving orders to the nurses," he thinks, "it is good that I myself can exercise their duties properly."

Having reached the end of his fourth year, and completed the exams in the *medical college*, the candidate is eligible for the qualification to practice: By this I mean that he can present himself for the state exam.

The methods followed in these exams are also of interest, especially since these tests are the same as those required for a foreign doctor wishing to practice in America.

The exams are carried out by a commission appointed by the state (*State Board of Examiners*) and consist of written tests: They focus on eight subjects, namely: Anatomy, Physiology, Hygiene, Chemistry, Surgery, Obstetrics and Gynecology, Pathology and Bacteriology, and Diagnostics.

To qualify for these tests, the candidates must demonstrate with appropriate certificates that they are at least 21 years of age; that they have good moral character; and that they have studied medicine for not less than four years and have obtained a degree from an American or foreign medical school.

The examinees complete two tests a day, one in the morning and the other in the afternoon. They must respond in writing in the English language to ten of the fifteen questions that they are asked about each subject.

The way in which these questions are asked is also interesting: It gives an idea of the practicality of the Americans, so I am reproducing here those that were used for the surgery test last September [2]. The content of the exams is similar for the other subjects:

Question 1: Describe the preparations to be used for an aseptic operation as regards the patient, the operator, the assistants, and the nurses: The instruments, the medication.

Question 2: Describe surgical shock: Name three causes.

Question 3: Describe the causes and treatment of ingrown toenail.

Question 4: What should be the treatment for a puncture wound?

Question 5: Describe an operation to excise a carcinoma of the lip.

Question 6: Describe the circumstances which should lead to an amputation rather than to a bony resection, and mention some of the dangers of a simple resection.

Question 7: Describe the symptoms of a patella fracture and the treatment.

Question 8: Describe an operation for chronic empyema.

Question 9: Describe the symptoms and treatment of floating kidney.

Question10: Describe the treatment of umbilical hemorrhage in newborns.

Question11: Describe the symptoms and treatment of cystitis.

Question12: Describe the initial symptoms of tuberculosis of the knee, and the causes of diagnostic error.

Question 13: Give the indications for aspirating the middle ear and describe the technique of the procedure.

Question 14: Give the symptoms of an abscess of the maxillary sinus (antrum of Highmore) and describe an operative procedure which may be indicated.

Question 15: Describe two methods of skin grafting.

It may seem to the reader that some of these questions are inappropriate, perhaps too complicated or extensive; but American surgeons are convinced that the way in which the candidate replies makes it clear whether he has good sense and knowledge of the subject.

The commission does not want rambling, it does not want scientific erudition, it does not want a review of literature or citations of authors' names; it does not even want the candidate to answer more than ten questions. It only requires that the answers be concise and clear.

A few years ago, an obstetrician compatriot of ours took the opportunity on a gynecology question to expostulate his point of view. The poor fellow had the unpleasant surprise of being miserably *rejected* because ... he had gone *off topic*.

But I also realize that I am going off topic, and therefore it is time to recapitulate.

I believe that the way in which medical-surgical teaching is imparted in America has several defects and some definite advantages.

In my opinion, the preparatory education required for admission to medical schools is deficient; the theoretical education imparted in the university setting also seemed to me deficient.

On the other hand, I found excellent practical methods, in which the young person is trained and followed during the individual study courses starting on the first day of school.

These strengths and weaknesses in the education of the American medical student leave a profound mark on the doctors and surgeons, and serve to give them those special characteristics that I will describe later.

I cannot continue my report without saying a word about another person who plays a large part in American surgical practice, a person who is the surgeon's faithful companion, who not only follows him on the wards but also accompanies him in the operating rooms, assists him, and prepares the patients, the instruments, and the medications.

I am referring to the American *nurse*, very different from our *infermiere*, our midwives, or our sisters of charity. To know the qualities of the *nurse*, we must consider her social position, education, and duties.

She does not come from the lower classes, such as her counterparts in Italy, but from the upper classes. She must possess a certain general culture and a separate medical education: The former is provided by primary and secondary schools; the latter by the *training schools for nurses* which are attached to the large hospitals.

Only girls who meet certain requirements are admitted to these schools; they must belong to a good family, offer absolute guarantees of morality, be in good physical condition, be at least 22 years old, and finally have a diploma from a *high school* or above.

A certified doctor attests to her physical condition, a religious leader and two prominent persons attest to her morality. You might think that all these requirements would limit the number of applicants, but the position of a nurse in the United States is so coveted by girls that only a small proportion of those who apply can be accepted.

In 1906, St. Luke's Hospital had 1153 applications and could only accept 93.

The rules are quite clear: St. Luke's Hospital states that only a limited number of nursing students can be admitted; they leave no doubt that the rejection of an application does not mean that the candidate is unworthy; she should therefore not be offended. However, the commission is not required to give any reason for its choice.

The lucky ones who are accepted go through an initial trial period during the first six months: If in this time they have shown that they are suitable for the profession, they are retained, otherwise they are simply expelled.

If retained, they formally enter the *training school*, must commit to at least three years at the hospital, and must submit to the rules of the institution.

At this point the apprenticeship and education begin.

The student lives at the hospital, which provides her with food, clothing, and books. She is employed all day on the *wards*, except for two hours of rest during the day and two half-days of vacation per week. She has three weeks of vacation per year. Otherwise, absences are not tolerated unless there are very serious reasons.

The daily instruction is imparted by the *nursing supervisor* and by the *head nurses*; lectures are given by the physicians and surgeons of the hospital.

To give a more precise idea of the education provided to these girls, I summarize here the subjects covered in the individual three years of study: This is the overall duration of the course.

First year

Caring for the patient: Teaching imparted with a series of lectures and practical demonstrations.

Elements of Pharmacology: Exercises supervised by the director of the pharmacy.

Elements of Anatomy and Physiology.

Elements of Medical Pathology.

Elements of Surgical Pathology.

Second year

Dietetics: The students in this course not only learn theoretically about the different types of diets and when they should be ordered, but they also learn to prepare the different diets themselves: An actual quarter of an hour of culinary art.

Urinalysis: Theoretical lectures and practical exercises.

Elements of Bacteriology: In this course the student is especially taught methods of preparing culture media, keeping them aseptic, making the culture itself, and so on. In short, it is a real course in bacteriological technique, since the nurse will have to help both the physician and the surgeon to carry out any studies that the case may require.

Massage.

Elements of clinical medicine taught through the presentation of clinical cases.

Third year

Elements of Clinical Surgery.

Theoretical and practical obstetrics: After a certain number of theoretical lectures, the student must attend a certain number of deliveries.

Pediatrics with special regard to the technique of examining children, their assistance and care.

At the end of each year, the student undergoes exams, and is not admitted to the next year until after passing them; at the end of the third year there is a final exam with very precise practical demonstrations.

After these exams, the *training school for nurses* awards the girl a certificate or diploma with which she can access the state exam. This last examination is carried out before the *Committee of the Medical Board* and with rules similar to the comparable one taken by medical-surgical graduates.

From this brief description, the reader can already form a concept of the education and practical value of the American *nurse*. She is the most active person in the hospital: In the operating rooms she is a very valuable aid to the operator. The equipment and medications are under her direct supervision: She knows all the surgical instruments individually and knows how to use them: On the evening before an operation, she chooses the ones that will be used, and takes care of their sterilization.

She also prepares the dressings and disinfectants; the surgeon does not have to worry about the preparations: He has only to give the nurse the number and name of the operations and he is certain that she will have everything ready at the time specified, the patient, the equipment, the sponges, the dressings. In all the time I have observed operations here in New York, I have never once heard a surgeon complain of a missing instrument or any deficiency in patient preparation. But not only is the *nurse* a skilled organizer, she follows the operative procedure with intelligent attention and, if in charge of the instruments or sponges, she anticipates what will be needed at different times: Very often I have observed operations where the surgeon did not have to say a word.

The dressings are also managed by the *nurse*, who follows the postoperative patient by taking the temperature, recording the temperature and pulse curves, and supervising the feeding. She attends to their bathing, and carries out the electrical and x-ray applications. In cooperation with the doctor, she writes up the clinical histories and daily notes.

If during an operative procedure the surgeon requires some histological or bacteriological study, the *nurse* hands him the test tubes with the culture or fixative materials, which she has already prepared ahead of time.

The rules of asepsis and antisepsis are admirably observed by the *nurse*, who gives to the painstaking maintenance of the equipment and the preparation of medication that enthusiasm and patient concern that only the female sex can provide.

The reader can imagine the kind of help such a person represents for the surgeon, but to really be convinced, it is necessary to spend time in one of these hospitals.

In private practice, the *nurse* also has a wide application: Any self-respecting doctor has a nurse available during reception hours; any well-to-do family will call for a *nurse* to treat and supervise a patient in the home. The *nurse* is highly respected in American society and … let me add, paid accordingly.

A nurse commonly earns from 25 to 40 dollars a week (125–200 *lire*) in the care of a patient, and can earn even more if she engages in special care, such as massage, electrical applications, etc., or if she is working for the most distinguished families instead of the middle class.

My friend Dr. Luzzati, captain of the Royal Navy and Commissioner of Emigration, also visited some of these *training schools*. He was enthusiastic about them and in a splendid report on the subject [3] he wondered if some of these institutions could exist in Italy.

The question is not as easy to answer as it might seem at first. Of course, it would be nice if such schools flourished here too, but would they find favorable ground?

I think the *nurse* is a product of American life, like their wonderful hotels, their *skyscrapers*, and so on. I believe the institution of *nurses* reflects the great respect that Americans have for women and their particularly favorable economic conditions.

The *nurse* could not be remunerated or regarded like one of our *infermiere* or even our midwives; how would she then find conditions in Italy suitable for an honorable exercise of her profession? I do not know; as an experiment, we could begin to find ways.

To understand how and why visceral surgery has been able to make such rapid progress in America, it is also necessary to know about another element of the health care environment, namely the hospital, the American clinic.

In the United States, and especially in the big cities, the hospitals have their own characteristics that clearly differentiate them from European ones. I cannot say that the hospitals I visited in the big cities represent the ideal of a modern hospital, but I am convinced that, given the local conditions, and above all the very high value of real estate, they are as perfect as could be imagined.

The prices of building land rise in the big American cities to fabulous figures: The area that was used for the *Flatiron Building*[8] cost $8000 or 40,000 *lire* per square meter, nor did this price set a *record,* since I know of land which cost even more in the center of New York. This condition has prevented the construction of hospital *pavilions* in the cities, which the most recent principles of hygiene would otherwise prefer. But it does not matter, the Americans have been able to make up for this lack of space with numerous resources as ingenious as they are original. Where they could not extend on the surface, they extended in height and erected buildings that rise into the clouds. Could they not have gardens for the convalescents to get some light and some air? Instead, they have created spacious verandas and flowering terraces on the roofs: True hanging gardens where the convalescent goes to enjoy that precious ray of sunshine, and from where, as from a hill, he commands a panorama and feels the incessant activity throbbing beneath him, the feverish work that awaits him as soon as he recovers. Could they not separate patients of different types or of different sexes into distinct buildings? Instead, they have multiplied the precautions for disinfection, and this has prevented harmful contamination.

Two factors further contribute to forming the American hospital, and to giving it a special character: Namely, the breadth of financial means, and an admirable spirit of organization. To prove the first circumstance, I only need to cite a few figures: For example, the constriction of the Mount Sinai Hospital (a hospital with only 450 beds) cost *5 million* dollars (equal to 25 million *lire*). In this hospital, the annual expense in 1907 amounted to *$383,057*: This means that the institution cost more than a thousand dollars a day, that is, more than *5,000 lire*. Divide this figure by 450 which is the hospital patient capacity, and you will have the cost per patient *per day* [4]. If you can believe this, then make the necessary comparisons with our balance sheets and you will see the difference. The land where they built St. Luke's Hospital (another hospital with about 400 beds) cost $530,000, while the building itself cost $2.5 million, a total of about 4 million dollars, or 20 million *lire*.

And I could go on and on with similar figures since there are at least fifty hospitals of this size in New York.

But you may ask, "Who pays these fabulous sums: the city, the state, or the nation?" None of these three, at least for the vast majority of such institutions.

The city gives only a paltry subsidy to three or four of New York's 50 hospitals, and these are by no means the fanciest. The American hospital is like their universities, like their medical colleges, like all their most flourishing local institutions, a private, independent, autonomous entity.

They arise from donations and bequests, and live and thrive on the generosity of individuals. When a hospital is founded, a group of patrons (*board of trustees)* is formed, who take responsibility for the institution and commend it to the charity of their fellow citizens. This charity is very large, judging from the gifts registered in the *annual reports* that are published every year. Every wealthy family wants to have its *own* bed in the hospital, which if *perpetual* costs *$5000,* if *temporary* costs from *$2500* to *$1500* depending on whether it is a *memorial bed* or a *life bed*. Every happy event, every successful affair, is celebrated with a gift to the hospital, and often large sums are donated that add ambitious emulation to the spirit of philanthropy.

The American gives generously to charity; I was told that last year the balance sheet of one of these hospitals closed with a liability of $80,000: Reviewing the accounts for the year during their last meeting in December, the *Board of Trustees* noticed the *deficit*. What would have happened in Italy? They would have considered digging into the assets, or at most would have taken time to organize collections, charity fairs, fundraising events, or other things. Not in America: The *trustees* did not want to close the year with the issue unresolved, and so they decided to make up the *deficit* on their own: They divided the $80,000 among themselves, signed four or five cheques, and in a few minutes the matter was settled.

Not very praiseworthy, you may say, for people with enormous resources!

This is true, I reply, but how many rich people are there in Italy who do not make donations even in proportion to half of their wealth? Furthermore, in Italy most of the donations consist of bequests, while the American gives during his natural life whenever the need arises. Is that not more praiseworthy?

The most evident qualities of American hospitals derive from the breadth of their financial resources: I am referring to the splendor of the buildings, the magnificence of their furnishings. The construction sometimes resembles that of the grand hotels of New York: The main entrance leads into a reception area with marble columns; immediately adjacent to this atrium are the administrative departments, the offices of the *superintendent* or administrative director, those of the telephone operators, of the *typists*, of the porters, the meeting room for the *board of trustees,* and so on. The wards are on the middle floors, the operating rooms usually in the highest part of the building. The stairs are used only exceptionally: Elevators in extraordinary abundance are available to everyone and transport you with dizzying speed wherever you wish to go.

The *wards* are built and furnished with real splendor: The floors are of polished wooden *parquet,* the walls of stucco for their entire height, the number of beds very small in relation to the size of the rooms. Entering these wards, I had a sense of admiration such as I had never felt before: Everything there is white, clean, and shiny. This is not to mention the abundance of isolation rooms, bathrooms, and toilets; attached to each ward is a *day room*, that is to say a large room with sofas, long chairs, rocking chairs, etc., where convalescents go as soon as they can get out of bed. Patients at a more advanced state of recovery can access the verandas, and on days of good weather the *roof gardens*.

The *operating rooms* deserve special mention, because the American surgeon has given all his attention to them. They are often placed in the highest parts of the building since there is the most abundant light. The *operating room* usually has the shape of an amphitheater since the operator does not want anyone else around him except those taking part in the procedure. Doctors who wish to observe can access the room through an entirely different entrance, and take their places to one side. The walls, railings, ceiling, doors, and floors are all of smooth white marble, so that no dust is produced and the room can be easily disinfected. Light enters from one of the walls and from the ceiling which is often domed or provided with large crystal skylights.

Those who visit one of these operating rooms for the first time have the impression of entering a temple or a marble theater, such is the size of the room, the abundance of light, and the smoothness of the walls.

To give an idea of the splendor of these rooms, a few figures are worth more than any description.

At the Roosevelt Hospital,[9] the operating rooms that existed before 1890 seemed inadequate, so Sims donated 1,750,000 *lire* to build new ones. McBurney was commissioned to develop a project; he came to Europe, reviewed the major hospitals and returned with the design of a room which cost a million *lire*. The remaining 750,000 was reserved for maintenance. However, the reader should realize that this operating suite is already considered antiquated: Those of St. Luke 's Hospital and the Mount Sinai Hospital built ten and fifteen years later are much more luxurious. In the latter hospital the entire 5th floor is used for operating rooms: There are five of them all in a row, of which the central one is marvelous; each of them opens into an atrium, which also overlooks two *anesthesia rooms*, three disinfection rooms with individual autoclaves, a darkroom, an X-ray room, two rooms for examining preoperative patients, a lounge for doctors and another for *nurses*; around the central hall are toilets for the operator and his assistants, and other rooms for equipment. But these furnishings seem even more luxurious when one considers that Mount Sinai contains fewer than two hundred surgical patients.

The visitor who wishes to get a precise concept of a hospital of this kind must not fail to take a look at the *basements*, the *nurses' home*, the *private rooms*, and the *outpatient department*.

The *basement* consists of two or three floors located below ground level and is entirely used for service areas: These include the kitchens, the steam laundries, the electric ironing rooms, the boilers, the engines, the dynamos. In Mount Sinai and I believe also in St. Luke's and the Presbyterian Hospital, the basements also contain factories for artificial ice, soda water, mechanical workshops, and even a print shop, all for the exclusive use of the institution.

The *nurses' home* is located in one of the adjacent buildings, but communicates directly with the hospital: It is also luxuriously furnished and has as many rooms as there are *nurses*. The ground floor and sometimes also the first floor is occupied by the classrooms, very elegant living rooms, a library, and a *waiting room* or reception hall where the nurses welcome their acquaintances and where once a year they give their friends a dance party. What more could you want?

The *private rooms* also occupy a small adjacent building: I will note here that these private rooms are the source of extra income for the hospital. These rooms for paying patients are equipped with every comfort, bathrooms, toilets, etc. and are obtained at the price of $25 to $100 per week.

The outpatient department or *dispensary* corresponds to our *ambulatorio*: It consists of a central waiting room, and side rooms for each medical-surgical specialty; there is also a pharmacy for the distribution of free medicines. Here the visits and outpatient treatments are carried out; if the case requires it, the patients are admitted to the hospital, but before definitively entering the wards, they stay for some time in special observation rooms. Here there is a permanent body of doctors on duty for emergencies, and I would also note that the hospital also carries out emergency home service in its district or neighborhood. Such is general practice of all hospitals in New York.

One word I should add about the way these institutions work, which is even more interesting than all the rest. The spirit of organization that characterizes all American life is also admirably expressed in the functioning of hospitals. The same order, the same discipline that you find in hotels, *office buildings*, and railways, exists in hospitals.

The doctors do not receive any salary, but their duties are well understood: The service provided by the *nurses* is impeccable, and if you observe the extreme cleanliness and the care taken with the premises, it is easy to believe that even the supporting personnel are no less diligent. In short, the impression that the European surgeon receives from a thorough and attentive visit to one of these institutions can only be favorable; and it clearly demonstrates that while these colleagues of ours have drawn from our glorious schools, they have a vitality with which they are preparing to surpass us.

[p. 1256]
Chicago, 5 April 1909

The American surgeon has the reputation of being more practical than scientific, a good technician but a mediocre clinician. I cannot say whether this opinion is generally true, but it certainly does not apply to everyone: It would be inaccurate for the Mayos, the Murphys, the Senns, the Deavers, in short, for those who represent the *leaders* (as they say here) of American surgery. But these are also a minority; for the majority, the opinion expressed above might be correct: At least I can affirm that the American surgeon excels more in practical applications that in scientific speculations and that, in the practical field, he enjoys operative technique more than diagnostic investigations.

It is not easy to say why the American surgeon has developed these characteristics: It may be influenced by their personal nature, their environmental circumstances, or their education. Regarding the last of these, I have already made several points in my previous correspondence from New York which I think are important: Their preliminary instruction, which forms the mind of the young person for university study of any kind, seemed to me deficient.

In *high school*, the preparatory courses for scientific knowledge (especially of physics and chemistry) indispensable for medical studies are effectively imparted; however, the literary, historical, and philosophical courses are too scanty for a young man who wants to devote himself to studies as vast and advanced as those of medicine.

At the age of 16-17, the student may have finished *high school* and enrolled in a *medical college*: This may be too young an age for such serious occupations.

The *medical college*, in turn, tries to put into the young man's head in four years only that which is needed *to be a surgical doctor*: It succeeds in this short time to impart the theoretical knowledge, and even more the practical knowledge, that is indispensable to practice the profession.

But there is too much impatience, too great a love of practicality!

At the age of 21, the young man can be graduated, and after a few months of an internship that is customary but not required, he is ready to enter the profession. If he has principles, and means well, he will no doubt conform to the culture of medicine, but can we believe that from his studies he has drawn that education of the mind, the passion and aptitude for research that are necessary for a scientific career? I would say no, judging from what I have observed in America.

The same points have already been made to the Americans by the English.

During my time in the United States, I happened to read in the *New York Herald* a rather silly argument between that journal and the English press: "You Americans," said the European critic, "are superficial people: You give young people a veneer of education, just enough to practice the profession to some degree, and nothing more."

"You Europeans," replied the American paper, "fill the boys' heads with useless knowledge: You stuff them with Latin and Greek, ancient history, and philosophy. Why does a professional need all this? Meanwhile, you exhaust their intellectual faculties so that they have no energy remaining for the studies that are truly essential to their practice environment. After all, continued the journalist, men must be judged by their works: Does England produce better professionals than America?"

I believe the quarrel ended at this point, since I could find no other mention of the subject: But the intelligent American knows that the objections raised are not unreasonable. Indeed, some changes have already begun; the medical school in Baltimore, for example, is beginning to require that young people have several years of preparation in addition to *high school* before entering the *medical college*, some other universities have already made attempts to increase the four years of the medical course to five, and I believe this example will soon be followed throughout the United States.

Meanwhile, with some exceptions, the present generation of doctors suffers from the original defect, and I believe this is one of the reasons why the American surgeon does not have a great passion for strictly scientific research. Instead, he may be an excellent practitioner; indeed, since surgery is an essentially a practical art, outstanding examples are to be found here. Let us see their qualities.

Asepsis is treated wonderfully in American operating environments. During the entire time I have visited hospitals, observing operations or other procedures, I have not noticed a single exception to this fundamental rule of technique. I am speaking not only of the surgeons, but also of the nurses who make all the preparations and directly assist. The American surgeon understands so well the necessity of asepsis that he has made it an undeviating habit.

In speaking with some colleagues in Chicago, I have heard Europe accused of less diligence in such precautions; they told of having witnessed surgical procedures in the famous clinics of Germany where the necessary precautions were not followed. Without making odious comparisons, I could not help noticing that the rules of asepsis are observed in the most scrupulous way everywhere here, not only in the most important clinics or in large hospitals, but even in smaller areas, and in private practice.

Preparation of the surgical patient is done by the nurse the day before, if it is a major operation, otherwise on the same day. After the bath and shaving, she sterilizes her hands and then disinfects the region with ether, sublimate,[10] and finally 95% alcohol.

The utmost importance is given to washing with hot sterile water and soap, and with alcohol: It seems to me that sublimate is used superfluously. A compress is generally applied, usually with boric solution, less often with sublimate 1:1000.

At the time of the operation, the compress is removed and the part washed again with ether, then with a 1:500 sublimate solution, and finally with alcohol. In the surgical department of Webster at the *Presbyterian Hospital*[11] in Chicago it is customary before laparotomies to wash the abdominal wall, and especially the umbilicus, with creosote, then with alcohol.

Disinfection of the hands is carried out with the usual washing in hot sterile water and a continuous stream of soap, then with alcohol and sublimate: American surgeons have been using rubber gloves for a long time (I was told for more than 10 years) and wear them even for the most minor operation. I have never seen cotton gloves used: Instead, I have seen a special type of rubber gloves with a rough surface used to prevent slipping.

Sterilization of the gloves is also part of the nurse's job, and she must regularly examine them to see if they are perfectly intact, then wrap them in gauze. They are usually boiled for 15 minutes in a sodium chloride solution; more rarely they are placed in an autoclave. After boiling they are dried with sterile cloths and sprinkled inside with talcum powder. The gowns, the caps, and the masks to cover the operator's face are sterilized in the autoclave. The forearms are also covered with special sleeves, so that no skin remains exposed above the upper limit of the glove.

The instruments are boiled in the usual soda solution; the cutting edges are also treated in this way, although wrapped in cotton layers; they are then dried with sterile towels and placed in dry basins, on sterile towels.

The silk and *crine di Firenze*[12] are boiled as we do. Horsehair is used extensively in America in plastic operations and disinfected as follows: After repeated washing with green soap and water, it is kept in ether for 24 hours, then boiled in sterile water for 20 minutes; after this, it is preserved in 95% alcohol.

Even the catgut is prepared by the nurse for the exclusive use of each hospital; in addition to the usual treatments, I observed a process here which they call the *formaldehyde method*. In other words, the catgut is immersed for 24 hours in a 5% formalin solution, then kept for 24 hours in sterile water, which is changed every hour; then it is placed in boiling water for a few minutes and set on sterile towels; once dry, it is placed and preserved in a solution of:

1 part corrosive sublimate
200 parts sterile glycerine
1000 parts 95% alcohol

In the clinics of Chicago, I have frequently seen linen thread used for intestinal sutures; indeed, some operators use it regularly for the delicate sero-serous sutures as long as it is prepared in a special way.

Here is this treatment, as one of the nurses in that city demonstrated it to me: The linen thread is boiled for 30 minutes in a 1% bicarbonate solution, rinsed, and left in distilled water for 6 hours. Then it is boiled again for 30 minutes and placed in absolute alcohol for 48 hours, then for another 48 hours in a mixture of colloidin, alcohol, and ether in equal parts with 1% sterile castor oil. After this immersion, the thread is left to dry, which takes two or three days; it is boiled again for one hour in physiological saline solution and kept in a 1:500 solution of *quinosol*.[13]

What special advantage this linen thread has in intestinal sutures I do not know precisely, but I saw it used so frequently here that I started experimenting with it.

I saw no special methods for the preparation of the operating rooms. During the operative procedure the strictest aseptic precautions are regularly used: Rubber gloves are changed every time a suspect area is touched, for example after an intestinal anastomosis; the same applies to the instruments.

Several operators, such as Webster in Chicago, in making the laparotomic incisions use one scalpel only for the incision of the skin, and set it aside immediately afterwards, continuing the dissection of the subcutaneous connective tissue with another blade. I could write extensively about such small precautions, which are nothing new: Taken in isolation, each probably has no great value, but together they give the American operator his special character of precision. We should pay attention to these numerous details, since they are largely responsible for the excellent success obtained here in abdominal surgery.

Anesthesia is another adjunct of which the Americans make good use. For the great majority of cases, they prefer general anesthesia and especially ether. This should not be surprising since ether was first used in this country, and here it remains dominant. From the first experiences in the United States by Long more than half a century ago, and from the first applications made by Warren and the dentist Morton, ether has continued to enjoy the favor of American operators. Chloroform, which has been more popular in Europe for some time, is considered dangerous and problematic here. Substitutes for ether and chloroform such as somnoform,[14] ethyl chloride, and the numerous sedative mixtures of every composition and quality have not taken root. During my entire time in American clinics or hospitals I have seen nothing used but ether, and I will admit that I have never seen such consistently benign and satisfactory anesthesia. Indeed, my impression has been confirmed by Prof. Clairmont of Vienna, who found the same thing during his recent trip to North America and published the same finding in the *Wiener Klinische Wochenschrift* [5].

Ether is used for any kind of operation, alone or preceded by a morphine injection, and even in patients in whom it may seem contraindicated due to possible bronchial complications.

The period of excitation, which we have worried may be rather prolonged, may sometimes be shortened by beginning the anesthetic with inhalation of nitrous oxide: However, I have actually only seen this done at the clinic of Dr. Bevan in Chicago; in the other institutions they use ether alone.

I do not think that the excellence of the anesthesia can be attributed to the quality of the anesthetic agent, but it may be useful to know that almost all hospitals get their supplies from the Squibb company in New York or from the Mallinckrodt factory in St. Louis.

I also do not think the shape of the mask is critical, since I have seen various shapes used: Preference is usually given to those of the small Esmarch style, masks very similar to those often used for chloroform, on the convexity of which the anesthetic is dripped at intervals.

The anesthetic is administered by special personnel and started in a room adjacent to that of the operation (anesthesia room): The patient is brought to the operating room completely asleep. The anesthetist is not always a doctor, but usually is a member of the staff with special competence in anesthesia: At the *Presbyterian Hospital* of Chicago, I saw some magnificent anesthetics performed by Dr. Herb: A few days before my arrival this lady doctor performed her twelve-thousandth etherization; I have heard of some nurses who have even more.

I really do not know what is the secret of such anesthesia: Despite what I have told you, I have not been able to gather any special technique other than continuous attention, without distractions. Of course, if the anesthesia is administered consistently by the same person, he or she will develop a special competence.

Anesthesia is usually started gradually but progressively; the conjunctival reflexes and the pupils are only rarely observed; on the contrary, the patient's eyes are generally covered by a thin layer of cotton and a rubber bandage, which are not removed until after the operation. Even the pulse is not monitored: I have never seen them palpate the radial and very rarely the facial at the lower margin of the mandible. The observation of the breathing is the only concern of the anesthetist, who absolutely must not be distracted by the operative procedure.

To ensure this, I have seen in some clinics a sort of cloth diaphragm applied in front of the patient's head. Many surgeons prefer to entrust the anesthesia to a nurse precisely because she has less interest than a doctor in watching the operation.

Ether narcosis by the rectum is not routinely performed in America, in fact so far I have never seen it done. I know that Brewer in New York has tried it with good results, even introducing some modifications in the technique, but during the time when I observed his clinic at the *Roosevelt Hospital,* I never saw it used.

Even local anesthesia is used more rarely in America than in Italy and I believe this is because the operators are so satisfied with the ether that they use it even for very minimal interventions.

Spinal anesthesia has not been favorably received: I was told that it had been tried, but not adopted. I believe that it was in fact tried with some reluctance and perhaps with some preconceptions. I have not had the opportunity even once to see it used, not even in those cases where it might have been preferable.

As far as technique is concerned, American surgeons are distinguished by great precision. Even the way in which the operating environment is prepared shows particular attention and great care for order and punctuality. The spirit of organization is so marked that the tasks are admirably distributed; I have often observed several interventions performed without a single word being said. In operations on the abdomen the diligence becomes meticulous: Not a single part of the peritoneal surface is left uncovered if adhesions were torn or detached, the bloody parts are sutured, covered, or, if this is impossible, cauterized. The operator therefore gives the impression of being more diligent than brilliant: In general, he is not fast, but very accurate. The instrumentation is reduced to the maximum of simplicity: In New York I observed a surgeon operating almost exclusively with scissors.

Straight needles are almost exclusively used for intestinal sutures. Abdominal drainage is used very sparingly and often in the form of a small *cigarette drain*: This consists of a rubber tube contained in a sleeve of hydrophilic gauze wrapped in turn with rubber. This kind of plug has the advantage of leading directly into a given area, and of being smooth and easy to remove; I have seen it being widely applied in operations on the biliary tract.

In the dressings I have also observed a great simplicity; no drying powders, no ointments. A sterile hydrophilic gauze is applied alone to the fresh wound and kept there until the stitches are removed; iodoform or otherwise medicated gauze is seldom used. The Americans use hypodermoclysis only rarely; it seemed rather strange to me that they more often use enteroclysis.

Nowhere has exploratory laparotomy gained favor more than in America. During my stay in New York I saw a dozen of them; in a single morning at the *Presbyterian Hospital* in Chicago I witnessed four such operations. If you look at the schedule of operations to be carried out on a given day, you note that the description "*abdominal exploration*" is very common. It is further understood that this *exploration* almost never remains such, but is then coupled with one of the various visceral operations that are common in abdominal surgery.

When the operator prepares to do an *abdominal exploration*, it means that he has not made a precise diagnosis, but he suspects that the cause of the disease is to be found in the abdomen. This is a confession of ignorance, which the American surgeon makes quite often and with distinct comfort. I do not mean by this that he completely neglects the diagnostic methods that the art teaches as suitable for making a judgment of the site and nature of a specific disease, but he does not insist on them, and often finds it more convenient to use the scalpel.

Exploratory laparotomy, he says, is a diagnostic tool like any other, indeed it is more benign than many others, and certainly one of the safest. Why must we torment a poor patient with repeated gastric probings, why must we make him swallow bowls of bismuth paste, or make him spend a great deal of money on x-rays, when with a small incision we can remove all doubt in the matter?

The laparotomy itself is benign, therefore there is no reason to reject it, whenever it can enlighten us. As can be seen, the reasoning is not wrong: The premises are correct, and we Europeans can admit this too; but the difference is that the American is more logical and puts into practice more seriously what we simply preach.

But I have not yet mentioned another important element, indeed the most important of all: The customer.

When we Europeans confess to one of our patients the failure of our diagnostic resources, and we propose an exploratory laparotomy, we certainly do not meet with a good reception. The patient looks us in the face with amazement and terror, and he is reluctant to accept such a *criminal* proposal: It seems unreasonable to him that the doctor too ignorant to *understand* his illness; he must not know his job and consequently needs to be changed. So, this reasonable proposal results in a disastrous goal, namely losing the customer.

American patients are much more submissive, indeed, far too submissive. If you spend some time in one of the many surgical *dispensaries*, you will soon agree. They have infinite trust in the art of surgery; they know that with modern means of asepsis the abdomen can be opened and closed safely, and they willingly submit to this rather than enduring diagnostic procedures that keep them out of work. They do not take long to decide, sometimes behaving like children, and submit to what the surgeon wants ... as long as he does it quickly.

Thus, if gastric symptoms have lasted for some time, with a history that suggests surgical disease, exploratory laparotomy is performed without much delay.

But suppose that a patient has vague, uncertain symptoms which may be common to a mobile kidney, chronic appendicitis, cholecystitis, or gastric disease: He consults a doctor, but to no avail; he tries another one, and sees him change the diagnosis. You can be sure that, if things don't get better, the third step is the surgeon, who proposes abdominal exploration. And then, having taken due precautions, he makes his laparotomy incision just large enough to introduce a hand into the peritoneal cavity, and methodically searches first for the appendix, then the kidney, then the gallbladder, and then the pylorus, and so on until he finds the reason for the disease. You can be sure that something will come out; at least the appendix will be sacrificed.

One such case came under my observation a few days after my arrival in America. It involved a lady who had multiple ailments for a long time. She had pains in the lumbar area radiating to the hypogastrium and thigh, but gynecological investigation revealed nothing abnormal; she had gastric troubles but they were not characteristic of any well-defined disease; her right iliac fossa was a little tender, but there was no appendiceal disease in her history; her right upper quadrant was also a bit tender, but she had never been jaundiced; her right kidney seemed somewhat mobile, but she was multiparous. The poor woman had consulted numerous doctors, but without improvement; meanwhile she had become withdrawn and depressed. She finally decided to consult a surgeon, who proposed and performed an exploratory laparotomy. I assisted in the operation: A gallbladder full of stones was found, with some adhesions around the pylorus, and a large, thick appendix containing numerous fecaliths. The adhesions were lysed, the stones were removed, a cholecystostomy and an appendectomy were performed. The lady left the hospital some time later, and now she is recovering well: Obviously, the laparotomy was beneficial!

Here in America a surgeon is never accused of being too eager to operate; as long as he has good results, the public is happy.

A friend of mine, Italian by origin and a surgeon in New York, admitted that he had lost a number of patients by being too reluctant to offer operative treatment. As you can see, things run quite differently than in Europe. Whether this is a good thing or a bad thing I cannot say: It is certain, however, that many of the successes obtained by surgery depend in part on this submissiveness, or rather the unlimited trust that the people have in the resources of the surgical art.

In my time at clinics in New York and Chicago, I saw a huge number of operations for appendicitis. This is, in truth, a very frequent disease in America: Surgeons have a lot of experience with it, and I believe the foundations of such an important chapter in modern surgical pathology were laid here: McBurney devoted a good part of its activity to this topic. Although Kelly was a gynecologist, he did not hesitate to summarize all the knowledge concerning this disease in a masterful work. An unbelievable number of lesser works on appendicitis have also been published in America.

Why appendicitis is so frequent in this country is not yet clear: The reason has been sought in some habits typical of the American people; or in atmospheric circumstances. The peculiar way of eating and the quality of the food would belong to the former: It is known that inhabitants of the big cities in the United States are absorbed in tireless work which lasts from morning to evening and allows only a minimum amount of time for meals, especially at midday. Anyone who has visited the commercial or industrial districts will have seen the fast restaurants or *quick lunches* consisting of taverns, bars, and sometimes shacks or itinerant carts with their crowds of employees and businessmen. There, with little money and in a few moments, they satisfy their appetites by gobbling down food without even sitting down, and immediately return to work. On summer days, they also abuse fruit and iced drinks, resulting in gastritis and enteric disorders that are in turn neglected: These unhygienic habits have been considered as explanations for the frequency of appendicitis.

However, others blame the unforgiving climate of the country: The rapid changes in temperature, the sudden changes between unbearable heat and intense cold, the strong humidity of the atmosphere in the cities located by the sea or on the great rivers are indeed common causes of a many rheumatic diseases, and could be important factors for those who consider appendicitis a disease of this kind.

Whatever the cause, the fact remains that appendicitis is very frequent in the United States, and it has been studied here with great attention by both physicians and surgeons.

The ideas about the etiology of this disease correspond entirely to ours. The diagnostic concepts are the same: In the search for suppuration there is great value in the temperature curve and the pulse; examination of the blood is also done frequently, especially from the point of view of leukocytosis.

In recent years there has been great enthusiasm for the use of the opsonic index.[15]

In this regard, the reader will recall the questions that have arisen about the theory of opsonins and its application in the surgical field both for diagnostic and curative purposes. The measurement of the opsonic index actually gives valuable clues in acute inflammatory conditions, and can reveal not only the infection, but also the pathogenic agent. In appendicitis, since it has a deep focus and is difficult to examine with the usual means, the theory of opsonins has seemed likely to give practical results. Unfortunately, the difficulty of the methods for studying the index and the uncertainty of the results obtained have diminished the importance of this diagnostic method. I came to this conclusion last year following a series of observations made in the Ponti Pavilion,[16] and the research of American surgeons has come to the same result. The use of the opsonic index has declined, and the enthusiasm initially aroused by Wright's theory has faded. Americans are practical people, and when they find that a diagnostic tool does not add real value, or fails to be commonly used, they abandon it.

The treatment of appendicitis is not accomplished here by means other than ours; only the implementation of these means is different.

Appendectomy performed within 24 hours of the first attack is quite common; in my short stay I have seen numerous interventions of this kind, while in all my practice in Italy, I did this only once. In Lausanne and in Bern I did not see a single case, and I remember that Prof. Roux admitted to having performed only about ten such early operations.

The people in this country have their own approach to appendicitis, and recognize the advantages that can be obtained from an immediate intervention. Another circumstance influences the increase in the number of appendectomies in the initial stage, and I want to point this out here as it seems to me to exist only in America. To my amazement, I found that physicians and surgeons get along perfectly here: The surgeon consults the physician willingly and frequently in appropriate cases, and the physician does not hesitate to pass on to the surgeon the cases that are rightfully his.

Thus, an attack of appendicitis is rarely overlooked and often arrives in the hands of the operator in good time: The patient readily accepts an operation, and the curative results are very good. Bevan of Chicago was able to collect 700 cases of appendectomies without purulence (*clean*) with zero mortality, a large part of which were early interventions.

After the initial stage (24-48 hours) has elapsed, the treatment is modified, as in Italy, to expectant management: The Americas prefer moist heat to ice packs; purgatives are severely condemned; opiates are used in moderation.

Appendectomy *à froid*[17] is performed with what they call here the "McBurney method," which seems appropriate: This author was in fact the first [6] to propose splitting the fibers of the abdominal muscles instead of dividing them. The abdominal incision corresponds to the original iliac incision of Roux, and is followed by the retraction of the fibers of the internal oblique and transversus in the direction of their fibers: The appendix is crushed at its base, then ligated and divided with scalpel or scissors, or rarely with thermo-cautery. The small stump that remains is inverted with a purse-string suture: For this, American surgeons usually use a linen thread.

It goes without saying that this intervention is one of the most common and is quick and easy.

The radical operation for inguinal hernia is as widely performed in America as it is everywhere else. It is a large part of general surgery, so all hospitals admit a greater or lesser number of hernias. In New York, however, I found an institution especially for such patients. I don't know if this is a good idea, but the fact is that in this city where the division of labor has been maximized, a strange legacy has brought together hernias (*ruptured*) and deformities (*crippled*) under a single roof. The *Hospital for Ruptured and Crippled*[18] occupies one of the most central places in the metropolis near *Central Station* and the famous *Lexington Avenue,* and here they perform 15 to 20 radical herniorraphies every day: The student who wants to observe a great variety of hernias has only to go there every morning from eight to noon and he will witness a steady series of operations carried out simultaneously on two tables in a magnificent operating room.

The method used is that of Bassini, and Dr. Coley deserves credit for introducing it in America, where it has spread widely. However, during my quick trip I have not always found it performed in the same way. In some Chicago hospitals, the method of Bassini is applied only in the worst cases, namely those where the posterior wall of the inguinal canal is profoundly attenuated and needs durable reinforcement. In some cases of hernia, especially in boys or young men, they often use what they call the *natural* *method*, which they attribute to Fergusson. Basically, this is just our old Bottini procedure, and consists of opening the canal, isolating the sac and excising it: If it is deemed necessary, a stitch is also placed at the internal inguinal ring to rebuild the canal. I have been told that the results are good, and I easily believe it since the cases treated in this way are the most benign. Having consulted some statistics, however, I found that recurrences are more numerous following this procedure than the classic one described by our illustrious clinician of Padua.[19]

Not everyone performs Bassini's procedure in the same way. For example, not everyone is equally convinced of the need to incise the *transversalis* before making the deep suture. Some accept the classic method, while others find that it can just be inverted below the internal oblique and transverse muscles without dividing the fascia, and that this constitutes a sufficient reinforcement of the wall: Thus, the hernia surgeons are divided into two groups, one dividing and the other conserving the *transversalis*. In my experience, I found more of the latter than the former: But never mind! I should not make too much of it.

In the reconstruction of the anterior wall of the inguinal canal I have often seen a small modification applied, which I think has already been recommended in France by Lucas-Championnière. Instead of suturing the aponeurosis of the external oblique edge to edge in front of the cord, they superimpose the lower flap on the upper: The margin of the latter is sutured to the inguinal ligament, and the former is placed on top of it; thus, the anterior wall of the canal now consists of a doubled sheet of the aponeurosis.

The method of suturing the internal oblique and transverse muscles to the inguinal ligament also varies according to the surgeon; In New York I saw silk used, in Chicago linen and chromic catgut.

According to some of them, linen prepared with the process I described earlier should be absorbed only very slowly or not at all; and it should not become infected because it is not absorbent.

Chromic catgut should be absorbed much more slowly than the usual catgut; therefore it should retain its strength until the muscles and inguinal ligament have united. This catgut is prepared in America by large-scale pharmaceutical companies: It is marketed in glass vials, which are opened at the time of use.

Metal wire is not used, or at least I have not seen it used.

Chicago is home to a great university, magnificent hospitals, and talented surgeons. Senn carried out his tireless activity in this metropolis: After long years of work and teaching, he had retired to private life when last year he was seized by a sudden illness and died mourned by his colleagues and fellow citizens. His memory is still alive as much as ever, and his pupils continually praise him. He was an extremely skilled surgeon, and had an additional gift that is not easy to find in America: He was both an extraordinary clinician and a very cultured man. He was said to be equally learned in medical and surgical pathology, so that he was also consulted for cases that went beyond his primary subject matter; his diagnoses were detailed and precise, his lectures highly erudite.

Senn is remembered for his love of Italy and familiarity with our work. They say that when Lorenz came to Chicago to demonstrate reduction of a congenital hip dislocation, Senn pointed out to the famous German orthopedist that the bloodless method should be credited to Paci. When an American surgeon presented work on vein surgery at a scientific meeting, Senn recalled the research of Tansini on porto-caval grafts. The traditions of his school are now continued by his son, who is also a well-known surgeon.

Murphy is now Chicago's foremost surgical personality: He teaches clinical surgery and pathology, and operates at the Mercy Hospital[20] on 26th Street, one of the most modern institutions in the city.

The names of Senn and Murphy are associated with the history of intestinal anastomosis: Indeed, this subject has been carefully studied and energetically discussed more in Chicago than anywhere else.

The reader surely remembers the infinite vicissitudes in developing techniques for intestinal anastomosis: The difficulties of an operative problem which seemed almost insoluble were addressed time after time, with varying success, using a series of more or less ingenious mechanical devices.

According to the literature, the history of anastomotic buttons dates back to Ruggero of Salerno: It is said that this primitive operator introduced very thin elderberry tubes into the lumen of the intestine, onto which he sutured the margins of the bowel. According to Giordano, Rolando supported this technique and described specific principles. However, this topic was bound to be controversial, and indeed Bruno and Saliceto challenged any method that made use of foreign bodies introduced into the intestine.

"*Neque hoc*" (referring to the rudimentary anastomotic buttons) "*neque aliud est utili in hac operatione*."[21]

If we then consult Fallopius [7] we find the most beautiful criticisms of anastomotic buttons: Here are a few lines: "our surgeons of ancient times used sutures, which I still greatly admire ... however some performed the suturing by taking a cinnamon stick or an elderberry fistula and inserting it through the wound into the lumen of the intestine and then sewing up the intestine and the abdomen; and their reasoning was that this method of suture would prevent the chyle contained in the intestine from escaping through the lips of the sutured wound, instead flowing and passing through the tube … But I do not like this method very much, since I doubt that nature will create the fistula according to their intention while the wound is healing; thus the doctor and the patient are deceived; thus I deplore attempting such a dubious and uncertain procedure."

Fallopius had a hundred thousand reasons, but, says an English proverb: *Wrong is the matter in a dirty place*;[22] and when an undertaking is difficult one clings to every means of assistance.

More than two hundred years after the death of Fallopius, specifically in 1888 and in Chicago, foreign bodies in the intestine resurfaced in the form of the Senn plates.[23] The reader is already familiar with the method: It uses two plates of decalcified bone suitably disinfected and armed with wires, which are introduced into the intestinal lumen and brought together to facilitate the anastomosis. The serous surfaces heal quickly, the decalcified bone is absorbed, and the patency and continuity of the enteric lumen is restored.

The Senn plates lasted only a short time in clinical practice: They had their share of enthusiasm, which then waned and gave way to metal buttons. The absorbable and decomposable substance was replaced by steel which could not resolve in the enteric lumen, but was easily eliminated by natural means. Thus, the Murphy button was born.

It would be too long an undertaking for me to describe the advantages of this tool compared to simple suture, its defects, and its risks. It is not as simple as asserting that the simple suture is best for very skillful hands, while the button can be used successfully by everyone: It has been demonstrated that to use the button well you need as much practice as for simple suture.

The other precept which advises us to use the button in urgent cases perhaps contains some truth: It may be true that a virtuoso of intestinal surgery takes equal time in executing the two procedures; however, it is undeniable that the majority of operators save a few moments with the button. From this advantage derive the sympathies which even today support anastomosis with the Murphy button, and still make it a viable method.

Carle, Tricomi, and d'Antona still use it especially in gastroenterostomy: During my scientific travels, I saw Roux use it several times in gastrostomy operations performed with the method of Tavel.

While spending time in Chicago, and having repeated opportunities to visit Mercy Hospital, I was very keen to know Murphy's opinion on this subject. Therefore, one morning between cases I put the question to him clearly and precisely. The professor answered me at length; indeed, addressing all those present, he took the opportunity of my *inquiry* to make a statement.

"*The Italian doctor*," he told them, "wants to know when I use my button and for which operations.

"I use it:

1. In all cases of gastroenterostomy whatever the patient's condition: But here I use the oval button, not the round one.
2. I also use the oval button in all side-to-side anastomoses of the intestine.
3. In end-to-side anastomoses when there is considerable difference in the size of the lumens: For example, in anastomoses between small intestine and colon.
4. I use my round button for anastomoses between two ends of the large intestine.
5. I use the small round button to perform cholecysto-enterostomy.
6. In children, I never use buttons, only simple sutures."

To these declarations I cannot add a word, as someone who has already had too many discussions on the subject to go back to it again.

I would have liked to ask him if he had ever observed any of the complications that have been described, or how he avoided them, but there was no opportunity since he had already begun to operate.

In spite of Murphy's opinions, American surgeons do not make much use of the button: they consider it an unreliable device, and reserve it for cases of extreme urgency; the small model has not been abandoned, and indeed is often used for cholecysto-enterostomy. In all other cases simple sutures have triumphed: I have witnessed a dozen gastroenterostomies, and just as many intestinal anastomoses, but I have never seen the button used.

[p. 1413]

Rochester, Minnesota, 12 April 1909

"Rochester?" the reader may wonder, "Where is this city, and what does it have to do with surgery?"

I fully appreciate your surprise, since this citadel is not even shown on the usual geographical maps: If you want to find it, you must have a fairly detailed and recent map, and then following a straight line from Chicago to Minneapolis, near the border between Minnesota and Iowa, on the right bank of the Mississippi you will find the name Rochester.

It is a township of eight thousand inhabitants out in the middle of the prairies far from any major center, a kind of hermitage in the middle of the Far West, a small town which did not even exist forty years ago.

Nothing remarkable so far, but you will certainly be surprised when I assure you that this town is the Mecca of American surgeons, and contains the best-known surgical clinic in the United States, and one of the greatest in the world!

America is the land of oddities, a land of surprises, and among the marvels that can be observed there, the city of Rochester represents the most interesting for the surgeon.

But here I need to introduce a couple words of history.

About thirty years ago, in the location of Rochester there were only a few cottages gathered around a small railway station: These were residences and farmhouses of a group of pioneers, who made their living from the prairies and woods. A mission of Catholic nuns belonging to the order of St. Francis had erected a small hospital here, and cared for the sick of any country or nationality. The tiny hospital was overseen by the village doctor, a man of great heart and, they say, of uncommon intelligence.

His name was Doctor Mayo, and he had a special passion for surgery: He undertook operations, he studied ways to improve the hospital, and, what is most important, he was able to instill in his children that love for the surgical art that he felt so deeply.

The poor man died while still young,[24] but in the meantime the two young men Will and Charlie Mayo[25] had taken his place, strong in scientific knowledge, passionate for surgery, and full of enthusiasm.

St. Mary's Hospital was transformed: New and very modern operating rooms were added; the two brothers had perfected their studies in European clinics, and had transplanted to their hermitage all the best they could find. They operated boldly and with brilliant results, and meanwhile their fame was spreading. Already all of Minnesota was sending patients to the Mayo brothers, but soon they began to flock from the Dakotas, Wisconsin, Nebraska, and Iowa – in a word, from all over the Far West. The hospital had to be doubled, tripled; hotels had to be built in the town where patients and their relatives could stay during their consultations; doctors also flocked to consult with the two brothers and to assist in the operations.

In short, the Mayos became *Kings of Surgery,* as the Rockefellers were Kings of Oil: In 1908 alone they performed 6,451 operations, including 3,647 just on the abdomen.

The reader will not believe it, and I can understand, because ... I did not believe it either at first. To be convinced, you really have to do what I did: Come here and see for yourself. St. Mary's hospital now consists of two large buildings located at the two ends of the city: One of them welcomes patients with aseptic diseases and contains 215 beds, the other is for infected cases and has another 100 beds. In reality, these 315 beds are not enough for the enormous work, and therefore only patients appropriate for major surgical treatment are admitted and only for a limited time: Those who can be treated with less complicated surgery are housed in the *hotels* or *boarding houses*. Postoperative patients, after their stitches have been removed, are discharged and transported, with due caution, to these hotels to convalesce. But this circumstance makes the clinical material very interesting. Only patients with difficult surgical problems reach the Mayo brothers: The failures of other surgeons, and generally chronic cases, since only such patients can undertake the long and tiring journey. Here you can see numerous abdominal tumors, chronic inflammations of the biliary tract, intestinal and pyloric stenoses, goiters, in a word all that is most interesting in surgical pathology. Here are some figures: In 1908, 1339 appendiceal cases, 75 breast cancers, 20 rectal carcinomas, 97 stomach carcinomas, 167 cases of cholecystitis, 321 with gallstones, 435 goiters of which 239 were exophthalmic, 63 ulcers of the duodenum and pylorus, 50 gastric ulcers and so on.

In the same year, they performed 105 gastroenterostomies, 14 stomach resections, 25 large bowel resections for cancer, 20 rectal resections, 84 cholecystectomies, 330 cholecystostomies, 73 choledochotomies … Clearly everyone else's statistics are destined to pale before these figures, but to persuade the reader of the veracity of such data, I will transcribe here some lists of operations, taking them *entirely* out of my diary: In this way you can see how the *schedules* are prepared for the visitors each morning, and perhaps you will want to make the pilgrimage in turn.

Monday 5 April 1909, 25 operations:
Inguinal undescended testicle: Orchidopexy
Umbilical hernia: Radical operation with the Mayo method
Ditto
Goiter: Thyroidectomy
Ditto
Appendectomy
Ditto
Ditto
Vaginal hysterectomy for cancer
Ditto
Ovariectomy for ovarian cancer: Pedicle torsion
Inoperable gastric cancer: Exploratory laparotomy
Gastroenterostomy for carcinoma

Vaginal hysterectomy for carcinoma of the uterus
Complete uterus-vaginal prolapse: Hysterectomy with vaginoplasty according to the Mayo method
Nephrectomy for hypernephroma
Hernia of the linea alba: Radical operation
Neck lymphomas: Enucleation
Gallstones: Cholecystostomy
Ditto
Appendectomy
Ditto
Ditto
Iliac sigmoid carcinoma: Resection of the sigmoid with amputation of the rectum: Abdomino-perineal method of Quénu-Baudit
Rhinoplasty: Indian method

Tuesday 6 April, 30 operations: Including 2 thyroidectomies for goiter; ectopic pregnancy: tubal abortion and removal of sac; cholecystostomy for gallstones and cholecystitis; 2 gastroenterostomies (one anterior, the other posterior); pelvic ureterotomy for calculus; perineal prostatectomy (Proust method).

Wednesday 7 April, 27 operations: Including thyroidectomy for goiter; cholecystostomy for gallstones; cholecystotomy for gallstones; resection of the entire ascending colon, part of the transverse colon and portion of the small intestine for extensive carcinoma of the hepatic flexure; lateral ileocolic anastomosis; partial cystectomy for cancerous papilloma of the bladder; 2 perineal prostatectomies: Proust method; abdominal hysterectomy for fibroids. Among the minor operations I noted some excisions of cervical lymphomas, a palatoplasty (Langenbeck method), a breast amputation for cancer with excision of the pectoral muscles, etc.

Thursday, 8 April, 22 operations: Including 4 goiters with thyroidectomy, cervical esophagostomy; choledochotomy for calculus: drainage of the liver; cholecystostomy for stone. cystotomy for calculus; cholecystectomy; resection of the stomach for carcinoma of the pylorus. I could continue in this way, but it seems to me that the reader must be tired of all these figures. I will simply summarize by saying that during the six days of my stay (excluding Sundays, when they do not operate) I personally witnessed 150 operative procedures of which 16 were on the biliary tract, 6 on the stomach, and 38 on the intestine.

Do you think that is enough?

The way in which St. Mary's hospital operates is just as amazing: Some have compared this hospital to a large factory: One person described it as similar to the Armour & Company factory in Chicago! This humorist was not entirely wrong, since all the great American institutions have the same qualities in an equally admirable way: Order, discipline, and division of labor.

Thus, in the firm of Mayo Bros. & Co. of Rochester the elder of the two, Dr. Will, deals only with abdominal surgery, while the other, Dr. Charlie, does everything else.

When a patient wants to be treated by the Mayos, he must present himself to the *offices*, which constitute the atrium, or, you might say, the reception room. These offices occupy the entire ground floor of a vast building located in the middle of the city, and consist of a certain number of waiting rooms, a certain number of *departments*, and at least the same number of consulting rooms.

In each department there is a specialist who only evaluates the patient in his area of specialty.

The patient initially passes by the central *department* where a chart is initiated by some women (I think they are *nurses*). These ladies also take a quick history to determine whether they should send him to Dr. Will or to Dr. Charlie. When his turn comes, he introduces himself and begins the report of his ailments, but after a few moments the surgeon has already sensed which organ could be diseased, and sends him to the corresponding specialist.

So, suppose it concerns a stomach disorder. The patient is accompanied to the department of the gastric specialist, who carries out all the investigations that are suitable for making the diagnosis. If he thinks it is appropriate, he admits him to St. Mary's Hospital, gives him the ticket for a bed, and when he thinks the time has come for an operation, schedules it and has it prepared for the next day.

Thus Dr. Will, dealing with an abdominal case, sees his patient reappear after a few days on the operating table with a ready-made and detailed diagnosis: He has only to pick up his scalpel.

But supposing the specialist doctor has not reached a diagnosis, which is not uncommon, although he has put all his resources to work: He has consulted his other colleagues, the *radiographer*, the *chemist*, the *histologist*, whatever he wants ... but in vain. Then he only warns the patient that the diagnosis is unclear, and, if he agrees, he can move on to an *abdominal exploration*. This is accepted without hesitation and then Dr. Will knows he has to make the diagnosis by an anatomical exploration.

One of these cases, interesting from every point of view, came under my observation: It was a gastric patient about 50 years of age: In the remote history there were some symptoms that could suggest a previous ulcer, in the recent history and in the present state something resembling pyloric carcinoma. Altogether unclear, nothing certain, except a pyloric stenosis with evident motor insufficiency. Of course, this proceeded to an *abdominal exploration* where the pylorus appeared a little thickened and firm, with surrounding adhesions and some enlarged nodes: Was it a *hypertrophic ulcer* or a *carcinoma*? Gastroenterostomy or gastric resection?

Dr. Will excised a node and nodded to the nurse, and she pressed a button with her foot: The ringing of a bell set in motion three people at the same time in the nearby Histology Department, namely Professor Wilson, director of the department, his assistant Dr. MacCarty, and the histology orderly.

The first sat down at the microscope, the third at the freezing microtome, the second hastened into the operating room to collect the specimen. The lymph node soon arrived in the department, was quickly sectioned, and after 55 seconds (by my watch), Prof. Wilson had the preparation under his microscope and a few moments later the report was ready.[26]

It was a carcinoma, and therefore a pylorogastric resection was performed using the Billroth II method. The lymph nodes were removed, along with a piece of pancreas that looked suspicious; the patient tolerated the operation very well, and was already undergoing his initial convalescence when I left Rochester. The division of labor and discipline produce real miracles at St. Mary's Hospital in Rochester.

Every morning (except Sundays) operations begin at precisely half past seven simultaneously in three operating rooms located on the same floor. Dr. Will works in one, and it is a temple of gastric, biliary, and intestinal surgery; Dr. Charlie works in the second, and Dr. Judd does minor surgery in the third. The layout of the rooms is such that a visiting doctor can easily pass from one to another without causing any disturbance and observe the most interesting parts of the three interventions that are taking place at the same time. The operations continue without interruption until 1:00 P.M., resulting in five hours of intense work, five hours of true intellectual enjoyment.

Here the most arduous and least common operative acts can be seen, the most interesting anatomical-pathological specimens, the most unusual cases.

In this institution, which is basically just a private *casa di salute*,[27] the most amazing statistics are being created.

Dr. Will can count 1400 operations on the stomach, of which 200 are pylorogastric resections; he has therefore greatly surpassed the statistics of Kocher and Mikulicz, which used to be the most impressive.

The same Dr. Will has also performed 2700 operations on the biliary tract, and has thus broken every record and left Kehr of Halberstadt far behind.

Soon Dr. Charlie will exceed Kocher's number of goiters, and he has already beaten him in the number of operations for toxic goiter.[28]

Such an admirable example of surgical activity could not go unnoticed. American universities have vied with each other to offer professorships to the Mayo brothers, but without success; these sons of the prairie prefer to remain in their center, because there they have created an institution, and given birth to a city. Practitioners, surgeons, and university teachers flock to them from all over the new world and the old, and the Mayo brothers have provided fitting accommodations for them; they established two *libraries*, a surgical society, a *club* where hospital visitors can gather in the afternoon to discuss the cases and operations seen in the morning.

There were no recreational opportunities, so they created a park: What more could you want? Greater hospitality cannot be imagined.

The American Surgical Association under the presidency of Murphy came to pay homage to the two brothers in Rochester. Kocher sent his son Albert there; Mikulicz (1903), Faure and DuBoise (1904),[29] Nyström of Uppsala[30] and Hahn of Breslau (1905),[31] Trendelenburg and Stiles (1906), Pfannenstiel and Kuëster have all visited.

Rochester has become the Mecca of American surgeons, the place of pilgrimage, where you go only for the surgery, and where in no time at all you can ... see all of surgery.

The technical methods adopted by the Mayo brothers do not differ much from those used by other American operators.

Anesthesia is regularly performed with ether and constantly administered by Misses Mary Hines, Florence Henderson, Maude Hubbard, or Margaret Condron:[32] Needless to say, these excellent *anesthetists* do nothing else, and each has administered several thousand anesthetics; last year St. Mary's Hospital had the most famous anesthetist in the entire United States: Miss A. Magaw could count more than 17,000 etherizations; this year she interrupted her brilliant career by marrying a doctor from Iowa.

Asepsis is equally well managed: In general, the patient enters the hospital the day before the operation and is allowed a normal diet; only in cases of gastric surgery is the food restricted to an egg yolk, a little tea, and some fruit. The evening before the operation, the patient takes a bath and receives two ounces of castor oil; gastric lavage is also done regularly in cases of stomach ailments.

Rubber gloves are *always* worn by operators and by all assistants and *nurses*; they are boiled for three minutes in a physiological solution.

For drains, preference is given to the *spiral drain*, a rubber tube cut into a spiral and stuffed with gauze strips; and the *cigarette drain* which I have described previously. In special cases, such as in choledochotomy, special drains are used such as the *fish-tail drain*; but more on this later.

The sponges and compresses are nothing special. Catgut, *crine de Firenze*, linen thread, and horsehair are used for sutures and ligatures. The catgut is usually sterilized with a rather complicated method which goes under the name of "Willard Bartlett Process";[33] after sterilization it is kept in glass containers containing a solution of potassium iodide in 1% methyl alcohol. Chromic catgut is used extensively in intestinal sutures (mucosa and muscular layer), while linen thread is reserved for serosal sutures. Horsehair is used only for skin sutures.

The instruments and drapes are prepared with the usual treatment common to all the American operating environments; in summary, there is very good anesthesia and very careful asepsis.

The Mayo brothers do not require much operative assistance; rarely more than one person helps the operator. I sometimes saw very complicated procedures being performed only with the assistance of a *nurse* or even one of the nuns.

While operating, the two Mayos are not dramatic, nor do they try to be fast; instead they have a calmness and an accuracy superior to any praise. While at work they talk continuously and explain every action or finding to the observers who are always very numerous.

The modesty and courtesy of these surgeons is admirable: they welcome every criticism, they satisfy your curiosity, they treat you as an equal; your admiration generates confidence and respect, and even affection. I was with them for a week, alas too short a time, but I will always treasure the memory of these people in my heart.

The authority of Dr. Will Mayo in biliary surgery is absolutely undisputed. When Keen wanted to publish his great textbook, he begged the Rochester surgeon to write this chapter, and there in plain and clear words are Mayo's ideas on this most important part of abdominal surgery.[34]

The huge number of patients who flock to Rochester with disease of the liver and biliary tracts, and the continuous observation of clinical cases and pathological anatomical findings following the operative interventions have allowed Will Mayo to have an exceptional experience.

In the genesis of hepatic calculi he, like all authors, ascribes the greatest importance to the infectious element. The *Bacterium coli* and sometimes also the typhoid bacillus play the principal part. On the so-called calculous diathesis he does not express himself decisively, but he seems to be skeptical. Regarding the path by which microorganisms reach the bile ducts, he willingly accepts the hypothesis of Lartigan [8] that they travel most often through the portal blood and reach the bile ducts through the hematogenous route.

For the diagnosis he emphasizes above all the history: The existence of chronic dyspeptic disturbances and attacks of colic even if distant and mild, is more important than the search for objective findings such as swelling of the hypochondrium, local pain, or above all jaundice.

In simple gallstones, the disturbances can be almost nonexistent, but when an even slight intermittent infection is added, colic occurs. The cause of the pain is above all the sudden and temporary obstruction of the neck of the gallbladder caused either by a stone or by swelling of the mucosa. The gallbladder fills up quickly with serous fluid, and a spasm of the muscular tunic follows.

In these cases, according to Mayo, there is no fever or tachycardia since the organ is poor in lymphatics so there is no absorption of septic material with sufficient rapidity to produce a temperature elevation. There is almost never jaundice, and the colic is often confused with a stomach disorder.

If a stone remains solidly wedged in the gallbladder neck, then the pain does not disappear quickly and completely as in the previous case, but continues in the form of a dull soreness at the outer edge of the rectus muscle. These are the cases which, contrary to the law of Courvoisier-Terrier, can give rise to hydropic swelling of the gallbladder.

Usually, however, the calculus in the cystic duct does not result in complete occlusion: Attacks of colic occur when it changes position.

In the clinical presentation, Mayo distinguishes three possible symptomatic pictures with cystic duct calculi:

1) There is partial obstruction of the duct with marked and acute infection of the bile. The gallbladder may not be very thickened and therefore may distend; the bile has a marked fecal odor: If the infection extends to the intrahepatic ducts, the symptoms of diffuse cholangitis with chills, fever, and sweats are added; if instead it attacks the pancreatic duct, then the signs of acute pancreatitis are found.

2) The stone is firmly wedged in the gallbladder, the walls of the gallbladder are contracted and thickened, and the lumen contains an infected mucopurulent fluid. There is no jaundice, but episodes of intermittent fever at irregular intervals. Serious systemic findings similar to the symptoms of

absorption of septic materials are observed.

3) The calculus is wedged into the gallbladder and it is retracted and thickened, but does not contain septic fluid: The clinical picture consists exclusively of gastric symptoms, and the diagnosis can be confused with that of gastric and duodenal ulcer.

If there are stones in the common bile duct, according to Mayo, jaundice is found in most cases.

Episodes of colic may not be serious, but are frequent. The jaundice changes from day to day in the initial stages, but can sometimes become permanent, especially in the case of a single, firmly wedged calculus.

The symptoms caused by gallstones essentially depend on obstruction and infection.

If the ampulla of Vater is obstructed, the jaundice is intense and the findings of altered pancreatic function can be added; in all cases, the complications due to infectious cholangitis with fever, chills, and sweats are added.

In such circumstances it happens quite often that the calculus ulcerates through the duct and opens its way to the duodenal lumen; Mayo cites four fairly characteristic cases of this kind. The possibility that stones can form in the common bile duct is demonstrated by three cases in which this occurred a few years after the cholecystectomy had been performed.

Regarding the pancreatic complications of gallstones Mayo has made some important observations and more than once drawn the attention of scholars [9].

In December 1907 he counted 2,200 operations on the bile ducts, in which 141 times he had noted significant changes in the pancreas. Examining these statistics, he noted that the participation of this organ in the morbid process occurred especially with gallstones, and precisely 18.6% in operations on the common bile duct (268 at that time) and only 4.45% of the time in the simple forms of the gallbladder.

Going further in his observations, he noted that in the 141 cases of pancreatic lesions, 124 times the head of the organ alone was affected, and only 17 times the whole organ. The explanation for these facts was not difficult; in fact, it is known from anatomy that in the 62% of cases the last portion of the common bile duct goes through the pancreatic tissue, while in 38% it borders the rear face of the organ in a groove there. The result is a mutuality and an intimate bond for the afflictions of the two organs: Inflammations or neoplasms of the head of the pancreas are associated with functional and anatomical disturbances on the common bile duct, and vice versa.

If a calculus of the common bile duct compresses the duct of Wirsung, the persistence of pancreatic function depends on the patency of the duct of Santorini; but if the mechanical impediment is in the papilla of Vater, the bile may ascend into the duct of Wirsung and cause pancreatitis of a chemical or infectious nature, as the case may be.

In most cases the injured part of the pancreas is limited to a triangle delimited above by the duct of Santorini, below by the duct of Wirsung, and externally by the edge of the duodenum.

Usually, this condition has the character and signs of a chronic inflammation.

Other researchers are working on the relationship of gallstones to chronic interstitial pancreatitis. Riedel reported 6 cases in 1896, and Robson several others in 1900. Mayo agrees completely with these two authors in recognizing two anatomical-pathological forms, one interlobular, the other interacinar. The first is, fortunately, the most frequent: the pancreatic tissue is granular and firm, with a consistency similar to carcinoma; the affected part of the organ is quite enlarged. In the interacinar form, on the other hand, the organ is thin and retracted, and appears atrophic; glycosuria occurs here with great frequency, while it is rarer in the other variety. In the search for a diagnosis there are, according to Mayo, notable difficulties: Many of the symptoms may be referable to cholelithiasis itself, as well as to the pancreatic complication. Jaundice can be due to gallstones: However, with pancreatic complications the skin pigmentation is more intense and the emaciation of the patient more pronounced.

If the calculus is associated with pancreatitis, according to the Courvoisier-Terrier law, there is no biliary tumor, the gallbladder should be retracted, non-distended: This is true, at least according to Mayo, in 86% of cases. With bile duct tumors, the gallbladder wall is little altered: But this is even more true for a carcinoma of the head of the pancreas, or for primary pancreatitis not caused by common bile duct stones.

In thin individuals with very lax abdominal walls, enlargement of the pancreas can be felt on palpation in the interlobular form: but this is not a consistent symptom. A stool test can provide important data about the quantity of fats and stercobilin. Mayo does not give much weight to the Cammidge test.

The Rochester surgeon finds that the prognosis of surgery for cholelithiasis is greatly aggravated by pancreatic complications. There is a definite tendency to hemorrhage, against which he uses chloride or calcium lactate for coagulant purposes before and after the operation. He strongly recommends the removal of the stones, and making sure that the common bile duct is completely free; if possible, he introduces a finger into the lumen of the duct. The extraction of the stones and drainage of the biliary tract constitute the best means of treatment against the complicating pancreatitis: If the alteration of the organ has gone so far as to compromise the patency of the bile duct, all that remains is to perform a cholecysto-enterostomy.

When is operative treatment indicated for cholelithiasis? It is important to return to this question, especially since it appears that America and Europe do not completely agree on it. In the last surgical congress held in Brussels, Kehr confirmed that not all cases of gallstones indicate surgical treatment: Indeed, according to his personal experience, it should be concluded that most of the time one should treat them medically.

This author had the opportunity to observe as many as 4,000 patients with this disease, and only found an indication for surgery 1,300 times. Based on the concept that gallbladder stones are not dangerous in themselves, but only become so when coupled with inflammatory events, Kehr directs the therapy for the primary purpose of healing the inflammation, and bringing the lithiasis back to a state of latency.

Following this principle, the Halberstadt clinician was able to verify that cholelithiasis tends to resolve 80% of the time, and that by following appropriate and continuous medical care, this quiescence of every stormy (*stürmisch*) symptom is equivalent to recovery. According to him, even acute mechanical occlusion of the common bile duct (*akuter Choledochusverschluss*) is, with some exceptions, susceptible to medical treatment: Only when there are signs of cholangitis, and the jaundice leads to systemic weakness, should one proceed to an operation [10].

In summary, most cases of cholelithiasis with or without jaundice are of medical concern: Hydrops, empyema, dangerous gallbladder processes go to the surgeon. I don't know if all Old World surgeons follow Kehr's ideas, but our American colleagues are rebelling against them.

Mayo states as a principle that whenever the diagnosis of gallstones can be made with certainty, surgery is indicated. According to the American school, a gallstone is like a foreign body; it does not belong there. It may be true that it can remain in the gallbladder for a long time without causing trouble, but in practice this does not apply; when the patient presents to the doctor, it means that this stone is causing symptoms; the disease is no longer in the period of latency.

To say that cholelithiasis requires surgery *only* when accompanied by inflammatory events violates basic principles. Isn't it now generally accepted that inflammation and infection of the biliary tract is the cause of stone formation? Who talks about a calculous diathesis today?

Furthermore, if an operation is only deemed appropriate in cases of serious inflammatory or mechanical complications, then one falls into a situation of absurdity: It is inconceivable that a modern surgeon would wait to take the scalpel until the most dangerous complications are present to worsen the prognosis of his intervention.

According to Mayo, this concept would be like waiting on appendicitis until there is peritonitis, or waiting on a hernia until it strangulates.

If we add the statistics to the theoretical arguments, then we must nod our heads. In operations performed for simple calculi of the gallbladder, the Rochester surgeon has a mortality equal to 0.33%: In all operations (that is, including empyema, hydrops, etc.) a mortality equal to 2%.

But please note that these statistics, based on 2700 operations, are not selected figures but complete. The mortalities include those from the famous post-laparotomy pneumonia or typhoid that occurred in the first week: When Mayo tells you that he has 2% mortality, this means that out of a hundred operated on, 2 died, and 98 recovered. Last year (1908) they performed 261 cholecystostomies with two deaths, 100 cholecystectomies with three deaths, 52 choledochotomies with one death.

Now, asks Mayo, admitting that in uncomplicated cases the mortality rate is 0.33%, is it worth keeping an infirmity of this kind, a constant risk, a real sword of Damocles hanging over your head? Is it better to subject oneself to continuous, tedious, unsafe, expensive therapy, such as medical treatment, in the hope not of curing the disease, but simply of bring it back to a hypothetical period of latency; to keep a sleeping lion at home, which could wake up at any moment?

The answer is provided by the American people, who do not want to hear about long treatments and uncertain outcomes, and prefer to risk even more than 0.30%, just to avoid having their activities curtailed. On average, only one out of six people who are found to have cholelithiasis does not consent to immediate intervention: After 1200 cholecystostomies, Mayo has only once observed recurrent calculi.

Given these premises, the reader should not be surprised to find so many operations on the biliary tract in America: Let's not argue about who is right, let's see instead something of the technique ... and it will be better.

For biliary tract operations Mayo uses the Baldwin table along with the Lilienthal elevator;[35] this accessory has the advantage of lifting the right hypochondrium and making a more comfortable operating field for the surgeon. Instead of Péan's or Kocher's hemostats, he uses those of Carmalt; for retractors he prefers those of Simpson or Deaver; to empty the gallbladder he uses the Ochsner trocar aspirator.

For sutures he uses Dilrell-Fergusson needles and the Murphy needle holder; to remove the calculi he preferably uses the long spoon of Robson, or the small baby spoon of Finney. To drain the gallbladder he uses the usual cigarette drain, for the common bile duct the Billie fish-tail tube, which has the great advantage of allowing the flow of bile towards the duodenum, while carrying the excess fluid to the outside (through the drain), thus preventing excessive pressure.

The patient is always put to sleep with ether: Mayo warns that operating around the neck of the gallbladder and the common bile duct can produce spasm of the diaphragm and stertorous breathing. This should be anticipated.

For any operation on the biliary system, Mayo uses a vertical incision which passes through the rectus muscle a few centimeters from its external edge; this incision is long enough to allow the introduction of a hand into the abdominal cavity; if a more complicated procedure requires a wider opening, especially if deeper organs are involved, then he resorts to the incision of Bevan or that of Robson: Kocher's incision has few adherents, and those of Courvoisier and Kehr are absolutely and decisively rejected.

In the exploration of the bile ducts, Mayo is very prudent; before closing the abdomen, he pays attention that the operating field is isolated from the rest of the peritoneal cavity by a flap of omentum.

Of all the procedures I saw performed at the Rochester clinic, cholecystostomy was the most frequent. In fact, it constitutes the usual intervention in biliary lithiasis: The operation of choice.

After exploration of the gallbladder, Mayo draws the fundus into the abdominal wound and carefully isolates it with packs; if there are adhesions, they are divided just enough to have enough space to operate on the fundus of the gallbladder and to palpate the cystic and the common bile ducts. Mayo feels it is not necessary to divide all the adhesions, as you risk opening new areas to infection and the adhesions will reform anyway.

If stones are palpated in the cystic duct or gallbladder neck, it is good to try to move them towards the fundus before opening it.

Once the fundus has been surrounded with gauze, aspiration is carried out with the Ochsner trocar, then the opening is enlarged and the edges are grasped with Carmalt clamps.

The gallbladder lumen is swabbed and cleaned using strips of gauze, then the stones are extracted with a spoon or with an appropriate forceps. Once assured that the bile ducts are patent, the cigarette-shaped drain is introduced into the cystic cavity and the margins of the opening are inverted so that the serous surface comes into contact with the rubber of the drainage tube, then the opening is adapted and narrowed with two concentric purse string sutures.

The fundus of the gallbladder is finally secured to the parietal peritoneum with one or two catgut sutures at the upper end of the incision and the wound is closed. If it is thought appropriate to also leave a drain outside the gallbladder, it will be placed along the lower face of the organ. Mayo generally uses a *spiral drain* (see above) and fixes it in place with a suture of catgut, since the movement of the liver with respiration will otherwise tend to displace it.

For the dressings, he connects the *cigarette drain* to another rubber tube which leads to a small bottle secured to the bandage: Thus, the bandage does not become stained with bile.

The drains are removed on the seventh or eighth postoperative day: Even if they were fixed with a few stitches of catgut, there is no difficulty when they are removed since the suture has been absorbed during this time.

The post-operative diet does not differ from the usual one used after laparotomy. No solid food is allowed until after the drains have been removed and after purging. This is given on the seventh or eighth day in the form of Seidlitz powder or Rochelle salts (never castor oil). The patient usually gets out of bed on the ninth day and leaves the hospital on the eleventh.

The "ideal cholecystotomy"[36] is rejected by Mayo for its many drawbacks, which I will not elaborate.

Cholecystectomy is used only in cases where the cystic duct is occluded, or in those where the gallbladder has become a useless or dangerous organ because its walls have been altered by an inflammatory or neoplastic process.

The technique is nothing special: Puncture of the gallbladder is *never* done, the isolation and the *cholecystectomy* start from the bottom up, that is from the neck towards the fundus. The cystic duct is divided between two clamps. After the organ has been completely removed, the hepatic peritoneum is sutured over the raw surface. A small split drain is usually left (a gauze strip surrounded by a split rubber tube). Postoperative treatment does not differ essentially from that followed after cholecystostomy: The drains are removed on the sixth or seventh day.

One point to which Mayo draws attention is the appearance on the second or third day of a moderate cholestasis manifested by restlessness, pallor, nausea, and vomiting. In such cases it is helpful to use gastric lavage with warm water.

In choledochotomy, Mayo approaches only the supraduodenal and retroduodenal portion of the duct and the parietoduodenal or ampullary portion. He does not approach the retropancreatic portion reached by a transpancreatic route by Terrier and MacGraw, or by the posterior route by Quénu and Wiart; he believes that any stone in the common bile duct can be removed and extracted through the ampulla or above the duodenum.

In the two choledochotomies that I saw in Rochester, the calculus was indeed located in the retropancreatic portion, but could be moved upwards and removed from the opening made in the supraduodenal portion.

In the ampullary duodenal choledochotomy, Mayo uses the McBurney method, on which I do not think it is necessary to dwell.

In the supra- or retro-duodenal choledochotomy he proceeds as follows: To the usual para-rectus incision he adds a second oblique one directed superiorly towards the sternum: He retracts the liver superiorly and inspects the biliary tract. If the gallbladder is distended by liquid or calculi, it is emptied as in cholecystostomy, then temporarily packed with gauze and closed with forceps.

If there is a stone in the common bile duct, it is grasped through the walls of the duct with two fingers (thumb and forefinger of the left hand) and moved upwards. This maneuver almost always succeeds, according to Mayo: Once the calculus has been brought into the retro- or supra-duodenal portion, it is held in this position, while with the right hand two sutures on each side of the stone are passed through the wall of the common bile duct. The sutures are held by two clamps and serve as retractors.

Without removing the left hand from its place, the common bile duct is incised over the stone and it is extracted. The duct is then examined to observe if there are other stones, which can be removed in the same way or with the small Finney spoon introduced into the lumen. If possible, Mayo introduces a finger into the common bile duct (which is very often dilated), and when he is sure that the passages are free, he drains the duct with a *fish-tail drain*, which he secures with a fine catgut suture.

Around this tube he places two or three *cigarette drains*, one of which is in the hepatorenal pouch. Of course, if the gallbladder was opened, it is treated as in cholecystostomy.

However, if the cystic duct is dilated enough to allow the passage of a drainage tube from the gallbladder into the choledochus, then this can be sutured. Drains are removed on the seventh day after the operation; but sometimes they are left until the twelfth day. They are not replaced, but if the tract that remains is wide, a strip of gauze is introduced and changed every day. It may be that there are symptoms of temporary obstruction of the canal: In this case, Mayo intervenes by administering a little calomel.

There were no complications in the two cases I saw. I did not have the opportunity to see any cholecysto-enterostomies performed: I know, however, that in Rochester, as in many other American clinics, the small Murphy button is used in this operation; they assure me it works very well.

[p. 1571]

Rochester, Minnesota, 12 April 1909

Will Mayo has some original ideas about gastric ulcer that deserve to be known. After having operated on several hundred cases of this disease, one has the right to form one's own concepts and the duty to make them known to others: Since 1904, Mayo has specifically found that his data did not correspond with those of other authors.

While it is commonly believed that duodenal ulcers are rare, accounting for 10% of gastro-duodenal ulcers, he found them to be far more frequent. In 231 operations performed for ulcers, he found them 139 times in the stomach, 60 times in the duodenum and 12 times simultaneously in both organs. Thus, 72 of the 231 involved the duodenum, which meant a frequency of about 40%.

Why this difference? Evidently it could not be believed that ulcers were in the duodenum more often in America than in Europe, or that the disease had changed its location in recent years. Instead, Mayo believes it is a question of an error of calculation or study: Gastric ulcers have been confused with duodenal ulcers. While some gastric ulcers were being discussed, diagnosed, and treated, they were actually duodenal ulcers.

In previous years, statistics were developed from cadavers, and in these the secondary morbid complications obscured the field so that the primary site of the lesion could not be precisely established. Most ulcer patients do not die directly from their ulcers, but from some intercurrent illness, especially secondary anemia or malnutrition. Over time, the ulcerative process in the first portion of the duodenum extends and, according to Mayo, can go beyond the pyloric ring; These ulcers, observed on the autopsy table, were thus described as pyloric, and classified with the large group of gastric ulcers.

Judging whether it is one location or the other can be difficult even at the operating table, that is, when the disease is still localized to its primary site. In order not to fall into error, it is necessary to orient oneself according to the two veins which join to form a circle around the pylorus, marking the limit of the duodenum. These are easy to recognize on the external or serous surface of the organ. Following this guide, the surgeon of Rochester was able to show that many of the ulcers that would have been attributed to the stomach were actually in the first portion of the duodenum.

But Mayo's observations do not end there; he has been able to ascertain that while ulcers of the stomach affect the two sexes almost equally, those of the duodenum are more frequent in men. Out of 100 cases of duodenal ulcer, only 23 belonged to women: That is, precisely the opposite to cholelithiasis, which affects men 24% of the time and women 76%.

Mayo wanted, rightly or wrongly, to relate these two facts, and noted that the relationship of the duodenum to the common bile duct is different between the two sexes.

While the first portion of the duodenum ascends obliquely in men, it is horizontal or descending in women: It follows that this section of the intestine is closer to the common bile duct in the female than in the male. Furthermore, the alkaline biliary and pancreatic secretions can reflux more easily in women than in men, and thus neutralize the acid chyme in the first portion of the duodenum more effectively.

The differential diagnosis between duodenal and gastric ulcer is difficult; however, according to Mayo, it is possible in most cases. In the former, the pain usually spreads from the midline to the right, arises several hours after eating rather than immediately, and the affected persons suffer from a particular feeling of hunger when fasting.

Unlike gastric ulcers, duodenal ulcers rarely degenerate into carcinoma. Of all the carcinomas of the upper digestive tract observed and operated on in Rochester, only one *probably* arose from a previous duodenal ulcer.

As far as the surgical cure is concerned, the Mayo experience provides interesting data. With respect to the surgical therapy of peptic ulcer, he divides his experience into three periods: The first prior to 1900; the second between 1900 and 1903; and the third after 1905.

During the first period, surgery was limited to stenoses from scarring; therefore, this complication of the ulcers was treated rather than the condition itself. The results obtained were brilliant, and since it solved a simple mechanical problem, the improvement followed immediately and was felt.

The operative procedures applied during that time were gastrojejunostomy and pyloroplasty. The latter, performed in the manner of Heineke-Mikulicz, did not give consistent results; indeed, a third of the patients had to subsequently undergo another operation.

The first of these was performed with the Murphy button, but this resulted in some complications. The overall mortality reached 6%.

In the second period (1900-1905), encouraged by the brilliant curative results obtained on the strictures, Mayo wanted to extend the intervention to cases of active ulcer without stricture. The operative mortality decreased slightly (5%) as the technique was improved, but the therapeutic results were not very encouraging. While the complaints from mechanical stenosis resolved, those from active ulcers were only moderately improved.

Mayo was one of the first to reduce enthusiasm for gastroenterostomy in the treatment of gastric ulcer; he noted that the stomach is not just a bag which empties due to gravity, but a muscular organ which peristaltically carries the contents in a given direction. If the pylorus is opened up, the chyme can more easily continue on its way towards the duodenum, rather than into the jejunum.

However, when the ulcer is located some distance upstream of the pylorus, a certain benefit is produced by gastroenterostomy due to the passive drainage of gastric juices through the new opening when the stomach is fasting, that is inactive. At this time Mayo began to associate the excision of gastric (non-duodenal) ulcer with gastrojejunostomy. But here there were new problems, since in a some cases presenting as peptic ulcer, it was possible to palpate and find the lesion, but in others this was not possible.

Mayo wanted to compare the results obtained from simple gastroenterostomy in the two groups of ulcers, that is, in those with induration apparent on external examination of the organ, and in those that were not detectable by palpation. He found that in the former the operation brought advantages, but in the latter it did not. Unable to explain the reason, he began to question whether some of the cases that came to the operating table for ulcers might instead be presentations of other disorders of the digestive system that cannot be treated surgically, or at least are not susceptible to improvement with gastroenterostomy.

With this in mind, he initiated a study, and in cases where he was unable to definitely palpate an ulcer, he began to methodically and diligently examine the other abdominal viscera. To his amazement, a good number of these patients had abnormalities in the cecum, in the appendix, and especially in the biliary tract. Considering appendicitis, typhlitis, and cholecystitis with or without gallstones, he concluded that some of the typical symptoms of gastric ulcer, and especially pylorospasm, can be produced by any irritation of the intestines or biliary tract. From this he concluded that the real cases of ulcer that can be healed with gastroenterostomy are those in which the ulcer is demonstrable by palpation. They stopped treating patients with non-palpable ulcers surgically in Rochester.

We thus enter the third period, in which, once the doubtful cases have been eliminated, the curative results are once again brilliant. In simple stenosis due to scarring he performs gastroenterostomy with the Mayo modification (see below). In duodenal ulcers, which are not liable to degenerate malignantly, the same operation is the rule. In active stomach ulcers, excision is usually accompanied by gastroenterostomy, and if the disease resides in the pylorus and the alteration is extensive, pyloro-gastric resection is also used. By the end of 1907, 234 cases had been operated on: 189 of them were cured, 21 improved, 10 felt no advantage. Overall mortality had dropped to between three and four percent.

Will Mayo has the largest number of gastric resections in the world: In August 1908 they presented at Homer[37] 191 gastrectomies performed for pyloric carcinoma alone: During my stay in Rochester, I witnessed his 230th resection of the stomach.

The results he obtains are relatively good, as they are for several colleagues.

First of all, the ease with which exploratory laparotomy is carried out in America means that a good number of gastric carcinomas will undergo operation when they are not only resectable, but the neoplasm has not extended beyond the local area and the lymphatics are still intact. Mayo can give the most brilliant proof that even in depleted individuals such as those afflicted with cancer, an exploratory laparotomy is still benign.

Out of 25 such operations, he did not have a single death. Although many of his *abdominal explorations* are performed in somewhat dubious cases, they ended up with pyloro-gastric resections due to cancer, and were followed by good results.

In my correspondence from Chicago I have already said enough about the American concept of laparotomy as a means of diagnosis: I think I am justified in saying that if there is an condition where this intervention should be considered, it is indeed gastric carcinoma; offering exploratory laparotomy rather than waiting for other diagnostic methods will make a radical cure more likely and more effective.

Regarding the method, the Billroth II is favored in Rochester; indeed, no other method is used. If the reader has seen my report from Bern, he will be interested in a description of gastrectomy as performed by W. Mayo; I will provide it here.

After the usual preparations and under ether anesthesia, he makes an incision from the xiphoid to the umbilicus large enough to introduce his (left) hand into the abdominal cavity; by palpation, he performs a classic *exploration*; if a tumor is found, he lengthens the opening inferiorly a little and places retractors on the edges of the wound: In the case that I witnessed, he wanted to verify the diagnosis by histological examination; he excised one of the enlarged nodes by the greater curvature and handed it over to one of the assistants.

After a few moments the response indicated the nature of the neoplasm; then Mayo isolated the pylorus from its omental attachments along the lesser and greater curves for about 3 centimeters beyond the limits of the tumor: he removed the nodes and resected a small section of the head of the pancreas which did not appear completely normal. He applied two crushing clamps on the duodenum and divided it between them, cauterizing the stumps. He oversewed the limbs of the (internal) crushing clamp with a running suture so that it would not let go, then he made a similar suture around the other forceps, leaving the ends free; he tightened them only when the assistant removed the clamp; the duodenal lumen thus remained completely sealed at the crushing line. He inverted the stump and secured its closure with two purse-strings of linen suture, then carefully buried the stump with retroperitoneal connective tissue flaps and with omentum.

He then proceeded to the resection of the tumor on the other side, applying two long crushing clamps some distance from the tumor and cutting close to the one placed inwards (i.e. towards the pyloric end): He cauterized the bleeding muscle but not the serosa, and closed with a full-thickness suture, to which he added interrupted stitches of linen, and finally a continuous sero-serous suture, also of linen.

The full-thickness suture of the gastric walls deserves to be described in detail, but for that purpose it would be necessary to help the exposition with illustrations: It is a very original mattress suture performed so as to invert the layers in order to solidly face the peritoneal surfaces; this suture is performed with chromic catgut, while the others (sero-serous) are made with linen thread prepared with the usual celloidine (Pagenstecher method[38]).

Resection of the tumor was followed by posterior gastrojejunostomy (with simple sutures). This was followed by closure of the abdominal wall in layers: The entire operation lasted an hour and ten minutes.

The early results are absolutely good: The average mortality is 14%, although the gastrectomies performed in 1908 had an unusually high mortality (18%). The reader will also wish to know something of the long-term results, and thanks to the extreme kindness of W. Mayo, I can provide this too.

From 1903 to 1908, 126 patients were operated on, of whom 88 were male and 38 were female: The average age was 51 years. Of these operated including all of 1908, 78 have died, that is 61%; 42 are alive, which is 33.5%; another 6 are alive but in not very good condition.

Among the mortalities:

14 survived for less than 6 months
14 survived from 6 months to 1 year
16 survived from 1-2 years

10 survived from 2-3 years
2 survived from 3-4 years
2 survived more than 4 years
6 died after an unknown amount of time
14 died a short time after the operation
78 total

Of the 42 alive at the end of 1908 and in good condition:
11 underwent operation less than 1 year previously
9 underwent operation 1-2 years previously
14 underwent operation 2-3 years previously
4 underwent operation 3-4 years previously
3 underwent operation 4-5 years previously
1 underwent operation more than 5 years previously
42 total

As you can see, the figures are relatively encouraging!

During my stay in Rochester, I had the opportunity to observe a considerable number of gastroenterostomies, and I noticed a modification of the usual technique which deserves to be mentioned.

When performing an anterior or posterior gastrojejunostomy, the textbooks say to choose a loop 20 or 30 centimeters from the ligament of Treitz and to attach it to the gastric wall so that peristalsis takes place in the two organs in the same direction; in a word, the stomach and intestine are *isoperistaltic*.

This precept has been undisputed for a long time, and this seemed to be a good precaution to prevent the so-called vicious circle.

Mayo disagrees with this principle. He has observed that in most cases the first loop of the jejunum runs from right to left; only exceptionally does it go in the opposite direction, and in those cases there is actually an abnormally developed ligament of Treitz which forms a peritoneal fold that follows the intestine itself for a little while. If we place the loop in an isoperistaltic direction, we are obliged to give it a direction from left to right; that is, to reverse the natural disposition in most individuals. This deviation, according to Mayo, does more harm than good; instead of preventing a vicious circle, it causes it.

Following his own ideas, the Rochester surgeon leaves the loop in its natural position without worrying about isoperistalsis. Indeed, there is more: Considering that the exceptional disposition from left to right represents a developmental defect, he corrects it by severing the peritoneal fold and the ligament of Treitz for a certain distance; the loop then goes spontaneously from right to left and in this orientation he attaches it to the gastric wall.

I do not know if Mayo's observations are correct, but the modification he recommends has now been applied many times. In about a thousand interventions of this kind, no vicious circle was ever observed: The new technique also seemed reasonable to many others, and I know that Ochsner in Chicago also uses it routinely.

If he is convinced, the reader can also try it out.

Baltimore, 23 April 1909

Medical doctors consider the city of Baltimore to be the Athens of the United States: Here is the Johns Hopkins University, here is the Johns Hopkins Hospital: Two renowned institutions which, born through the generosity of a private individual, have acquired fame and dignity for the diligent work of its superb teachers. Among the obvious people who belong to the medico-surgical faculty, the reader will know Kelly, Cushing, and Finney.

During this same year, the Atheneum of Baltimore has suffered the serious loss of Prof. Osler, director of the medical clinic. This great scientist was called to the University of Oxford in England.

Kelly is universally known as a gynecologist: However, his activity also extends beyond this specialty. His valuable monograph on appendicitis is evidence for this. The works of this author on direct cystoscopy and on ureteral catheterization in women are also familiar. His method is so well known that I don't think I need to describe it: During my stay at the Johns Hopkins Hospital I had the opportunity to see it applied by Kelly himself. I was told that he uses it often with good results.

The impression I got from it was not very positive: I did not like the procedure, and it was not really because I had already seen it applied by Mangiagalli when I was an assistant at the clinic in Pavia; nor did my opinion change having seen it done by Kelly himself. It seems to me that direct cystoscopy has no purpose since the brilliant results obtained by Nitze's instrument:[39] and the spread of the latter approach not only in Europe but also in America convinces me that I am correct.

Kelly nevertheless persists in using his method, and the scholars who observe or visit the Johns Hopkins Hospital always attend the cystoscopy sessions, which he holds frequently in a special room of the gynecological clinic.

Cushing's work in the field of brain surgery is widely known. This operator has brilliant statistics of resections of the Gasserian ganglion (I think about eighty cases, with a 2% mortality rate). He performs trepanation of the skull and opening of the ventricles in cases of severe acute uremia, both congenital and acquired hydrocephalus, and even in basilar skull fractures. In cerebral hemorrhages he also uses trepanation to decrease the intracranial pressure, and in some cases also for extraction of the clot. The results of these bold operations are sometimes good: I believe, however, that the statistics are still too sparse to justify a definitive judgment.

Cushing is Associate Professor of Surgical Pathology at the Medical College but is specifically charged with the teaching of operative surgery. I was able to attend some of his lectures, and I found them quite original.

The course on surgical technique is held in one of the experimental pathology institutes adjacent to the Johns Hopkins Hospital and consists of a series of theoretical lectures followed by practical exercises done not on the cadaver but on living animals, such as dogs. Following this path, Cushing accustoms his pupils to operate *in vivo*: That is, to practice asepsis, anesthesia, and hemostasis; students also get some experience in following the post-operative course. These are real advantages, which, however, are partly offset by the anatomical diversity.

Finney teaches in the surgical clinic and works in the great amphitheater of the Johns Hopkins Hospital. He has a definite preference for abdominal surgery, and also has his own methods. Thus, in pyloric stenosis he often practices gastroduodenostomy with a procedure which somewhat resembles that proposed by Jaboulay in France.

I cannot comment on the value of this operation, not having seen it carried out. However, I believe that it does not have real advantages over gastrojejunostomy, while it has all the defects attributed to pyloric surgery. The fact that I have not seen it practiced even in America shows that it has not been accepted.

New York, 28 April 1909

My travels through the United States are drawing to an end: However, I cannot finish these surgical notes without making a brief reference to some experiments which I had the good fortune to witness at the Rockefeller Institute for Medical Research.

I am referring to the experiments of Alexis Carrel, and I hope that the reader will forgive my digression from the clinical field of surgery field to that of experimental research. The work of Carrel is of major importance for surgery, and certainly a topic of great popular interest. The results of these ingenious and daring investigations are known to both the academic world and to the public, as they have been circulated by popular as well as scientific journals. It may be useful for the Italian surgeon to know what is real in such news, and what is inexact or exaggerated, to learn some details from someone who was a first-hand witness.

Thanks to the extreme courtesy of Dr. Carrel and Prof. Flexner, director of the Rockefeller Institute, I was able to witness a series of experiments, and I had the opportunity to follow the operated animals in order to form exact concepts not only on the surgical technique, but also on the importance that these studies may have in the future of the surgical art.

In fact, I have witnessed numerous transplants of arteries and veins, two ear transplants, and two transplants of an entire lower limb. I was also able to observe and follow quite a few animals previously operated on for visceral transplants, such as kidneys, and I have examined a series of anatomical-pathological preparations produced by Carrel from his previous experiments.

Let us begin with the vascular transplants.

Transplanting one section of artery to another is not a new operation [11]. Jaboulay made the first attempt of this kind in 1896, hoping to use this method for the treatment of aneurysms. His experiments failed; the anastomoses were imperfect, and thrombus formed on the suture lines. Nine years later, Höpfner succeeded in transplanting arterial segments using the method of Payr (internal canalization using magnesium tubes); thrombosis was, however, rarely avoided. In 1905, Carrel introduced his circular suture procedure, and found that it gave good results even when the vessels were of different calibers.

The transplantation of an arterial segment onto another of the same caliber is a fairly rapid and not particularly difficult operation, once one has acquired some practice in vascular suturing; it does require a certain flexibility of the wrist and above all excellent visual acuity; Carrel uses extremely thin straight needles and almost invisible silk thread: To see these threads, he surrounds the operating field with black sterile cloths.

The reader undoubtedly knows the process of anastomosis: It is a so-called *simple suture* method, and the sutures involve only the adventitia and the media; the intima is brought together by its internal or endothelial surface. Carrel first places three primary sutures which give the vessel the shape of a triangle: He supports the vessel by these three sutures, from which he leaves the threads long, and then completes the closure of the three intermediate sections with continuous sutures using one of the two threads of the primary sutures and tying a knot at each corner of the triangle. To further prevent blood clotting or thrombosis, he sprinkles the operating field and also the two vessel openings with a very thin spray of sterile Vaseline.

When the vessels have the same caliber, the surface at the anastomosis remains smooth, and after a few months the transplanted segment has absolutely the same appearance as the normal vessel. With no caliber modifications, there is no stenosis or dilatation, and the wall retains its elasticity and normal thickness. I was able to observe this at the Rockefeller Institute on preparations of anastomosed and transplanted arteries: The anastomosis becomes merely a thin whitish line. Microscopic examination shows that the wall does not undergo any major alteration.

The muscular and elastic fibers of the media remain normal: Only a slight increase of the interstitial connective tissue is noted. The intima is a little thickened in some places. In the preparations taken from transplanted arteries seventy days earlier, it is difficult to distinguish between the normal and the transplanted parts. The early and late functional results are excellent; I observed several dogs in which transplants of primary carotid or other arteries had been performed several months before. These animals were maintained in completely healthy condition.

Unfortunately, such experiments, although brilliant in their results, do not seem likely to be applicable in man, since it is difficult to procure fresh segments of human arteries. If it were possible to replace sections of artery with sections of vein, the practical problem would be solved, since it is easy to remove long and very accessible venous trunks from the patient himself. Even this kind of experiment is not new since Gluck tried it in 1898, Exner and Höpfner in 1903; but thrombotic events always intervened.

In 1905, Carrel successfully transplanted a long section of the external jugular into the common carotid artery. I have observed three or four such interventions at the Rockefeller Institute, all with excellent results.

The operation becomes more difficult, because aligning the two intimal openings is more laborious. However, the vein resists arterial pressure very well, indeed its walls undergo marked modification. Fifteen days after the operation, the wall is already quite thickened due to an increase in the connective tissue of the adventitia and the interstitial muscle fibers of the media. Four months later this thickening is even more marked: The muscle fibers do not increase but remain normal.

Even the long-term results are very good: Observing a dog after eight months, it was possible to see that the lumen of the vein was a little larger than that of the artery to which it had been transplanted, but its walls were thick and resistant; there was no stenosis or dilatation.

Carrel went even further: He tried to transplant some vascular segments after having kept them for some time in Locke's solution, in an absolutely aseptic medium, and at a temperature of one degree below zero.[40]

Here too the results were satisfactory, as a segment of carotid artery belonging to one dog and preserved for 10 days was able to heal to the carotid artery of another dog. Subsequent histological examinations demonstrated that the vessel was preserved in excellent anatomical and physiological condition.

The fortunate experimenter went further; and tried to transplant vascular grafts from species to species; that is, obtaining them from individuals belonging to different species. Here the results were less brilliant: If the transplanted tissues belong to a species far removed on the zoological scale, then they tend towards that process known as cytolysis; that is, the elements rapidly break down, are destroyed, and disappear. If they belong to less diverse species, then they do heal, there is no cytolysis, but some degree of atrophy occurs. Finally, if the species are related, then the results are absolutely positive.

Several attempts at heteroplastic transplants have been made by Höpfner of Berlin, but with very inconsistent results.

In 1906, Carrel succeeded in transplanting a section of the carotid artery from a dog into a cat: It succeeded, and the animal was presented to American Physiological Society; the cat is still alive, and everything suggests that the artery remains in excellent condition. Many other attempts between cat and dog have been made at the Rockefeller Institute, all of which were rewarded with a happy result. However, although there is no cytolysis, some signs of atrophy often appear in the grafted vessel segment: The individual elements, and especially the muscle fibers, decrease in number and volume; the vessel is often transformed into a tube mostly formed of connective tissue, but this vessel remains strong and vital, and it can function as an artery for a long time.

Transplanting whole organs is not original: Fox and Knauer grafted the ovary, Cristiani the thyroid. However, these transplants can be performed without a vessel anastomosis, and therefore, from a surgical point of view, they are nothing new. The true innovation that allowed Carrel to transplant not only small organs, but entire large viscera, is the vascular anastomosis.

During my stay in New York I saw two ear transplants, two of the lower extremity (thigh, leg and foot), and finally a dog in which both kidneys were removed and then one of them was returned to its normal place.

I will begin with the first ones.

Carrel removes the auricle from a recently killed dog with its external auditory canal, a portion of epicranial scalp, lymph nodes, and part of the original carotid artery and jugular vein: That is, a large flap of tissue with its vessels and nerves.

After preparing the vessels (carotid and jugular) he inserts a cannula into the artery and infuses Locke's solution until it comes out of the peripheral arterial and venous openings. The same resection is performed on another living dog and the first tissue specimen is placed over the bloody surface of the second dog: The ends of the carotid arteries and of the jugular veins are united with the usual methods and circulation is immediately established itself in the auricle.

The peripheral arterial branches now bleed profusely, and they are immediately grasped with hemostatic clamps and tied off. The new ear is attached with a circular suture of the cartilaginous canal; the auricular muscles are reattached, and the operative procedure is completed with the continuous suture (in catgut) of the skin without drainage. In the experiments that I witnessed, the wound healed by first intention, although there was some edema of the part in one case. After a few weeks, the new auricle had attained a normal appearance and consistency; only the color of the skin and hair gave evidence that the transplant had occurred.

During my stay in New York I did not have the good fortune to see any kidney transplants performed: Instead I had the opportunity to observe and follow a dog who had two kidneys removed and one of them put back into place. In this experiment, Carrel had removed the animal's left kidney, dividing all natural vascular, nervous, and ureteral attachments: The organ was extracted from the abdomen, infused with Locke's solution, and some of this solution was also injected through a cannula into the suitably prepared renal artery. After a few minutes the organ was put back in place, and the vascular anastomoses (arterial and venous) were performed as usual; the ureteral openings were also sutured together. The postoperative course had been normal: No complications had been observed.

On the fifteenth day after the first operation, the dog underwent a second operation, namely a right nephrectomy: This operation too was successful. The dog lived, showed no signs of uremia, and returned to a condition of perfect health, although now it only had the left kidney that had been removed and replaced.

During my time at the Rockefeller Institute, the animal had already recovered from the operative wounds, and appeared to be in a condition of absolute well-being: The urine did not contain albumin.

This experiment seemed to me important by demonstrating that the section of the nerves, temporary suppression of circulation, and perfusion or lavage with Locke's solution [12] does not produce such deleterious effects on the kidney as previously thought.

The transplantation of an entire lower extremity (thigh, leg, and foot) was the most dramatic operation I witnessed at the Rockefeller Institute. I saw two of them performed, as I will describe.

Carrel prepares two dogs of the same breed and of about the same size: He sacrifices one with an overdose of chloroform, and a few minutes after death he removes one of the lower extremities (or I should say posterior extremity since it is a dog) with a circular amputation through the middle third of the thigh. In performing this amputation, he pays special attention to the femoral vessels: The artery and vein are isolated carefully and dissected out more than the other tissues. Once the limb has been detached, Carrel inserts a cannula to the arterial opening and infuses Locke's solution until it drips out of the femoral vein.

Next, he lavages the rest of the raw surface of the amputated limb with the same solution and sprinkles it with a very thin layer of sterile Vaseline to prevent the blood from clotting. The limb is now ready for transplantation.

He anesthetizes the second dog (with ether) and performs a similar amputation through the thigh of the homologous extremity; here again he carefully prepares the femoral vessels, which he occludes with gentle pressure hemostatic clamps. He apposes the raw surface of the stump with that of the first amputated limb such that the individual parts are aligned with each other.

The bone ends (femurs) are joined by means of a perforated aluminum tube, which is introduced by gentle pressure into the medullary cavities; once the skeleton has been fixed, Carrel proceeds to suture the internal muscles of the thigh, i.e. those that form the floor of the femoral triangle (adductors, quadriceps, etc.) Next, he performs the anastomosis of the femoral vessels, starting with the arterial openings and following the usual method of silk suture performed with threaded, very thin straight needles, after applying the three primary sutures. Before suturing, Carrel coats the operating field and also the internal surface of the vessel (endothelial surface of the intima) with a very light layer of sterile Vaseline, again with the aim of preventing coagulation. Once the arteries have been connected, he loosens the two hemostatic clamps to observe whether the anastomosis is perfectly sealed and tolerates the pressure; if there is no problem, the blood should drip from the vein after a few seconds.

The venous ends are brought together immediately afterward using the same procedure: Then the hemostatic clamps are completely removed and the blood circulation is perfectly restored in the limb: The pulse in the foot is clearly palpable, the limb takes on the normal living color, and blood drips from the unstitched surfaces of the tissues. The final stage consists of suturing the nerves, muscles, aponeurosis, and finally the skin. The area is bandaged and covered with a starch plaster cast, and the animal is placed for some time in a special electric *drying cage*.

During the immediate postoperative period it is kept in the *animal hospital* and continuously watched over by a *nurse*, who has no other duties.

Of the two lower extremity transplants I saw at the Rockefeller Institute, one failed due to subsequent inflammatory complications, which made the postoperative course extremely stormy. The other, however, had a fortunate outcome: At the time of my departure from New York, i.e. about a month after the operation, not only was the pulse in the foot clearly perceptible, but the condition of nutrition throughout the limb was excellent. It was of course too early to render a judgment on the future function, especially regarding sensitivity and motility.

In any case, the observed result convinced me absolutely of the possibility of transplanting an extremity from one animal to another. Despite the temporary interruption of circulation, the irrigation with Locke's solution, the separation from the central nervous system, and even more the *change of domicile*, the limb remains alive and heals admirably.

The practical applications of these admirable and audacious experiments I dare not say, nor do I want to make foolish predictions. Nothing prevents you from believing that the same interventions should produce similar results also in man, but the difficulty of finding the tissue for transplantation will not soon be solved in practice. However, even if it is not possible to think about transplanting entire organs or viscera, it may open the field to smaller transplants, for example to those of vascular parts or segments: Matas of New Orleans has already provided an example in a case of popliteal aneurysm.

But I don't want to speculate; only to give an eyewitness report. With this, I will close this digression, along with my correspondence from the land of America.

Original Notes

1. These are the standards required for admission to most medical colleges. Later, I will describe the modifications recently introduced in some universities.
2. All of this refers to the state of New York. The rules are similar in the other states but have some variations.
3. Luzzati. La *Training School for Nurses* nel *St. Luke's Hospital. Annali di Medicina Navale*, July 1907.

4. The cost per patient *per day* is equal to $5.38 or 11.90 Italian *lire*. These data were taken from the 55th *Annual Report of the Mount Sinai Hospital*, published on 1 January 1908.
5. Clairmont. *Chirurgische Eindrücke aus Nordamerika*, *Wiener Klinische Wochenschrift*, 1908.
6. See McBurney. "The incision made in the abdominal wall in cases of appendicitis with a description of a new method of operating," *Annals of Surgery*, 1894.
7. See the most recent edition of the very erudite treatise on operative medicine by Giordano.
8. Lartigan, New York Academy of Medicine, 1902.
9. See in this regard in addition to the textbook of Kehr: W. Mayo, Pancreatitis resulting from gallstone disease, 1908. Am. Med. Association.
10. See Report of the Congress of Brussels. *Zentralblatt für Chirurgie*, no. 45, 1908.
11. These brief "surgical notes" do not enable me to go into a complete bibliographic review of the subject. However, I realize that many bold Italian operators have worked on vascular surgery: I will merely mention the names of Ceccherelli, Burci, Muscatello, Tansini, and Fieschi. Unfortunately, our scientific work is not very well known abroad.
12. Locke's solution is no doubt already known to the reader: It consists of:

Sodium chloride	…	9 grams
Calcium chloride	…	0.24 grams
Potassium chloride	…	0.42 grams
Sodium bicarbonate	…	1 gram
Water	…	1000 grams

Biographical Sources

Majocchi A., *Life and Death: The Autobiography of a Surgeon*, Translated by Wallace Brockway, New York: Knight, 1937.

Spinelli S., "Andrea Majocchi," *Ospedale Maggiore* 1965; 60:570-573.

Publication Source

La Clinica Chirurgica ceased publication in 1949. Historical issues can be obtained through the Hathi Trust.

Translation Notes

1) The author spent a year traveling outside Italy. He had previously described his time in Switzerland (*La Clinica Chirurgica* 1909; 17:270-279,478-487,726-731) and would subsequently describe his time in Germany (17:1701-1708,1851-1859,2038-2044,2221-2230).
2) The author published an abbreviated report in *L'Arte Ostetrica* 1909; 23:237-247,262-267. There, and in his autobiography, he says that the principal incentive for his visit to America had come from Theodore J. Doederlein of Chicago, who was similarly traveling and studying at Dr. Roux's clinic in Lausanne. The two visitors became friends, and Dr. Doederlein "mapped out an itinerary for me and provided me with addresses and valuable introductions."
3) For historical perspective on this now almost forgotten entity, see Moss SW, "Floating kidneys: A century of nephroptosis and nephropexy," *Journal of Urology* 1997; 158:699-702.
4) The *lira* (plural *lire*) was the monetary unit of Italy, worth about $0.20.
5) The author makes the common error of calling him "John Hopkins."
6) Europeans have distinguished two types of secondary schools, the gymnasium (*ginnasio*) and the lyceum (*liceo*), based partly upon how much they emphasize studying Greek and Latin. The specific definitions vary by country.
7) Now part of the New York – Presbyterian Hospital.
8) Now the Mount Sinai Morningside Hospital.
9) The Roosevelt Hospital in New York, founded by a distant cousin of the presidents with that name, is now the Mount Sinai West Hospital.
10) Mercuric chloride, no longer used.
11) Today part of Rush University Medical Center.
12) *Crine di Firenze* or *crin de Florence* (in French) was a fiber made from silkworm gut.
13) Quinosol or chinosol, potassium oxyquinoline sulfate.
14) Somnoform was a mixture of ethyl chloride, methyl chloride, and ethyl bromide.
15) Opsonins were new and exciting in 1908, although in 1906 George Bernard Shaw had satirized them (and surgeons) in his play *The Doctor's Dilemma*. For a historical perspective see Forsdyke DR, *Microbes and Infection* 2016; 18:450-459.
16) Part of the Ospedale Maggiore (Central Hospital) in Milan.

17) Literally “cold,” a term usually applied to a normal appendix in America, but “à froid” is apparently used in Europe to describe a previously inflamed appendix that has “cooled off.” See Engkvist O, “Appendectomy à froid a superfluous routine operation?,” *Acta Chir Scand* 1971; 137:797-800.
18) Today the Hospital for Special Surgery, 535 East 70th Street.
19) Referring to Bassini, who was Professor in Padua.
20) Today called the Insight Hospital and Medical Center.
21) “Neither this nor anything else is useful for such an operation.”
22) The author writes these words in English, but the saying is actually “Dirt is only matter in the wrong place”, and the meaning here is unclear.
23) See Senn N, “An experimental contribution to intestinal surgery with special reference to the treatment of intestinal obstruction,” *Annals of Surgery* 1888; 7:1-21,421-430.
24) In 1909, William Worrall Mayo was actually alive and well at the age of 90.
25) The author actually calls them “Willy” and “Charley.”
26) See Gal AA, “The centennial anniversary of the frozen section technique at the Mayo Clinic,” *Archives of Pathology and Laboratory Medicine* 2005; 129:1532-1535.
27) In Italy, a distinction is made between a *casa di salute* (a private hospital) and an *ospedale* (a charitable institution).
28) Like others on the European continent, the author calls toxic goiter “Basedow’s disease”; in English-speaking countries it has often been called “Graves’ disease.”
29) DuBois is a common name in French-speaking countries, and there were some European surgeons with variations of that name, but I have found no evidence that any of them visited America at this time. Did the author mean to say Pozzi?
30) The author actually writes “Nistron di Upsala.” Nyström does not mention the Mayo brothers in his report (Chapter 11), although he did visit Minnesota. William Mayo’s description of his meeting Nyström in Sweden several years later (*Journal-Lancet* 1914; 34:351-456,475-480) does not suggest that they were already acquainted. Was the author conflating Nyström and Helling (Chapter 12)?
31) This probably refers to Bernhard Hahn, who presented a paper at the Chicago Medical Society in 1905 about “The clinical experiences with Sauerbruch’s operative cabinet” (*Illinois Medical*

Journal 1905; 7:309-315). The following year, he published a similar article giving his residence as Tacoma WA (*American Journal of the Medical Sciences* 1906; 132:41-53).

32) The author misspells two of these names. The correct spellings are found in the Division of Publications, Mayo Clinic, *Sketch of the History of the Mayo Clinic and the Mayo Foundation*, Philadelphia: W. B. Saunders, 1926, page 92.

33) Described by Bartlett in the *Journal of the American Medical Association* 1906; 46:1168-1169.

34) See Mayo WJ, Mayo CH, "Surgery of the liver, the gall-bladder, and the biliary ducts," in Keen WW, editor, *Surgery: Its Principles and Practice*, Philadelphia: W. B. Saunders, 1909, Volume III, pp. 966-1034.

35) Depicted in the chapter cited above, p. 1008.

36) The "ideal cholecystotomy" consisted of opening the gallbladder, removing the stones, closing the gallbladder, and leaving it in place without intubation.

37) See Graham C, "Cancer of the stomach," *Boston Medical and Surgical Journal* 1908; 159:635-639 ("Read Aug. 5, 1908, at the centennial meeting of the Cortland County Medical Society at Homer, N.Y.")

38) Pagenstecher [F], "Celluloidzwirn, ein neues Näh- und Unterbindungsmaterial," *Deutsche Medicinische Wochenschrift* 1899; 25: Therapeutische Beilage 4:V, 26.

39) See Herr HW, "Max Nitze, the cystoscope and urology," *Journal of Urology* 2006; 176:1313-1316.

40) A temperature of -1° C. is about 30° F., somewhat above the freezing point of a salt solution.

18

Samuel Pozzi (1909)

Jean Samuel Pozzy (he changed the spelling to Pozzi later) was born in 1846 in Dordogne, France, to a family of Protestant Italian/Swiss background. His mother died when he was 10, and his father remarried an Englishwoman, so that Samuel became fluent in the English language. He studied medicine in Paris and served as a medic in the Franco-Prussian War of 1870. He was an assistant to the surgeon and neurologist Paul Broca at the Lourcine-Pascal Hospital (later renamed the Broca Hospital), and developed an interest in gynecology, traveling to Germany and Britain for additional training. He wrote one of the first textbooks of gynecology, which was extremely popular and was translated into several languages. He was named Professor of Gynecology in 1884.

His active social life has recently been the subject of several biographies, which describe his artistic and literary pursuits, and his many famous male and female associates. He was a well-known personality of his time and the subject of a classic portrait by John Singer Sargent.

He visited America three times, in 1893 (attending the Columbian Exposition in Chicago), 1904 (attending the World's Fair in St. Louis and presenting a paper at the American Surgical Association, which elected him an Honorary Fellow in 1907), and 1909 (presenting a paper at the American Gynecological Society, which elected him an Honorary Fellow the same year). The following pages are a report of his last visit to America, which he made at the age of 63.

He continued practicing general surgery as well as gynecology, and rejoined the French Army medical corps in 1914. In 1918, a patient whom he had operated upon for varicocele three years before came to his consulting room. The patient believed that the operation had made him impotent, shot his surgeon in the abdomen, and then killed himself with a shot to the head. Samuel Pozzi underwent laparotomy, where multiple bowel perforations and a laceration of the iliac vein were discovered, and he died on the operating table.

Un voyage chirurgical aux États-Unis
Bulletin de la Société de l'Internat des Hôpitaux de Paris 1909; 6:166-188

A surgical trip to the United States
by Professor S. Pozzi

French surgeons do not know enough about America and American surgeons do not know enough about France. Guided by a certain affinity of race and language and perhaps subconsciously by the prestige which attaches to victory,[1] they mostly go to Germany when they come to study on this side of the Atlantic.

For our part, the trip overseas seems very long, and many of those among us believe too readily that American operators are either reckless or, to put it bluntly, charlatans. Certainly they have some of these (and are there not also some over here?) But like all summary judgments, this one is false. Are we forgetting that America once gave us ovariotomy and more recently appendicitis surgery, to name but two of the most brilliant surgical triumphs?

There is a whole phalanx of eminent surgeons in the United States, operators of the highest quality. Furthermore, there are exemplary hospitals that surpass our own facilities, which are quite backward from many points of view.

I hope you will not mind spending an hour with me in this distant country.

American Hospitals

I have always regretted that European architects, and in particular French architects, have not gone to America to study the construction of hospitals. Of course, they would not have to learn the art of making beautiful façades and stonework buildings able to defy the destructive action of the centuries, which has long seemed to be their main concern. However, they could get some useful ideas about the convenient and suitable arrangement of the various parts of the building. Above all, they could take lessons in the art, almost unknown to us, of effective ventilation and the continuous provision of fresh air to rooms, large and small, in order to maintain an even temperature and pure atmosphere everywhere.

A rational system of ventilation *sucks*, as they say in English, the stale air from the top of each room as an essential complement to the supply of new air.

Fifteen years ago I supervised the construction for my new service at the Broca Hospital. Although I had been educated from a previous visit to America, I had great difficulty obtaining an installation of this kind, which was unfamiliar to the distinguished architect of the *Assistance Publique*. He insisted that the air was sufficiently refreshed by the opening of the doors and, if necessary, the windows. But I finally managed to get ventilation *à l'américaine*! In other establishments (and not necessarily the least important), it is supposed that ventilation of a room is accomplished simply by moving the air around with fans, which we improperly call *ventilateurs*; however, these instruments really just agitate the atmosphere, while true ventilation must be synonymous with renewal of the breathable air.

I would never finish if I tried to specify all the improvements, large and small, that I have observed in American hospitals.

On each floor, in addition to a small pharmacy, there is a small auxiliary kitchen with warming tables and ovens to prevent food from cooling down. Each floor is connected to the main kitchen by large elevators that allow the rapid transport of various dishes and utensils. There are also coolers on each floor for storing drinks and food.

Everywhere within reach of the patients are bathrooms and toilets perfectly installed, ventilated and heated like the wards.

Measures are taken so that the patients are protected from noise; the floors and partitions (double-walled) are lined with felt.

Finally, there are special precautions against fire: Huge pipes carry municipal water to the top of the building, and on each floor there are multiple hoses of rolled-up canvas that can be immediately used to flood any corner of the building; fire extinguishers in the form of tanks and grenades are also abundant everywhere. In addition, exterior iron fire escapes are easily accessible and well-marked day and night for all to see.

I do not plan to describe or even list all the great hospitals of New York, Chicago, or the other principal cities; I will simply point out briefly some of their common and characteristic features. I should add that my comments relate specifically to the cities of the East and the Midwest, which I have just visited for the third time.

Hospital organization is quite similar to what it was in France before the Revolution. Each hospital has a real autonomy, and is not subordinate to a huge administration as is the case in Paris today. The cities or the states do have certain hospitals which they subsidize, especially for the poor (for example Bellevue Hospital in New York and the County Hospital in Chicago), but these are only a minority of hospitals. Nearly all are the product of a private religious or philanthropic association, or a private donation. Some of the finest hospitals have a distinctly religious origin, such as the Mount Sinai Hospital in New York founded by the Jewish community, the Saint Francis Hospital[2] in New York which is Catholic, the Presbyterian Hospital[3] in Chicago which is Protestant, the Mercy Hospital[4] in Chicago which is Catholic, etc. There are also two other very fine hospitals in New York, the French Hospital[5] (450 West 34th Street), subsidized by the French Benevolent Society and the French Government, and the German Hospital,[6] subsidized by the German community and the German Government.

Both are among the best established institutions, and I am pleased to acknowledge here the zeal and science of the physicians and surgeons of our hospital in New York, Drs. Potter, Ferrer, Monory, McConnell, for medicine, Drs. Peck and Pool for surgery, Dr. Ulysse Kahn for the Gynecology Clinic, and the devotion of all the members of the Medical Council of the Benevolent Society, among whom I will mention only the Dean, Dr. J.-J. Henna.

This French hospital is of new construction, very well organized, and equipped with all the improvements which I have indicated above. It is staffed by both nurses and nuns.

During the last fiscal year (1907-1908) there were 1151 hospital admissions; 3712 patients were treated at the dispensary and the number of consultations rose to 9960. This hospital is supported by the French Benevolent Society of New York founded in 1809. "It aims to help French people and descendants of French people who find themselves in need. It distributes relief in cash and in kind (clothing, bread, meat, coal, etc.) It finds jobs for unemployed workers; its doctors treat needy patients free of charge and provide them with the necessary medicines; it repatriates old people, widows, and children; it protects French immigrants, helps them to find housing, and directs them to the interior. It gives shelter for the night to the homeless poor, and provides them with meals; it runs a dispensary open every day at one o'clock (except Sundays) where the poor receive free consultations and medicines.

"Finally, the French Benevolent Society maintains the hospital where free beds are available for the indigent, and where rooms are provided for paying patients without distinction of nationality."

The cost for a patient in the medical rooms is 7 dollars per week (35 francs)[7] and in the surgical rooms is 10 dollars per week (50 francs).

Among the finest hospitals in New York is the German Hospital (77th Street, Park and Lexington Avenues) in one of the wealthiest neighborhoods of the city, near Central Park.

During the year 1908, 3,446 patients were treated there. The dispensary received 11,639 men and 10,919 women.

The physicians of this establishment include Dr. Einhorn, the surgeons include Drs. Kammerer and Willy Meyer; and the gynecologists include Dr. Seeligmann.

For the year 1908, the total expenses amounted to $196,511 (the cost per day for inpatients was $2.10 and for outpatients of the dispensary $0.14 per consultation). These figures show the importance of this establishment.

A comparison is necessary: During the 1907-1908 financial year, the expenses of the French hospital did not reach $70,000! It would be desirable for the Government of the Republic to subsidize more extensively an institution which renders such great services to our compatriots and which contributes so much to maintaining the prestige of our nation. It is urgent to allocate immediately the sum that has long been requested to build a new wing, the need for which is absolutely felt; the land has already been acquired.

As I have said, American hospitals are quite autonomous, and are led by a board of directors or *trustees*, notable personages who make a point of giving their time without pay for the benefit of the poor. We find similar organizations in France, in the Committee of Hospitals and Hospices of Lyon and in other towns.

The resources of hospitals are provided both by the funds that have been given or bequeathed to them and by annual and regular contributions from benevolent individuals, by fundraising events, and often by the proceeds of festivals organized by the benefactors of the hospital; some also receive subsidies from the city. Finally, its income includes the numerous gifts and legacies which are extremely frequent in America, and are often of great importance. For the year 1908 alone, I note as having been willed to the German Hospital: $50,250 due to six persons, one of whom gave more than $40,000, that is to say 200,000 francs; in addition, there was $27,000 from eight donors. These donations are often made by the heirs, when they receive a major inheritance. We must regret that this idea does not also occur to our compatriots.

Moreover, it should be noted that there is infinitely more interest in hospitals in America (and in general abroad) than in France. With us, the excessive administrative centralization and the development of the powers of a welfare state have accustomed us to rely on the government for all public services, including charity.

In America, each district, each association, each church, each corporation is interested in a particular hospital and takes on the honor of supporting it and improving its facilities. A circumstance which adds to this interest is the administration of the hospital by notable persons, instead of officials. It is therefore quite natural that Ladies' Committees are formed who visit the sick, organize events for the benefit of the hospital and for the entertainment of the patients, and work to give them relief and comfort. In the annual report of Saint Luke's Hospital of Chicago,[8] there is a special report of the Ladies' Committee, composed of about sixty personalities, further divided into sub-committees, each having its president, its secretary, its treasurer, and its delegate. Thus, the linen sub-committee includes one lady delegated for inspection, one for styles, one for purchases, another for children's clothing. There is also a sub-committee for the upkeep of the kindergarten (attached to the hospital), a committee for "delicacies," a committee for books and magazines, and finally a committee for appointing those entitled to certain beds in ordinary paying rooms which have been donated to the hospital by benefactors.

We see how important this institution is and we can imagine the services it can render to maintain or promote the generosity of donors and to provide comfort to the patients; furthermore, it creates an atmosphere of sympathy and solicitude at the hospital, the influence of which is particularly pleasant.

There is hardly an American hospital that does not have its Ladies' Committee: It would be nice if the same were true of French hospitals, and I myself have instituted one for fifteen years at the Broca Hospital, thanks to which I can distribute 4 to 6,000 francs worth of assistance each year. I organize parties twice a year, on Christmas and July 14, in the wards of the hospital for my old and new patients and their families, and after a small theatrical performance we give presents of clothes, treats, and toys to the children.

In almost every hospital in America, at the head of certain beds, one can see marble plaques indicating the name of the donor. At St. Luke's Hospital in Chicago, such donations are particularly frequent. These are the regulations that are published in each annual report of this hospital:

A donation of $10,000 (50,000 francs) endows a particular room in perpetuity, and the name of the donor is attributed to this room;

A donation of $5,000 (25,000 francs) endows a bed in a room, in perpetuity;

A donation of $300 (1,500 francs) endows a bed for one year.

Is this not yet another example to offer our millionaires?

The operating rooms are particularly luxurious; in almost all the great hospitals they are covered with marble, sometimes not only on the walls, but on the ceiling; the doors there are often (as at the Roosevelt Hospital[9] and Mount Sinai Hospital) formed of a single slab of marble. There is an exaggerated luxury here; it must be said that it often comes from the will of a donor who specified that his bequest should be entirely used for building the operating room.

Some hospitals have nuns at the same time as nurses: For example, Saint Luke's Hospital and Saint Francis Hospital in New York, Mercy Hospital in Chicago, Saint Mary's Hospital in Rochester, etc.

Most often these nurses have been educated in the hospital itself, at the *training school for nurses* affiliated with each large hospital. However, the French hospital in New York does not have its own. (In the 1906-1907 fiscal year, it awarded diplomas to 16 students: 7 lay people and 9 nuns, and in the 1907-1908 fiscal year, to only 6 students, no nun having taken the exam.)

The courses generally last two years, sometimes three years (Saint Luke's Hospital in Chicago) and are very serious; they include: *materia medica*, medical practice, anatomy, massage, hygiene, surgery, gynecology, urinalysis, etc. … A cooking class is done at the *diet kitchen* where special foods are prepared for certain kinds of patients and for convalescents. These nursing schools are sometimes very large: Thus, in the German Hospital in New York (in 1908), there were no fewer than 74 students; at St. Luke's Hospital in Chicago (in 1908) there were 88 students.

These establishments are quite well equipped and the students enjoy a degree of comfort that many of our city dwellers would envy. They have private rooms, meeting rooms, reading rooms equipped with an extensive library and various magazines, games, an *afternoon tea*, etc.

Outside school hours, they are employed in the patient wards and get practical experience there by caring for them, but they always have enough free time to be able to go about their own business or indulge in reading or study, without being overworked.

Their simple but elegant costumes help make them look like *ladies of charity* rather than mere hirelings. Furthermore, one of the striking features of American hospitals is the quite elevated status of nurses. The *trained nurses* are real *ladies*; almost all come from a relatively high class of society; they are the daughters of doctors, lawyers, merchants, pastors, civil servants, most of them not independently wealthy and who enter the hospital as formerly aristocratic girls might have entered a convent. They are sure to find there an honored and well-paid position: A qualified nurse earns an average of 500 francs per month and sometimes 600 francs. She is, moreover, largely defrayed of all her expenses. Even considering the difference between the franc and the dollar, we can say that an American nurse has a salary three or four times greater than that of nurses in our hospitals.

Certainly, I would be careful not to criticize the latter, I esteem their devotion and I pay homage to their qualities; but it must be admitted that, as a result of the social level occupied by the profession of a nurse in our country, largely due to its low remuneration and the lack of interest that *society* takes in hospitals, our nurses do not do not enjoy the consideration they deserve. It would be unlikely for a wealthy family to invite a nurse to dinner and even less likely for the son of the house to marry one; this is common in America and gossips even claim that many poor girls who are pretty and well brought up wear the nurse's cap in the hope of not wearing Saint Catherine's.[10]

I have spared no praise for American hospitals. However, some criticisms can be addressed to them.

While most of them offer the almost perfect modern installations that I have described, there are still a certain number which, like ours, are poorly equipped in old and insufficient buildings.

Moreover, a French doctor could not help being shocked to see that most of the fine hospitals were more like *maisons de santé*[11] for the rich than refuges for indigent patients. Sometimes half the beds (and even more) are occupied by paying patients.

Room prices are pretty much the same everywhere. Here are the ones from St. Luke's Hospital in Chicago:

Room containing 2 to 3 beds …12 to 14 dollars per week.
Room with a single bed … 16 dollars or more.
A room with a bathroom costs an extra dollar a day.

A special nurse costs 15 dollars per week if she does not have a diploma and 25 dollars per week if she is fully qualified. There are also charges for some incidental costs, the use of the operating room, etc.

Some facilities are remarkably luxurious. Thus, at Mount Sinai Hospital there are private sickrooms comparable to rooms at the largest hotels.

The surgeons' fees are, of course, paid separately.

The *maisons de santé* annexed to the hospitals are a considerable source of income for them which does benefit the poor up to a certain point; in addition, they provide surgeons with great convenience for operations and visits and incomparable safety for postoperative care. Indeed, at the hospital there is always very experienced staff and resident doctors to provide assistance in case of need.

It would be nice if our French hospitals could take what is good from this system without falling into the excesses that I have pointed out. Separation of paying patients into two or three classes, according to the number of beds, is very practical and enables the middle-class patient to be treated as comfortably, if not as luxuriously, as the millionaires.

American surgeons

To evaluate the level of the medical profession in America, it must be remembered that for many years diplomas were granted there with excessive ease; it was enough for a few doctors to meet and justify the small capital intended for the needs of teaching to be authorized to found a university and to produce doctors. Later, a state examination was required to allow the practice of the profession, but the tests were so easy that they offered no guarantee. Many universities required only three years of study and some two years; however, there are many doctors whose diplomas date from this period: 50%, I was told.

Currently there is a strong movement in medical circles to overcome this educational weakness, and most of the large universities have extended the duration of their courses from 4 to 5 years. Finally, in almost all the states of the union, in addition to the university degree, a special examination is now required before allowing one to practice in the state and, by reciprocity, in the neighboring states. It must be said that the medical profession is therefore on the right path. However, it must be admitted that its level is generally much lower than it is in Europe and especially in France. Not only does the professional education of doctors, physicians, or surgeons leave much to be desired, but their general education itself is generally incomplete.

Above this lower class, so to speak, of ordinary practitioners, there exists a middle class and, finally, an elite which is in no way inferior to that of any country; some surgeons in the United States are truly of the highest quality.

The surgeons attached to the hospitals are not appointed by way of competition, but are chosen by the *trustees* or members of the board of directors; thus, they often owe their place to special friendships, kinship, or political influences. The result is a great unevenness in the quality of hospital staff members. Next to an operator who forced the door by his superiority, we can see an average and even mediocre surgeon. In certain towns, I have been told, electoral influences are absolutely predominant and without counterweight.

Certainly, our recruitment by competition has its faults and shortcomings, but although this mechanism sometimes has regrettable flaws, it nevertheless constitutes a selection process far superior to simple favor.

All the American surgeons whom I have seen operate are strictly aseptic; almost all use custom-made rubber gloves (at Mount Sinai Hospital, they spend 5-6,000 francs a year on gloves alone); their assistants and their nurses are also provided with them.

Anesthesia almost everywhere is with ether. For suture material, catgut is employed prepared in different ways, with formalin, with cumol,[12] with iodine, with sublimate,[13] and, to make it last longer, with chromic acid. For intestinal sutures, these different kinds of catgut are employed for sutures which only involve the mucous membranes, and linen thread for seroserous sutures. For those of the skin and mucous membranes, silver wire has almost everywhere been abandoned and silk or *crin de Florence*[14] is used instead; horsehair for the most superficial sutures of the skin.

As drainage, the fenestrated rubber tube of Chassaignac[15] is frequently replaced by a tube cut into a spiral into which a wick may be inserted. Finally, great use is made of *cigarette drains* which can be made in two ways: Either by simply rolling up a certain thickness of gauze within a sheet of laminated rubber, or by wrapping a rubber tube with a fairly thick layer of gauze covered with a waterproof envelope. The latter, which cannot be sterilized by heat, is sterilized by prolonged immersion for about ten days in a 1:1000 sublimate solution (Mayo).

The boldness of American surgeons is proverbial, and it is to this that we are indebted for some of the triumphs of surgery, including ovariotomy.

In 1909, a humble surgeon from a small town in Kentucky, Ephraim McDowell, had the audacity to attempt a procedure hitherto unknown, to cut open a woman's abdomen and remove a huge cyst. The patient recovered and other successes followed.

It is this memorable date that the American Gynecological Society wanted to commemorate when it invited me to represent France at the centennial celebrations last April. I had the honor to present there an account of the evolution of ovariotomy during the last century in our country, and to mention, as appropriate, the names of our glorious compatriots, Koeberlé, Péan, Terrier. I emphasized a fact that should not be forgotten abroad, namely that forcipressure,[16] which has renewed surgical technique everywhere, is a triumph of French surgery.

Self-confidence and the desire to move forward are characteristics of all Americans; we find them among surgeons and this mentality explains both their qualities and their faults.

Here is a story about it:

In the early days following McDowell's bold attempt, a country surgeon described traveling some distance to perform his first ovariotomy, in a letter to a friend of his which has been found. As he rode through the woods with his surgical instruments behind him, he gave himself up to preliminary thoughts:

"'My boy', he said to himself, 'you are going to perform an operation you have never performed, you are going to open a belly; how will you recognize the cyst? – I know the stomach, I won't take that out! I know the liver, I won't take that out! I know the bladder, I won't take that out! My boy, you will take out all you don't know!'"

I cannot tell you if this patient recovered.

Here are two bold applications of Dr. Alexis Carrel's new method of suturing vessels, made in America.

Dr. Murphy of Chicago recently showed me in his ward at the Mercy Hospital a patient with an embolism whom he had explored for a clot through a longitudinal incision in the femoral artery at the level of Scarpa's triangle[17] where its presence was suspected from the absence of pulsation. He was able to remove a long fibrinous clot, and as he could not reach its upper end, he did not hesitate to introduce from below upwards as far as the iliac artery a metal rod (hysterometer)[18] in order to unblock the vessel, so to speak. This bold maneuver succeeded perfectly; the upper end of the clot was extracted, and after suturing the artery, the operative wound healed quickly. Unfortunately, Murphy had been able to intervene only too late (four days after the onset of symptoms); gangrene of the foot was already an accomplished fact; but it did not progress and the rest of the limb immediately recovered perfect circulation.

I will describe another operation of our compatriot Carrel.

Although he is not a practicing surgeon, he did not hesitate to yield to the entreaties of one of his colleagues, an assistant at the Roosevelt hospital, who called on him to help his child. The baby, a few days old, was dying of acute anemia following a major hematoma. Carrel practiced, so to speak, *in extremis* the transfusion of blood by the temporary establishment of the "community of the circulation" which my master Alphonse Guérin had foreseen more than thirty years ago, but which only a perfect technique could realize. Carrel made an anastomosis between the radial artery of the father and the femoral vein of the child; it was rapidly *injected*, so to speak, and became pink then almost purplish; the vascular communication was then immediately interrupted. The child was resuscitated, not only temporarily, but permanently, because this was two years ago, and he is now perfectly well.

This almost miraculous story was told to me by Carrel and certified by Doctor Peck, chief surgeon of the French Hospital, and by various other colleagues.

Nowhere does medical quackery flourish with such boldness and freedom as in the United States. The newspapers there are full of advertisements with pictures either of cured patients, or of medical specialists treating patients (especially in the West) with herbs or serums with recipes borrowed from Chinese or Indian medicine; electricians, masseurs (very *magnetic*) also abound. Here are two characteristic examples of these advertisements.

The first is taken from a great Chicago newspaper, the *Sunday Tribune*: I reproduce the title, in large letters, of a long article intended to advocate an alleged professor Adkin, in Rochester (State of New York, not to be confused with Rochester, Minnesota).

RESCUED ON WAY TO GRAVE;
PROFESSOR STOPS FUNERAL;
RESTORES WOMAN TO LIFE

DOES HE POSSESS DIVINE POWER?

Woman Threatened with Burial Is Revived by
This Man's Mysterious Mastery
Over Disease.

MOST PHENOMENAL MIRACLE OF THE AGE.

Without the Use of Drastic Drugs, Medicines or the
Surgeon's Knife He Defeats Death and Restores
Life and Health to Suffering Mankind.

COMPLETELY UPSETS MODERN MEDICAL PRACTICE

Gives Services to Rich and Poor Alike Without Charge – Cures
Men and Women Thousands of Miles Away as
Surely as Those Who Call in Person.

(From *Cincinnati Post*)

Here is now, after the medical advertisement, a surgical advertisement; it is also taken from a great American newspaper of which I present to you a copy:

NEW BLOODLESS SURGERY
A remarkable new operation that opens a hole without cutting into the

flesh and allows the surgeon to reach and remove the appendix without pain or bloodshed.

At the top of this advertisement is a little girl ready to come down the stairs of the *maison de santé* in her traveling clothes. She is holding a bottle in her hand. Below this inscription:

Little patient holding her appendix in her hand and talking about returning home to Rome (State of New York) the same day of her operation.

Then come the explanatory figures:

Figure 1 shows, in natural size, the marvelous instrument, the "Reidiseam" so named after the name of the inventor, Doctor W.-B. Reid.[19] It is a kind of pointed metal cone, in the shape of a spinning top equipped with a handle. Doctor Reid claims to insert it through one of the pores of the skin by simply displacing the tissue which forms the dermis. Here is the legend of the figure:

"The curious new polished and rounded instrument called the 'Reidiseam' which opens an orifice in the tissues without spilling blood and without causing the slightest shock."

Figure 2 shows:

"*How the instrument is inserted into the abdominal wall three inches to the left of the hip bone on the right side, making a hole the width of a silver dollar* (a 5-franc ecu) *through which one can reach the diseased appendix*."

Figure 3 represents:

"*The new dilator ring with which the orifice made is held open while the surgeon extracts the appendix*."

A group of eight retraction hooks is passed to widen it by pulling all around the circular wound and are attached to straps provided with buckles which are themselves fixed on a metal ring, held to the body by straps. This forms the strangest of apparatuses, absurd from a practical point of view, but well calculated to strike the common imagination.

Finally, at the bottom of the page, is a figure showing the patient lying down, covered with a sheet, ready to be operated on, a dramatic scene intended to prove the seriousness of the intervention. The bed is surrounded by very serious nurses and assistants in hospital garb. Next to it is a diseased appendix, life-size, covered in terrifying-looking pustules!

In the interminable exposition of his "method," Dr. Reid enters into the strangest pseudo-scientific considerations. It begins like this:

"An extraordinary revolution in the operation of appendicitis, so frequent and so dreaded, has been accomplished by Dr. William B. Reid, the well-known surgeon of Rome, New York.

"Doctor Reid removes the appendix without scalpel, pain, or shock, so the patient is able to leave immediately afterwards.

"For ten years, Dr. Reid has been renowned as an expert surgeon, particularly for appendicitis.

"His experience of the old-fashioned (!) method of incision with the scalpel convinced him that the fear of the operating amphitheater, the nervous shock which is the result of the operation and the uncertainty of the result, were the cause that many victims of the disease hesitated to submit to the operation until the moment when a fatal outcome was probable or even certain."

This shameless publicity and this criminal trickery are spread out in a major newspaper, between an article on *the women's vote* and the dramatic description of a *child abduction*, one of those *kidnappings* which constitute one of the most lucrative branches of the American gangster industry.

The colleague who communicated it to me was in no way indignant; he just smiled. He was used to it! [1]

In the United States, the profession is infested by pseudo-medical sects: *Osteopaths* and *Christian Scientists*. The former claim to cure all ailments by massage and potassium iodide; the latter make use of suggestion and prayer, even for surgical cases.

The success of the latter is truly incredible; they skillfully mingle religion with their trade and disguise their greed under the mask of objectivity. This sect was founded by a woman, Mary Baker G. Eddy, some 30 years ago. She wrote *Science and Health, with a Key to the Scriptures*, of which more than 500,000 copies have been distributed, and which is sold in the churches of this sect in the same format and with the same cover as the Bible.

Here is the basis of the doctrine: Suffering does not exist; what we call disease is only the fear of suffering. Convince yourself, then, that you cannot suffer. Health is the feeling of the unreality of pain and disease itself. Man was made in the image of God; but God is a pure spirit and the image of God cannot suffer. He himself is not matter, He is spirit; the body and the senses are only illusions. God could not create evil and suffering; therefore, evil and suffering are illusions.

To cure a sick person, a man of faith (*Christian Scientist*) remains near him and persuades him by his exhortations and prayers that he does not suffer. – A wonderful thing! This crude suggestion has acted effectively enough on a host of people to have procured for the sect a genuinely implausible vogue; it has continued to increase in recent years and in 1903 (according to a document which I copied) it already numbered 12,000 ministers having about 600 churches and 75 Institutes or Colleges.

It is headquartered in Boston, Massachusetts. Mrs. Eddy has assumed the titles of *President of the Massachusetts Metaphysical College* and *Pastor of the first Established Church of Christ*.

Already in 1903, for seven years she had received 4,000 disciples in her college and she collected 2 million dollars for her church in Boston. Since then, the development of the sect has continued to the point of becoming a danger to public health.

I visited the two large and beautiful churches owned by Christian Science in New York. On each side of the pulpit where the pastor stands are two large inscriptions engraved on the walls: One is a saying of Christ taken from the Bible and the other is a passage from the work of Mrs. Eddy who is thus placed almost on the same level as the Saviour! In fact, for her disciples, she is a kind of prophet or pope.

In addition to the Sunday service, every Wednesday evening a meeting is held in the main church where anyone in the audience can proclaim the healing of a sick person with the help of Christian Science.

I saw a fine collection of hysterics there with a number of fraudsters, and came out of that meeting absolutely appalled at the naïveté of a sizable portion of this great nation.

Although Christian Science has supporters all over the world, I doubt it will ever achieve much success in our beautiful country of France!

The Mayo Brothers

The greatest surgical center of the United States is neither New York, nor Chicago, nor Baltimore, nor Philadelphia, nor Boston, nor any of the large cities of this immense country, it is Rochester, a small town among the endless plains that stretch between Chicago and Minneapolis, Minnesota.

In 1844, only Indians were there. A trapper came, built a small cabin, and lived there for some time with his wife. She died of smallpox; the trapper left, then returned soon after with some companions. It is said that he bought all the land where the present town is built from the Government for a dollar and a half.

The father of the Mayo brothers came to live in this small *settlement*. He had just received a medical degree, after having first been a professor of physics, which he had studied with the famous Dalton.[20] He lived there modestly, raising his two sons, William and Charles, and began their medical education, which they completed first in Minneapolis and then in

Chicago.[21]

Within a few years, these two young men, almost the same age, began to show great abilities.

Twenty years ago, in 1889, some Sisters of Saint Francis of Assisi established a small hospital in Rochester, where there are many Catholics, where the Mayo brothers began to operate. It initially included 45 beds and soon attracted all the patients of the region. The Mayo brothers had the opportunity to show their skill, and their reputation was established there; three hundred patients passed through this hospital in the first year of its foundation.

Despite the success of their practice, the Mayo brothers did not stop studying and made frequent trips to Chicago, New York, Baltimore, etc., then abroad and especially to Germany, to visit hospitals and keep abreast of science.

Their growing reputation required the gradual expansion of the hospital by successive additions, in 1893, 1898, 1903, and finally last year when an entire wing, containing 100 beds, was added at the cost of 150,000 dollars (750,000 francs). The hospital is more like a *maison de santé*, because most of the patients are paying, but the price there is quite moderate: In the common rooms which contain a very small number of patients, from 7 to 10 dollars per week (35 to 50 francs, or about 5 francs a day, about the same price of our paying inpatients). For private rooms, 12 dollars per week (60 francs) and above. These prices include the cost of nurses, medications, and dressings. A nursing school is attached to the building.

The facilities are perfect, especially the heating and ventilation, which leave nothing to be desired and could serve as a model for our institutions.

The hospital currently has 300 beds, of which 225 are allocated to patients and the others to staff. Since its foundation twenty years ago, it has received and cared for more than 28,800 patients. People come here not only from neighboring regions but from all parts of the United States, Canada, and Mexico. Last year (1908), 6451 operations were performed there on 5591 patients, of whom 4243 were inpatients and 1348 were outpatients. They have to minimize the length of stay for each patient, so most of those operated on for appendicitis are transferred on the third postoperative day back to the hotel or boarding house where they were staying before entering St. Mary's; the other laparotomies are discharged after eight to ten days, unless they are especially serious.

The work of the chief surgeons is considerably lightened by an ingenious system of consultations carried out by a dozen assistant surgeons, doctors, and specialists who first see the patients successively in a consultation building or *office* comprising numerous consulting rooms and laboratories. The final decision is left to the Mayos.

The little town, which has barely 6-8,000 inhabitants, is entirely focused on Saint Mary's hospital, upon which it depends just as Bayreuth depends upon Wagner's theatre; large hotels and countless *boarding houses* constantly receive the patients who come for consultations or surgery, as well as the doctors who accompany them or wish to observe the operations. The Mayos are the kings of this country; they are also its benefactors. They endowed the city with several important buildings. Recently they have built, at their own expense, a sort of Medical Club with a library where the numerous staff of their enormous *maison de santé* can meet and where visiting doctors are invited. Meetings are held there every day and on Wednesday evenings there is a small Surgical Society. While drinking ice water and eating red Oregon apples, the professors and students discuss new findings, results of clinical or laboratory work, or simply talk to their colleagues about what they have read in the national or foreign periodicals that are kept methodically on a large rotating table in the center of the room.

I had the privilege of being invited to one of these *informal* sessions where the two Mayos, mingled with their disciples, took their turn to speak in the midst of this sort of medical phalanstery.[22]

It has only been a few years since the reputation of the Mayo Brothers extended beyond America. I believe I was the first to have mentioned their name in France, in the opening address I gave as president of the French Congress of Surgery almost five years ago.[23] I had been to see them for the first time in June 1904, and after this quick visit I was eager to visit them again; I returned last April and had the privilege of being received for three days in the home of William Mayo, in the friendliest way. The long talks I had with him enabled me to appreciate his qualities.

Since my first visit, I have introduced my two colleagues Jean-Louis Faure and Robert Proust to them. Like me, they came back charmed and amazed by their visit.

How could it be otherwise? Every day, from 8 A.M. to 1 P.M., in three large, perfectly equipped operating rooms, three unusually talented surgeons operate tirelessly: William and Charles Mayo and either Dr. E. S. Judd or Dr. E. H. Beckman, who recently joined them. Attached to the wall in each of the three rooms is a list, typed (this is the rule in America) with all the operations for that day, 20 to 24 in number and of the greatest variety.

William Mayo is mainly engaged in abdominal surgery and in particular that of the liver, stomach, and intestine, while Charles Mayo operates on anything from a cataract to a club foot, a hernia or a goiter.

As soon as an operation is over, the room is quickly cleaned with damp cloths and a few minutes later another patient is brought in, already asleep. During this short interval, the operator may lie down on a daybed in a small adjoining room. As soon as an operation begins in one of the three amphitheaters, a bell rings to alert the observers who move as they wish from one room to another to see this or that operation.

These observers watch from a portable stand, 30 to 40 in number, in shirt sleeves: A few are given special permission to stand near the operator and they are dressed in a white blouse without sleeves forming a kind of bag to prevent them from touching anything, in case they are tempted.

These are the assistants of William Mayo: First, a nurse anesthetist who pours ether drop by drop onto a mask stuffed with gauze (each patient has previously received a subcutaneous injection of atropine and morphine.) A kind of metal frame covered with a cloth forms a hood over the head of the patient and completely isolates the anesthetist from the operator. William Mayo has only one direct assistant who is a sister of Saint Francis, Sister Mary Joseph,[24] serious and silent under her white headdress and her gold spectacles with crescent-shaped lenses, probably a gift from her chief who himself wears similar ones while operating. She is completely covered with sterile white clothing, her hands are covered with rubber gloves which reach very high on her forearm. Mayo, his assistants, and nurses are all gloved and have their mouths covered with a gauze pad. Everyone is silent except Mayo who talks continuously, explaining the operation, giving details of all kinds and rarely missing an opportunity to throw some satirical comment at the charlatans of the profession, osteopaths or Christian Scientists.

All the nurses have their hair completely covered with a sterilized gauze cap, which they put on when they enter the operating room and which they take off when they leave and put on their uniform cap. This is a habit which could well be imitated in all our hospitals; its absence greatly shocked William Mayo, during a scientific trip he made to England, the report of which he published ("Present day surgery in England and Scotland," *Northwestern Lancet*, 1 December 1907):

"I was glad to see in many of the hospitals," he said, "that the nurses were compelled to wear a head-covering in the operating-room instead of allowing their hair (some of it their own) to fly about their heads in the barbaric manner prescribed by modern style. It is certainly incongruous that an operating-room nurse should be covered by a gown, rubber gloves, and sleeves, and yet allow her hair to fly in every direction like shaking a hair duster over things she is supposed to protect."

A second sister, close to the operator, is in charge of the compresses, the spare instruments, and the sutures. Another assistant stands ready to go from one to the other to help if needed.

A small table similar to that which is fitted to beds for convalescents is attached to the operating table, above the legs of the patient, within easy reach of the surgeon who finds his most indispensable instruments there (scissors, scalpels, forceps) and special instruments for each operation. These are therefore handled only by him. As soon as the operation is finished, for the suture of the wound, the sister brings a new set of instruments in a sterile towel and places them on the small table. There are always needles threaded in advance and the operator never waits.

Next to the operating rooms is a small laboratory for microscopic and chemical examination, allowing immediate completion of the diagnosis during an intervention. The *pathologist* attends it constantly, and I have witnessed the usefulness of such an organization.

It was a patient with a stomach lesion and, during the operation, William Mayo warned the audience that he had some doubts about the nature of the disease. Was it a simple ulcer? Was it a malignant ulcer? It was hard to tell in advance. On inspection and palpation of the exposed stomach, a small indurated plaque was found at the level of the ulcer. Mayo laterally incised the stomach wall on the side of the questionable neoplasm, removed a small fragment, and gave it to the *pathologist* who was forewarned and waiting for it; he ran to the laboratory, fixed the fragment by freezing it with liquid carbonic acid, cut it, stained it, examined it and reported the histological diagnosis: It was cancer! Meanwhile, Mayo had explained to the audience that if the outcome was benign he would only perform a limited resection, while if it was malignant he would do a more extensive gastrectomy. He therefore proceeded immediately to the latter operation, pointing out the extreme usefulness of a precise diagnosis which only the microscope could provide.

But here is the most interesting point that I want to make: Guess how much time had elapsed between the moment when the pathologist (Dr. L. B. Wilson) received the specimen and when he delivered the result? Fifty-five seconds, less than a minute! (The time was measured with a stopwatch). In truth, Doctor Wilson confessed to me that this was a record, and that generally he took two and sometimes three minutes to give the result; no doubt he wanted to impress the French professor, and I confess that he succeeded.[25]

Any time I tell someone about the Mayo brothers and their success, they are astonished that such a thing could happen in a remote region like Rochester. How could such a small town allow such an extensive practice?

How did rural surgeons manage to make themselves known so quickly to an entire large country, and that without questionable means or shameful advertising? Certainly the fact is surprising and yet it is true. There is indeed a kind of miracle here, but it is explained both by the exceptional qualities of these two men, by their unique dedication and their diligence in work, and also by the speed, unknown in the Old World, with which reputations and fortunes can be built in America. Be that as it may, it was not without difficulty that they managed to take the first steps. Dr. Moore, one of their professors from the Medical College in Minneapolis, told me of the following incident. After an initial series of successful abdominal operations, the Mayo brothers sent a report to an eastern medical journal, requesting publication. They were then totally unknown, and their statistics were so extensive and wonderful that the editor returned their manuscript with an ironic letter in which he clearly expressed his skepticism. It was only later that they had the opportunity to speak at the American Surgical Association and that their successes, however surprising, were confirmed by eyewitnesses, received credence, and established their authority. Currently, it is based both on their perfect scientific honesty, on their undeniable skill, on the incomparable extent of their practice, and on the simplicity and amenity of their manners which disarm any jealousy.

Their experience is based on an absolutely astonishing series of operations. Shall I quote some figures? William Mayo published (*Annals of Surgery*, June 1908) a year ago, a statistical report of the operations for ulcers of the stomach and duodenum performed by his brother and himself. Up to June 1, 1906, these included 379 cases with a mortality of 4.8%.

In a single year (1906-1907) these two surgeons operated on no fewer than 193 ulcers, including 119 of the duodenum and 60 of the stomach, and 14 of both the stomach and the duodenum. Mortality had been only 2.8%.

Another example: Charles Mayo published in the journal *Surgery, Gynecology and Obstetrics* of Chicago (March 1907, p. 237) on "Considerations on the mortality of a thousand goitre operations" performed by him and his brother; this number includes not only the (partial) excisions but also the ligature of the vessels, which they practice as a preliminary treatment especially in serious cases of exophthalmic goiters (which they prefer to call *hyperthyroidism*). In this last category they had 19 deaths out of 405 operations. Among these operations, 295 were more or less extensive excisions of the gland with 18 deaths: The other cases were related to atrophic ligations.

These are certainly respectable figures!

In consulting the statistics of the operations performed last year at St. Mary's Hospital (Nineteenth Annual Report) I found the following figures:

Thyroidectomies for simple goiters: 196 operations with 1 death.

Thyroidectomies for exophthalmic goiters: 125 operations with 4 deaths.

Gastroenterostomy:

a) For stomach cancer: 24 operations, 4 deaths.
b) For chronic ulcer or hourglass stomach: 24 operations, 0 death.
c) For perforating stomach ulcer: 5 operations, 0 death.
d) For chronic ulcer of the duodenum: 35 operations, 0 death.
e) For perforating ulcer of the duodenum: 17 operations, 1 death.

Appendicitis operations:

a) Acute suppurative: 514 operations, 1 death.
b) Acute with diffuse general peritonitis: 4 operations, 2 deaths.
c) Chronic: 819 operations, 0 death.

Cholecystectomy, 84 operations, 2 deaths.

Cholecystostomy for inflammation and stones of the gallbladder or cystic duct: 330 operations, 5 deaths.

Choledochotomy, bile duct stones: 73 operations, 3 deaths.

Radical cure of inguinal hernia: 504 operations, 2 deaths.

Supra-vaginal hysterectomy: 141 operations, 0 death.

Perineal prostatectomy (including cancer): 54 operations, 6 deaths.

Suprapubic prostatectomy (including cancer): 32 operations, 2 deaths.

Laparotomy for pyo-salpinx: 31 operations, 0 death.

Laparotomy for tuberculous pyo-salpinx: 4 operations, 0 death.

Laparotomy for salpingo-ovaritis: 4 operations, 0 death.

(You can see how small these last three figures are in comparison with those of similar operations at some of our large services in Paris.)

There were no fewer than 3,647 abdominal operations last year at St. Mary's Hospital, with a mortality of 2.05% which is reduced to 1.05% if the cases of cancer are removed.

These figures speak eloquently for themselves.

The Mayo brothers live a life full of honor, profit, and simplicity. The number of their patients is such that their earnings are considerable, although their fees are generally moderate. I have heard that the income for each of them is estimated at nearly a million francs a year. They live in two elegant houses almost entirely built of wood (lodges) along one of the main avenues that criss-cross the small town, which are like large cottages with turrets and bow windows. Both are of the same style; that of William Mayo is painted white, while that of Charles Mayo is painted red. They are neighbors, each surrounded by a garden, and the two families practically live together, although each has its own home; their life is patriarchal.

The 90-year-old father of the two Mayos is a robust old man, spending his time going from his farm in the countryside to his sons' *maison de santé*. Last year he took a vacation to Mexico by himself.

William Mayo is the older son; he is around 45 to 50 years old.[26] He is tall, handsome, clean-shaven, wearing his gray hair short; his face open and smiling, lit up by eyebrows of golden blond and by blue eyes with a deep gaze which recall those of the beautiful portrait of Ménard in the Luxembourg. Very simple in appearance, very affable, he talks easily, without loquacity, and never speaks ill of his colleagues, although he judges them with great freedom. This is how he told me of a renowned surgeon who had recently died in the United States: "He was a good musician, but *it was small music*!"

Charles Mayo, who appears to be 5 or 6 years younger than his brother,[27] is much shorter and forms a real contrast with him. He has a dark complexion, black hair, dark eyes, and he tends to stand in a slightly inclined position which makes him look shy. He is rather talkative like his brother, whom he seems to worship; it is touching to see how much William returns his friendship and his esteem, and several times when I lingered near him to watch an abdominal operation, he would say to me softly: "You should go and see Charles operate; he operates very well."

Otherwise, the two brothers enjoy an equal reputation.

They publish little, but always work of great originality and based on an incomparable number of cases. When they speak in a learned society, as I was able to see for myself, their entry into the discussions immediately produces silence and attention. Their colleagues do not envy them, despite their enormous success; most of them even seem to be proud of them as of a national treasure, and often, although not intimate friends, speak of them familiarly using the diminutives of their names: "Will" and "Charlie."[28]

These two men live very quietly in their small town, occupied only with surgery and apparently indifferent to any other intellectual preoccupation. Their houses, although comfortably furnished, contain no works of art. On the other hand, they have many photographs; at William Mayo's house, one shows the capture of Malakoff, another Henry IV presenting Gabrielle d'Estrées to his courtiers. I have also noticed that the two Mayos have, one a bust, the other a statue of Napoleon I, whose popularity appears to exceed that of Washington in this new country which above all admires strength.[29]

At William Mayo's a phonograph has replaced the player piano that I had seen there five years before. Incidentally, it is rare to meet true musicians among the townspeople there. The player piano is much more common than the piano, and an American lady told me that the granddaughter of one of her friends, having seen at her house a tuner who was playing chords on the keys of her Pleyel,[30] was frightened and shouted, "Mommy, there's a man in the living room playing the piano *with his fingers*!"

Nowhere have I had a more intense sense of American energy than in this quiet little town of Rochester. We feel there the power of the will, the persistence of effort, the constant tension towards a single goal, towards an absorbing *business* which fills their existence. Rochester is truly a surgical factory, an immense health factory with a prodigious output like other great American factories. We can say that the Mayos are the Kings of the Scalpel, just as such and such are the Kings of Oil or Steel.

In William Mayo's study hangs on the wall one of those little signs in multicolored calligraphy of the kind favored by the Anglo-Saxons, which usually reproduce a passage from the Scriptures. This one contains a simple sentence from Emerson:

"If a man can write a better book, preach a better sermon, or make a better mousetrap than his neighbor, you will find a broad hard-beaten road to his house, though it be in the woods."

First a road, then a highway have been made to the door of the Mayo brothers. I invite my French colleagues to make this surgical pilgrimage in their turn.

Original Notes

1. Since I gave this lecture, I have received a very curious letter on this subject from the state of Connecticut. I think I cannot do better than to publish it here *in full*, retaining the spelling. (I have removed the name of the city of origin of the letter and that of its author, out of discretion.) The claims it makes are fantastic, and the very nature of my honorable correspondent is not without significance; let us judge:

   "Monsieur Pozzi,

   "Director of the Hospitals of Paris,

   President of the Academy of Medicine, Paris.

   "Distinguished Master!

   "By pure chance I came across a circulating issue of the *Gazette des Hôpitaux* of Saturday June 26, 1909 in which I read with pleasure an article on a conference held by you in which you say something about charlatanism in the United States. Enclosed you will find an advertisement for Sunday July 10 in the New York *World* which seems to me to be the *non plus ultra* of charlatanism or rather a parody of the boldness which the charlatans make the public swallow: I will only translate what I marked with two lines in the advertisement because I don't know if you know this horrible English language.

"'It is a secret which took me many years of my life to perfect, I can only say that my results are obtained by treating all diseases through the eyes. I cure by dripping a colorless liquid which I prepare into the eye. Strange as it may seem, so-called incurable diseases like consumption, Bright's disease, taste, epilepsy, nervous prostration are miraculously cured in this way. The basis of my system is entirely scientific in principle. *The eye is the window to the soul* (sic). I found a system to treat other diseases of the body, the basis of which is the relationship between the eye and the body as a principle.'

"Well, what do you say? I beg your pardon that I take the liberty of interrupting your valuable attention for such a strange thing. But reading your lecture was an incentive. Excuse my mistakes, I am neither American nor French, I am Dutch. And I am a 'Doctor of Podiatry' by New York and New Jersey state law, another weird American thing. We are counted as 'specialists' and we must pass the state examination by the faculty of Medicine of New York and Trenton.

"Accept, my illustrious Master, the assurance of my highest consideration, and I have the honor to be your very devoted servant.

"Dr. Ph. C.

"N.B. This advertisement cost approximately 250 dollars or 1250 francs to insert."

Original Illustrations

[Not reproduced in this volume]
Fig. 1 – The French Hospital.
Fig. 2 – The German Hospital.
Fig. 3 – American Nurses.
Portrait of Ephraim McDowell, "Father of Ovariotomy."
Newspaper headlines starting with "RESCUED ON WAY TO GRAVE"
Newspaper article about "A NEW BLOODLESS SURGERY"
Fig. 4 – Saint Mary's Hospital.
Portrait of the Mayo brothers and their father.

Biographical Sources

Vanderpooten C, *Samuel Pozzi, Chirurgien et Ami des Femmes,* Ozoir-la-Ferrière: V&O Éditions, 1992.

DeCosta C, Miller F, *The Diva and Doctor God*, Bloomington IN: Xlibris, 2010.

Barnes J, *The Man in the Red Coat*, New York: Alfred A. Knopf, 2020.

Publication Source

Bulletin de la Société de l'Internat des Hôpitaux de Paris (Bulletin of the Society of the Internship of the Hospitals of Paris) was published from 1904-1932. Historical issues were obtained by interlibrary loan.

Translation Notes

1) France had been quickly defeated in the Franco-Prussian War of 1870.
2) St. Francis Hospital on East 5th Street closed in 1966.
3) Today part of Rush University Medical Center.
4) Today called the Insight Hospital and Medical Center.
5) The French Hospital moved to a new building on West 30th Street in 1928 and closed in 1977. It is depicted in the movie *The Godfather*.
6) Today the Lenox Hill Hospital.
7) The *franc* was the monetary unit for France, Belgium, and Switzerland, and was equivalent to about $0.19.
8) Today part of Rush University Medical Center.
9) The Roosevelt Hospital in New York, founded by a distant cousin of the presidents with that name, is now the Mount Sinai West Hospital.
10) Catherine was the patron saint of unmarried woman, and on her feast day the French tradition was to place a muslin cap on the head of any unmarried woman older than 25.
11) French authors make a distinction between the *hôpital*, a charitable institution, and the *maison de santé*, which we might call a "private hospital" for paying patients.
12) Cumol or cumene is isopropyl benzene.
13) Mercuric chloride, no longer used.

14) A fiber made from silkworm gut.
15) Édouard-Pierre-Marie Chassaignac, French surgeon (1804-1879).
16) Compression of a blood vessel with forceps for hemostasis.
17) Femoral triangle.
18) A uterine sound with markings to allow measurement of the uterine cavity.
19) It could be said that Dr. Reid was simply a century ahead of his time, but lacking a laparoscope. See also Reid WB, "An original method of examining the gall-bladder through a vaginal incision," *Surgery, Gynecology and Obstetrics* 1909; 8:642-643.
20) William W. Mayo attended John Dalton's school as a boy, but did not graduate from a British university and was never a professor.
21) William J. Mayo's medical degree was from the University of Michigan and Charles H. Mayo's medical degree was from Northwestern University in Chicago. Neither attended medical school in Minnesota.
22) A *phalanstère* or phalanstery was a building housing a community of coworkers, as envisioned by the French utopian socialist Charles Fourier.
23) Association Française de Chirurgie, "Séance d'inauguration," *Dix-septième Congrès de Chirurgie*, Paris 1904, pp. 1-11.
24) See Nelson CW, "100th anniversary of Sister Mary Joseph Dempsey," *Mayo Clinic Proceedings* 1992; 67:512.
25) See Gal AA, "The centennial anniversary of the frozen section technique at the Mayo Clinic," *Archives of Pathology and Laboratory Medicine* 2005; 129:1532-1535.
26) William J. Mayo was 48 years old in 1909.
27) Charles H. Mayo was 44 years old in 1909.
28) The author actually writes "Willy" and "Charley."
29) The capture of Malakoff was a victory of the French Army in the Crimean War in 1855. Gabrielle d'Estrées was mistress and advisor to King Henry IV of France. The Mayos may have placed these French pictures and statues in their homes in anticipation of their French visitor. Only a Frenchman would think that Americans admired Napoleon more than Washington.
30) Pleyel was a famous French piano manufacturing company which subsequently went out of business but has recently been revived.

19

Max Hofmeier (1909)

Max Hofmeier was born in 1854 on the island of Rügen on the Baltic coast of Germany. He studied medicine at the University of Greifswald and other German universities, and after graduation worked in the gynecologic clinics first in Greifswald and then in Berlin. At the age of 33 he was called to be Professor of Gynecology in Giessen, and the following year Professor in Würzburg, where he remained for the rest of his career. His scientific studies focused on the placenta, and he was recognized clinically as a master of obstetrical techniques, with an especially low rate of post-partum infections. He also concentrated on gynecologic surgery and wrote a textbook on diseases of the female reproductive system.

In 1909, at the age of 55, he traveled to America to attend the meeting of the American Gynecological Society, which elected him an Honorary Fellow the same year. He extended his visit to see several parts of the country, as described in the following pages.

He retired in 1923, and died after a series of strokes in 1927.

Amerikanische Reiseeindrücke
Zeitschrift für Geburtshülfe und Gynäkologie 1910; 65:242-252.

American travel impressions
by M. Hofmeier

An invitation from the American Gynecological Society and the American Medical Association to participate in their meetings this year gave me the opportunity to travel for several months in the United States this spring, in order to observe the hospitals and universities as well as the land and people, and to become acquainted with our American colleagues and their work. Although quite a number of our colleagues have had similar invitations in recent years, and have themselves been "over there" to become familiar with conditions in America, nevertheless the following lines may be of interest to some even if they can of course hardly claim to constitute definitive judgments. Unfortunately, it was not possible for me to attend the sessions of the large American Medical Association in Atlantic City June 9-11, since the American Gynecological Society – this year for the first time – rescheduled its sessions from the end of May to April 20-22, which meant that there were 6 weeks between the two meetings. The AGS session was a special occasion celebrating the centenary of the first ovariotomy by McDowell.[1] They had invited representatives of the three great European national cultures – Germany, England, and France – that had especially contributed to the growth of ovariotomy during the past century. These representatives (Pozzi for France, Herbert Spencer for England, and myself for Germany) were given the specific assignment to prepare an overview of the historical development of ovariotomy in these three countries, to be delivered at the closing banquet of the three-day session.

The American Gynecological Society differs fundamentally from our similarly named German society, in that it is limited to 100 members, and that admission depends among other things upon the satisfactory assessment of a submitted scientific work. I have been told that this provision is basically for the purpose of excluding socially undesirable elements. But it cannot be denied that this numerical limitation for all of America and this complicated process exclude a considerable number of capable and especially younger colleagues from the scientific life of this society. And older colleagues in particular cannot be blamed if they do not want to risk the possibility of having their submitted work rejected. This sort of guild-like exclusivity in a scientific society would be unthinkable in Germany, a country which the Americans tend to consider old-fashioned. But this is just a fitting example of how the democratic ideals of equality and freedom are applied in America. The external democratic forms do not prevent a widespread social exclusivity!

The sessions of the society, during which unlike our European custom many people were smoking, took place in the solarium (roof garden meeting hall) of the huge Waldorf-Astoria Hotel under the chairmanship of Riddle Goffe of New York. From this roof garden on the 18th floor, when permitted by the rainy weather, one could during the breaks enjoy a wide view of the giant city with its fantastic skyscrapers, the Hudson on one side, the East River with its four strong iron bridges to Brooklyn on the other side, and cool off after the somewhat heated discussions.

As you know, gynecology in America differs from that in Germany, insofar as American gynecologists (often completely abandoning obstetrics) practice abdominal surgery in the broad sense of the word, and therefore part of their activity is not even limited to women. Nevertheless, one of the three symposia addressed an obstetrical topic, albeit an operative question: The place of Caesarean section in the management of placenta previa. It was clear from the presentations and discussion that this indication for Caesarean section was recognized only to a limited extent and for a small number of cases (although the concept of this indication actually originated in America), and that they generally preferred conservative methods, especially combined version.

The second theme addressed the question of the best use of anesthesia. It is remarkable that Americans exclusively use ether, and never use spinal anesthesia. I asked several different operators about this and was told that a few bad experiences during the introduction of spinal anesthesia had scared them away from further attempts, and that they were so satisfied with ether anesthesia that they saw no reason for change. Anesthesia is often administered by nurses, of whom I saw some that had experience with 10-12,000 cases. There are also anesthesiologists who do nothing but administer anesthetics; many practitioners considered this the ideal.

The third theme addressed complications of abdominal operations (incisional hernias, adhesions, etc.) and suggestions for avoiding them.

Most of the presentations had to do with purely practical and operative techniques. They lacked the great variety of the German meetings enabled by considering anatomical, bacteriological, embryological, and especially obstetrical issues; for example, there were no arrangements for microscopic or other slide projections. Similarly, there were none of the exhibits that are so abundant and interesting at our meetings (apart from an occasional demonstration).

Of course, it is not easy for a foreigner to evaluate the practical experience of the individual speakers and operators in America. It seemed to me that the concentration of material in our German clinics and hospitals is basically larger, or it might be better to say that the leaders of these institutions can accumulate a greater experience, since in the American hospitals there are often three or four representatives of the same specialty who rotate on different days of the week or every three or four months. Naturally, this considerably divides up the material. We consider it almost axiomatic that all Americans are born lecturers and skilled debaters. And certainly the form of their debates is skillful and polite. But it made a remarkable impression that all the talks, including the featured presentations, were read word for word.

The conclusion of the sessions consisted of a very festive banquet dedicated to the memory of McDowell, his practice, his life and work, and even his patient. An entire address was dedicated to this patient, a Mrs. Crawford, who was clearly an advocate of early mobilization after laparotomy: When McDowell went to see her on the fifth day, he found her making her own bed.

Following the American custom, the official talks began after dinner (at 10:00) and went on for 2½ hours without interruption. It particularly affected those used to European customs that only Appolinaris water was served to drink during the main course of the excellent meal, since Americans, even in the large hotels, generally only drink ice water at mealtimes.

There is no doubt that gynecology and especially operative gynecology is highly developed in America. The new hospitals (in America almost exclusively established and maintained by foundations and voluntary donations, or by religious societies) almost all have excellent operating rooms, sometimes very luxuriously equipped. They operate with strict asepsis (rubber gloves, masks, etc.), and generally through a very short vertical incision in the linea alba. The indications for operative intervention are very broad; the appendix is almost always removed incidentally during laparotomy. I do not think that I saw a single laparotomy performed in America where this was not done. This was justified by the assertion that appendicitis is much more common in America than in Germany, especially among immigrants. The appendiceal specimens did not always show pathological findings.

The admixture of the different races in America presents the opportunity for interesting comparative observations. (For example, at a little railroad station in the desert of New Mexico we saw pure racial specimens next to each other: Anglo-Saxons, Negroes, Indians, Mexicans, Japanese). Several different experienced operators in Chicago assured me that the German population had significantly more cancers than the other population groups. However, in other American cities in the east this very striking observation was not confirmed, despite my repeated particular inquiries.

Clinical instruction is generally provided as we do. In the gynecology clinic in St. Louis, I saw the practice that I believe was formerly followed throughout America, whereby the woman to be examined has her upper body in one space while her lower body is in another. They are separated by a curtain, so that the examiner and the patient cannot see each other's faces.

It seems to me that clinical instruction in obstetrics still needs further development in America. There are dedicated obstetrical institutions (for example the large Lying-In Hospital[2] in New York), but not very many (perhaps only this one). But even the obstetrical departments at different hospitals, which might be considered for obstetrical education, are rather small and primitive. This is consistent with the fact that American women do not want to go to institutions, they want to be delivered at home. And under no conditions do they want to be the subject of clinical instruction. In this respect it was very characteristic that among 6274 patients at the Lying-In Hospital of New York in 1908 (according to its official report), only 949 were native-born Americans. In Washington, the majority of the patients in the obstetrical department are Blacks. Here too it was possible to observe the strict social opposition of the Black and White population, despite the political equality, which becomes more apparent the further south one goes. Just as it is impossible (due to the refusal of the Whites) to have both Black and White servants, just as in the streetcars and railroads the Blacks and Whites are separated into their own sections, so it is impossible to have Black and White obstetrical patients in the same room. Even the newborns, who do not stay with their mothers but go to their own rooms, have to be kept separate. Among the newborns there was an abundant selection of different colors from yellow-gray to the purest black, and many exhibited the pronounced Negro skull type in an almost comical way. The little Negroes are usually rather light-skinned after birth; they reach the true dark color only after the first 14 days of life.

Since the universities almost never have their own hospitals or obstetrical institutions for the medical schools, and indeed these may not even exist, the students at some of them (especially in cities with a population of ½ - 1 million) are basically only taught theoretically about obstetrics and then have to enter a clinical practice without ever examining a pregnant patient or one in labor. Furthermore, there are no midwives or midwifery schools in America, or rather there are only immigrant midwives (German and Italian) to serve the poor immigrant population. The other deliveries are attended by doctors (with some obstetrical institutions), supported by nurses who are trained in obstetrics but not able or allowed to perform examinations.

As you know, there is an extraordinarily large number of medical schools in the United States. Their connection to the universities, even in the large cities, is mostly quite recent and rather loose. As a result, the latter with the majority of their large and numerous buildings are often in a completely different location from their medical school (for example in San Francisco, Boston, etc.) and the overall appearance and facilities of the medical school are often in great contrast to the stately and imposing university buildings. The generous foundation support for the universities have not benefitted the construction and equipment of the medical schools. Yet there are exceptions, as for example the Johns Hopkins University in Baltimore, the Pennsylvania University in Philadelphia, Harvard University in Boston, etc.[3] While the "academic" hospitals in our sense are rather sparingly provided, the private hospitals are mostly very beautiful, modern, and luxurious. Of course, they have quite different costs for admission (up to 40 *Mark*[4] per day for a room with bath). Almost every large hospital has an attached nursing school, which does an excellent job of training nurses in 2- or 3-year courses. The staff to assist with medical care is thereby very large everywhere. These nurses mostly come from the best classes of society and correspond somewhat to our Viktoria-, Luisen-, or Alice-Sisters; however, this system is much more and much better developed in America. Corresponding to the higher educational costs and the social position of the nurses, the remuneration for home care is also much higher than with us (10 *Mark* per day in addition to boarding costs).

As you know, the universities are also private institutions with few exceptions, supported by foundations. Each of the famous multimillionaires or their families has "its university," that it looks after. But although these institutions are also marvelous, the salaries for the faculty are not so marvelous by American standards. The practitioners and their assistants are not reimbursed a penny for their efforts. They have to earn their high cost of living exclusively through private practice. It seems likely that their educational activity suffers as a result. A few attempts have been made by foundations to address this salary issue and possibly to provide for university teachers who are older and no longer competitive in practice.

As you know, the status of medicine in America has significantly improved in recent years. To practice medicine, a degree from some medical school is no longer enough, but one must pass an examination by a commission of doctors named by the state. However, it should be noted that his examination only applies to the specific state, not for the entire country, so that for example (as I was told) a doctor established in New York and approved by the state of New York cannot practice in Jersey City on the other side of the Hudson without a special license.

It is well known that the situation of the universities differs in America, where they are almost all purely private institutions, from those in Germany, where they are all state institutions. Student life is also quite different over there. In many respects, it is nothing more than an extended *Gymnasium*.[5] The students mostly live in so-called dormitories, which are barracks-like apartments near the university buildings. There they have their athletic fields, their libraries, and their nicely furnished clubhouse, in which absolutely no alcoholic beverages are served. In some universities, for example Harvard in Cambridge, they all dine together. The gigantic Memorial Hall there had places for about 1000 students. There is no opportunity for students to wander from one university to another. Whoever has chosen a university remains there until graduation, with few exceptions. And this apparently leads to a certain class spirit that is maintained later in life. Attendance at lectures is strictly monitored: Whoever misses a medical lecture or a course three times without an adequate excuse is expelled without further consideration. It is well known how much importance is placed on physical development and sports in the American universities, just as in England. At the University of California, the students are even trained militarily with weapons, and are obligated on admission to take part in these exercises. Each of the large universities has its own stadium, in which the athletic contests take place between the students of that university and those of other universities, before a crowd of spectators numbering 12-20,000. We could observe the part taken by the entire population in these games for example in St. Louis, where in the evening in the city hundreds and thousands of people crowded together and held lively discussions around the places on the street where the results were posted. As another sign of this high opinion of physical skill and the reputation enjoyed by the victors in these contests, I can mention a beautiful, life-sized bronze statue that I saw under the lovely oak trees on the campus of the University in Berkeley (California): A prize for two-time victory in football.[6] The names of all those who had participated in the contests were chiseled into the pedestal.

The famous Greek Theater[7] is also here in Berkeley: Wonderfully built into a hillside, framed by dark-leaved tropical trees, where academic ceremonies are held in the open air as well as presentations of classical dramas. I was there along with 12,000 others on a Sunday afternoon under the radiant California sun for the academic ceremonies at which the commencement address was delivered to the new graduates. This year's graduates, the young men along with a fairly large number of young women, were wearing a sort of gown with a very stylish cap.

I was told that this unusually extensive attention to sports facilities, which must strongly interfere with scientific studies, is not only valuable for building physical strength but more importantly for developing character and self-confidence in the young men. There is no question that it is more useful than the mindless tavern life with which so many of our students sadly while away the hours. Our students could also learn from their American counterparts that one can have a bright and cheerful youth even without guzzling several liters of beer every day. And even if the academic sporting scene is overdone in America and the scientific studies suffer as a result (as I was often told), it would still be well worth developing this more at our universities at the expense of the tavern life.

The structure of the purely scientific activity in the medical schools, at least as it applies to the practical subjects, creates some limitations. Since the professors are basically all in practice, and there are no paid assistants who could help the younger men spend more time on purely scientific work, there is not much time for such activity. However, Rockefeller has founded and supported an Institute for Medical Research in New York, dedicated to the encouragement of scientific medicine and somewhat analogous to the *Institut für experimentelle Pathologie*[8] in Frankfurt am Main.

The study of anatomy and anatomic pathology encounters significant problems at American universities, primarily because of the difficulty in obtaining cadavers and autopsies. Almost all the pathologists that I met had been trained in Germany, and many of both the younger and the older American colleagues who had spent time at the German schools expressed their gratitude for German science and the German universities.

No doctor and especially no doctor interested in the operative aspects of our specialty can visit the United States without being asked: Have you been to see the Mayos in Rochester? And indeed, no doctor should leave America without making a side trip to this small city in Minnesota (an overnight from Chicago), where the brothers William and Charles Mayo have organized a medical practice on an industrial scale unequalled anywhere else in the world. They have been able to turn this little isolated city (population about 10,000) into a medical Mecca, not only for patients but for the doctors of America. Starting with a hospital of 35 beds founded by their father, who still lives there, they now have 250 beds at their disposal, not to mention a number of sanatoriums. A staff of excellent and diligent specialists in all areas of medical practice helps to manage the steady flow of patients, and they operate along with their first assistant in three different operating rooms every day from 8:00 to 1:00. Every day they do about 20 operations, every year on average 5-6000. Several pathologists, who have very well-equipped laboratories available, receive the specimens for further study. The principle of division of labor is generally followed, so that William Mayo does most of the operations on the abdomen while Charles Mayo does those on the upper body. A constantly changing crowd of doctors from all over America is there to observe, and then gathers each afternoon in a so-called international debating club to discuss the cases seen that morning. As one operation in one room is finishing, another is starting in another room. I myself saw them carry out an entire series of different operations (in the peritoneal cavity, on the kidneys, on the torso, on the neck, on the head, 20 in all) in one morning, with excellent technique and asepsis, and can only speak highly about everything I saw there, and I must also express my gratitude for the personal kindness with which I was received there.

Whoever has been active for a long time in academic life, especially in the center of the German medical world, is sure to find a large number of his former colleagues and students in respected and well-paid positions in America, and they will greet him joyfully as a tangible part of the old country. Thus, I was reunited with old colleagues and students in the different cities of this broad land and received in the most kindly fashion. What they say that they like best about their new country is the greater elbow-room and the feeling of complete equality of everyone, without the social class structure that is undoubtedly found in the Old World, including Germany and even among doctors. The external relationships between colleagues and with the public are more strictly regulated than with us. The principle here is democratic equality. Just as the visiting cards are all quite small and contain nothing other than the name to indicate a person's status or activity, so also the doctor's office only has his name on a small sign in the ground-floor window, without any further designation. However, behind this democratic equality and fraternity I think there is more competitiveness than with us. The high cost of living requires intense activity. There is a lively effort for continuing education and participation in current scientific endeavors, as evidenced by the large number of general and special societies. I should also recognize the large and well-organized medical libraries that are made available to members of these societies, and indeed libraries have been developed by foundations and municipal support in America more than anywhere else in the world. The large state and city libraries in Washington, New York, Chicago, and Boston are truly wonderful both in their external appearance and their internal arrangements.

The number of German colleagues in New York and Chicago is large enough to have purely German medical societies in addition to the many others. The inclination of Germans to join organizations for some purpose is also quite apparent everywhere in America: There are said to be no fewer than 2000 (!) German associations in New York! But how much longer will these German entities remain in the United States? It is well-known that the volume of new immigrants has greatly decreased. It is true that the immigrants themselves are actively maintaining their connections to the old country. Indeed, I have heard many say that all of them, even if they give no external sign and are well-off over there, are homesick for the old Fatherland deep in their hearts. I have also heard older colleagues describe in a touching way their feelings when they visited their old Fatherland but were sometimes disappointed to find that the old places had become unfamiliar. And just as these German colleagues often speak English with each other, the next generation even in purely German families is externally and apparently often internally already completely Americanized. German families have seemed to resist assimilation in Slavic and Oriental countries, and to some degree in those with Romance languages, but not the Anglo-Saxon culture and the English language. But I may say in conclusion that I frequently saw efforts, especially in New York, to combat energetically this Americanization of German culture, and likewise the increasing official Puritanism. In this respect there is a legalized intolerance that our concepts of individual and democratic freedom cannot accept.

Biographical Source

Schmitt W, "Max Hofmeier," *Monatsschrift für Geburtshilfe und Gynäkologie* 1927; 76:387-396.

Publication Source

The *Zeitschrift für Geburtshülfe und Gynäkologie* changed its name to the *Zeitschrift für Geburtshilfe und Perinatologie* in 1972, and then ceased publication in 1994. Historical issues can be obtained through the Internet Archive.

Translation Notes

1) See *Transactions of the American Gynecological Society* 1909; 34:573-636.

2) The Lying-In Hospital (E. 2nd Avenue, 17th-18th Street), was an autonomous women's hospital donated by J. P. Morgan. It merged with New York Hospital in 1932, dropping the name, and has today been converted into condominiums called Rutherford Place.

3) The author misspells the names of all three of these institutions.

4) The *Mark* was the monetary unit of Germany, worth about $0.24.

5) The *Gymnasium* in Germany is a secondary school that prepares students for university. It roughly corresponds to an American high school plus the first two years of an American college.

6) "The Football Players," by sculptor Douglas Tilden, was awarded to Berkeley as the "Prize of Superiority in Football" after they beat Stanford in 1898 and 1899. It is still there.

7) The Greek Theater, donated by William Randolph Hearst in 1903, is also still in Berkeley, and has extended its functions to include rock concerts.

8) Paul Ehrlich was the principal investigator at this institute, which has since been absorbed into the Goethe University in Frankfurt.

20

Nicolai Guleke (1909)

Nicolai (sometimes written “Nikolai”) Gustav Hermann Woldemar Guleke was born in 1878 in Pernau (at that time a predominantly German-speaking part of the Russian Empire, today Pärnu, Estonia). He studied medicine at several German universities, especially in Berlin, where he was a protegé of the famous surgeon Ernst von Bergmann. He trained broadly in general surgery, with a particular interest in neurosurgery. After the death of Bergmann in 1907, he became Privat-Dozent in Strassburg (then part of the German Empire, today Strasbourg, France).

In 1909, at the age of 31, he traveled in the United States for three months, and reported on his experience later that year.

He stayed at Strassburg through the First World War, worked briefly in Marburg, and then became Professor of Surgery in Jena, where he spent the rest of his career, continuing to specialize in neurosurgery. In 1937, he was called to be an advisor to the German Army and obliged to join the Nazi Party. In 1938 he was President of the *Deutsche Gesellschaft für Chirurgie* (DGCh, German Surgical Society). Rudolf Nissen later credited him with trying to minimize Nazi influence on the surgical profession.

After the Second World War, he remained in Jena, which became part of the German Democratic Republic (East Germany). He retired in 1950, and the following year did not return to the East after attending the DGCh Congress in Munich. He lived in Wiesbaden until his death in 1958.

Chirurgische Reiseeindrücke aus Nordamerika
Münchener Medizinische Wochenschrift, 1909; 56: 2321-2324, 2380-2383, 2426-2428

Surgical travel impressions from North America
by Privat-Dozent[1] Dr. N. Guleke,
Senior Physician of the Surgical University Clinic in Strassburg i. E.[2]

Riding the 20th Century Limited with a speed of 100 kph from New York to Chicago, which less than 40 years ago was just the smoldering ruins of a terrible fire but today is a metropolis whose growth even overshadows that of New York, one gets some idea of the immensity of this land, its power, and its unprecedented development. No wonder that the Americans, despite their respect for an older culture, are proud of their young country! Just as the development of all branches of economic and commercial life are rapidly progressing, so also will the intellectual and scientific areas, which have been relatively restrained, now be eagerly pursued. American surgery, which hardly existed 20 years ago – at that time it was only that derived from Europe – has developed so much in recent decades that it is not only independent of its European roots, but in many respects has surpassed them. Thus, against the current of American doctors who have been streaming for many years to study in Europe, there is in recent years a countercurrent, still modest at present, which will lead in time to a more equal exchange between here and there.

My three-month journey through the eastern parts of the United States illustrates how rewarding a surgical study tour in North America has already become, and how many interesting things can be seen thanks to the extraordinary hospitality of American surgeons. I owe the initiative for this trip to my honored Chief, Prof. Madelung. Through his kind advocacy, I was able to obtain financial support from His Excellency, the Imperial Governor, and from the Kunitz Foundation and the Lücke Foundation of Strassburg University, for which I would like to express my gratitude here.

Of course, in such a relatively short time – I was on American soil for 10½ weeks – one can only collect a set of impressions, without being able to form final judgments about many things. Fairly often I could only see surgeons operate with inadequate material or in unfavorable circumstances, and it would be wrong to draw definite conclusions from such observations.

However, for many things I have had such consistent impressions, and – thanks to the free and friendly reception I had from the Americans, which I expressly and gratefully acknowledge – I have also absolutely seen so much that I appreciate this opportunity to report on some of my American surgical observations and impressions. If here and there a word of criticism is included, then I hope it will not offend my worthy colleagues, whose hospitality I have enjoyed in every respect. Quite the contrary! We can only advance through a mutual exchange of ideas, and of course this includes criticism on both sides.

The geographical situation of the country and its cities, the reputation of individual men, and external conditions have the result that most European surgeons who come to America for study will follow roughly the same route. Thus, it happened that I ran into Herr Geheimrat Friedrich[3] from Marburg several times at different locations, and we were following in the footsteps of Mikulicz, Trendelenburg, Schmieden, Sauerbruch, and Clairmont. Most commonly visited are the large centers of the East, then one generally travels west to Chicago and possibly St. Louis, but above all to Rochester, Minnesota, to meet the Mayo brothers and see their clinic, whose material and organization are unique in the world.

The surgeons of the far western states are right to complain that they are being neglected by surgical travelers. Considering the presentations and discussions that I heard at meetings in Philadelphia and Atlantic City, where colleagues from the West were energetic participants, I have no doubt that one could see a lot of interesting things by visiting them.

I was particularly impressed by how generously, indeed how eagerly, the Americans would show what they were doing or working on to a colleague who had come from far away.

It may be partly due to the fact that European guests are still relatively uncommon. However, it is surely also due to the natural hospitality of Americans, who are eager to show a guest who wishes to observe and learn something from them at least a quick look at their activities, interests, and work. They were even happy to present and discuss incomplete – unpublished – studies. Although this sometimes leads to the feeling that fundamental scientific facts are being ignored and that only hypotheses are being raised, it is still a good way to become acquainted better and more naturally with a person's thoughts, concepts, and individual characteristics.

Many of my observations and much of that which was said and demonstrated to me have already been described by Clairmont in his "Surgical impressions of North America"[1], some of it in almost the same words that I heard a year later. Clairmont's article was a welcome addition and confirmation for many of my own experiences and observations, and I will refer to it several times in what follows.

The first thing that impresses a European surgeon arriving in New York is its amazingly luxurious hospitals. There is nothing in Europe like the white marble Lying-In Hospital[4] built by Pierpont Morgan or the Mount Sinai Hospital. The latter covers a huge area of the most expensive ground in New York, wonderfully situated on Fifth Avenue across from Central Park, and is equipped with every comfort imaginable, a large space for each patient, diffuse light in the hospital wards, etc. One is even more amazed to hear that almost all hospitals in America are built and maintained through private means, as gifts from wealthy people, and that there are hardly any city or state hospitals. This includes more than 40 hospitals in New York, and a proportionate number in the other large cities and even the smaller cities, for example Peoria in Illinois, have well-equipped hospitals. Even if we consider the wealth of a Pierpont Morgan or Rockefeller – the latter is supposed to have a fortune of 2000-5000 million dollars, which is hard for us to imagine – and emphasize that these kinds of gifts are easy for such a Croesus, the fact is still that Rockefeller, for example, has donated more than 100 million dollars for universities and similar institutions, of which 10 million has been devoted to medical science. Often, as with the Jewish Mount Sinai Hospital, several gentlemen join together, and then one building or hall will be endowed by one donor, another part of the institution by another, including the ongoing maintenance, which is an important point. In many hospitals donations have also paid for private rooms (often by former patients) and in most a very large number of beds on the wards, which is particularly important since they generally do not have any form of health insurance.

If sometimes such gifts are overdone (this might apply to the Mount Sinai Hospital, which occupies the most expensive real estate in New York), still it appeals to the practical sense of the American, that so much money can do a lot of good. It takes account of the overall health and welfare of the sick in the broadest sense. Almost everywhere one finds not only bright and welcoming wards with relatively few beds, comfortable adjoining rooms and lounges, visiting rooms, and plenty of isolation rooms for the severely ill or dying, but also in many hospitals every individual bed can be separated from the others by a light, transportable screen, so every patient can have some relatively undisturbed privacy. It is considered a matter of course that such a screen should be used when a patient undergoes an examination on the ward, just as it is understood that the patient's permission should be requested before he or she is presented as a case to a visiting doctor, and this is not just a formality. On the other hand, I particularly noticed that even many of the newer hospitals did not have dressing rooms for each department, so that dressings sometimes have to be changed on the ward and sometimes in the operating room (although at Mount Sinai every dressing room is almost like a small operating room). Since the pavilion system cannot be used in the large cities due to the expensive real estate and lack of space, hospitals are built 4-6 stories high, and the flat roofs are used for lounges, special facilities, and roof gardens, which allow the patient plenty of light, air, and sunshine, and often wonderful views. For the winter, this includes glass-walled, heated lounges. In other Hospitals, such as Lakeside Hospital[5] in Cleveland, Johns Hopkins Hospital in Baltimore, and Corey Hill Hospital[6] in Boston (a private clinic), there are open balconies and lounges on every floor that are particularly used for the postoperative care of surgical patients. Crile in Cleveland ascribes much of his success with surgical tuberculosis to this outdoor treatment right on the shore of Lake Erie, but also puts his other postoperative patients into the fresh air as soon as possible after general anesthesia, since they recover and feel better more quickly.

As far as other facilities go, the operating rooms in most hospitals are practically and appropriately furnished. I cannot agree entirely with the opinion of Clairmont, who was generally disappointed with the equipment in American operating rooms. It is true that sometimes in a major hospital, for example the German Hospital[7] in Philadelphia, the modest dimensions of the operating room are surprising, an impression that is made even stronger since in many places the sterilization equipment is placed in the operating room itself. However, in general I thought the rooms were of an appropriate size, well lit, and appropriately equipped. The size of the operating rooms depends of course on the purposes they serve, so in hospitals like the Johns Hopkins Hospital, the Massachusetts General Hospital, etc. there are giant operating amphitheaters with space for 300-500 observers (Jefferson Hospital in Philadelphia, Presbyterian Hospital in Chicago) but also smaller rooms for the usual operations, which nevertheless have space for the very practical portable iron scaffolds that can seat about 20 observers, which are found everywhere in America. Of course, in the non-teaching hospitals they do not have these large operating rooms. Most places have several operating rooms (for example in Mount Sinai, which is especially well equipped in this respect, there are two aseptic, two septic, and one large amphitheater) and in a whole series of hospitals I was told that the rooms for septic and aseptic cases are kept strictly separate. White tile and marble are preferred for constructing operating rooms (in Mount Sinai the entire suite is grey marble, even the ceilings). As an innovation, St. Luke's Hospital[8] now has matte glass for floor and walls, which is considered particularly practical and hygienic, and also has a very nice appearance. Many hospitals, and even small private clinics like the Corey Hill Hospital in Boston, have numerous practical auxiliary rooms for sterilization of instruments, anesthetic induction, dressings, etc. and it was especially noteworthy that in several hospitals the postoperative patients are transported to special rooms where they stay under observation until they have completely awoken from the anesthetic, or even longer than that. On the one hand, this allows for careful monitoring of the patient while they are recovering from anesthesia, and immediate intervention by the nearby surgeon if necessary, and on the other hand the other patients do not have to witness the unpleasant after-effects of general anesthesia. Furthermore, this avoids exposing them to the ether exhaled by those recovering from anesthesia, which many American surgeons think is important.

The "dispensaries" (outpatient clinics) attached to all the larger hospitals see quite a huge number of patients every day (the Mount Sinai Hospital, with perhaps the largest ambulatory clinic in the world, treats 700-1000 outpatients daily), and are for the most part exemplary. In this area the American talent for organization is especially useful, and the facilities, departmentalization, and administration of the clinic is extraordinarily practical and straightforward. The new dispensary of the German Hospital[9] in New York deserves mention as it meets all of the modern requirements. Surrounding a large, brightly lit waiting room there are separate examining areas for surgery, internal medicine, gynecology, urology, otology, ophthalmology, and dentistry. The area for each department consists of two or three small rooms, one for the doctor, one well-equipped examining room, and a small dressing room. The orthopedic area at the Massachusetts General Hospital dispensary is notable for its large rooms for applying plaster casts, and the Boston Children's Hospital dispensary also handles a large volume of orthopedic surgical material with relatively simple methods. Later, I will discuss the private clinic of the Mayo brothers in Rochester.

Just as with the physical plant, so do the administrative structures of the outpatient clinics deserve comment, since they are often exemplary. Through the assistance of a sufficient number of office personnel, mostly women, all the written work is promptly and carefully recorded, including entries to patient charts, which takes a great burden off of the medical staff and simplifies the process, especially in the largest dispensaries. Everything is typed up immediately after dictation, and at the end of the clinic hours is registered on special pre-printed cards maintained according to different aspects (name, illness, body region, etiology, etc.) At the Lying-in Hospital there are rooms full of such statistically sorted cards, with three clerks specifically employed in their registration and maintenance. This obviously enables an overview of the clinical experience at any time, without wasting the doctor's time. I should mention that I have found the same sort of system, of course on a smaller scale, in the private offices of American doctors, for example Dr. Collins in Peoria.[10] Indeed, the offices of many surgeons, which are clearly set up along generally accepted principles and mostly include an operating room that meets all the requirements of asepsis, surprise us with their practical, comfortable, and efficient arrangements.

The patient cards, patient charts, temperature curves, annual reports, etc. in the largest hospitals are all printed in their own print shops, just as almost all other services required to run the hospital are provided internally. Along with the expected facilities for central heat, hot water, and electricity, you can find a carpentry shop, locksmith, metalworking shop, sewing shop, steam laundry, and ironing shop. At the Mount Sinai Hospital, they have even taken the excess carbonic acid from their icemaking shop and incorporated it into their water supply, so that the patients have as much seltzer water on tap as they might want. Every hospital has many reliable elevators for transporting patients as well as for the food and laundry services, and indeed the stairways in public buildings in America are rarely used. Finally, I should mention the clean and well-organized rooms for storage of the patients' clothing. Their street clothes are exchanged for hospital clothes and carefully disinfected before being stored.

Despite all of these not entirely inexpensive arrangements and comforts for the patients, the daily cost of care is not much higher than ours, so actually it is less expensive, relatively speaking. The third-class patient has to pay about a dollar a day. However, since there is still no universal health insurance, and the patients very often cannot afford to pay for a longer stay, they frequently make use of the widely available free beds that are paid for by charitable donations. At the Mount Sinai Hospital, about 70-80% of the patients are in free beds. Thus, the income of the hospital is limited to the private rooms, which are often constructed with great luxury and are priced accordingly. The cost for private rooms varies from 20 to 120 dollars a week, indeed I saw rooms that cost 25-30 dollars a day at St. Luke's Hospital in New York and the Corey Hill Hospital in Boston. On average, however, you can count on paying 20 dollars a week for a private room, including with the Mayos in Rochester. The bathing facilities, very well furnished by our standards, made a pleasant impression. Most of the time there is a bathroom between each two patient rooms, accessible from either side, which is the usual arrangement in American hotels.

Although many of the large hospitals in America have a large number of beds (for example, Mount Sinai Hospital has 450), still the number of patients allotted to the chief of each department is relatively limited. To begin with, half the beds are usually assigned to Internal Medicine, and the remainder are further divided among several surgical department chiefs, who change places every six months. Usually there are three men, of which one is always on leave for half of the year and operates at another hospital. In America, neither the chief nor his assistants receive a salary. Their service only gives them the right to admit their private patients to the hospital, a right which extends to their assistants (secondary or what we might call "tertiary" doctors). The average number of inpatients assigned to the individual chief doctor is generally not more than 60-70. A similar relationship exists at the large outpatient clinics. Even here there is an abundance of doctors, since a hospital appointment is significant for their practice. Therefore, even in the giant clinics like that of Mount Sinai Hospital, the individual physician who works here by the hour only sees a small fraction of the material, since there are almost 150 doctors at this hospital.

At this point, I should mention another thing that repeatedly impressed me about American hospitals. Both in the large hospitals and in the smaller provincial hospitals I always saw an impressive number of visiting doctors, who observed the operations eagerly and with very good understanding. It is very characteristic of the American doctor that he tries to continue his education in every way. The particular interest in the surgical area is probably related to the fact that more or less every American doctor performs surgery from time to time. I do not believe that this circumstance is entirely explained by the relative superficiality in their undergraduate training, which is perhaps in many respects different from ours, but instead it seems that the American doctor feels an inner desire to continue his postgraduate education. Evidence of this are the "postgraduate medical schools" (something like our continuing education courses) that exist in every large city, and the multiple-week vacation study tours that almost all doctors, especially specialists, undertake every year to the large medical centers, for which no distance or expense is too great. The average medical level among these practitioners, with whom I made many interesting acquaintances, was surprisingly good.

For one who has been involved with scientific or experimental work, an exposure to American laboratories is especially interesting. What I found impressive was not only the wonderful institutes and arrangements that facilitate the work so much that it is almost a pleasure, but also the widespread enjoyment of scientific work and creativity that I encountered, and an idealism that would not be suspected from the customary characterization of an American. The Americans want to be on an equal footing with their old schoolteacher Europe, not only in practice but also in science, and the works of Halsted, Cushing, Flexner, Opie, and others show that they have this capability. They also have teachers who can awaken the love and desire for scientific questions, and understand how to excite the younger generation for experimental work, as I have seen with Crile, and especially with Cushing. The latter, as Clairmont also reported, emphasizes that students should ideally learn operative technique not on cadavers as is customary in Europe, but on living animals, since only in this way can they gain an accurate insight into the demands and the need for good asepsis. According to Clairmont, Cushing has provided his students in the Hunter Laboratory affiliated with Johns Hopkins Hospital the opportunity to make clinical observations on animals and carry out appropriate operative interventions, and furthermore due to their diligent care and successful healing of the experimental animals the citizens of Baltimore prefer to bring their sick pets to this laboratory for surgery, despite the antivivisection movement that also exists there.

The Rockefeller Institute in New York and the Harvard Medical School in Boston are provided with far greater resources, both for buildings and for equipment. The Rockefeller Institute was built by Rockefeller for four million dollars and so far has exclusively supported scientific and experimental research. However, in the near future there will be a multi-story hospital next door, which was still just an iron framework during my stay in New York, and this will be devoted to the practical application of methods developed at the Rockefeller Institute. The Director of the Institute is Flexner, who has recently become known especially for his work on epidemic meningitis.[11] Also employed at the Institute are Opie,[12] who has made such great contributions to the study of the pancreas, the physiologist Meltzer,[13] Carrel, and others. The numerous beautiful workplaces are also open to outside researchers, who must of course first obtain permission. While I was there, only Professor Willy Meyer from the German Hospital was working with his brother on a pressure differential chamber, and I saw him perform a very successful operation on a dog in the recently completed double chamber.

Carrel's laboratory facilities were of particular interest to me, and it will be worthwhile for me to say a few words about them. For his work on vascular suture, the main requirement is painstaking asepsis during and after the operation. Accordingly, his facilities, although small, are set up just as in a good hospital. Located on the top floor of the Institute, there are in sequence a washroom for the dogs, an anesthetic and preparation room (the animals are not shaved and prepped until under anesthesia), a sterilization room, and a well-lit comfortable operating room with a good operating table, and on the other side a room with warming boxes for animals who have gone into shock during surgery. In the operating room there is an instrument case, which is well supplied, although relatively simply due to Carrel's skill and efficiency. On the same level with these rooms is the flat roof of the Institute, which allows space for the animals to run around and has a number of additional rooms each with 2-3 cages. Here there is also a space for recently operated or seriously ill animals, with special beds having a rubber pad with a space cut out for defecation etc. During the day, these "patients" are monitored by a certified nurse, who also assists with the operations and sterilization, takes care of the animals, and keeps them calm and fed. At night this care is continued by a keeper. Once healed and out of danger, the animals who are going to be observed for long-term results are sent to a farm that is maintained by the Institute for this purpose, where they are kept with complete freedom.

Carrel himself emphasized repeatedly that this very exemplary system is no frivolous luxury, but an absolute necessity for the success of the series of fine experiments like his organ and extremity transplantations, and I can only agree based on my own experience in this area. A quick look at Carrel's exhibit cases, which he showed me with the greatest hospitality and most friendly patience, is enough to show the diligent work being done here and what Carrel's methods of vascular suture might enable. Next to a series of successful blood vessel transplants, even utilizing veins from different species, I saw a series of blood vessel transplants followed microscopically for different lengths of time after preserving the vascular segment on ice. Many of these exhibits had been excised 1-2 years after reimplantation and all cases showed good functional results. The anatomical results depend on the length of time between excision and reimplantation. I was convinced of Carrel's confidence in his success by the number of exhibits of completed transplantations of kidneys, thyroids, and extremities, and the two extremity transplantations whose course and complete healing I was able to follow during my stay. He was busy at that time with investigating how one can best avoid the lymphedema that sometimes develops after transplantation, which he told me is very bothersome after an otherwise completely aseptic case. I myself was able to admire Carrel's technique in performing some vascular transplants, but do not need to say more since the results speak for themselves and the technical details have been described by Carrel himself and by Clairmont.

Even greater than the Rockefeller Institute is the Harvard Medical

School, which was especially built for teaching purposes [2]. Far to the southern part of Boston on a slight elevation, the five elegant and well-situated buildings of white marble make a monumental impression, which is enhanced by their internal facilities. A large central building accommodates the administrative departments, large and welcoming club-like lounges for the students, and a large amphitheater with epidiascope etc. for conferences and major presentations. In front of the central building is a beautiful slope with an open lawn, framed on each side by two of the other buildings, which serves as a gathering place for conferences, dinners, etc. The buildings on each side are devoted to experimental research in all areas of medicine, and each is divided into two departments, so that there is a home for surgery, internal medicine, anatomy, histology/embryology, pathology, physiology, pharmacology, and hygiene. In addition to excellent large and small workrooms with all comfortable facilities, each department has a beautiful amphitheater for lectures, a well-stocked specialty library, a typist immediately available to all researchers for transcribing experimental results, well-constructed animal stalls on the roofs, etc. The animal operating rooms are even better than at the Rockefeller Institute, although I noticed that they are located in the Department of Internal Medicine. Very practical and valuable is a large mechanical workshop, in which apparatus, instruments, and anything else required for the experiments is prepared by industrious mechanics under the direct supervision of the researchers.

Each department has its own fund for experimental work, which is apportioned among the researchers after criticism of the proposals by the directors, and often entails substantial support (the Rockefeller Institute has nothing like this). Here also any qualified doctor can obtain a place to work, without any special restrictions.

In three years, they plan to build a great associated hospital with 500 beds next to the Harvard Medical School, where the results discovered experimentally can find their practical application. “Once the planned modern hospital is built in this area, it will be possible to teach the practical subjects right next to the theoretical ones and it will surpass any such institution in the entire world” (Clairmont).

I also found the effort to ideally unite theory and practice at the Gratwick Laboratory in Buffalo, which is dedicated exclusively to cancer research.[14] Here also they hope in the near future to build an associated hospital that would likewise devote itself to cancer patients. The institute is led by Gaylord, who worked for many years in Europe with Orth, Chiari, and Mikulicz and has made a name for himself through his efforts in the area of cancer research. A convinced disciple of the parasite theory, Gaylord[15] is now attempting to show experimentally the mechanisms through which carcinomas are transmitted through infection, often actual epidemics, seen in the great American fish hatcheries. He has amassed a colossal amount of material including numerous cases of tumor transmission in the fish, of which I saw some microscopic preparations that undoubtedly look like definite carcinomas and sarcomas consistent with the clinical picture and metastasis, plus large collections and statistics about the different associated issues, and not least a thorough investigation of the cases. This is increasing every day, since not only doctors but also fish hatcheries in the entire United States have become interested and send new observations to the institute.

In the Cushing Laboratory (named after Harvey Cushing's father) in Cleveland, which is smaller and more simply equipped compared to the other research institutes I have mentioned, Crile kindly demonstrated some animal experiments. First, he attempted a resuscitation on a dog using his method of epinephrine infusion into the heart via the carotid artery. The animal, who had been "killed" by an overdose of nitrous oxide, had not taken a breath for five minutes, and had no pulse on the electrocardiogram for one minute, did indeed show strong cardiac contractions after an infusion of saline solution with epinephrine into the carotid, and after a period of artificial respiration did begin to breathe spontaneously. Crile believes that the essential factor in cardiac resuscitation is elevating the blood pressure in the coronary system, and that it is easier to achieve this by infusion through the large arteries than through the veins. Crile is now attempting to determine how long individual organs and especially the neurologic centers can survive and remain capable of resuscitation. In his opinion, the more highly differentiated centers die off earlier than the less differentiated ones, including finally the respiratory and circulatory centers. By seven minutes, everything in the brain except these two lowest centers have died. Thus, any attempt at resuscitation after that time can do nothing more than restore breathing and circulation, that is a vegetative state, and so he feels it is pointless to continue. Crile also demonstrated blood transfusion on a dog, and I will return to this subject later.

In addition to these laboratories dedicated to special scientific experimental research as freestanding institutes, I can also mention a whole series of hospital laboratories that have earned particular respect. For example, Dr. Rosenberger at the laboratory of Jefferson College in Philadelphia has recently produced a new method for detecting the tubercle bacillus in blood, which has excited interest in America and would be important if it is confirmed. Dr. Wright, the pathologist at the Massachusetts General Hospital,[16] showed me some interesting preparations about the genesis of blood platelets, which could be important for us surgeons given the issue of hemophilia; he has also succeeded in developing a model of actinomycosis and finding a fungus similar to that of actinomycosis in Madura foot. I saw numerous beautiful preparations, radiographs, and photographs of malformations and diseases of the urinary system in the well-equipped laboratory of the Presbyterian Hospital in Chicago with Bevan. St. Mary's Hospital in Rochester, which I will describe again later, has a modern laboratory that meets all modern requirements in every respect, and its various departments are worth seeing.

In every American hospital one finds an extraordinarily prompt and precise coordination of the laboratories with the clinical departments and operating room. Often the pathologist is waiting for the excised tumor and immediately brings the frozen section with the diagnosis. In doubtful cases, they always pause until the biopsy has been examined microscopically, which usually takes 3-4 minutes. This arrangement and its management is also exemplary in Rochester.

Appropriate to the needs of a large city, New York has a biochemical laboratory available to the practicing doctor, where urine, sputum, etc. are analyzed. Prof. Sondern privately founded this institute, the first of its kind in America. Its colossal workload shows how greatly it was needed. Here also one finds an excellently organized and equipped laboratory, using all the gadgets of American commerce (typewriters, phonograph for dictating letters and records, different card files, etc.) A large part of the Sondern's activity involves blood tests, which are often used in America for prognosis of inflammatory processes. One is guided by the relationship of the polymorphonuclear leucocytes to the overall leucocytosis. If the number of polys is large while the leucocyte count is low, then the prognosis is poor and the given case should undergo operation. On the other hand, if number of polys is low compared to the overall leucocyte count, one can safely continue to observe. Prof. Sondern said he had never had a failure with this approach in over 1000 cases.

[p. 2380]

Returning now to the clinical operations of the hospitals, one is struck above all by the fantastic provision of well-educated nurses. The assisting doctors at many large hospitals rotate very often (at the German Hospital in New York every 10 weeks), so they often are inadequate assistants and three or four have to be utilized, whereas the nurses both in the operating room and in the departments are always well trained and often extraordinarily efficient. It is immediately apparent that the nurses are all well educated –

that is a requirement for their admission – and often come from the best backgrounds in the country. Accordingly, they have a respected professional status and a preferred social status. An independent graduate nurse earns 25-40 dollars per week. Of course, before graduating she has to undergo a three-year course of training in the hospital, including fundamental theoretical education, and pass two difficult examinations. As a result, I have sometimes seen young nurses who know more than many doctors. In general, the number of nurses in the hospitals is regulated so that each has about three patients (in Mount Sinai with 450 beds – 180 nurses). If one compares this to the situation in Europe, it must be frankly recognized that in general the care of the sick is far better in America than with us. This is true not only for the hospitals, but in private life, since in America anytime there is an illness in the family the custom is to hire a nurse, and in severe cases several nurses. The demand for nurses is so great that it cannot be satisfied, even though there are a large number of them and every hospital has an associated nursing school.

The certified nurses must be distinguished from the nuns who are in charge of many hospitals. Thus, one finds Protestant German sisters at the German Hospital of Philadelphia, but otherwise mostly Catholic sisters, often Franciscan (St. Francis Hospital in New York, the same in Peoria, St. Mary's Hospital in Rochester). These are also mostly from Germany. Anyone who has seen the nun[17] who is the only person who assists William Mayo even with the most difficult laparotomies could not imagine a better assistant. Just as outstanding was the private scrub nurse of Dr. Brooks in Boston, who assisted while also passing the instruments.

In America, they prefer to have nurses administer the anesthetics. They are accustomed to the idea that anesthesia is not a secondary consideration in the conduct of an operation, but should be seen as an equally important intervention that is best in the hand of a specialist. Thus, many hospitals have special "anesthesiologists," doctors who only administer anesthesia. In others, nurses are preferred (Crile, Mayo), since it may be assumed that they will be less interested in the operation itself and thus less distracted.

The anesthetics used are indeed excellent, and complications are hardly ever seen. It is remarkable that they do not monitor the pupillary reflexes or facial appearance; to protect the eyes from ether, they always apply Vaseline and tape them shut. On the other hand, they monitor the heart rate and breathing with a stethoscope, and in almost all hospitals they keep an exact record or curve every five minutes on preprinted tables, from which you can see at a glance how the patient is doing.

For an anesthetic in America they use almost exclusively ether, specifically in the form of an open drip. In New York, I saw a few cases where nitrous oxide was used prior to ether, but I never saw chloroform used. As an exception, Crile uses nitrous oxide systematically for certain cases, which is indeed difficult to manage but has some advantages, namely that it is more pleasant for the patient, less likely to cause vomiting, and most importantly does not affect the resistance of the patient as much as ether in cases of severe infection (peritonitis etc.) Nitrous oxide is most suitable for women, children, and especially weak and decrepit patients; it is least suitable for strong men and drinkers. I had the opportunity to see two of these nitrous oxide anesthetics with Crile, but have to say I was not convinced of its merits. In both cases the patients did indeed awaken almost immediately with a good pulse, felt fresh and cheerful, and described the anesthetic as "delicious," even though one patient vomited repeatedly, but the intraoperative back-and-forth between asphyxia and awakening, the congestive bleeding, the continuance of muscle tone, and the difficulties in dosing and the alternating insufflation of oxygen and nitrous oxide leave me doubtful that this method will be adopted.

The consistently excellent results with ether anesthesia in America have made them disinclined to take part in our recurring attempts to replace the usual general anesthetic with other methods. The only one to my knowledge over there who has used morphine-scopolamine anesthesia to any large extent is Dr. Clifford Collins in Peoria, who has tried this method in more than 1000 cases with good success. Spinal anesthesia is completely rejected in America, and local anesthesia used only in extremely rare cases. All told, I saw 242 operations on humans in America, of which only two were performed with local anesthesia, specifically with the old Schleich infiltration method.[18] Despite multiple inquiries, I never heard anything about our newer methods in this area, and I was repeatedly told that the patients would probably refuse to try them, since the familiar ether is viewed as much safer and more pleasant.

I was assured everywhere that the postoperative pulmonary complications that we fear so much are very uncommon. Only in Rochester with the Mayos did I have the opportunity to follow the postoperative course of the patients who had undergone the major operations that I observed, and in this large experience I found only two pneumonias that had occurred during convalescence. The general opinion (Crile, Robb, Elliot) is that pneumonias are brought on by excessive cooling of the patient on the operating table, since the autoregulation of body temperature is disturbed by the anesthetic, especially if the patient is not carefully dried off after being washed. Therefore, they take great care that the patient is cooled as little as possible, kept dry, and if possible warmed during the operation. I saw a very simple and practical arrangement for heating the operating table with Dr. Robb, the gynecologist at Lakeside Hospital in Cleveland. Under the usual operating table, two iron bars were attached lengthwise, each of which had six electric lamps that could be adjusted and turned on and off as desired. In this way, it was possible to generate quite a lot of heat without the risk of burning the patient or bothering the operator.

Just as with the anesthesia, I had the opportunity to see that asepsis is appropriately maintained both in the larger and in the smaller hospitals. One notices the consistency with which the rules of modern asepsis are followed everywhere here, and if here and there there are breaks in technique these are extremely rare exceptions. Facilities of a purely technical nature enable meticulous aseptic procedures, along with the extraordinarily careful training of the doctors and staff. Almost everywhere they use caps, masks, rubber gloves, and special long fabric or rubber sleeves or gowns with long sleeves so that their ends can be covered by the rubber gloves. The hands of the operator or his assistant therefore do not touch the patient. Sometimes I saw cotton gloves used, especially with laparotomies, and a few surgeons who usually operate with rubber gloves do not wear them during abdominal operations. The complete exclusion of the operator's hands may explain why in many clinics the time used for handwashing is surprisingly short (although the method of hand disinfection is the same as ours).

Washing the patient also takes much less time than with us. They reason that the skin can never be completely disinfected, and so would rather avoid abrading and inflaming it by excessive scrubbing, which could lead to secondary infections. Thus, one does not see preparatory antiseptic bandages or shaving, for example the scalp, on the day before the operation. Cushing in particular emphasizes avoiding any irritation of the scalp by excessive disinfection before his craniotomies. Usually, he only shaves the scalp in the operative area, which shows how sure he is of this approach to asepsis.

Of the external facilities, which Clairmont also described, I would only mention the many sterile trays that are hung with specially constructed sterile rings from simple hooks fixed to the tables or wall in many operating rooms (for example with Dr. Gibson in St. Luke's Hospital). The used sponges during an operation are also frequently placed in sterile trays, which avoids spreading germs onto the floor. This gives the workplace a clean appearance.

It appears that most American surgeons follow the same technical principles, just as they follow the same aseptic principles. Certainly, most of the operators that I saw used the same methods, the same handgrips, the same procedures. I will not deny that, along with the practical skill of the Americans, these methods and procedures were most efficient, but I missed seeing some individuality. Like Clairmont, I was impressed that most American surgeons operate rather slowly and pay extraordinary attention to hemostasis. The Halsted School has especially made a principle of this painstaking method of operating, with the goal of minimizing tissue injury. This indeed can lead to splendid results, as I saw with a case of Cushing, where he excised a cerebellar tumor the size of a walnut with no disturbance of the pulse or respiration and no bleeding during or after the operation.

They make small incisions over there, and we know that the Americans smile sadly about the extent of our incisions for appendicitis or gallstone surgery. I found the technique of operating through small incisions especially developed by Deaver, who incidentally is a very rapid operator, and saw him perform a series of chronic appendectomies each in 4½-5 minutes skin to skin.

Another impression that repeatedly occurred to me was the extremely limited use of retractors, at least by our standards. The reason appears to be that the American surgeons are trying to avoid tissue damage. In my opinion, however, this has the disadvantage that the operator and assistants often work with their hands in the wound.

For ligature and suture material, except for skin sutures, they only use catgut, usually chromic or prepared using Bartlett's method.[19] I was convinced of the suppleness and strength of the latter during my time with the Mayos, who only use this material and believe it is reliably sterile. I often saw the same running suture of catgut used for peritoneum, muscles and fascia, and finally also for an intracutaneous closure. This is enabled by the fact that the types of catgut I have mentioned are absorbed much more slowly than plain catgut, and keep their strength much longer. If there are particular concerns about the durability of the suture, kangaroo tendon is also used.

During abdominal wound closure, the Americans emphasize the precise suture of fascia and aponeuroses, and generally overlap the fascia. For skin closure they usually make an intracutaneous suture with catgut or wire. Cushing uses fine black silk for skin closure, which contains iron that is thought to be antiseptic. I saw tincture of benzoin used to make the scars as invisible as possible, and indeed I saw two cases of the Ochsner brothers where scars after this treatment were scarcely visible. Frequently fresh wounds are covered with thin sheets of silvered paper, which is thought to have a mild antiseptic action that protects against stitch abscesses and secondary infection of the wound.

For drainage in America the rubber drain has very largely been replaced by the cigarette drain, which is constructed from rubber sheets disinfected in sublimate[20] and twisted together as desired by the operator. This works well for drainage after laparotomies, since it does not lead to adhesions, is easy and painless to remove, and fits any shape of wound. I frequently saw, for example with gallbladder operations, that the operative region was packed with iodoform gauze and then the iodoform gauze was wrapped in a rubber sheet. In other cases, an additional rubber drain was passed through the pack. The versatility and convenient handling and storage of the rubber sheets confirm this as a very useful drainage material. The rubber sheet is particularly useful with transplantations,[21] where it is a dressing material that is very comfortable to change (Willy Meyer).

The only time I saw glass drains was with Deaver, in a case of appendicitis with exudative peritonitis, where he inserted a drain in the space of Douglas and then aspirated the pus with a syringe.

Before I proceed to a short discussion of particular operations that I saw over there, permit me to make a general comment about the indications and diagnostic procedures of our American colleagues.

In this area, the American surgeon is in a better position than we are in Europe, because Americans in general are quite willing to undergo an operation, preferring to take on the risk in hopes of a quicker recovery, rather than lie there and hope for a cure with other treatments. This can certainly lead to a relaxation of the indications that we would consider necessary. I have seen patients operated upon here with gallstones or stomach ulcers, whom we would surely have treated with other methods. I cannot deny that the outcomes after an early operation are very good, and certainly much better than in the far advanced cases that we often encounter surgically. However, I am sure that some cases slip in that would undoubtedly have healed without an operation. On the other hand, the frequent use of exploratory laparotomy identifies some cases of early cancers that are still operable, which we would not have discovered. I saw extremely broad indications for appendectomy. During almost any laparotomy even a fairly healthy appendix is removed prophylactically, and sometimes I saw the same attitude toward the gallbladder. I have to admit that this was mostly among technically excellent surgeons, in whose hands the additional procedure only increased the operative time by a few minutes, and that the overall condition of the patient was first carefully considered. With gynecologic operations, the indications for removing the uterus or adnexa were definitely too loose by our standards. The conservative views of the Mayo brothers were a reassuring contrast.

While some clinicians pay much attention to the patient's history, and this is the most important part of the clinical assessment, still it seemed to me that the physical examination was often too superficial, and objective findings were overlooked or underappreciated. For example, I saw two cases operated upon with a diagnosis of early gastric cancer that both had a stone the size of a cherry in the appendix.

By far the most operations that I had the opportunity to see in America were in the area of abdominal surgery. Without question, almost all American surgeons consider the most important part of their activity to be abdominal surgery, and I have to express my concern that the other areas of our specialty are relatively neglected. One indication of this was the discussion about fracture management in Atlantic City, during which Ochsner and other reputable surgeons explicitly stated that the necessary interest was often not being given to fracture management, which was always relegated to the youngest assistant. Among 242 operations that I saw over there, 162 or two-thirds were in the area of abdominal surgery.

Among laparotomies, I most often saw appendectomy for chronic appendicitis (40 cases), compared to only six for acute appendicitis. Clairmont has already described the opinion of American surgeons concerning operation in the acute phase. Therefore, I will only mention a few points that I noticed about their technique. The McBurney incision and the paramedian incision are used about equally, although some surgeons prefer the lower midline. Deaver uses particularly small incisions. The appendiceal stump is managed in different ways. Most surgeons simply invert the stump, either ligated or unligated, through a purse-string suture, having cauterized it with Pacquelin[22] or phenol. At the Mount Sinai Hospital, the appendix is cut off after ligation with iodized catgut, the cut surface is cauterized with Pacquelin, and then simply placed back in the abdominal cavity without any oversewing or pack. Nevertheless, their results are very good with 300-400 appendectomies of all kinds every year. At any rate, the generally minimal oversewing has shown me that we clearly do not need to be so concerned as we often are in this respect.

Operations on the gallbladder were also a large part of the laparotomies, especially since they were often performed incidentally. It was interesting to see that even gynecologists would palpate the gallbladder during their operations and intervene if they found a stone. Usually, they would make a relatively small incision through the rectus. Most operations on the gallbladder were extremely easy, but although some operators like the Mayos had splendid technique, this was in part due to the fact that they were operated on at a very early stage. In the great majority of cases a cholecystostomy was performed. I only saw a cholecystectomy with the Mayos, in whose hands removal of the gallbladder is not much more dangerous than creating a fistula (William Mayo's mortality after cholecystectomy is 4%). Mayo himself attributes his excellent results to the early operation for gallstones, which he has stated repeatedly. I also noticed during cholecystostomies that there was less of an effort to isolate the closure from the rest of the abdominal cavity than we would usually do (using packs etc.) The Mayos generally make two or three purse-string sutures on top of each other, so that the gallbladder mucosa is deeply inverted around the drain, which is then brought out through the abdominal wound without any further packing. In many cases, the gallbladder is only minimally attached to the peritoneum, or not at all. I saw Deaver bring the drain out through a special opening and completely close the main incision.

Among operations on the stomach, I saw William Mayo perform four resections (two for ulcer and two for cancer), one gastroenterostomy for duodenal ulcer, and one gastrostomy. Clairmont has already reported on Mayo's opinions about ulcer and carcinoma. I would only add that even if a gastroenterostomy is done, a gastric ulcer should be excised whenever possible, since they often cause bleeding or develop into carcinomas. Twice I saw W. Mayo excise an ulcer on the lesser curvature near the cardia. He thinks that in the setting of an acute perforation only an excision and oversewing should be done, and not a gastroenterostomy, since these usually result in peritonitis. The two extended gastrectomies that I saw performed by W. Mayo (45 minutes including the gastroenterostomy) were among the most impressive operations I have ever seen in this area. Furthermore, the patients were doing surprisingly well on the first postoperative day.

I saw Finney perform a pyloroplasty using his method, and with the relatively simple and very clean technique and the skilled hands of Finney this produced a considerable enlargement of the pylorus. In this case there was an acute ulcer on the posterior wall of the pylorus in addition to the stenosis from chronic ulceration, which was not discovered until the pylorus was opened, so that a gastroenterostomy might have been more effective. However, it seems clear to me that pyloroplasty would be a useful method for simple benign pyloric stenosis, since it allows as much enlargement of the lumen as desired and can be performed by the prescribed technique with secure asepsis.

For the repair of inguinal hernias, the method of Bassini in a great variety of modifications is used most often, with the spermatic cord sometimes placed under the internal oblique aponeurosis, sometimes over it, and sometimes between folds. The largest experience is probably that of Coley at the Hospital for Ruptured and Crippled, to which flows a great stream of hernia cases.[23] One morning I saw him repair four hernias while his assistants repaired three on a neighboring table. The opinion of Munro (Carney Hospital in Boston) deserves mention, since he always operates on both sides in cases of inguinal hernia, on the assumption that the contralateral side is also prone to develop a hernia. It was also interesting for me to hear that W. Mayo and Ochsner do as little as possible with femoral hernias, because the results get even worse the more one tries to repair the hernia defect.[24]

Since all American surgeons also perform gynecological operations, and since these sometimes constitute more than half of their practice, I saw numerous gynecologic laparotomies as well as vaginal procedures. I have given my impressions of this area above.

In addition to eight nephrectomies, most of which I saw in Rochester, I also saw three pyelotomies performed by W. Mayo for stones in the ureter or renal pelvis. Here also they make a very small incision, so that especially in obese men operating in the depth of the wound becomes unusually difficult and confusing, even if the 12th rib is resected. During this last maneuver, W. Mayo says he has entered the pleural space 30 or 40 times, without any ill effects on the patient. In cases of renal tuberculosis, Mayo recommends transecting the ureter at a high level and leaving it in place (not to make a partial resection) after injecting it with pure phenol. With this method he has obtained splendid healing even with severe tuberculosis of the ureter, while partial resection always leads to fistula formation and spreading of the tuberculosis. In general, they make extensive use of the modern methods of examination for kidney cases, including ureteral catheterization and cystoscopy. However, cryoscopy[25] and the phloridzine[26] and indigo carmine tests do not enjoy much of a reputation. They use an American cystoscope without a lens in the ocular, that is, with direct visualization. While this makes it easier to learn cystoscopy and is useful for irrigation, it only allows for visualization in the long axis of the cystoscope, which seems like a major disadvantage. Incidentally, in connection with a cystoscopy I saw Dr. Braasch in Rochester[27] perform a lithotripsy, although generally in America they do a transvesical removal of bladder stones.

I saw prostatectomies done twice suprapubic and three times perineal. While Young does this only via the perineal approach, exposing the prostate widely through a curved incision anterior to the anus, Charles Mayo uses a midline incision for the perineal approach that is just large enough to insert his index finger, and for the suprapubic approach an incision that barely admits two fingers. While one has to admire the speed and sureness with which Ch. Mayo works in the dark, one cannot avoid the thought that such incisions are only appropriate for such an experienced operator and would result in great danger if anything went wrong. The case of Young also showed that it can be useful to have a generous access to the operating field, since after apparently total excision of the prostate a further revision revealed a peach-sized lobe high above behind the bladder, which had not been felt on initial retraction of the prostatic capsule.

With respect to the choice of operations, Ch. Mayo and many others use the suprapubic approach when a lobe protrudes prominently into the bladder, and the perineal approach when they bulge into the rectum. In general, the perineal approach seems to be preferred in America. The cases that I saw resected in Rochester we would have considered not very advanced, with mild symptoms such as the need to urinate 4-5 times at night. Here also the tendency is to operate early, since the results are worse in more advanced cases.

The modern efforts in thoracic surgery, especially the positive and negative pressure methods, have not generated much popularity in America. Only two American surgeons have been involved with these questions for a long time, namely Willy Meyer in New York and Robinson in Boston. Willy Meyer and his brother Julius Meyer have created a viable way to make the Sauerbruch chamber more useful with their modification constructed not with a heavy iron frame but with disassemblable wire mesh and balloon fabric. A further innovation in the chamber of W. Meyer is that there are two airtight chambers, one inside the other, so that one can simultaneously generate positive pressure in the inner chamber and negative pressure in the outer chamber. In the inner chamber are the head of the patient and space for two assistants who supervise the anesthesia. In the the outer chamber there is space for the patient, operator and assistants, instrument table, and even several observers. One now has much greater freedom to alter the absolute pressures and can maintain a constant difference in pressure between the head chamber and the outer chamber, and work with positive or negative pressure or both at the same time. An electric motor drives the pumps, which is safer because all the belt work is avoided. To generate the positive or negative pressure, instead of the water pressure valves used before, a very simple device has been designed by the engineer Julius Meyer. A fundamental advantage of the construction for the operator is the displacement of the head box, so that it is no longer in the way as with the Sauerbruch chamber. The feeling of security while working is enhanced by the ability to communicate easily with the anesthetist through the wall of the chamber consisting of balloon fabric, which was obviously difficult with the iron chamber. For now, the apparatus is unfortunately not generally useful due to its high cost, but this modification shows the direction that might be taken to make it more generally applicable and useful. I have seen the Meyers' chamber used both for humans and for dogs, and although it was not really necessary in the case of lung abscess that I saw operated upon by W. Meyer, it functioned perfectly and gave the operator and all the observers an extraordinarily satisfactory feeling of security against any accidents. I saw Meyer perform an esophagectomy, an esophagogastrostomy, and multiple lung resections with his own methods for managing the bronchial stumps (see his presentations in Philadelphia and Atlantic City). [3][28]

In contrast to Willy Meyer, Robinson uses a positive-pressure apparatus that can be comfortably worn by a man. This consists basically of an airtight metal and rubber mask and a motor that can be connected to any electric outlet. The associated tubing with an attachment for the anesthetic and the usual manometers and vents is simple and uncomplicated. The whole apparatus costs only 60 dollars. Robinson emphasizes, having been convinced by numerous experiments, that one does not need to be concerned about any temporary loss of the positive pressure, since no important or lasting disturbance is seen even if this lasts for a minute. This also addresses the objection that methods of this sort, especially with a mask, are dangerous because of the possibility of vomiting. For the same reason, he thinks that the provision of an airlock to prevent sudden changes in pressure when entering or leaving the Sauerbruch or Meyer chambers is unnecessary.

I learned about a final, possibly very fundamental study in the field of pressure difference methods just before my departure from New York from Dr. Elsberg (Mount Sinai Hospital), which he had carried out in collaboration with Dr. Meltzer at the Rockefeller Institute, and which has since been published.[29]

I encountered an extraordinarily rich experience of neurosurgical cases with Dr. Harvey Cushing at the Johns Hopkins Hospital in Baltimore. I saw Cushing operate on three brain tumors, perform a subtemporal trepanation for an acute skull fracture, and excise a cerebellar tumor. This last operation especially showed me the extent to which Cushing has developed the technique for this kind of operation. I saw neither a drop of blood nor any disturbance in the general condition of the patient, although the operation was taking place immediately adjacent to the medulla oblongata. In addition to his excellent technique, Cushing is impressive for his comprehensive knowledge of neurology, and he repeatedly emphasizes that in this specialty one must be both an expert neurologist and an expert surgeon, and that it is not only unworthy to be a simple tool of the neurologist but that one must be a master of both disciplines in order to always be master of the situation. In addition to these operations, Cushing presented me with a series of previously operated patients, through whom I could see both the short-term and the long-term results of his interventions, and especially the extraordinarily effective outcomes of his trepanations beneath the temporalis muscle. Clairmont has reported so thoroughly in his article about Cushing's techniques and results that I unfortunately cannot add much more, but the hours that I spent with Cushing were among the most interesting and educational that I experienced in America. I will only mention that in all cases threatened or already afflicted with meningitis, Cushing has for a while been using urotropin in large doses and believes that it has enabled him to save several cases that would otherwise have been lost. Incidentally, Crile told me the same thing.

Among other procedures, I saw relatively large number of thyroidectomies. While goiters in general appear to be less frequent in America than in Europe, toxic goiter[30] is much more frequent than with us. In 1908 the Mayos operated on 196 common goiters and 239 cases of toxic goiter (with 5 deaths). Of the ten thyroidectomies that I saw performed by Charles Mayo in Rochester (five of them on the same day), the vast majority had exophthalmic goiters. I noticed that they operate more slowly than is usual in Germany. Again, this has to do with the effort to injure the tissues as little as possible, and also that especially with toxic goiters they try to avoid any major resorption of thyroid secretions. Hemostasis is meticulous, and blood vessels are ligated prior to division wherever possible. With mild toxicosis and massive goiters, Charles Mayo first ligates the thyroid arteries bilaterally, and only if the condition does not improve will undertake thyroidectomy, but not before three months. In all cases, care is taken with the posterior portion of the gland so as not to injure the parathyroid glands that usually lie behind it. Since their location is variable, Ch. Mayo carefully preserves anything in the area behind the thyroid capsule that even looks like it might be a parathyroid gland.

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I did not see much extremity surgery, but it was interesting to hear the attitudes of American surgeons about some of our generally accepted practices. Here again I was impressed by the bloodless surgery even with very complicated extremity operations (bridging callus after forearm fracture, bone suture after pseudarthrosis of the lower leg, etc.) I often heard that they would rather expend more effort on intraoperative hemostasis than worry about excessive postoperative bleeding. They use remarkably little traction management; all the surgeons I asked, including those with an extraordinarily large fracture experience (Gibson), prefer plaster casts, since they can mobilize the patient sooner and avoid a long hospital stay. Similarly, the Americans generally do not employ Bier's hyperemic method.[31] The only one that I saw using it was Willy Meyer in New York.

I will briefly mention two arthroplasties by Murphy, whose excellent results I witnessed at a demonstration in Atlantic City. The one patient, who had an ankylosis of the knee operated upon by Murphy using his method, was able to move her knee actively in a completely normal way.

I saw Charles Mayo perform a simple and very nice operation for bunion (hallux valgus) using his own method, in which he resected the head of the first metatarsal and relocated the previously mobilized subcutaneous bursa that had been on top of it into the position of the previous joint. Ch. Mayo considers the main cause of bunions to be excessive length of the great toe, which therefore experiences too strong a lateral force. He reports that he has seen no recurrences after his operation, since it removes the cause by shortening the toe.

Among procedures that are so far used only in America, I should mention blood transfusion. This has been used in America more widely in recent years, especially for pernicious anemia, severe hemorrhage, and sepsis. Carrel has used it with Barlow's Disease[32] (from mother to child) and believes it saved the child in two cases. He uses his circumferential vascular suture for the transfusion, anastomosing the radial artery of the donor to the femoral vein of the recipient. After the transfusion, the vessels are ligated and the anastomotic site is excised. Before the transfusion, he verifies in a test tube that the foreign blood does not cause hemolysis, and only uses compatible persons whose blood does not have this property. He pays them 20-25 dollars.

By contrast, Crile told me that in urgent cases he omits the *in vitro* assessment for hemolysis, since the conditions in a test tube are not the same as in the human body. He believes that transfusion reactions are always caused by technical errors. Like Elsberg, he employs a specially made cannula similar to the magnesium prosthesis that Payr uses for vascular suture and fitted with a handle. This fairly easily allows a secure union of intima to intima. At a conference in Philadelphia, Brewer also demonstrated a very simple bayonet-shaped glass cannula that he has used repeatedly used for transfusion. On the other hand, I have to report that I personally saw another doctor attempt transfusion using a similar cannula with completely unsatisfactory results. Against the use of all these cannulas Carrel emphasizes the security of a simple vascular suture.

Crile is extremely enthusiastic about the success of transfusions.

However, other surgeons spoke very skeptically about it. At any rate, my conversations with a number of active and respected doctors indicates that the procedure has also been adopted widely in outpatient practice.

I saw Dr. Stone in the Boston Children's Hospital treat angiomas and nevi with liquid air. The application is extremely simple, requiring only immersing a cotton-tipped applicator in the bottle of liquid air and then pressing it firmly against the lesion for 10 to 25 seconds. Strong pressure is required, or the effect will not be sufficient. A series of ten cases that I saw were improved or healed after two to four sessions, compared to their pre-treatment photographs. The scars are impressively nice, smooth and pale. However, I was not sure how successful it would be with a very large angioma, especially at its base.

I had an excellent opportunity to learn from presentations and discussion of the leading American surgeons from all parts of the United States at the meetings in Philadelphia and Atlantic City. In Philadelphia from June 3-5 was the Annual Meeting of the American Surgical Association, which is basically like our surgical society,[33] with the difference that the number of actual members is limited. Election into the American society, which is limited to 100 members, is difficult and is offered only to the best-known and most deserving surgeons. The sessions are public, but only invited guests can participate in the discussion. The meeting of the American Medical Association (this time in Atlantic City) corresponds completely to the meetings of our Society for Natural Scientists and Physicians,[34] both in the external arrangements and in the organization and procedures. As a result, the best presentations were in Philadelphia, while in Atlantic City there was more emphasis on social aspects. It has to be admitted that the selection of this most famous seaside resort with its varied but limited life was ideal for such a purpose. The location of this meeting changes from year to year. They had planned to have the meeting on the west coast (Los Angeles) next year, but this plan failed due to the opposition of the eastern colleagues. The western colleagues seem to have a greater mobility and interest in travel. At least I was very surprised to see how many had flocked to this meeting, I would say from every city in the West. I have already commented on the many study tours made by the western colleagues, who do not mind crossing an entire continent.

I can make a number of specific comments about things I observed at these conferences, especially the eagerness with which they attend the sessions from beginning to end with no sign of fatigue. I never saw a mass exodus of the audience during a presentation, such as we regularly experience at our surgical congress before the infamous breakfast break. This would not be in keeping with the courtesy that the Americans give to every speaker. I was impressed that they are relatively generous with applause, indeed the best-known speakers are applauded loudly when they get up to speak as well as after leaving the podium. I also observed that opposing views are always presented in a most chivalrous and polite form, so that it was sometimes even difficult to determine whether the discussant disagreed with the original speaker. In this setting, neither age nor position made any difference, since titles are not used in America and the overall feeling of equality also guides the relationships within medical circles. The most popular men, who have their sometimes loudly enthusiastic supporters, are the Mayo brothers, Murphy, and Ochsner, and their opinions were sought with particular attention. One arrangement at the Atlantic City meeting that struck me particularly was that after each presentation the chairman would solicit an opinion from the most respected surgeons before opening the general discussion.

The questions that were of greatest general interest during this gathering were addressed by the two invited guests, Geheimrat Friedrich from Marburg and Mr. Lane[35] from London.

The former spoke in Philadelphia and in Atlantic City about the current goals and efforts of thoracic surgery, especially regarding pleuropneumolysis.[36] In the subsequent discussion, it was plain to see the hesitancy of American surgeons with respect to modern thoracic surgery, especially experiences with positive and negative pressure. The leader of the opposition was Murphy, who portrayed the opening of both pleural cavities in the course of an operation as perfectly safe! He spoke against rib resection in the management of empyemas and advocated the injection of a 2% solution of formaldehyde in glycerine. He believes it is possible with this method to safely avoid the many broncho-pleural fistulas that have so often resulted from previous operations. The latest method of managing these fistulas, presented for discussion by the Beck brothers of Chicago, was supported by many well-known surgeons. Only a very small number of American surgeons were actively involved in management with pressure differences and reported on the apparatus they had constructed and experiments they had performed. Halsted demonstrated his simple positive pressure device and Blake reported on a positive pressure device constructed by his assistant Green at the Roosevelt Hospital, which they had used successfully on a person. Willy Meyer from New York presented his new chamber, which I have described in some detail above, and his successfully applied methods for management of the bronchial stump and esophagogastrostomy. Robinson from Boston enthusiastically supported the new methods and summarized briefly and clearly what has been accomplished in this area.

Lane from London, who received an especially warm welcome as an Englishman, spoke about his management of fractures, which is basically operative. For 17 years, he has been operating on every acute fracture, and with this approach, demonstrated by the radiographs, he has achieved almost ideal results. I was interested to see that the Americans were also hesitant about this concept. They generally expressed similar opinions to those we have here in Germany about hemorrhage during fracture treatment. The same was true about Lane's report of total colectomy for severe incurable constipation. This arose during the discussion of a presentation by William Mayo, who spoke about the necessity of performing a relatively extensive operation for colon cancer including wide resection of the mesocolon, since the lymphatics are involved early in this disease. Depending upon the location of the carcinoma, that is which section of the colon, a different radical procedure is required.

The highlight of the sessions in Atlantic City was Cushing's presentation about his pituitary work and the experimental evidence that the organism can no more tolerate the total loss of this organ than it can the total removal of the thyroid. A large series of difficult and painstaking animal operations has led to this result.

A larger discussion developed in connection with a presentation of Matas about tetanus after colon surgery, in which he advocated the prophylactic avoidance of any raw fruits for three days before operation, since tetanus spores can often be found on them, and can cause an infection since the spores remain viable despite digestion. On this occasion it was interesting to hear how different the incidence of tetanus is in the different parts of America, and that there are large regions where they have never seen a case. Hutchings from Detroit recommended management of tetanus with Chloretone,[37] with which he has had good success.

Coley proposed the treatment of inoperable sarcomas by means of his serum derived from a mixture of Streptococci and Prodigiosus,[38] and reported on eight cases who had survived in good health for ten years, even after unsuccessful operation and recurrences.[39] Bevan has seen improvement but no cures with this treatment, and Bloodgood pointed out that spontaneous healing of some sarcomas has been seen even without any treatment, but it seems to me that a trial with Coley's serum is justified for inoperable cases, since there is nothing else that can be done.

In conclusion, allow me to give a short description of the impressions I had in Rochester with the Mayo brothers, since readers in our country will be interested to hear about how the institution is organized where they achieve such well-known excellent results, for example in the area of gallstone surgery. The St. Mary's Hospital was founded in 1889 by Franciscan nuns. The father of today's Mayo brothers practiced surgery there. For years, this activity stayed within narrow boundaries, until the two Mayo sons, based upon their very thorough studies, began to enlarge the little hospital, and in response to the increasing demand, to double and quadruple it. It was extremely interesting for me to hear from William Mayo himself, during a drive out to his farm, about the enormous difficulties the brothers struggled with as they enlarged the enterprise. Today the hospital has 180 beds and is equipped to meet all modern requirements. Two hotels, or pensions, can house another 300 patients who can be managed as outpatients or no longer need to be in the hospital. Not only these rooms, but also the charming villa-like cottages of almost every resident of the town are almost always crowded with patients, who are exclusively private patients. They are sent here from all parts of the United States or are accompanied by their doctors, particularly from the western states. In 1908, they performed 6451 operations on 5591 patients. The outpatient clinic, which takes place every afternoon from 2:00 to 5:00 and is also attended only by private patients, sees 150-180 patients per day. Obviously, this gigantic volume cannot be managed by the two brothers alone, but there is a whole staff of assistants to deal with it. William Mayo told me that all told he has 32 assistants working for him, of whom most are excellently trained specialists, have worked at different institutions in Europe for many years, and are recognized experts. Each of these colleagues has his own department in the outpatient clinic and in the hospital, and their laboratories are well furnished. I remember especially the laboratories for pathology, photography, and microphotography, and the Urology Department that was being built while I was there. The excellent collaboration among the different departments is well organized, for example the support of the operator's diagnosis by the pathologist using frozen section is exemplary (Dr. MacCarty). If one asks how such an establishment can develop in a small town far from the major centers and so difficult to reach, I have to say it is attributable not only to the particular conditions in America but largely the truly excellent success of the Mayo brothers. Of course, one should not forget that only more or less chronic cases undergo operation here – it could not be otherwise given the distances – so that there are no acute cases, which naturally generate the most complications. This may partly explain the major difference between the statistics of the Mayo brothers and those of other surgeons (in 1908 they had only a 2% mortality for 3647 abdominal operations). On the other hand, I would emphasize that whoever has seen William Mayo operate could not be surprised at the excellent results. A further explanation for the enormous accumulation of patients is the outstanding care and conscientiousness of both brothers for the well-being of their patients. When considering the indications for surgery, they are always guided by what is best for the patient given his circumstances, including his social situation. In this respect, they stand far above many of their colleagues.

The morning in Rochester is completely devoted to the operations. As soon as one sees the operating room schedule each morning, one gets a concept of how much work is done here. During each of the nine days that I was in Rochester, there were 24-28 major operations on the schedule, which were carried out by William and Charles Mayo and their assistant Dr. Judd between 7:45 A.M. and 1:00 P.M. Only on one day did the schedule have "only" 18 operations. The cases are divided up such that William Mayo does only abdominal operations, Charles Mayo does some abdominal operations but also thyroidectomies, prostatectomies, and other major operations, while Dr. Judd does the simpler cases.

Before starting to operate, the brothers make rounds on all the patients in the hospital. After lunch, during which they dictate their correspondence to a stenographer, the outpatient clinic is held from 2:00 to 5:00, and they also see patients in the hotels and elsewhere in town. After completing this huge amount of work, each brother drives to his farm, where he relaxes with this family and, as far as I could tell, at least cannot be reached by the patients. It is a natural demand after an overwhelming burden of work each day, and I have learned to appreciate this healthy feeling of Americans, that one should allow himself such a respite in pleasant surroundings, as William Mayo has understood on his farm. Anyway, some of the evening is spent reading the latest literature. Just about every visitor to Rochester is amazed at the Mayos' familiarity with every area of modern research. This too speaks for their excellent organizational talent, since every assistant has his particular area of the literature to study and report on, as I could see from their regular lecture series.

Since there is always quite a number of visiting doctors in Rochester, either for study or accompanying their patients for an operation, everything possible has been done to provide for their comfort and to give them the opportunity to follow what is happening as exactly as possible. In each of the three operating rooms is one of the iron scaffolds for observers that I have previously mentioned as commonly seen in America, which have room for 20 to 30 people. A chime, audible in all three rooms, signifies when a new operation is beginning, and the number times the bell rings indicates in which room it will take place. Since this indicates when each operation is being followed by the next, and furthermore the schedule is already known, it is very easy to choose and thoroughly observe what one finds most interesting. The operations are also organized so that while an operation is in progress in one room, washing and preparation are being done in another, and while a closure is underway in the first operation they are already starting the second, so during this time they are able to discuss the indications for surgery and the experience with this type of operation. This gives the opportunity to admire both the extraordinary knowledge that the Mayo brothers have about their own experience and their comprehensive knowledge of all the latest research. The Mayos always emphasize that they only want to be practical surgeons, not scientists, yet their theoretical knowledge rivals that of any scientist.

The Mayos have not only welcomed the visiting doctors in the morning but have taken care that their afternoons are productive by setting up a Surgeons' Club, for whose meetings they provide a clubhouse with a good library, beautiful lounges, and even a few places to live. Meetings of the club take place every afternoon from 3:30 to 5:30, open to any doctor who has traveled there. For five dollars one becomes a life-long member, and for two dollars a member for the duration of one's current stay. Foreign surgeons are usually made honorary members. The purpose of the club is to enable the doctors to socialize in the pleasant workrooms and lounges during their time in Rochester. The purpose of the regular afternoon sessions is for them to freely discuss the operations seen that morning and the lectures that have been given. In order not to influence the assertions or criticisms of the doctors, neither the Mayos nor their assistants are present. Each day, three of the visiting doctors are chosen to be reporters for the next day, meaning that each will be the reporter for one of the three operating rooms and must stay in that room from beginning to end and prepare a detailed report. In exchange, he gets to have the best seat. A similar arrangement exists for monitoring the immediate postoperative results: Twice a week one of the doctors is chosen as house reporter and goes through the entire hospital to see how all of the postoperative patients are doing and to report back to the group. These reports are then open for comments and are discussed very knowledgeably and with great attention. Topics of general interest are also debated, and special lectures are given by well-known surgeons who are present. The club is also used for evening meetings, where the directors of the different laboratories talk about their work. At one of these, I heard a lecture by Dr. Wilson about "The development of carcinoma in the base of gastric ulcers."

In the Surgeons' Club, and also because almost all the doctors in the little town are living in the same hotel and are often thrown together, one makes many acquaintances, almost all very pleasant. Although there was a complete changeover of the visitors during my stay, there were always about 40 of them, mostly from the western states. I got to know almost all of them and spent many stimulating and friendly hours with them. Everyone clearly enjoyed meeting a foreign colleague who had come to study and learn, and made every effort to support this goal through introductions and explanations of every kind.

I thought that I should give this brief sketch of life in Rochester because it indeed presents something unique that is not found anywhere else in the world. For anyone who wants to get an insight into American surgery, a visit to this center of practical surgery is as essential as a visit to the Johns Hopkins Hospital, the center of American medical science.

I hope what I have presented will suffice to show that it is no longer correct for the American doctors to say, "We have the great buildings, you have the great men." The balance between here and there is getting closer even from year to year, and even if the expansion of science varies in different lands, that can only benefit the whole. The more energetically and frequently we can exchange ideas, the more beneficial it will be for our overall development.

Original Notes

1. *Wiener klinische Wochenschrift*, Year XXI, Nos. 30, 31, & 32, 1908.
2. Unfortunately I could not directly observe the actual teaching of American surgeons, since my travel time coincided with the American university holidays.
3. A detailed description of the chamber will be published next week (Editor).

Biographical Sources

Dube W, Besel R, Maier F, "Nikolai Guleke – Begründer und Wegbereiter der Neurochirurgie in Thüringen," *Zentralblatt für Neurochirurgie* 1989; 50:210-212.

Sachs M, "Prof. Dr. med. Nicolai Gustav Hermann Woldemar Guleke (1878-1958)," In: Sachs M, Schmiedebach H-P, Schwoch R, editors, *Deutsche Gesellschaft für Chirurgie 1933-1945: Die Präsidenten*, Heidelberg: Kaden Verlag; 2011:119-129.

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Translation Notes

1) *Privat-Dozent* is a European academic title approximately equivalent to Associate Professor.
2) Now Strasbourg, France. The abbreviation stands for *im Elsass* (in Alsace, which at that time was part of the German Empire).
3) Paul Leopold Friedrich (1864-1916), at that time Professor in Marburg. *Geheimrat* means Privy Councillor, a title bestowed by the Emperor.
4) The Lying-In Hospital (E. 2nd Avenue, 17th-18th Street), was an autonomous women's hospital donated by J. P. Morgan. It merged with New York Hospital in 1932, dropping the name, and has today been converted into condominiums called Rutherford Place.
5) Now part of the University Hospitals Cleveland Medical Center.
6) The Corey Hill Hospital was actually in Brookline MA.
7) Now the Lankenau Medical Center.
8) Now the Mount Sinai Morningside Hospital.
9) Now the Lenox Hill Hospital.
10) Clifford U. Collins was a respected surgeon in Peoria IL, but Guleke probably had family or other reasons to visit this city.
11) Not Abraham Flexner who would soon write the famous report on medical education, but his brother Simon. See Flexner S, Jobling JW, "Serum treatment of epidemic cerebro-spinal meningitis," *Journal of Experimental Medicine* 1908; 10:141-203.
12) See Blackstone M, "The Opie Century," *Pancreas* 1988; 3:340-342.
13) See Meltzer A, "Dr. Samuel James Meltzer and intratracheal anesthesia," *Journal of Clinical Anesthesia* 1990; 2:54-58.
14) Now the Roswell Park Comprehensive Cancer Center.

15) See Gaylord HR, "Parisitism and infection in cancer," *New York State Journal of Medicine* 1907; 7:189-190.
16) See Lee R, Young R, Castleman B, "James Homer Wright: A biography of the enigmatic creator of the Wright stain on the occasion of its centennial," *American Journal of Surgical Pathology* 2002; 26:88-96.
17) See Nelson CW, "100th anniversary of Sister Mary Joseph Dempsey," *Mayo Clinic Proceedings* 1992; 67:512.
18) See Goerig M, "Carl Ludwig Schleich and the introduction of infiltration anesthesia into clinical practice," *Regional Anesthesia and Pain Medicine* 1998; 23:538-539.
19) See Bartlett W, "A simplified heat method of sterilizing and storing catgut," *Journal of the American Medical Association* 1906; 46:1168-1169.
20) Mercuric chloride, no longer used.
21) Presumably referring to skin grafts.
22) An electrocautery device invented by Pacquelin in France.
23) See Coley WB, Hoguet JP, "Operative treatment of hernia," *Annals of Surgery* 1918; 68:255-268.
24) See Ochsner AJ, "Femoral herniotomy," *Journal of the American Medical Association* 1906; 47:751-754.
25) A method to estimate specific gravity by freezing point depression. See "Cryoscopy of the urine," *Journal of the American Medical Association* 1901; 36:1254-1255.
26) Phloridzine was a substance given to induce glycosuria, used as a test of renal function. See Krotoszyner M, Willard WP, "Experience with the methods of determining physiological kidney-function for operative procedure," *American Journal of Urology* 1905; 2:35-40.
27) The author actually writes "Dr. Paasche in Rochester," but there was nobody by that name and he is clearly referring to William F. Braasch, who was a urologist that worked with the Mayos.
28) Meyer W, "Fortschritte im Druckdifferenzverfahren für intrathorakale Operationen," *Münchener Medizinische Wochenschrift* 1909; 56:2414-2416. See also Meyer HW, "The history of the development of the negative differential pressure chamber for thoracic surgery," *Journal of Thoracic Surgery* 1955; 30:114-128.
29) See Elsberg CA, "Clinical experiences with intratracheal insufflation (Meltzer), with remarks upon the value of the method for thoracic surgery," *Annals of Surgery* 1910; 52:23-29. The application of positive pressure through an endotracheal tube by Meltzer and his

colleagues was indeed the fundamental innovation that showed the way forward.

30) Like others on the European continent, the author calls toxic goiter "Basedow's disease"; in English-speaking countries it has often been called "Graves' disease."

31) See Meyer W, "Bier's treatment ('Stauungs-hyperaemie') in chronic and acute surgical infectious diseases," *Journal of the American Medical Association* 1907; 49:560-566.

32) See Evans PR, "Infantile scurvy: the centenary of Barlow's disease," British Medical Journal 1983; 287:1862-1863.

33) *Deutsche Gesellschaft für Chirurgie*, still active.

34) *Gesellschaft Deutscher Naturforscher und Ärzte*, still active.

35) See Brand RA, "Sir William Arbuthnot Lane, 1856-1943," *Clinical Orthopedics and Related Research* 2009; 467:1939-1943.

36) Lysis of intrathoracic adhesions, especially for tuberculosis.

37) A drug related to chloroform and chloral hydrate. See Houghton EM, Aldrich TB, "Chloretone: A new hypnotic and anesthetic," *Journal of the American Medical Association* 1899; 33:777-778.

38) Bacillus prodigiosus, now called Serratia marcescens.

39) See Coley, "The treatment of inoperable sarcoma by bacterial toxins," *Proceedings of the Royal Society of Medicine* 1909; 3(3) (Surgical Section):1-48.

21

Franz Ebermayer (1909-1910)

Franz Ebermayer was born in Munich in 1878. He studied medicine at the University in Munich, receiving his doctorate in 1905 with a thesis on tuberculous arthritis, and underwent postgraduate surgical training in Vienna with Anton von Eiselsberg and in Berlin with August Bier. He was appointed assistant surgeon at a municipal hospital in Munich.

In 1909-1910, at the age of 31, he traveled to America, and published a report of his experiences later in 1910.

He was awarded the King Ludwig Cross for his services during the First World War. He practiced surgery in Munich, apparently unaffiliated with any academic institution but receiving the civil distinction of *Sanitäts-Rat* [Public Health Councillor].

He was a life-long member of the German Surgical Society until his death in 1957.

Chirurgische studien aus Nord-Amerika
Beiträge zur klinischen Chirurgie 1910; 70:131-138.

Surgical studies from North America
by Franz Ebermayer, Specialist Physician in Munich

My extensive study trips last year and earlier this year have taken me to the major clinics of Switzerland, Austria, and North Germany, and have provided me with a good first-hand overview of German surgery. During this time, I have also been able to make two voyages to North America, and to spend a total of five weeks in New York and Baltimore. Circumstances did not permit me to extend my visit to include the West, as some German surgeons have done before me, but I was able to learn a lot about American surgery at the excellent clinics in the two cities mentioned.

I have to say at the outset that these are exactly at the level of the German clinics, neither superior nor inferior. I can express this best by saying that I often forgot I was in America until I was reminded because somebody spoke to me in English.

I will not say much about the hospitals in general, since various publications in recent years have described their construction, features, and administration. I do want to emphasize one thing. The first time I came to this country, I expected to find first-class facilities in every hospital, as I had understood from the enthusiastic descriptions of previous German visitors to America. In fact, most hospitals are neither better nor worse than ours, that is, they are equipped with comforts and innovations just like ours. Only a few rise above this level – and indeed very far above it – for example, the truly wonderful Mount Sinai Hospital in New York.

I will also not go into specifics about the customary facilities at these hospitals, the excellent outpatient departments, the ambulances, the patient reception and patient care. However, the method of medical direction should be pointed out, since in most of the clinics I visited there was a totally different system. Specifically, the leadership here rotates in turn among a series of doctors, who take this on in addition to their private practices. This system has the definite disadvantage, in my opinion, that a uniform clinical approach cannot evolve and the patients are passed from one person to the next; on the other hand, it has the advantage of allowing a series of doctors to develop their independent careers using the resources of the hospital, so that numerous talented individuals have the opportunity to develop.

Now to the operating rooms, which are usually on the top floor of the building. Here we can observe aseptic practice. In this respect, I have only seen excellence. The sterilization equipment, which by the way is usually from German companies, is well arranged and the methods of disinfection are carried out with great thoroughness. Everyone uses rubber gloves for every operation. A German surgeon is therefore all the more surprised to find that the operating rooms are not arranged as we would think proper. We consider it obvious that anything not required for the operation should be removed and stored outside the room, but the American operating rooms do not follow this principle and leave sterilization equipment and other things all around the walls.

I saw them use almost exclusively ether as an anesthetic agent, rarely Anaesthol (a mixture of chloroform, ether, and ethylene chloride),[1] and they monitored only the pulse and respiration to determine the depth of anesthesia, never observing the pupils. All the anesthetics were excellently administered, whether by doctors or by nurses. Most recently I also saw a new apparatus that makes it possible to mix oxygen and nitrous oxide and administer it through a Roth-Dräger apparatus; a further modification also allows ether fumes to be added. The gas mixture passes further in tubes through a small hot water kettle and is thus warmed so that the irritation of the bronchi and consequent secretion of mucus is considerably decreased. The anesthetics that I saw administered using this apparatus were quite satisfactory. There was almost no excitation and with limited administration of the ether the depth of anesthesia for a long case was completely adequate. The patients woke up shortly after the end of the operations and felt relatively well. Of course, I would not want to draw sweeping conclusions from just the few such anesthetics that I saw.

I was also impressed by many differences in the methods of operating compared to what I had seen in German clinics. The Americans operate more slowly than we do; however, I do not mean this as a criticism, because they also proceed very carefully and conscientiously. Although Americans love all kinds of sports, they do not treat surgery like a sport of fast operating or even the *parforce*-operating[2] often seen in Germany, trying to set records; indeed, they decisively reject this idea. They prefer incisions as small as possible, especially for laparotomy, and is a bit strange for us to see them working in the depth of the wound with their fingers protected by rubber gloves. I was impressed that both the operator and assistants often touch the wound surfaces with their fingers, whereas we do so only with sterile instruments.

I was particularly interested in the subject of appendicitis over there, as I am over here. It seems that there is absolute unanimity in America that the management of appendicitis is a matter for the surgeon. This unanimity is not only among physicians but among the general population. The American above all does not want to be sick for very long, and so he prefers the promise of a rapid cure from surgery much more than with us, where most patients are treated for a long time in the clinics etc. The degree to which the public is convinced that appendicitis is a surgical disease was evident among other things by the description of a patent medicine that was sent to me in New York. This explained in the familiar advertising language that the medicine was good for any disease, even cancer, but should only be used for mild cases of appendicitis, since it was no substitute for the surgeon's knife when this disease was accompanied by suppuration. Over there, even the panacea manufacturers do not dare to claim that their potions or powders can heal a definite case of appendicitis. This widespread opinion is undoubtedly the reason why American appendectomy statistics show such good results, since almost all cases present early to the surgeon, and the cases with a delayed diagnosis, which we see almost every day in the German clinics, are here the exception.

The performance of appendectomy also had some features worth mentioning. The incision was different at each clinic. They all strive to make the incision as small as possible, just as we do in early cases. The appendix is then delivered through the small opening with a limited portion of the cecum, ligated at its base, and divided with thermocautery. The mucosa of the stump is cauterized, the cecum is replaced, and the wound is closed. I never saw the stump oversewn. The surgeons told me they had never seen any problems due to not oversewing the stump. If there were abscesses, a cigarette drain was placed, instead of our usual gauze strips.

The management of more advanced and diffuse appendicitis with peritonitis was mostly the same as ours. Only with Torek in New York was I introduced to a new method that really surprised me. With diffuse peritonitis, Torek makes a very long midline incision. Then he removes the appendix and explores the whole abdomen, removing all the pus and irrigating copiously with saline solution. Once he has removed the pus as much as possible, he closes the whole wound without drainage. Only if there are gangrenous places on the cecum does he place a single cigarette drain through a separate wound in this area. Using this method, Torek has achieved an astounding 83.5% healing rate, reported in two series. Torek bases his method on the concepts that the peritoneum can deal with a certain small amount of contamination as long as the source of contamination has been removed, and furthermore that animal experiments have shown that packing the peritoneal cavity with sterile gauze etc. is actually not harmless but can damage the peritoneum and directly lead to death. This method was so unexpected and the results are so good that I thought I should present it in some detail.

In the postoperative management of peritonitis, I saw extensive use of continuous enemas. For positioning the patient, several used our customary elevation of the foot of the bed as proposed by Trendelenburg, but others were enthusiastic advocates for the contrary principle of elevating the head of the bed as proposed by Fowler, in order to keep the purulent material from the more easily resorbing diaphragm.

I will not go into further operations, since they did not seem to differ as much from our own methods.

In New York, I had the opportunity to see Professor Willy Meyer's modification of Sauerbruch's chamber for thoracic surgery in use. I will assume that its nature is known, since a description has been published in the *Münchener Medizinische Wochenschrift*,[3] and I will only remind the reader that it consists of two chambers constructed of balloon fabric over an iron frame, one inside the other; the outer one has space for 10-12 people in addition to the instruments and operating table, while the inner one is equipped with an airlock and can accommodate 2 people. With a simple but effective system of ventilation, negative pressure is created in the outer one with a suction pump, while positive pressure is created in the inner one. This allows for several useful combinations during the performance of operations, since the pressures can be altered at any time.

I saw Willy Meyer perform a complete removal of the left lung on a dog, during which the advantages of the device were readily apparent. Before opening the pleura, the negative pressure was initiated. When the pleura was opened, the lung remained fully inflated and there was no change in respiration. During the procedure, one of the visiting doctors had to leave, and it was interesting to observe how within a few moments positive pressure was instituted in the inner chamber, while the outer chamber was brought to + - 0 so it could be opened, all without any disturbance of the dog's breathing. Other advantages of the chamber are its permeability to sound, so that direct conversation with the anesthetist is possible, and the excellent ventilation which kept the air fresh despite the presence of a dozen people in the chamber for an hour. In any case, the combination of negative and positive pressures seems like an unusually clever idea which is destined to make it much easier for us to engage in thoracic surgery.

I was particularly interested in the amazing, almost unbelievable experiments of Carrel, whose name has been frequently mentioned in recent years. The Rockefeller Institute for Medical Research, located on a hill by the East

River, is a 5-story building dedicated solely to scientific research; here on the floor beneath the flat roof are the rooms where Carrel has carried out his amazing procedures. When I was there for the first time, Carrel was about to begin an operation, and I was surprised to find him and his assistants dressed in black gowns, as indeed the tables etc. were also covered in black. The advantage of this measure was quickly apparent when a large vessel spurted, but the blood was not visible on the black drapes. I have to say that it was more esthetic to see everything covered with black rather than with blood-spattered white drapes.

The operative subject was a medium-sized dog, who was being artificially ventilated with a mixture of air and ether through a catheter introduced as far as the bifurcation using the method of Meltzer and Auer.[4] The experiments, which I do not think I should describe in detail since they involve ongoing research, involved the heart and aorta on the morning that I spent with Carrel, and were definitely the most interesting that I have ever seen. At one point, it involved determining how long the heart could remain undamaged without its blood supply, by temporarily excluding the root of the aorta from the circulation. It was truly a pleasure to witness the sureness and unflappable calm with which Carrel performed these procedures on the heart and great vessels.

For sutures, Carrel used exclusively Chinese silk sterilized in Vaseline; Vaseline-impregnated silk was also used for the closure. Carrel uses Vaseline for sterilization to keep the exposed organs moist so that they are protected from injury and cooling.

After the operations, Carrel showed me his unique exhibits. There I was able to see how well pieces of the femoral vein had healed to the carotid and how their walls gradually took on the strength of an artery; or how arterial segments appeared to heal without formation of a scar. Equally favorable results have been obtained using vessels preserved in an icebox for days or weeks. After 1½ years, one can barely see the suture line of a carotid that was kept in an icebox for a week and then replaced. I also saw wonderful results with kidney transplantation. Here also, the scars on the vessels could only be seen with an effort after a few months, and the replanted kidney had completely the same status as the other one that had not been disturbed. Similarly good results could be seen with the transplantation of a kidney preserved in the icebox.

Two other exhibits showed the wonderfully good healing of a hind leg of one fox terrier transplanted to another. The scars on the skin, soft tissues, and vessels were absolutely ideal, and the bones were united with callus formation.

It was very educational to walk through the dog kennels. There Carrel showed me the individual dogs that had undergone operations and explained in his exciting manner the results of the experiments. Among others, I saw a dog in whom he had removed both kidneys a long time ago and replaced one, and who appeared perfectly healthy.

I saw a lot of other new things in the hospitals and scientific institutes, but believe I have described the most interesting above, and at least demonstrated that in North America there is so much to see and so much excitement in the areas of practical and experimental surgery, that it is very worthwhile to make a study tour over there.

At sea, February 1910

Biographical Sources

Jahres-Verzeichnis der an den Deutschen Universitäten erschienenen Schriften, XXII, 15 August 1906 bis 14 August 1907. Berlin: Behrend & Co., 1908.

Personalien-Beilagen zum Verordnungs-Blatt des Königlich Bayerischen Kriegsministeriums für das 1. Halbjahr 1916. München: Kriegsministerium, 1916.

"Amtliche Nachrichten. Titelverleihungen," *Bayerisches Aerztliches Correspondenzblatt* 1927; 30:695.

Bauer KH, "Eröffnungsansprache des Vorsitzenden: 75. Tagung der Deutschen Gesellschaft für Chirurgie." *Langenbecks Archiv für Klinische Chirurgie* 1958; 289:3-27.

Hübner A, *Chirurgenverzeichnis*, Berlin: Springer Verlag, 1958.

Publication Source

Beiträge zur klinischen Chirurgie [Contributions to clinical surgery] was founded in 1885 by Paul von Bruns of Tübingen, and was often called *Bruns' Beiträge*. It was a leading German surgical journal of the time, but in 1975 it was absorbed into *Langenbecks Archiv für Chirurgie*, which in turn has become *Langenbeck's Archives of Surgery* (published in English). Historical issues can be obtained through the Hathi Trust.

Translation Notes

1) See Sanford CH, "Nitrous oxide, oxygen, Anaesthol sequence in oral surgery," *Annals of Surgery* 1918; 67:462-464.
2) *Parforce* hunting was a ritualized form of hunting where a large group of horsemen and hounds chased the animal to the point of exhaustion so that the king could administer the final blow personally with a special knife.
3) Meyer W, "Fortschritte im Druckdifferenzverfahren für intrathorakale Operationen," *Münchener Medizinische Wochenschrift* 1909; 56:2414-2416. See also Meyer HW, "The history of the development of the negative differential pressure chamber for thoracic surgery," *Journal of Thoracic Surgery* 1955; 30:114-128.
4) Meltzer SJ, Auer J, "Continuous respiration without respiratory movements," *Journal of Experimental Medicine* 1909; 11:622-625.

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Anton Hengge (1910)

Anton Hengge was born in 1873 in Donauwörth (Bavaria) Germany. He studied medicine at the University of Munich, receiving his degree in 1898. He received further training in gynecology in Munich, Prague, and Greifswald, and joined the obstetrical staff of the Deaconess Institute in Munich.

In 1910, at the age of 37, he undertook a study tour of England and the United States, and his impressions are described in the following pages.

He rose to be director of the gynecologic staff at the Deaconess Institute, and during the 1920's and 1930's became increasingly involved in the Munich, Bavarian, and German gynecological societies. He also joined the National Socialist (Nazi) Party in 1933, and his party connections were apparently a factor in his election to the Presidency of the Bavarian Gynecological Society in 1939. He died in 1945.

Reiseeindrücke aus England und den Vereinigten Staaten
Muenchener Medizinische Wochenschrift 1911; 58:1197-1200

Travel impressions from England and the United States
by Dr. Anton Hengge

As presented to the Munich Gynecological Society on 15 December 1910

My journey was primarily intended for the study of English and American hospitals; my findings at institutions under construction, in development, and in use were to be considered in the planning for an institute of obstetrics and gynecology proposed by the "Frauenheim" organization in Munich.

The English hospitals are supported by voluntary contributions. Enormous amounts are raised by individual hospitals every year in this way. When one considers that the patients do not pay anything, and receive no reimbursement from the community or insurance plans, it is apparent that they can be characterized as charitable institutions. In order to give some idea of the sums involved, I can mention the London Hospital in Whitechapel[1] as an example; this approximately 900-bed hospital has an annual operating budget of about £100,000 = 2 million *Mark*.[2] Of this, about £20,000 is covered by subsidies. The remaining £80,000, or more than 1½ million *Mark*, has to be raised every year by voluntary contributions. Furthermore, London has about a dozen large hospitals and about 100 smaller ones. Only three of the large hospitals are fortunate enough to have all their expenses covered by subsidies and endowments. The powerful efforts of public charity are remarkable, whatever one may think about the appropriateness of supporting hospitals in this way. It seemed even more amazing that the hospitals take the initiative to put up collection boxes requesting contributions for the comfort of their patients. You find such collection boxes in public places near the hospital, even in the railroad stations.

The English hospitals generally do not come up to modern expectations, but they offer a modest comfort, with a friendly tone and a pleasant atmosphere. In America, there is a more severe practicality. The English always consider the comfort of their patients, for example even the most modern hospitals of London have a fireplace in addition to central heating. When I asked why they had built an unnecessary fireplace, I was told, "Our patients, even the poorest, are accustomed to having an open fire in their dwellings, and do not like to be without it; we build one into our hospitals so that people feel more at home." And this is all for non-paying patients.

Much care and love also go into the furnishing of the patient rooms; you see flowers and leafy plants in great abundance, and sometimes there are so many flowers in the middle of the ward that the patients on one side cannot see those on the other side. The wards are provided with a piano or harmonium; at the Charing Cross Hospital they have both. The walls are enlivened with washable pictures, especially in the children's ward, and there are comfortable reclining chairs and footstools. These amenities, as well as the flowers, are all gifts from the benefactors of the hospital. I have to mention one more sympathetic arrangement: On visiting days, the patients are enabled to serve tea and cakes to their visitors. The minimal expense this entails for the hospital is amply repaid by the happiness of the patients.

In the design and construction of patient facilities there is an effort to allow the greatest possible amount of light and fresh air. Patients do not seem to mind even a steady draft, whereas I found many hospitals, especially in America, that overheated the rooms. Special love and care are given to providing extensive balconies, terraces, and covered walkways where the patients can spend time both in and out of bed. Dayrooms serve the comfort of the convalescents, and reclining chairs are grouped in a pleasant semicircle around the open fireplace. In America, they especially like roof gardens; the seriously ill and convalescents, and especially new mothers, often spend their entire hospital stay day and night in the roof garden. In an obstetrical unit in New York, I found a 3-week-old baby being cared for in the not exactly warm November air in the roof garden with the explanation that "the little one needs fresh air, he is a premature baby." The concern for light and air – in addition to the high price of real estate – means that hospitals in America are often built very high. I was advised: "Never build a hospital less than six stories high, only with that elevation can you get above the dust and have clean air and plenty of sun." One of the largest hospitals in New York, Bellevue, is currently being renovated and will have pavilions seven stories high. But this is not enough, they plan to build another three stories for the pediatric department: "The children especially must have lots of air and light."

Currently an extensive renovation of hospital facilities is underway in the United States, many new hospitals are being built, others are in the planning stage, and many old hospitals are being thoroughly renovated. The present hospitals are sometimes wastefully luxurious, but often have obsolete and inadequate conditions.

Most of our hospitals are woefully lacking in one arrangement which is standard in England and America: Over there they consider it almost unthinkable that an immediately postoperative patient, or one who has just been given an anesthetic, should be brought to the general ward, where there are patients who have been previously operated upon or are waiting for an operation. Everywhere they have created rooms where the freshly operated or anesthetized patients can recover from the immediate effects of the procedure. They stay here one or more days, have their own nurse, receive visits from their families, and only after initial recovery return to the general ward. In such circumstances, it is understandable that the patients would rather have larger wards with a larger number of beds, as long as these people are protected from the most unpleasant disturbances of the common ward. I encountered similar arrangements for obstetrical institutions. Indeed, in the obstetrical department of the University of Pennsylvania in Philadelphia, there is even an arrangement that every new mother has her own individual room for the first week; this even applies to people who have paid a minimal fee or nothing at all. At the New England Hospital[3] in Boston, every patient is brought to the roof garden after undergoing an anesthetic. If staying there is impossible due to bad weather, the patient is wrapped up warmly in a special bed with the head in front of a window while the body of the patient remains in the warm room. Everywhere you see the earnest effort to make the patient's situation as easy as possible.

The female attendants in English and American hospitals are trained following fairly standard principles. The staff are carefully educated in excellent nursing schools, the duration of their training is sufficiently long, and they are kept in good physical and mental condition. The nurses have much more time for recreation than is the case with us, although we are increasingly aware of the importance of nursing care and the urgent need for its reorganization. In view of this, I will briefly describe the situation that I have encountered, which differs only moderately between England and America. In the United States there are currently about 900 nursing schools and the best of them have an extraordinary attraction, since they offer their students the opportunity not only for a thorough education but also for a respectable situation with room and board. There are *ten times* as many applicants as can be accepted. As a result, admission can be very selective. The age limits are 21-33 years, and better educational preparation is given preference. Recommendations from a religious leader, a doctor, and a dentist are required, and furthermore the full address of two people who are not related to the applicant but have known her for several years. The course of instruction generally requires 3 to 4 years, and includes a series of examinations. The number of nurses is generally so well provided that an 8-hour shift is possible. The nursing organization strives for an 8-hour workday. Recreational time is provided by one free afternoon during the week, a part of Sunday, and at least two free hours during the day. The hospitals have dedicated "nurses' homes" attached to them. Often these buildings, with space for 100-200 nurses, have been donated by a single benefactor. In the nurses' home each nurse has her own pleasant room; 4-6 share a bathroom, and each floor has a small living room, library, and music room. In America, there is usually one of the beloved roof gardens. There are also common rooms: Dining rooms, a large reception room for guests, and a large room which is partly used for instruction but sometimes for parties or as an exercise room. The nurses' home has its own kitchen, completely separate from the hospital kitchen. For the nurses on the night shift, there are quiet sleeping rooms, and these nurses are also provided with a fresh, warm meal around midnight. I should note that the service is divided up so that each nurse has night duty for ½ - ¾ of the year.

These external arrangements are at any rate such that one might expect to have a well-educated, physically and mentally fresh, and diligent patient care staff. Conscientious care and a well-intentioned friendly attitude toward the patient are always a matter of character, but these qualities are more likely to be encountered among a staff that is not dulled by overwork. The decisive influence is always maintained by the spirit in which an institution is led; this is as true over there as it is with us. In one large hospital in Boston, the nurses told me "When the current nursing supervisor started two years ago, the nurses were sullen and dissatisfied, complained about the institution and the supervisor, and were unfriendly to the patients. With the new supervisor, there was a new spirit, and today there is no more complaining."

The students generally get a small stipend of 8 dollars a month, but this payment is expressly meant only as a reimbursement for any necessary expenses. The head nurses earn about 50 dollars a month, and the supervisor about 125 dollars a month. The highest annual salary that a supervisor receives today is about 2500 dollars.

The eventual fate of a nurse after her education can vary quite a bit. A number obtain positions in hospitals and charitable institutions: There is an extraordinary demand for nurses from good schools. I have seen institutions with 500-600 requests for a trained nurse. Many nurses have developed small private clinics in which 2 or 3 join together. The number of such small private clinics is extremely large in some places. In one part of London, where there are many specialist physicians, there are something like 600 small private clinics. For many nurses, the profession leads to marriage, especially to young doctors. For the continuing education of nurses there are courses and excellent nursing journals. The nurses in the English-speaking countries are united in large and powerful organizations, which energetically represent their interests. It is impressive that these organizations appropriately recognize the necessity of communal care for age and disability, although all efforts in this regard have failed so far due to the resistance of individuals who want to remain independent of any large entity.

Regarding medical practice in England and America, the colleagues there have repeatedly said: "We have no lack of doctors"; and this seems to be true at least for the cities. There is also ample provision for their successors. In London alone, for example, there are 12 independent medical schools at the large hospitals, and the United States currently have about 175 medical schools; for comparison, I will mention that Germany only has 21 universities.

It is apparent even in England that the facilities of the different medical schools are very unequal, especially the facilities for the scientific institutes. This is probably explained by the fact that the medical schools in England, like the hospitals, are maintained by private means, either voluntary donations or foundations. The medical schools of the United States are likewise completely independent private entities, and differ like night and day in their capabilities. The best of the universities over there are completely at the level of ours, but the number of these exemplary institutions can hardly be more than a dozen. I found many that followed the German model in all respects, especially in the biochemistry laboratories, where many of the assistants and directors had studied in Germany. In these laboratories, the visit of Friedrich von Müller to America was especially well remembered.[4]

A study tour will naturally lead the visitor to come in contact almost exclusively with the best schools and the best representatives of our science, and this undoubtedly influences the judgment of the visitor very strongly. However, our American colleagues themselves complain most vociferously that the quality of their individual schools is so variable; even the entrance requirements are very different and they caution against any general conclusions based on the brilliant impression made by a few leading schools. The extreme variability over there is also caused by the fact that each individual state of the union has its own medical examination, with very different stricter or more lenient criteria. The State of Illinois, for example, allows young people to study medicine after only a high school education,[5] without any preparation at the university level. With a certificate from his medical school, the prospective physician applies for examination through his state government, and after passing this examination is permitted to practice. However, each physician can only practice in the state where he passed the examination. If he wishes to practice in any of the other 39 states, he has to pass another examination. ("United States"!) The natural competition will gradually eliminate the bad medical schools.

The clinical instruction that I observed in England and America was just as good as in a German university, and was substantially similar both in theoretical and practical terms. The knowledge of the students was comparable to our level and – on Election Day, a political holiday, they skipped the clinic. They operated on bowel cancers and gallbladders in the gynecology clinic, but this is a peculiarity of American gynecology. The clinical rounds, which I joined many times in England, were especially valuable for the students. The teacher goes to the department with only a small number of students and spends hours with them at the bedside of the patients, so that each individual case is thoroughly discussed.

The continuing education of physicians gets a great deal of attention. In America, they have postgraduate schools for this purpose. Opinions about the value of these institutions are somewhat diverse, but I could see that all of these schools were very well attended, as were the many courses for practicing doctors. In one such course in Boston, for example, I saw 40 colleagues, mostly older grey-haired gentlemen, who came from a wide area around the city. This voluntary continuing education is a magnificent indication of the ambition and seriousness of the American physician. The English doctors also report that there is great interest in our system of continuing medical education.

It is peculiar that women, who are now energetically moving into public life in England and America, have separated themselves from their male colleagues for the study of medicine. In London, there is a medical school exclusively for female students at the Royal Free Hospital. The Women's Hospital[6] on Euston Road in London is exclusively directed and run by female physicians, as is the large New England Hospital in Boston. A 1909 catalogue counts 468 female doctors practicing in England. I certainly do not think that separating medical students by sex is a good idea or one that should be emulated; it also does not seem right to establish hospitals that are exclusively led and staffed by female doctors. Women who seek equal professional opportunities and equal rights with men should not and need not avoid collaboration with men. Separation eliminates the stimulation that arises from free interaction.

The importance of sports at the English and especially the American universities has been described often enough: Most of our students have some distance to catch up. The downsides and excesses of sports should not be taken too seriously, since they are easily limited.

We cannot speak about the status of medical practice today without also touching upon the question of reimbursement. In England, I had the impression that this wealthy country can afford to pay its doctors well. Nevertheless, competition creates some unpleasant aspects. Under English conditions, most of the doctors live in a private house that is leased for 49-99 years and then returns to the owner of the property. It makes a remarkable impression to see a large district of London that is exclusively inhabited by physicians. Block after block of some streets have doctors living next door to each other, mostly specialist physicians. I made a peculiar observation in the fancy waiting-rooms of these English doctors. Everywhere I found the well-known book "An Englishman's Home"[7] and furthermore only writings that celebrated the friendship between England and France. I hope you will not mind if I enter into the field of politics, but I could not avoid it over there. I was surprised when I first came to London and spent an evening with a colleague, who suddenly asked, "When will Germany attack us?" Soon, I became so accustomed to this question that I anticipated it from each new acquaintance, and it always came. Even in America, I rarely failed to hear the question, "When will Germany attack England?" This fact throws a remarkable light on political thought and judgment over there.

Regarding reimbursement of doctors in America, I can best quote the opinions of colleagues over there: "Doctors are not rich here" – "Half of the doctors operate" – "Conditions for doctors are very unfavorable, there are too many doctors and too much competition." These are in accordance with the facts. In Cleveland, for example, a city of 500,000 inhabitants, there are more than 1000 doctors and the city has three medial schools, whose many teachers are all in practice. Regarding fees, I was told: Any operation or delivery can be had for $100; with lower-class people the doctor gets $10 - $12, but has to be present for the birth, take care of mother and baby after the delivery (there are no midwives), and make weekly postpartum visits. We must also consider the much lower value of money and the greater expenses. The considerable extent of the cities (for example, Chicago has streets that are more than 25 miles long) and the unaffordable cost of taxis require most doctors to have their own automobile. The waiting rooms of most doctors in America have a sober appearance; the doctor has his office in the commercial area of the city, but lives in the suburbs. In one building in the center of Chicago, I counted more than 60 doctors' offices; often two or three share a common waiting room.

I hardly need to mention that quackery is alive and well in England and America, since their nostrums and humbugs find their way even to us. Faith healing is especially popular and can even be administered by telephone. If the patient is not better the next day, it can be repeated. The faith healers are organized and have their own office that manages the business aspects (orders and payment).

The "Frauenheim" organization in Munich has among other requirements the following goal: Every woman should be offered the opportunity to have her delivery at an institution that meets modern standards. The woman should have the doctor of her choice present. This idea is completely understood and accepted in the United States, but in England there is no noticeable inclination toward this idea among the well-to-do population.

The Englishwoman of the upper classes generally delivers in her private home, while the obstetrical institutions of England are only for the poor people. A conversation with the Archbishop of South London showed me how new our concept of institutional delivery is for the English public. This gentleman said literally, "Over many years, I remember only one lady who wished to go to an institution for her delivery. I think there would be great opposition in England to move deliveries to institutions." I soon obtained the explanation for this reluctance of Englishwomen through further interactions with English colleagues and closer understanding of the conditions at English hospitals. In England, the upper-class circles do not even go to the hospital for an operation. Surgery in England is performed in private homes, and not only emergency cases such as appendectomy or operations for hemorrhage, but operations of every kind. If there is sufficient time, a room of the patient's house is prepared with all the necessary apparatus and equipment, operating table, sterile drapes, dressings, instruments, etc. This is not only true in small villages, but is also the rule in the large cities like London and Liverpool. It is like the conditions that we had decades ago. At that time, we also considered the hospital as a refuge for the poor people. This English peculiarity is consistent with the fact that the hospitals supported by voluntary donations have the character of charitable institutions. The care and treatment of patients is completely free of charge in the hospitals; space for paying patients is provided only as an exception and to a limited extent. The current private hospitals are small and almost completely inaccessible, and this financial difficulty explains why they often have only 2-4 beds. Doctors are forbidden to own or operate private clinics, which would be considered unworthy of their status in England. One other circumstance favors operating in private homes: The single-family house is much more common in England than with us.

It was very interesting to hear the opinion of English colleagues about this question. I received only one answer: "Operating in private homes is a concession, an indulgence to the patients. The poor people who undergo surgery in hospitals are better off than the rich people who have their operations under inadequate conditions." However, the idea of transferring deliveries from the homes to institutions is still new, even for the doctors.

Regarding obstetrical care in the United States, Hofmeier wrote a few years ago that "American women do not want to go to institutions, they want to be delivered at home." From what I saw, this statement is no longer valid. Instead, there is an increasing tendency for the women of the upper classes to insist on being provided with good obstetrical institutions. Accordingly, private obstetrical institutions have been established throughout the country. Ownership and operation of a private clinic is not considered unworthy for doctors in America. In the opinion of experienced American colleagues, this is not a temporary phenomenon, but a fundamental and lasting movement. Prof. Ochsner in Chicago told me "In 20 years, all of our women will undergo institutional delivery, and this will be better for the family and the husband. He won't drink if he is allowed to be with his wife in an institution." Undoubtedly this is affected by other factors, especially living conditions. In the United States, many of the well-off people live in situations similar to a hotel. People have a furnished apartment in a boarding house without their own household. In such conditions, a delivery would be very disruptive. These living conditions are exactly opposite from those in England.

The transition from home delivery to institutional delivery in the states is so far benefiting only the upper classes. Obstetrical care for poor women is completely insufficient. The public obstetrical institutions are always full, especially with Negro women; but poor women that do not come here are not provided with competent advice and assistance. The few charitable institutions can hardly satisfy the enormous demand. In the old Quaker city of Philadelphia, which is especially notable for its many charitable institutions, there is an exemplary institution, the Preston Retreat [1], to accommodate married women free of charge. The chief doctor there showed me in the book "The Medical Institutions of Philadelphia" the following: "Women find in this building (the Preston Retreat) accommodations that cannot be offered in the homes of the rich." He added, "With us in the area of obstetrics it will be just as in gynecology; just as the public has gotten used to the idea of coming to the hospital for appendicitis, so it will be for deliveries. In 10-20 years, we will have obstetrical institutions available for women. Today I am forced to treat paying patients who want to deliver in an institution at a private clinic that is not at all equipped for the particular purpose of obstetrics. In fact, the poor women that I treat without pay are better off than the rich women that I am not allowed to accept into the institution, and for whom there is no appropriate facility available." I was very pleasantly surprised to find this complete agreement of American colleagues with our own principles, after having found very little understanding by English colleagues. Comprehensive pre- and post-partum care is lacking in America as well as in England; in both countries our social legislation and our public health system is greatly admired and they always say "You Germans are so energetic," but they do not want to make the necessary expenditures to do something similar, although I have seen from the English reports that the situation of the poor and disabled, and in particular the poor obstetrical patients is often wretched.

Obstetrical education for doctors and midwives in England is assigned to the public obstetrical institutions, and the obstetrical service in the polyclinics is widely used for instructional purposes, especially for midwives. Most of the large hospitals in England have small obstetrical departments, usually consisting of only 8-12 beds. The pregnant women in England are examined on admission by the supervising nurse midwife, and the doctor is consulted only if this midwife finds something out of the ordinary. The conduct of the delivery and the practical instruction of the student midwives are also left to the supervisor. Only in pathological cases "when things go wrong" is the resident doctor called, which is also true in the clinic. The resident doctor is a young colleague, who in no way approaches the influence and the status of an experienced supervising midwife. At the City Lying-in Hospital,[8] now one of the most modern obstetrical institutions in London, the doctor was until recently considered so unimportant that there was no doctor in the hospital, but the surgical obstetrician was only required to live near the institution and his place was usually taken by a general practitioner nearby. Only since the opening of a new building two years ago is there a doctor in the building.

In the United States, only a few medical schools have an associated obstetrical institution. In most cases, small obstetrical departments are used for instruction, but these are generally poorly maintained and sparingly equipped. Often the students attend deliveries from the clinic with a teacher and a nurse. The lack of pregnant patients for clinical examinations and instructional purposes is very noticeable. The education of nurses at the obstetrical institutions in America does not include any training to be a midwife. Instead, the nurses are instructed to call for a doctor and to care for the post-partum patient and the infant. The nurses are not allowed to examine pregnant or delivering women or to be in charge of a childbirth.

The decision about performing an artificial abortion occurs in the States, as far as I can determine, quite correctly and consistent with our views. Their judgments may be less narrow-minded than ours when considering social conditions and their consequences, hunger, poverty and frailty, and perhaps also psychological conditions (hysteria). American colleagues told me that criminal abortions are very common, and punishable under the law, but not usually prosecuted very strongly.

Midwifery in England and America is worth special attention. In 1910, a new law was passed regulating midwifery in England. Until then, any woman could qualify for the state examination after a 3-month course in an obstetrical clinic. Starting in 1910, it was determined that only trained nurses could become midwives. These are nurses who have completed a 3-year educational course. To become midwives, they must then spend 5 months in an obstetrical institution, 2 months in the post-partum ward, 1 month in the delivery room, and the last 2 months in the obstetrical clinic. Then they can take the state examination. According to the new regulations, each candidate for a midwife's certificate must have independently examined and delivered 20 births. The requirement that only trained nurses can be admitted as student midwives is clearly a major superiority to our system. In practice, the current situation in England is generally that the poor people are delivered by the midwives from the clinic, the middle class has private midwives, and the rich are delivered by a doctor assisted by an experienced nurse.

In America there are absolutely no standards for midwifery, and the only constant is that there are no midwives, no courses, no textbook. The particular requirements of individual states for assistance with childbirth are not much different from each other. The strictest requirement (New York State) only requires that a woman present certification from two doctors that she has assisted with 20 deliveries. The many Jewish and Italian women are attended at childbirth by others from their own country.

American gynecologists are abdominal surgeons; their operative areas include not only appendix and kidneys, but stomach, bowel, and gallbladder, and I have to say that any division of these areas seems forced and not justified by any natural barriers. Anyway, over there universality goes even further, so that an obstetrician and gynecologist may operate on goiters and even prostates, as I saw in Chicago. The extension of operative activity to the entire abdomen leads to the general practice of exploring the entire abdominal cavity at laparotomy, and it was not rare to see after closure of one laparotomy wound that a second one was made elsewhere to address another organ, especially the gallbladder. It appears to me that the ability to explore the entire abdominal cavity is also a reason why the vaginal celiotomy is rarely used and perhaps also a reason why transverse incisions are uncommon, since the longitudinal incision makes it easier to see and palpate other areas. Another factor against vaginal celiotomy is that the assistants spend only 2-3 months in the gynecology department and do not develop the necessary technique to assist with this approach, which makes it more difficult to use.

Regarding mobilization of patients after an operation the principle is that the patient is allowed to get out of bed when he or she expresses the wish to do so. However, even over there many operators have kept up the old method of leaving the recently operated or delivered patients at complete bedrest for several days, and others have returned to this old method.

Anesthesia is generally administered not by doctors, but by specially trained ladies. The Merck preparations of chloroform and ether are often used. Spinal anesthesia has generally been abandoned.

At present, anesthesia with nitrous oxide is widely used, but in combination with oxygen, not the dangerous old asphyxiating method.[9] The new approach was introduced by a dentist in Cleveland, and the results have been extremely satisfactory. Among 13,000 anesthetics there was only one death in an 80-year-old patient. After nitrous oxide with oxygen the patients have fewer complaints and less vomiting. A certain disadvantage is that there is less muscle relaxation, especially in the perineum, and for operations in this region the patient must be positioned accordingly prior to starting the anesthetic. Often the nitrous oxide is used only for induction of anesthesia and is then replaced by chloroform or ether. The Mayo brothers in Rochester have given up on nitrous oxide and use ether. Cardiac dilatation and arteriosclerosis are considered contraindications to nitrous oxide.

I saw ethyl chloride used with good success as a short-acting general anesthetic.

Introduced by sponsors and friends, I enjoyed the most friendly reception and every kind of support from colleagues in England and especially in the United States, for which I again express my warmest thanks.

Original Notes

1. Preston was an honorable physician, but a strict Quaker. Any woman who came to his institution for delivery had to show her marriage certificate.

Biographical Source

Dross F, Frobenius W, Thum A, Bastian A, "'Ausführer und Vollstrecker des Gesetzeswillens' – die Deutsche Gesellschaft für Gynäkologie

im Nationalsozialismus," *Geburtshilfe und Frauenheilkunde* 2016; 76(Suppl):S121-S122.

Publication Source

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Translation Notes

1) Today called the Royal London Hospital. Whitechapel was a neighborhood of East London considered at the time to be one of the most impoverished.
2) The *Mark* was the monetary unit of Germany, worth about $0.24 at the time.
3) The New England Hospital for Women and Children, which as the author later describes was run entirely by women. It has evolved into the present-day Dimock Community Health Center.
4) See Bonner TN, "Friedrich von Müller of Munich and the growth of clinical science in America, 1902-14," *Journal of the History of Medicine and Allied Sciences* 1990; 45:556-569.
5) The author actually writes "Mittelschule" [middle school], but is clearly referring to an American high school, which even today would not meet the expectation for university study in Europe.
6) This was renamed the Elizabeth Garret Anderson Hospital in honor of its founder, after her death in 1917. It is now a wing of the University College Hospital.
7) The title of a popular drama of 1909 written by Guy DuMaurier, in which England is invaded by "Nearland" (widely assumed to represent Germany).
8) The General Lying-In Hospital closed in 1971. The building is now part of a hotel.
9) "First, the asphyxiating form. For this purpose a large mask is used, covering the whole face … so that very little, if any, air is admitted." *Surgical Technic: A Text-book on Operative Surgery*, by Esmarch Fv, Kowalzig E, translated by Grau LH, Sullivan WN, edited by Senn N, New York: MacMillan, 1903, Page 188.

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Anton von Eiselsberg (1910)

Anton Freiherr von Eiselsberg was born in Steinhaus, Austria in 1860. His father was an army officer and a member of the minor nobility; the title of “Freiherr” is generally equivalent to the English “Baron.” He studied medicine at the University of Vienna, receiving his doctorate in 1884. He trained as a surgeon with the famous Theodor Billroth and progressed to become his principal assistant, taking a special interest in neurological surgery in addition to abdominal and thyroid surgery. He was called to be Professor of Surgery in Utrecht in 1893, in Königsberg in 1896, and finally back to Vienna in 1901.

In 1910, at the age of 50, he was invited to address the American Surgical Association (ASA). He took the opportunity to tour surgical centers in America, as reported on the following pages, and to visit his friend William S. Halsted, whom he had seen several times in Europe. Eiselsberg was elected an Honorary Fellow of the ASA in 1911.

During the First World War he served as a consulting surgeon to the Austrian Navy and the Red Cross. His honorary fellowship in the ASA was revoked in 1919 because of the war, but it was restored in 1928. He was the leading surgeon of Austria for many years, and several of his students also became professors. Shortly after the beginning of the Second World War in 1939, he was killed in a railway crash attributed to sabotage.

Aerztliche Reiseeindrücke aus Nordamerika
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Medical travel impressions from North America
by Prof. A. Freiherr von Eiselsberg

Presented in part at the Imperial and Royal Society of Physicians on 24 June 1910

Gentlemen! Since returning from a brief study tour, during which I spent a total of 4½ weeks on American soil, I have been repeatedly asked to share my impressions. I am agreeing to this request with the consideration that my report can only be a brief sketch; furthermore, I am afraid I do not have much new to add, since my assistant, Dr. Clairmont [1] has reported extensively on his surgical tour of North America, and I basically visited the same places he did.

Just as the English have given us antisepsis and consequently asepsis, Americans have every reason to be proud that anesthesia was discovered and developed in their country. They faithfully preserve the memory of this great deed, which has saved millions of lives and avoids the most awful pain every day. We do not usually think of America as a place to find historic sites. Therefore, any physician who visits the Massachusetts Hospital in Boston is pleasantly surprised to see the little operating room in which ether was first used as an anesthetic in 1846. This operating room has been kept as it was at that time, with the old operating table and glass ether mask. One can see a picture that memorializes the first operation under general anesthesia. Next to the dentist Morton and the surgeon Dr. Warren are a row of younger doctors, one of whom is the now famous Dr. Bigelow. In order to keep the memory of the first anesthetic fresh in the minds of the medical students, October 16 is celebrated every year as "Ether Day," with speeches and presentations emphasizing the meaning of this day.

From one of these presentations, I understand that Jackson recommended ether as painkilling drops for severe toothaches. The dentist Morton then experimented with ether anesthesia in different animals. He was not satisfied with its effect on several students, probably because the preparation was not sufficiently pure. Finally, he inhaled it himself from a handkerchief soaked in a more pure preparation, and was unconscious for seven or eight minutes. That very day he used this wonderful substance during a tooth extraction with success. He reported this enthusiastically to Jackson: However, Jackson though that it was not enough to show that a tooth could be pulled without pain; a more convincing demonstration should be found. Therefore, Morton approached Dr. John Warren, a senior surgeon at the Massachusetts Hospital in Boston, and on 16 October 1846 the first major operation under general anesthesia was performed at the location mentioned above. A congenital hemangioma was removed from the jaw of a 20-year-old man; five minutes after beginning the anesthetic, the patient was unconscious, and to the great surprise of all those present, the patient did not start the usual screaming and showed no sign of pain as the procedure was performed. When the patient awoke a short time later, he said he had felt no pain at all. Now Warren was completely reassured, and on the same day removed a lipoma from a woman under ether anesthesia. It must have seemed like a miracle to those who witnessed this first anesthetic; had not the great Velpeau said just a few years earlier (1839), "Operating without pain is a fantasy that we cannot pursue today."[1] Although ether anesthesia was then attempted in other places, Warren regretted that it would not be as enthusiastically adopted as if it had come from a European clinic. Nevertheless, in a short time the medical world became full of the new discovery, and anesthesia soon became part of the armamentarium of physicians throughout the world.

The faith that Americans have in ether is demonstrated not only by the preservation of the original operating room and the "Ether Day," but even more by the fact that, despite subsequent innovations, they still use the diethyl ether[2] that was first employed in 1846. Indeed, the Americans are the masters of anesthesia. The anesthetics are administered sometimes by dedicated physicians and sometimes by ladies (nurses), who perform this task year after year and develop great proficiency. The anesthetic is delivered almost exclusively by the drop method; observation of the eyes, which for us is an important aspect of anesthetic monitoring, is completely omitted, indeed becomes impossible since both eyes are taped shut over damp pads at the beginning of the anesthetic. During the well over 100 procedures that I saw, the anesthesia was faultless, without any serious complication. A few times, the patient was given 0.5 mg of atropine a half hour preoperatively. I saw no postoperative pneumonias. The Americans consider it very important to maintain the patient's body warmth during preoperative washing and during the operation. Recently, they have often been inducing anesthesia with nitrous oxide and then converting to the ether drop method. This is thought to prevent unpleasant irritation of the nasal passages. Not only would the high price of this gas make it difficult to introduce into general hospital practice, but the patient sometimes becomes so unsettlingly cyanotic that I could not be comfortable with this agent. Spinal anesthesia is only used occasionally, and local anesthesia very seldom. I never saw chloroform used. Ether is so faultlessly administered, and for minor procedures even its early stages are so skillfully used, that there seems to be no need for anything new.

I hardly need to mention how clean everything is, and indeed there is excellent asepsis. The influence of German surgery is seen everywhere, especially the teachings of our unforgettable von Mikulicz.[3] The great majority of surgeons operate with rubber gloves; the suture material is generally silk, although the Mayo brothers only use catgut sterilized according to the method of Bartlett [2].[4] The Halsted school takes extraordinary care with the skin closure. After muscles and fascia have been closed in several layers, and the usual skin sutures, they place numerous fine stitches in between and cover with a thin layer of silver paper. Indeed, the scars are barely visible. Instead of Mikulicz tampons,[5] they often use a fenestrated rubber dam, in which iodoform gauze strips have been inserted, and the removal of the dam is more gentle. With Dr. Gibson at St. Luke's Hospital[6] in New York, I saw a good method of hand disinfection for cases of severe infection. This is quick and effective, even if it is irritating to the hands if used often. A pinch of calcium hypochlorite and sodium carbonate[7] are rubbed together with some warm water, which releases free chlorine, after which the hands are thoroughly rinsed with lukewarm water.

The calmness of American operators is exemplary. Nothing interferes with their composure, there is very little talking, and even that is in whispers [3]. I had the same experience in New York, Baltimore, Philadelphia, Chicago, Rochester, and Boston.

The hospitals are almost all completely modern and worth seeing, many of them provided with great luxury and elegance. Individual private hospitals, for example the Corey Hill Hospital,[8] where the excellent Boston surgeon Dr. Richardson operates, are simpler but practically and tastefully furnished. In the large cities, where space for a garden would be too expensive, the flat roofs of the hospitals have so-called "roof gardens," where the patients can spend a good part of the day in the open air. The origin of the hospitals is indeed quite different from ours. Our hospitals are always built by the state, either the country or the municipality, and private institutions are an exception; however, in America the marvelous hospitals and wonderful clinics, as well as numerous university hospitals, are all built and maintained by private foundations. It is true that there are many more rich people in America, and almost every rich man leaves a legacy to one of these charitable institutions, but even the moderately well-to-do man will make an annual donation to a hospital. This is done without ulterior motives, since there are no titles or ranks in America; there is a well-developed sense of charity and the importance of humanitarian organizations. During my brief stay in Boston, Dr. Warren (grandson of the surgeon mentioned earlier) raised more than $5000 towards the foundation of a cancer hospital. In addition to the generous donations, the hospitals are also supported by the income from private patients. The attending surgeons admit their patients to the private rooms, which are very nicely furnished. Doctors and patients both praise this arrangement, which I would particularly like to emphasize because a few years ago here in Vienna the private rooms that were set in the renovation plans for our clinic were unexpectedly deleted, apparently at the instigation of the general practitioners. As far as I know, the American general practitioners have never protested this kind of *Zahlstock*,[9] which could certainly not have been avoided if it interfered in any way with collegiality. The feeling of collegiality is very delicate over there, and any transgression is strongly punished. Thus, the American Medical Association has struggled with great energy and success against medical advertising in the newspapers; a paper guilty of this failure redeemed itself by almost daily news reported from the camp of the antivivisectionists. Large placards with the names and specialties of the doctors written in large letters are absolutely disparaged [4]. The signs are the same size everywhere, and only say Dr. X. X.

As a curiosity, I can report that 150 doctors have their office in one large building in Chicago, without any disagreements. None of the principal surgeons receives any salary for their activities in the hospital, and none pays any income tax. The demand for such hospital positions is so great, that any individual surgeon is in charge of no more than 40, or at most 60 beds, and only for four to eight months of the year. Often, for example at the Mount Sinai Hospital in New York, there are more attending surgeons and gynecologists on the staff than available operating rooms, and so each surgeon is assigned certain days and hours to operate, an arrangement about which many colleagues were very unhappy. The Mount Sinai Hospital that I have just mentioned is also an example of the establishment of a hospital through private means. It was built at an expense of five million dollars by the Jews of New York; even more luxurious is the completely new Michael Reese Hospital[10] in Chicago, built by the Jews of that city.

As mentioned above, nearly all the universities, especially the medical schools, are private institutions. Johns Hopkins set a marvelous example by bequeathing a capital of five million dollars during the 1870s in Baltimore for the university that now bears his name. In Boston, a whole group of magnificent medical buildings of white marble is under construction in a large park. A palace for anatomy, one for pathology [5], a third for physiology, donated in part by Morgan and Carnegie. Next to these, a similarly well-equipped clinical hospital will be built, and not far away the stadium for all the students of the famous Harvard University in Cambridge. In the presence of more than 30,000 (!) people, for whom there are seats in this open theater built in the style of the Colosseum, the students will engage in their athletic events. Just as in England, the American students give much more emphasis to their physical development, whereby I should also mention that the majority abstain from alcohol and sexual activity. Harvard College is a magnificent institution! In one of the dining halls, more than 1000 students are provided with their meals, served exclusively by Negroes. The eagerness to raise private money for modern medical schools seems to be increasing in America. Thus, there is already a plan to build an outstanding medical school in Saint Louis as good as the one in Boston, and I am told that the money for it is, for the most part, already available.

Recently there has been welcome progress in the effort to reduce the large number of medical schools. I have heard that there are about 150 medical schools in North America, of which some are quite poorly equipped. In Baltimore, for example, there are four or five schools other than Johns Hopkins University that can grant the Doctor of Medicine degree. This situation certainly does not contribute to increasing the quality of the medical profession, not only because the education is different but also because there are very different prerequisites for admission. The leading schools require completion of "high school" and college (the latter corresponds approximately to our old *Lyzeum*[11], teaching primarily biology, chemistry, physics, etc.), whereas others are satisfied simply with the "high school" (corresponding approximately to our *Bürgerschule*[12]). This explains why the American doctor always emphasizes proudly that he is a Johns Hopkins [6], a Harvard, a Jefferson, or a Rush College "man." The education at these and a few other elite schools is incomparably superior to most of the others. Happily, efforts are underway to reduce the excessive number of medical schools and thereby better provide for the individual schools. To some extent, the regrettable inequality in prerequisites as well as instruction is evened out, because every doctor, no matter which school he graduates from [7],[13] has to pass an examination by a commission of the applicable state before he can practice, which remarkably is only valid for that state; if he moves to another state, for example from New York to Pennsylvania, he has to pass a new examination. Gentlemen, you have surely heard of the Rockefeller Foundation; it has built an Institute exclusively for medical research, whose results are world-famous. I only need to mention A. Carell, Flexner, and Meltzer! Next, Rockefeller plans to build a hospital next to this purely research institution, in which the scientific results can be applied, for example allowing Carell to use his magnificently developed vascular suture on human subjects (e.g., aneurysms). It was fascinating to see Meltzer demonstrate the quite simple method of positive pressure ventilation on a dog on one floor of this wonderful institute, while at the same time on another floor Willy Meyer and his brother (an experienced engineer) tried out his ingenious but costly and complicated apparatus for combining positive and negative pressure.

The College of Physicians of Philadelphia presents a wonderful building, which in addition to a large auditorium has a series of smaller lecture rooms, club rooms, restaurants, and an unusually voluminous library. It subscribes to almost all the German and English medical journals, and I believe many French ones as well. Although the membership fee is not large, this is made possible because many well-off doctors leave bequests to support this College. The cost for a number of rooms was contributed by the relatives of a deceased member, a picture of whom is placed in the room. Thus, there is a "Samuel Gross Room," containing his portrait and the private library of this famous former surgeon of Philadelphia. In the entrance hall, the names of physicians who died in the line of duty are inscribed in gold letters on marble panels.

Having given this general introduction, I will allow myself to provide some details [8].

I will start with a word about the Johns Hopkins Hospital. Welch, the outstanding pathologist and scientific leader of the Johns Hopkins Hospital, chose the excellent staff, including Halsted, whose name is well-known through his publications – I will only mention his method of mastectomy, and his experimental studies on the thyroid and parathyroids. Halsted has understood very well how to select the best among his disciples. He is Chief of Surgery and has gradually relinquished the neurologic cases to Cushing, the urologic cases to Young, the stomach and bowel cases to Finney, and the extremities to Bloodgood. Thus he has four followers who are recognized even beyond their own country.

Clairmont's article reported extensively about Cushing's operations on the brain. I saw him beautifully excise a Gasserian ganglion using his own method, and a pituitary tumor approached through the labial mucosa anterior to the maxilla, after preliminary tracheotomy. I could recognize in Cushing not only the brilliant technician, but also the excellent diagnostician, since he establishes his own diagnoses. But I admired this remarkable man even further after seeing how he teaches the students in his course on surgical operations. He starts with the correct view that performing procedures on a cadaver does not provide the students with a proper education; therefore, he has set up an operating course in the scientific laboratory of the university, every Saturday from 12:00 to 5:30, where they operate on living anesthetized animals. In connection with the case [9] that happened to be presented during the week, the technique of gastroenterostomy was discussed and then performed on anesthetized dogs by eight groups, each with four students. Thus, the aspiring surgeon learns four specific things: Anesthesia, careful hemostasis, the practice of asepsis, and finally avoiding incidental injuries; all of these are very important lessons that cannot be learned by operating on a cadaver.

The skill of American surgeons is indeed amazing. At the excellent Mercy Hospital,[14] which is run by Catholic sisters, I saw Murphy do ten major operations between 9:00 and 1:00, including several gynecologic cases. Gynecology is part of general surgery almost everywhere in America, just as it is in France. I saw Murphy perform a gastroenterostomy using his button, which has recently been made in an oval shape, and which he uses in alternation with suturing. I should mention his method for avoiding adhesions after laparotomy by always everting the peritoneum when closing it with sutures. His somewhat complicated arthroplasty for ankylosis has achieved excellent functional results.[15] In all operations for ankylosis, he emphasizes that the capsule must be incised completely, since it is the chief obstacle to regaining mobility. Murphy considers one of his most important scientific studies to be the management of acute arthritis, for example due to gonorrhea (but not to be used for tuberculosis), with a 2% formalin-glycerine solution prepared 24 hours in advance. About 20 grams of the solution are injected slowly into the joint with a gonorrhea syringe[16] under general anesthesia, after which the joint is gently moved back and forth. Morphine is administered to avoid pain after the procedure. Murphy injects the same solution for thoracic empyemas, and believes he has avoided the need for rib resection in many cases.

In addition to these results of Murphy are the remarkable successes of the brothers Carl and Emil Beck [10] at their private hospital in Chicago with bismuth injections. The preparation consists of one part bismuth and two parts Vaseline. The injection brings about a chemotaxis and kills the bacteria. The injection is repeated if the drainage still contains bacteria. The technique is as follows: The area is washed with alcohol; a gonorrhea syringe is filled with the bismuth paste, and it is slowly injected. The injection is completely painless, and does not lead to bleeding or infection. Any excessive injected solution simply flows out of the fistula; if no more than 100 grams is injected, there are no signs of toxicity. These injections can be used for tuberculous fistulas, for example from the rectum. Emil Beck showed me some typical cases. Wyeth [11] has achieved excellent results using boiling water for rectal fistulas, especially if they are incomplete, as well as with congenital cavernomas. Liquid air is also frequently used for management of cavernomas. The Ochsner brothers in Chicago have a well-organized private hospital, where the older brother performs general surgery every day in front of a large auditorium, while the younger brother is mostly busy with orthopedics. Ochsner has an interesting opinion [12] about *arthritis deformans*;[17] he feels that the progression of this disease is often attributable to a focus of infection somewhere in the body, for example chronic constipation. He has often observed improvement in the arthritis after removing the appendix.

So much has already been written about the Mayo brothers in Rochester [13], that I will only make a few remarks. It is interesting that in this small town, with scarcely 6000 inhabitants [14], the private 250-bed hospital of the Mayo brothers, St. Mary's Hospital, run by Franciscan sisters, is almost always full, and there are two affiliated hospitals of similar size in the town. The two chief surgeons are supported by a staff of 32 doctors; the patients are thoroughly examined and prepared; the surgical specimens are analyzed by experienced pathologists as expertly as in any modern clinic. The museum in Rochester is therefore itself a thing worth seeing. The operative technique of the two brothers is indeed amazing. During the three mornings that I spent at St. Mary's Hospital, Charles Mayo (his brother William was unfortunately away) operated on ten goiters, mostly small masses associated with toxicity,[18] all under ether anesthesia, a similar number of appendix and gallbladder cases, several gastroenterostomies and numerous gynecologic cases. Anesthesia, asepsis, and operative technique are faultless. The annual report [15] for 1909 records that during that year 6489 patients underwent operation, including 3746 laparotomies, with an overall mortality of 1.8%. In addition there were 551 operations on the thyroid with 1.6% mortality and 80 prostatectomies with five deaths. Among the laparotomies, there were 1323 appendectomies with 4 deaths, 42 gastrectomies for cancer with 4 deaths, 144 gastroenterostomies with 4 deaths, and 64 nephrectomies with 2 deaths. I will say a few words about resections of the cecum and large intestine. W. Mayo [16] describes 27 resections of the cecum for malignant tumors with only three deaths, and emphasizes the importance of a thorough evaluation of the liver, since a mass in this location, or extension into the duodenum, are more important contraindications than extensive lymph node metastases. The procedure itself begins with an incision lateral to the cecum and its mobilization medially. Individual ligation of the mesenteric vessels is considered important; the bowel is resected primarily and a side-to-side ileocolostomy is performed at the hepatic flexure, leaving a noticeably short blind end. The transverse colon was resected seven times, with one death. The descending colon and sigmoid were resected 30 times, with four deaths. Altogether Mayo had performed 100 large bowel resections [17] with only twelve deaths, certainly an excellent result. For the distal sigmoid cancers, the combined method from above and below is considered. A rubber tube is inserted through the rectum, tied into the upper end, and the upper end invaginated into the lower end along with the tube; the tube is left in place for four to ten days. I can further report that Mayo performed 14 operations on the spleen, including 10 splenectomies with one death, and 27 operations for hydronephrosis, most of which were caused solely by abnormal blood vessels; Gentlemen, I think this will allow you to form a judgment about the abundance of scientific material available at St. Mary's Hospital in Rochester. The fact that this material has been so spectacularly analyzed is due in large part to the wonderful organizational talent of the Mayo brothers, which is so often found in our American colleagues. Every surgeon employs one or two stenographers, who work on their typewriters into the evening completing letters and patient histories.

I had a very interesting but unfortunately short visit with Crile, the surgeon of Cleveland. Crile considers shock to be the greatest risk for patients undergoing surgery for toxic goiter. Therefore, he has arranged for the patient to be kept alone in a small room and if possible without knowing when he will undergo operation. For several days, the patient receives either a few drops of ether or a few drops of *eau de Cologne* to breathe on a mask and a standard neck bandage, as he would when he undergoes operation. After the patient has become accustomed to this completely harmless routine, one day he is actually put to sleep with ether and the operation is performed, usually right in his bed. In Crile's laboratory, I saw one of his transfusion experiments on a dog, which as you know have led to his performing direct transfusions in humans. In urgent cases, he does not test for hemolysis, but attaches the artery of the donor, ideally a blood relative, to the vein of the recipient, specifically either with direct circular suture (method of A. Carrel) or with the help of a modified Payr prosthesis,[19] and lets the blood flow in this way. He reports extraordinary success in cases of severe anemia after hemorrhage, but has not seen beneficial effects with leukemia, acute poisoning, carcinoma, or uremia [18].

R. Matas,[20] the worthy surgeon of New Orleans, was this year President of the American Surgical Association, which met in Washington. This session was very stimulating. In connection with my talk on pituitary surgery, an interesting debate arose in which Mixter (Boston), Halstead[21] (Chicago), and Cushing (Baltimore) each reported a successful operative case. The patients of Matas are mostly Negroes, and he described his experience that Negro women have a remarkably high incidence of uterine myomas. I asked him whether Negroes had a high or low incidence of melanoma, and he said his impression was that this was quite rare. I had the same opinion from several other colleagues who practice in the southern United States. Matas reported briefly about the management of aneurysms that he had proposed, which is now been performed by numerous colleagues. This consists of suturing the aneurysm after excising enough of the sac so that the remainder is about the size of the original arterial lumen. He calls this operation endoaneurysmorrhaphy.[22] In total, 85 cases have been operated upon in America using the Matas method; 2 patients died, 2 had secondary hemorrhage, and 5 developed gangrene. This operation arises from the effort to restore circulation immediately after resection of an aneurysm, whereas after ligature one must await with some trepidation the development of an adequate collateral circulation. A more complete result would of course be obtained by resection followed by vascular suture. This concept certainly represents the operation of the future, considering the brilliant results of vascular suture in Murphy's animal experiments (Murphy's invagination method was the first method of vascular suture that resulted in end-to-end healing in humans), and more recently by A. Carrel on dogs. A. Carrel, whose animal experiments are world-renowned, has focused his attention on vascular suture and its use in developing new operative approaches. For four mornings, I was able to admire his incomparable technique and follow the interesting, difficult problems that he has set for himself. The operative preparations are as painstakingly aseptic as for a laparotomy on a human patient. It is interesting that he completely avoids shaving, but removes the hair over a wide area around the intended incision by application of a 10% solution of sodium sulfide[23] followed by scraping it off with a wooden spatula. Not only does Carrel suture a divided vessel – artery or vein – with complete security and success, but he connects carotid artery to jugular vein; he replaces a piece of the carotid with a piece of vein, or with a piece of carotid from another animal of the same species, and the piece may have been preserved for days or even weeks in the icebox in Vaseline or Locke's solution.[24] He replaces an artificial defect in the wall of the aorta with a piece of vein from the same or another animal. At present, he is occupied with the question of how long the tissue can survive outside the body, that is, how long it can remain viable for transplantation; he is also continuing his studies of kidney and extremity transplantation, and attempting to create a communication between the left ventricle and descending aorta after artificial stenosis of the aorta. It is true that the last experiment has not yet had positive results, but I can hardly doubt that it will finally succeed. The degree to which this result can be adapted to the treatment of human heart diseases remains to be seen. In addition to the vascular transplants mentioned above, I also saw the removal of a kidney, which was replaced after ten minutes (with end-to-end suture of the vessels and ureter). I also saw the transplantation of an extremity from a recently killed dog to the fresh amputation stump of another dog. Skeletal fixation was performed by introducing a metal rod into the medullary cavity, after which periosteum and muscles were sutured, followed by artery and vein. After removing the clamps, the transplanted extremity was warm and had a pulse. Carrel has kept such extremities viable for up to 28 days. A. Carrel himself does not dare – and this is a great credit for this keen experimenter – to apply these methods to humans yet, and is coming to this conclusion [19]: An animal from whom both kidneys have been removed and replaced with kidneys from another animal of the same species can live for a few weeks, 36 days, of which 18 days are in good health; whereas an animal from whom both kidneys have been removed and themselves replaced remains healthy for a long time. According to Carrel's own limitations, the practical value of this experiment in man has to be put in the background for now. For specific details about the status of this question, about which Carrel has played a leading role [20], I refer to the excellent article of R. Stichs, "Ueber Gefäß- und Organtransplantationen mittels Gefäßnaht," which is in the recently published *Ergebnisse der Chirurgie und Orthopädie* by Payr and Küttner. Although for now it is optimistic to hope that these experiments will have a practical application, the goal envisioned by the experimenter is so lofty that it justifies the effort applied to it. At least the attempts are of great scientific interest. Let us hope that the day will come when they can benefit suffering people.

If you will allow me to highlight a non-medical subject, I would like to mention above all the unceasing efforts and the open-minded willingness to work that one sees everywhere, which is surely the main reason for the gigantic progress of North America. It is interesting to observe the ruthless energy with which the immigration controls are applied, whereby considerations about the good of the nation often lead to sweeping regulations that are hard on individuals. The immigrant must be inoculated during the voyage and must have a certain amount of breathing space, which was recently increased [21] – this applies only to the steerage passengers, since those who can pay for a higher class are assumed to carry no infectious diseases and are admitted without any controls. When the ship lands in New York, all the steerage passengers (sometimes totaling 4000 to 5000) are brought to Ellis Island and undergo a detailed medical screening. Every immigrant is examined for the presence of a hernia, artificial limb, or infectious disease. Those suspected of trachoma are sent back without further consideration. "We want not to have the Egyptian eye-disease in our public school," I was told by the diligent and energetic supervisor on the island. And they are just as strict about passengers suspected of mental disturbances. In view of the huge mass of immigrants – in recent years averaging more than a million per year – it is not surprising that America is becoming stricter and more demanding with its controls. Thus, during my visit an immigrant who was noticeably obese – he weighed over 150 kilograms – was denied due to the likelihood that he would not be employable and would become a burden on the state. In addition to good physical condition, each immigrant must demonstrate sufficient financial resources – I believe the minimum is 50 dollars per person. The shipping companies are required to transport all refused steerage passengers back to Europe at no cost and pay a fine which is set against the account of the European agent, so the passengers have already been subjected to a careful screening in Europe before they board the ships.

Gentlemen! I have come to the end of my address and will make no further demands upon your attention. It was a great pleasure for me to confirm the high regard that our American colleagues have for the Viennese surgical school. Colleagues repeatedly emphasized their gratitude to this or that Viennese teacher. And the same gratitude and attachment that was paid to the earlier generations of Viennese teachers is enjoyed by the present one, especially the young *Dozenten*[25] of our university. It is hardly necessary to speak of the well-known American hospitality and friendliness with which I was received, starting with the Nestor[26] of American surgeons, W. W. Keen, down to the youngest colleague. I can only say that I am full of appreciation for the practical and scientific work that I saw in America.

It was once customary for every American surgeon, every specialist, almost every ambitious American doctor to visit Europe, and especially Vienna, not only as a student but on study tours later on to complete his training; now the time has come for European doctors to do the same and visit America, especially surgeons, who will find a study tour of America very stimulating and educational.

I believe it is safe to say that with respect to technique the American surgeons are at least the equal of the leading Europeans. However, the scientific life demonstrated in the institutes is so active and earnest, and is fostered and encouraged by such generous gifts and foundations, that there is no doubt that the American colleagues will keep pace here too with the best in Europe.

Let us rejoice in the giant steps that the energetic and progressive Americans have made in this area. Science and humanity can only benefit from the peaceful competition among the nations.

Original Notes

1. "Chirurgische Reiseeindrücke aus Amerika," *Wiener Klinische Wochenschrift* 1908, No. 30.
2. See Beckmann, "Operating Room Technique," *The Old Dominion Journal of Medicine and Surgery*, March 1909.
3. G. E. Brewer in New York has instituted a manual sign language with his assistants and nurses, and not a word is spoken during the operation.
4. A placard indicating that a doctor is a general practitioner and also a specialist for certain diseases would not be possible in America.
5. One can get an idea of the dimensions when I mention that a reception was held in my honor in the lobby of the pathology building with 600 people present, all of whom were easily contained in the spacious hall and the adjoining rooms.
6. Johns Hopkins requires evidence that the applicant knows German and French.
7. Before his first semester as Professor of Pediatrics, Prof. von Pirquet himself had to undergo such an examination.
8. Of course, I can only briefly report about a few surgeons that I saw. I am pleased to take this opportunity to express my gratitude also to the surgeons not specifically mentioned here for the kindness that they all showed me.
9. While I was there, a case of benign pyloric obstruction from the clinic was discussed.
10. "The surgical treatment of tuberculosis sinuses and their prevention," *Transactions of the 6th International Congress of Tuberculosis*, Washington 1908. "Surgical treatment of tuberculosis, pleuresis, etc.," *Journal of the American Medical Association* 1909; Volume 113.
11. "The treatment of the vascular tumors by the injection of water," *Journal of the American Medical Association* 1903.
12. "Surgical treatment of chronic arthritis," *Journal of the American Medical Association*, 5 March 1910.

13. See among others Clairmont *loc. cit.*, also Guleke, *Münchener Medizinische Wochenschrift* 1909 (45-47).
14. The father of the Mayo brothers, now over 90 years old, immigrated 70 years ago from England and fought against the Indians. He is proud of the success of his sons and pupils, who began assisting him with operations when they were ten- and twelve-year-old boys.
15. *20th Annual Report of St. Mary's Hospital*, Rochester, Minn. 1909.
16. "Tumors of the cecum," *The Northwestern Lancet*, December 1909.
17. "Surgery of the large intestine," *Annals of Surgery*, July 1909.
18. Crile, *Hemorrhage and Transfusion*. New York and London, Appleton and Co., 1909.
19. "Results of the transplantation of blood vessels, organs, and limbs," *Journal of the American Medical Association*, 14 November 1908. Address at this year's meeting of the American Surgical Association, Washington, May 1910.
20. I will mention in passing that E. Ullmann made the first attempt to transplant kidneys using vascular suture in Vienna in 1902, and A. Exner later also made an attempt.
21. On a large ship, this increase results in a reduction of several hundred passengers.

Biographical Sources

Eiselsberg Av, *Lebensweg eines Chirurgen*, Innsbruck: Deutscher Alpenverlag, 1939.

Rutkow IM, "The letters of William Halsted and Anton von Eiselsberg: A very special friendship," *Archives of Surgery* 1980; 115:993-1001.

Plarr's Lives of the Fellows online; livesonline.rcseng.ac.uk. Royal College of Surgeons of England; 2023.

Publication Source

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Translation Notes

1) "Eviter la douleur dans les opérations est un chimère qu'il n'est plus permis de poursuivre aujourd'hui." Velpeau A.-A.-L.-M., *Nouveaux Éléments de Médecine Opératoire*, Paris: J.-B. Ballière, 1839.
2) The author uses the German word *Schwefeläther* (sulfuric ether), which was formerly common because the compound had been historically synthesized from ethanol and sulfuric acid. It should be emphasized that $(CH_5)_2O$ (diethyl ether) does not itself contain sulfur.
3) Johann von Mikulicz had visited America in 1903, but a few months later developed symptoms of gastric cancer. His friend Eiselsberg performed an exploratory laparotomy in January 1905, but the cancer was unresectable and Mikulicz died later that year.
4) Described by Bartlett in the *Journal of the American Medical Association* 1906; 46:1168-1169.
5) The Mikulicz tampon was a gauze packing inside a larger sleeve of gauze. An improvement less likely to cause bleeding on removal was reported by Gibson CL, "The rubber dam Mikulicz tampon," *Annals of Surgery* 1921; 73:470-472.
6) Now the Mount Sinai Morningside Hospital.
7) The author actually writes "calcium carbonate" and *Waschsoda* (sodium carbonate), but in fact the chemicals used in New York hospitals are described by Weir RF, "On the disinfection of the hands," *Medical Record* 1897; 51:469-473.
8) A former hospital in Brookline MA.
9) The *Zahlstock* (paying floor) was an arrangement apparently unique to Austrian hospitals at the time.
10) The author misspells the name "Michel Rees." The colorful life and legacy of this Bavarian Jewish immigrant is described by Cutter CH, "Michael Reese: Parsimonious patron of the University of California," *California Historical Society Quarterly* 1963; 42:127-144.
11) Europeans have distinguished two types of secondary schools, the *Gymnasium* and the *Lyzeum* (lyceum), based partly upon how much they emphasize studying Greek and Latin. The specific definitions vary by country.
12) This was a secondary school for students not planning to attend university. The comparable school in Germany today is the *Realschule*.
13) Clemens von Pirquet, who is mentioned in Original Note [7], was

the brother of the author's wife. He came to Johns Hopkins as its first Professor of Pediatrics in 1909, but went back to Germany to be Professor in Breslau in 1910.

14) Mercy Hospital closed in 2021.

15) In 1912, Murphy (who was President of the AMA that year) published a six-part "Contribution to the surgery of bones, joints, and tendons" in *Journal of the American Medical Association* 58:985-990,1094-1104,1178-1189,1254-1265,1345-1352,1428-1431. The last two sections discuss his procedures for ankyloses.

16) A large syringe principally used to perform urethral injections for gonorrhea.

17) Rheumatoid arthritis.

18) Like others on the European continent, the author calls toxic goiter "Basedow's disease"; in English-speaking countries it has often been called "Graves' disease."

19) See Payr E, "Zur Frage der circulären Vereinigung von Blutgefässen mit resorbirbaren Prosthesen," *Archiv für Klinische Chirurgie* 1904; 72:32-54.

20) The author mistakenly writes "E. Matas."

21) Albert E. Halstead of Chicago, whose name is misspelled by this author and must have been frequently misspelled because of the more famous William S. Halsted.

22) See Matas R, "An operation for the radical cure of aneurism based upon arteriorrhaphy," *Annals of Surgery* 1903; 37:161-196.

23) This solution is mostly used on hairy animals, and even there milder depilatory creams or electric shaving are now preferred. See He X, Jia L, Zhang X, "The effect of different preoperative depilation ways on the healing of wounded skin in mice," *Animals* 2022; 12:581.

24) Locke's solution is a balanced salt solution similar to the more familiar Ringer's lactate solution.

25) *Privat-Dozent* is a European academic title approximately equivalent to Associate Professor.

26) In the *Iliad* and *Odyssey*, Nestor was an older warrior respected for his experience and wisdom.

24

Fritz Lange (1910)

Fritz Lange was born in 1864 in Dessau, in the eastern part of Germany. He studied medicine in Jena and Leipzig, finally graduating from the University of Munich. He was an assistant surgeon in Munich, Dessau, Rostock, and finally in Strassburg. He developed an interest in orthopedics and trained further with Adolf Lorenz in Vienna. He opened an orthopedic clinic in Munich in 1896, gradually building it up from a single basement room averaging less than one patient per day to a large and active institution. The University of Munich named him an Associate Professor in 1903 and a Full Professor in 1908.

In 1910, at the age of 45, he traveled to America, as reported in the following pages. He was subsequently elected an Honorary Member of the American Orthopedic Association.

During and after the First World War, he wrote numerous articles on the orthopedic management of battlefield injuries. His honorary membership in the AOA was revoked during the war, but he was later made a "Corresponding Member." Like many Germans, he was in a difficult economic situation after the war, and he could not accept an invitation to return to America during the 1920s. He retired in 1934, was greatly honored as an orthopedic pioneer in Germany, and died in 1952.

Amerikanische Reiseerinnerungen
Muenchener Medizinische Wochenschrift 1911; 58:1404-1409

American Travel Memories
Professor Dr. F. Lange, Munich

After the reports about American medicine that have been published in recent years by F. von Müller, Clairmont, von Eiselsberg,[1] Guleke, Hengge, and others, it may seem superfluous to give more travel impressions.

But whoever has seen American colleagues at work, has learned from them, and has enjoyed their incomparable hospitality must consider it an unavoidable debt of gratitude to talk about this youthful nation, whose development is not troubled by historical prejudices, and to encourage others to visit this land of unlimited possibilities.[2] Furthermore, the American facilities for studying medicine and for scientific research are excellent in many respects, and German visitors have all agreed that many of their ideas could be introduced in Germany, and would contribute to the improvement of our universities. So, I hope you will forgive my describing the trip to America that I undertook in the early part of 1910.

The opportunity was an invitation from the American Orthopedic Association to participate in their meeting in Washington. Added to this were other invitations to lecture and demonstrate operations in Boston, New York, Philadelphia, and Baltimore.[3] I thus became acquainted with the eastern universities of America. I had planned to visit Chicago and Rochester, the workplace of the Mayo brothers, but had to give these up for lack of time.

My main interests were American orthopedics and the management of crippling conditions in America. Orthopedics has been practiced as a specialty for a longer time in America than in Germany. It may be true that Strohmeyer's subcutaneous tenotomy made Germany the birthplace of orthopedics, but this was followed by the systematic development of orthopedics in America, especially by Sayre and Taylor in New York.

America produced the traction treatment using plaster bandages, ambulatory management of arthritis in walking apparatus, experience with suspension for scoliosis, plaster casting for spondylitis and scoliosis, etc.

These accomplishments have given orthopedics in America a very respected status and good working possibilities. Most of the large hospitals that I saw had orthopedic departments led by specialists.

I have to start by emphasizing that in the large American hospitals there are not only a Chief of Surgery and a Chief of Medicine, as in most German hospitals, but also each specialty is led by a prominent doctor. The Americans consider that patients at the large hospitals do not only have afflictions relating to surgery and internal medicine, but also other possible disorders that are best managed by specialists.

This point of view has been very beneficial for orthopedics, and thus in the different hospitals of a large cities there are ample opportunities for those with orthopedic disorders to be treated by specialists. The difference between America and Germany is best made by comparing Boston to Munich. Boston has about the same population as Munich. However, Boston, including its regional orthopedic facilities, has more than 300 beds for specialists to manage purely orthopedic patients; Munich has fewer than 50.

Just as the individual hospitals differ considerable from each other, so are the orthopedic departments in these hospitals very unequal. Among the university orthopedic institutes I saw very well equipped facilities. However, I also found orthopedic departments in the basement without light or ventilation, that needed electric light even at noontime, and that were even worse than our old much-maligned *Reisingeranium*,[4] where nevertheless much was accomplished.

The same is true for the homes for cripples. The American facilities for the crippled, like the hospitals, are very different from each other.

The number of beds for cripples in eastern American institutions is much greater than in German ones. They are also ahead of us in that every institution allows for the management of crippled patients by orthopedic specialists, whereas we in Germany still have many homes for cripples that only offer education and training in manual labor, but not treatment by a specialist.

Among the numerous institutions that I saw, I would like to mention three in particular. The one with the most attractive external appearance is the “Widener Home” in Philadelphia.[5] It is a gift of Mr. Widener, who spent 4 million *Mark*[6] just on the construction. In accordance with the building costs, it is an impressive marble palace like no other in the world. The crippled children can stay in this institution from age 4-20 and spend their childhood free from any material concerns. They are educated in a school, are trained in a trade, and receive medical treatment. Mr. Widener wished to offer his protégés a recompense for the sufferings caused by their crippling disorders and provide them with better living conditions than their normal contemporaries. You can see the extent to which this goes in that each of the older crippled girls has her own room; on her bureau are all the instruments for a manicure, last year's Christmas gift from Mr. Widener. The care is first class. The children have a bath every day, etc. Finally, they have the opportunity to spend the entire day in the fresh air in the beautiful park on the grounds of the institution; in brief, the external living conditions for the cripples are wonderful. However, such a luxurious facility has its dark side as well. First, it is very expensive to run such an institution (each cripple costs 4000 *Mark* per year). As a result, there is space for only 100 cripples, while for the same money thousands of cripples could easily be treated. The entire foundation of Widener has a value of 16 million *Mark*. Furthermore, the cripples get used to expectations that may be hard to satisfy after they reach the age of 20 and must leave the institution to fend for themselves.

The "Widener Home" in Philadelphia was unique among all the institutions for cripples that I saw in America.

In the other institutions, all the frills and finery were avoided, and the focus was on trying to help as many cripples as possible. On this basis, the "Industrial School for Crippled and Deformed Children"[7] was established in Boston by the honorable humanitarian Mr. Cotting.

The children cared for in Mr. Cotting's institution do not get full room and board, but just stay there during each day. In the morning, the crippled children who cannot come on foot are picked up at their parents' home by carriage; they have school and manual training in the morning and afternoon, have a simple lunch, and are then brought back home in the evening. In addition to schoolrooms, the institution has workshops for basket weaving, pottery, sewing, printing, woodworking, shoe making, and bookbinding.

Everything that I saw in this institution was exemplary in every respect; even the apparently incidental things like chairs, tables, and stairways showed evidence of the deep understanding and boundless love with which everything had been considered and carried out by the creator of this institution, Mr. Cotting. This institution has the place of honor among all the schools for cripples in the world.

A third institution, which has an especially prominent place among American institutions for the crippled is the "Massachusetts Hospital School" in Canton.[8] This institution is not quite complete; however, it promises to be an exemplary institution under the sponsorship of Bradford and the leadership of the experienced Superintendent Fish. Here the children will receive full room and board for several years. There are plans to have all the necessary facilities for management by leading specialists, as well as schoolrooms and workshops for learning a trade.

In addition to these outstanding institutions, I saw many simple homes for cripples, some of them built of wood. All the American homes for cripples that I saw had excellent arrangements for fresh air and very good food. These two factors are responsible for the radiantly healthy appearance of the children. Even the children with tuberculosis did not show evidence of their severe disease. The rosy cheeks did not allow you to suspect that many of the children suffered from severe fistulous coxitis or spondylitis.

I saw with genuine admiration that the Americans, thanks to their excellent institutions, could accomplish what we in Germany are trying to do in a more modest way.

You may ask, what do they do in these institutions?

My personal impression was that one sees far fewer cripples on the streets of American cities than with us. Also, in the hospitals it seemed that the severe deformities are much less frequent than in Germany.

This is probably related to the fact that in America those with orthopedic issues have had orthopedic clinics available for decades and get timely treatment. I do not have statistical proof for my personal belief that the long-standing and well-equipped hospital orthopedic departments in America have led to a decrease in cripples. However, I hope that Boston, which has taken a leading role in orthopedics and care of cripples, will also set an example and conduct a census of cripples among schoolchildren following the Bavarian model.

Until we someday obtain a statistical impression of the social effects of orthopedic clinics and institutions for the crippled in America, we have to depend on scientific studies to measure the effects of American orthopedics. Germany has maintained a leading role in orthopedics through the development of technical apparatus, the management of hip dislocation, studies of scoliosis, the introduction of tendon transfers, etc. Whoever knows only the German literature might think that orthopedics in recent decades was only due to German research.

However, whoever has seen the work of our American colleagues becomes more hesitant and modest. I believe the greatest success of my journey is that I have become familiar with the efforts of our colleagues across the ocean, and am now in a position to contribute an appropriate evaluation of American orthopedics in Germany.

The father of modern American orthopedics is Bradford. For a long time, he has not been appreciated in Germany as much as he should be. You have to have been in Boston to appreciate his effect, since his methods cannot be sufficiently learned from books.

You have to hear from his students, of whom Lovett is the leader, the gratitude and honor that they have for him; you have to see the institutions that he has established, and you have to see the reputation of orthopedics that he has created in Boston in order to understand how extremely grateful orthopedics worldwide should be for his life work. There is almost no area of orthopedics where Bradford has not made an important contribution. I will only mention one of his recent efforts: His method for reduction of congenital hip dislocation.

As you know, the Lorenz lever maneuver is generally used to reduce a congenital hip dislocation.[9] In older children, this requires a lot of physical strength by the operator and can also result in a sciatic palsy since the femoral head in chronic cases is easily pressed against the nerve. Some authors, like Schede, Bade, and myself have therefore converted to attempting reduction by extension without the lever maneuver. My method was previously to apply traction of 40-60 kilograms with a screw in the abducted leg. When the femoral head had been moved so that it was at the level of the acetabulum, I would apply lateral traction to drive the head through the narrowed capsule into the acetabulum.

With this method, I avoided the disadvantages of the lever maneuver. But in Bradford's clinic in Boston, I found that a very substantial improvement was possible. Bradford uses basically the same method. However, he does not use a fixed screw, but has a screw attached to a steel rod, which ends in a ball-joint and therefore can be moved in any direction. Thereby it is possible to exert traction in any position of the leg. This makes the relocation much easier. Bradford exerts lateral traction using a steel rod, which pushes the femoral head anteriorly as needed, and when it is in a lateral position pushes it medially. Finally, a fixation apparatus ensures that the pelvis remains completely stable. [1] I believe that Bradford's method is the best way to reduce a congenital hip dislocation that we have at this time.

However, it is not only through his own work that Bradford has so greatly developed orthopedics, but also the school that he has created that perpetuates the same spirit: Lovett, Goldthwait, Brackett, Painter, Osgood, Soutter, Sever, Stone in Boston and Taylor in Baltimore etc. are disciples of whom Bradford should be proud.

Let me mention some of their work as well:

You all know from your practice the complaints of back pain, especially the lower back. The gynecologist, the trauma surgeon, and the orthopedist all consider this the *crux medicorum*,[10] because they can do so little about it. So far, the origin of this kind of pain has not been understood. If we know more about it today, and can help our patients, this is thanks to American orthopedics.

The Boston orthopedist Goldthwait was the first to recognize that these pains are often associated with abnormal laxity of the ligaments of the sacroiliac joint.

The mobility in this joint is normally so limited that we do not consider it in taking care of our patients. The observation of Goldthwait and especially his successes leave no doubt that traumatic strains and loosening in this joint occur frequently that can lead to strong and persistent low back pains.

Not infrequently this sacro-iliac inflammation spreads to the sciatic. The sciatica can then become so prominent that the original affliction of the sacro-iliac joint is suppressed. But the origin of the sciatica in the sacro-iliac joint is revealed by the success of treatment. If one immobilizes the sacro-iliac joint with a strong binder or other bandage, not only the low back pain but also the sciatica will usually disappear.

As you know, there are also other causes of back and lumbar pain; of course, almost any gynecological disease can be responsible. The cause of many of these pains has been clarified by the excellent studies of two other Boston doctors, the gynecologist Reynolds[11] and the orthopedist Lovett, who is widely known and respected in Germany because of his distinguished research, especially his clinical investigations of the mobility of the spine. They had observed that many patients with back and lumbar pain had a unique posture, and hypothesized that the pain could be caused by the anterior displacement of the torso. To evaluate this, they had to determine the center of gravity of the human body. This was previously an unsolved problem. There were indeed rough calculations from cadavers, but an exact determination of the center of gravity in the living person had not been determined. The method by which Lovett and Reynolds solved the problem is so splendid and appealing in its simplicity that I would like to describe it.

The entire apparatus (Figure 1) consists of a board with one end A on a footstool and the other end B on a scale. If a person stands on this board, the pressure exerted on the scale is proportionally greater the closer the person stands toward the scale and lesser the closer the person stands toward the footstool.

One sees the same effect if the person keeps the feet fixed in the middle of the board and leans the body – and thus the center of gravity – forward or backward. Using a simple formula, whose derivation I will not take your time to describe, the position of the center of gravity with normal posture and with postural abnormalities can be determined. In normal posture, the center generally runs through the fifth metatarsal tuberosity of the foot.

In patients with back and lumbar pain, Reynolds and Lovett found the center of gravity displaced anteriorly. They concluded that this anterior displacement of the torso affected the relationship of the sacrum to the pelvis and caused a strain on the sacroiliac ligaments, and that the additional work required of the back muscles would be much greater than normal, so that the patient would become tired and suffer muscle pains in the *erector spinae*. The truth of this conclusion is shown by the success of the treatment. If a special corset or other measures were able to correct this anterior displacement of the trunk and the center of gravity, and a normal posture was attained, then the back and lumbar pain immediately disappeared.

Now the question is why the patients – mostly women – adopt this posture?

In a large proportion of women, Lovett and Reynolds found gynecologic conditions as a cause. For example, many female patients lean forward because this position reduces discomfort from a retroflexed uterus or an exudate. In male patients, it was explained by diseases of the prostate. Briefly, any possible condition associated with pain can lead to the patient consistently leaning forward if this relieves the pain. This happens without thinking. The patients would probably not adopt this posture if they knew that it would lead to another chronic pain. But the abnormal posture becomes so much of a habit that they maintain it despite the pain that it causes.

In another group of women, Lovett and Reynolds observed the development of pain with anterior displacement of the torso simply due to the incorrect design of a corset. The form of such an incorrectly designed corset is shown in Figure 2; for comparison, a correctly designed corset is shown in Figure 3.

Treatment must of course address the cause. If there is a gynecologic disease, that must be treated first. Often the pains do not disappear despite the gynecologic treatment, because the incorrect posture has become habitual; then orthopedic management – often simply fitting a correctly designed corset – eliminates the back pains.

Goldthwait has become acquainted with a third kind of back pain. This pain is located in the region of the shoulder blades. Goldthwait recognized the cause as a particular shape of the supraspinous fossa.[12] Normally, the bone that forms the supraspinous fossa presents a straight surface. However, it is frequently the case that the upper end of this bone is bent like a hook anteriorly (ventrally). In the wonderful bone collection of the Warren Museum in Boston I frequently saw this variant. Goldthwait came to the idea that this hooked shape of the supraspinous fossa might be the cause of scapular pain. It would be understandable if this hook, with its sharp edge superiorly might rub against the surface of the ribs and cause a mechanical injury and inflammation of the periosteum. This hypothesis was supported by the observation that a loud crepitation could be produced in many of these patients by vigorously rubbing the scapula against the ribcage. With an operation, Goldthwait provided the final proof that the pain was caused by the hook shaped of the supraspinous fossa. Indeed, the pains disappeared in his patients if he excised the malformed supraspinous fossa.

From this one subject of back pain you have sufficient information to form a judgment about the fundamental, profound work of our American colleagues and especially the Bradford school.

It would be too much for me to report on all the new accomplishments that I saw in America. I visited the clinics of Bradford, Lovett, Goldthwait, Brackett, Painter, and Osgood in Boston; Gibney in New York; Wilson, Young, Davis, and Willard in Philadelphia; Taylor and Baer in Baltimore. Here I found so many interesting cases that it is impossible to report on each one in detail. I will just emphasize a few particulars.

Above all I would single out the extensively planned and very carefully conducted investigation of Lovett on the spread of poliomyelitis in Massachusetts. With the support of the state, which allocated 40,000 *Mark* for this study in 1911, he was able to investigate the source of infection for every single case, and based on the preliminary results we can expect a fundamental, classical study comparable to the works of Medin and Wickmann.

Cook in Hartford is the preeminent representative of mechanical orthopedics. He has brilliantly solved the difficult problem of making a well-fitting and elegant-appearing shoe based on a plaster cast. Hartford has therefore become the Mecca for flat-footed Americans.[13]

Another problem that is being actively addressed in America is the operative mobilization of ankylotic joints. Helferich was the first German doctor who obtained a cure in a true case of ankylosis by open division of the bony adhesions and interposition of a muscle flap. However, we have not done much more to develop this idea further. Only a few operations have been done on the elbow and hip. Recently Payr, the good surgeon of Königsberg, has taken up this operation and found a solution for any joint, including the previously unapproachable knee joint, whereby the bone is sawn through and separated by a flap of fascia and fat. In America, Murphy has already had excellent results for some time with implantation of fascial flaps, including on the knee, as he told me.[14] Baer in Baltimore has tried another way to solve the problem.[15] He attaches a prepared pig's bladder in the wound after dividing the bony adhesions. The pig's bladder is resorbed in a few weeks; early passive motion must be started promptly. The results that Baer has obtained with this method, of which I have personally seen several cases, are wonderful. Even on the knee, which previously was the most resistant to mobilization, he has obtained a degree of normal mobility that is almost over a full range.

If I may finally also report on non-orthopedic activity, I would like especially mention Cushing in Baltimore, who certainly ranks in first place with Horsley among brain and spinal surgeons, and whose operations were a great pleasure to observe. His accomplishments are however so well known in Germany that it is not necessary to describe them in detail.[16] The same is true for the wonderful vascular operations of Carrel, which you have already seen extensively described by Enderlen in this journal last summer,[17] and is furthermore true for Flexner and Lewis, who were able to transfer the poliomyelitis toxin from one monkey to another.[18]

I will only report one thing in some detail that I saw in the Rockefeller Institute in New York, a new and remarkably simple procedure for positive pressure anesthesia by Meltzer. Meltzer introduces a rubber tube into the trachea up to the bifurcation, whose diameter is selected so that there is only a small space between the outer wall of the tube and the inner wall of the trachea. If one now insufflates a mixture of ether and air into the bronchi, it creates positive pressure within the bronchi, since the air in the narrow space between trachea and tube can only slowly leak out. Thus, the lungs are kept from collapsing, so that it is possible to have both pleural cavities open and keep an experimental animal alive for hours, as I was able to see for myself with dogs. Carrel exclusively uses this anesthetic method of Meltzer for his aortic operations.

This anesthetic technique has already been used on humans with good success,[19] and if the tracheal mucosa tolerates intubation in humans as well as in dogs, this simple procedure of Meltzer may make the complicated arrangements for positive and negative pressure unnecessary.

My report on American orthopedics would not be complete without discussing the position of orthopedics in the universities.

As you know from the presentation of F. von Müller in this journal,[20] the universities in America are generally not established by the state but are corporations founded by private benefactors.

Individual universities – the American speaks of college and medical school, law school, high school, etc. – are beautifully constructed. The marble palace of the Harvard Medical School in Boston is well known. Other schools are built more simply, depending on their means. You are also aware that in addition to the medical schools in Boston and Baltimore, which are exemplary in their instruction, their scientific research, and their patient care, there are very poor medical schools, especially in the west, where the students only learn the bare minimum required for general practice.

However, it is only a matter of time before these poor schools disappear.

The Americans have recognized that these schools are a discredit to their country and they will soon clean things up. I will spend no more time on these poor schools. I will rather base my discussion about American universities on an exemplary school, the Harvard Medical School in Boston.

If you leaf through a catalog, you are immediately struck by the large number of professors. For example, at the Harvard Medical School in Boston there are 28 full professors.[21] This large number of professors is explained by the fact that Americans do not distinguish between major specialties and subspecialties in medicine.[22]

Americans believe that in general just as much judgment, effort, and knowledge is required in the pursuit of a subspecialty as in a broader area. They maintain therefore that it makes no sense to distinguish between major specialties and subspecialties in the way that determines the organization of our entire faculties. Thus, in America anyone can be a full professor who excels in his specialty and has a good character, a good doctor who is also a good person.

The deciding factor for promotion of a *Dozent*[23] at our universities is what specialty he represents, whereas in America it is how he represents his specialty, and his personality.

These principles have also had great importance for the position of orthopedics in the universities. A summary by Wilson found 35 full professors of orthopedics in the American universities. In Boston, Bradford is the chief of orthopedics. You can see the extent of his reputation in that he is the only surgeon on the executive committee of the entire faculty, although the faculty has 23 surgeons and only 6 orthopedists. He was elected by the majority of surgeons. Thus, you can see how quickly a new specialty has been recognized in America. I was told that the same concerns arose in America as they did with us, as orthopedics became more independent. They feared that surgery would splinter, and that the orthopedists would steal patients from the surgery clinics. But the Americans have long since concluded that these fears are groundless, and in general there is a friendly relationship between the mother surgery and the daughter orthopedics.

Orthopedics has contributed to this friendly relationship by wisely restricting its scope. It has not developed as extremity surgery, and incorporated fractures and acute injuries; instead, it has limited itself to the chronic surgical afflictions that had historically received insufficient attention due to the immediate surgical needs of acute injuries and infections. These were the true childhood deformities[24] and also the chronic joint inflammations, not only tuberculous but also the so-called rheumatic arthritis, *arthritis deformans*,[25] etc.

This is how the Americans define orthopedics, just as I have always done in Munich and as other German specialists do as well.

By their rapid recognition of this new specialty, Americans have spared researchers in new areas much struggle, and they thus greatly encourage scientific work; the development of a new area requires that it be well defined.

Let me demonstrate this with an example.

Cushing, whose name I have already mentioned, works in Baltimore. His entire area of interest at this time is brain, spinal, and neurosurgery. In order to develop this area – and his success is known throughout the world – he no longer practices general surgery, but limits himself to neurosurgery.

At a German university there would be no place for a man like Cushing, who would be a star on any faculty, since a full professorship would demand that he be involved in general surgery.

In America, they hasten to create a professorship for such an outstanding surgeon, even if his specialty has never before existed in the history of the school.

While I was there, several universities were competing to attract Cushing. Boston is rightly proud that Cushing will be one of theirs starting in 1912. This is a marked difference between German and American universities. At the German universities they make it hard work to be a pioneer, because the new specialties do not have the status they deserve. We ourselves have recognized this as a disadvantage. In the establishment of continuing education academies for practice doctors this tradition has been abandoned, and the distinction between major and minor specialties no longer exists. Even at the universities there are efforts to give the so-called minor specialties a modest part in the administration of the faculty, although so far an entirely satisfactory solution has not been found. In Austria some of the Associate Professors have a voice on the faculty, in Prussia they participate in the meetings when the discussion affects their specialty; in Bavaria there is also a movement to extend the rights of the Associate Professors, but a truly satisfactory solution has not yet been found.

The way in which the same problem is approached in America and in Germany is characteristic for both countries. We try to untie the Gordian Knot very carefully and thoughtfully, while the American follows Alexander's example and cuts through the knot by giving all specialties the same status and the same rights at the university.

Of course, Americans do not ignore the fact that one specialty, for example internal medicine, is much more important for the education of students than another, for example dermatology. Therefore, an American curriculum will ensure just as we do that the students spend much more time on internal medicine than on one of our subspecialties, but the student still has to learn something about the subspecialties and should demonstrate on examination that he knows just as much about the subspecialties as about the major specialties. In the good American universities, examinations are administered by the representatives of otology, pediatrics, dermatology and venereal diseases, orthopedics, etc.

Even in the examinations, the Americans do not assume that one specialty is more important than another. The examination in internal medicine lasts 5-10 times as long as that in many subspecialties. But the examinations cover everything that the practicing doctor needs.

You may ask, how do the students manage to pass all these examinations?

In order to answer this question, I will briefly describe the process for a young American who wants to become a doctor. He attends school from age 6-18. The school years end earlier for an American than for a German, who at 17 or 18 is in the *Obersekunda*.[26] Then the American enters a college. College is a blend of school and university; it requires less discipline than the school but does not allow the freedom of our universities. Here he attends lectures that give him a good general education and especially a good knowledge of science; he spends 3-4 years in college. Only then, when he is about 22 years old, does he enter a medical school. Here he studies only medicine, since he has already covered the basic sciences.

During the college years, the student has plenty of time for other things, especially sports, but in medical school he has to work diligently. In many medical schools, attendance at the lectures is regularly monitored. The first absence is excused, the second results in a warning, and the third is grounds for dismissal. You can see that the young American does not have unlimited freedom. At other medical schools, the students are forced to attend lectures regularly by requiring an examination at the end of each academic year.

At the Harvard Medical School in Boston, there is an examination in anatomy and physiology after the first year, and in bacteriology, hygiene, and pathologic anatomy after the second year; after the third year, internal medicine, surgery, obstetrics, gynecology, pediatrics, dermatology, neurology, psychiatry, ophthalmology, otology, and orthopedics. The curriculum in these first three years is the same for all students. The student can devote the fourth year to the specialties that he finds particularly interesting but must also undergo an examination in these elective courses.

You can see that the course of study for an American doctor is completely different from that of a German doctor. The duration of my stay was of course too short to draw any definite conclusions about the advantages or disadvantages of the American approach compared to the German system.

If one considers that the main purpose of a university is to produce research scientists, the German system is undoubtedly preferable. It encourages the development of individual interests, because it allows the student much more freedom to arrange his plan of study, and it increases the pleasure and enthusiasm for work, because we avoid anything that seems like compulsory schoolwork.

But if one has the opinion that the university is primarily there to educate skillful practical doctors, because 90% of all students will go into general practice, then the American system might be preferable. In their courses and examinations, the Americans consider the requirements of general practice much more than we do. They have thoughtfully established the chief subjects that the practical physician absolutely needs to know in each specialty, and this minimum is drummed into the students by the young instructors and assistants so that at least this solid body of knowledge finds its way into practice. Of course, the professor in the clinic and the lectures does not limit himself to this minimum.

Our *Dozenten* are allowed complete freedom to lecture as they see fit, and it could happen that a university student does not learn something that he urgently needs in practice.

With us, there may be differences of opinion between the professors and the practicing physicians about what the student should be taught.

If a commission of practical physicians in our society were to develop a standard examination that considered primarily the requirements for practice, it would probably drop several things from our current examination material to make space for new ideas from the so-called subspecialties. I cannot avoid thinking that our current standard examination is still burdened with a lot of historic ballast that should be tossed overboard, and that we have been too slow to fit our examinations to current needs.

In this respect, the Americans are undoubtedly ahead of us.

Let me present an example:

Cushing, about whom it is always a pleasure to speak, concluded that a course on surgical technique using cadavers might be a good way to learn topographical anatomy, but did not actually provide students with a real surgical education. Therefore, he began to do operations on dogs with the students. They could observe the postoperative course together for weeks and months, and finally at the end of the course demonstrate the result at autopsy. In this way, the students undoubtedly learn more about surgery than from a cadaver. They learn about hemostasis, asepsis, avoiding incidental injuries, and wound management. This is more important for the future surgeon than the ligation of arteries in continuity or the articulation of joint lines etc., that are practiced in a cadaver course.

In Baltimore, they recognized the great progress as an educational method for students represented by Cushing's operative course on living dogs. They immediately changed the examination and since then have tested the students' knowledge of operative surgery not on human cadavers but on living dogs.

All the German surgeons who have experienced Cushing's courses are just as convinced as I am of the superiority of this operating course on living animals.

But tradition is too powerful with us to expect a change any time soon, and I think that during my lifetime the operating course on cadavers in Germany will have the same place in instruction and examinations that it has had for years.

Another advantage I see for the American system – if one considers the primary purpose of the university to educate practicing physicians – is that the annual examinations create an incentive for regular attendance at the lectures.

Our academic freedom is wonderful for the elite among our students, but it doesn't work for the great majority.

In the long run some incentives to study are unavoidable for most of our students. I think we could exercise a certain incentive in our current system of examinations if we were to introduce a few compulsory courses with certificates of completion for the so-called subspecialties, and hold ourselves to the letter of the law by making these certificates dependent upon "regular" attendance at the lectures. A memorandum of the Erlangen medical faculty (*Aerztliches Vereinsblatt* 1910, page 442) has already pointed out that the issuance of certificates of completion do not always follow the legal requirements. It is obviously easier to determine regular lecture attendance at the smaller universities compared to the larger universities, but a method should be found to distribute the certificates in accordance with the law. The excessive draw of students to medical study should not make us hesitant to require serious and regular work. We will thus benefit not only the individual doctors but our overall status.

We can only expect the social elevation of our status when we have succeeded in significantly reducing the number of doctors. All other measures are of only palliative value. Warnings against the study of medicine are no use. Only making the study of medicine more difficult can bring about a radical improvement. Our status does not lose anything if some are scared off by the increased demands of a medical profession. Quite the opposite! Among those doctors who do not contribute to the honor of our status are a large percentage of those who did not apply themselves at the university and only barely passed the examination. When I hear again and again from all sides that we should not ask too much of our students, I point to the example of America.

If American students can manage to learn all that I have described, so can German students, who are at least the equal of any student in the world with respect to scientific interest, understanding, and talent, and – assuming good teachers and appropriate teaching methods – can do it happily.

In America, the requirement to attend lectures, no matter how it is enforced, has certainly not been a disadvantage in medical education. I am convinced that the students at a good school like Harvard or Johns Hopkins[27] know more and can do more in surgery and orthopedics than our students. Even in most other specialties, the judgment of colleagues who have taught at both German and American schools is that the Americans are generally superior.

I think that this fact should give us something to think about.

We have had a great past in medicine, and we view the needs of the present under the influence of that past. The needs of the present can be learned most quickly in America. That is the chief advantage of the Americans, that they are a young people and therefore not hampered by tradition.

The unprejudiced way with which an American approaches the solution of every problem has made a great impression on me. In any situation, the American does not ask "how has this been done before," but instead asks "what is the best way to do this." That is true not only of the American universities, but for all institutions, for schools, for businesses, for factories, for technology, for libraries, for stables, etc. It is particularly true for schools. I have no doubt that more harm is done by rigid adherence to outmoded educational models than by unnecessary and unsuccessful experimentation.

The lack of traditions, which is often so helpful, does hinder America in areas where an established culture is absolutely necessary. This is found mostly in American art, music, painting, sculpture, and especially architecture. Viewing the American cityscapes, I was never so vividly reminded what Munich owes to the natural artistry of a man like Gabriel von Seidl.[28] A school of artists cannot be created from scratch overnight.

The same is true for the civil service. The potential change of officials with every election over there does not allow for the development of an apolitical civil service such as we have and of which we are justly proud.

On balance, however, I think the lack of tradition has been an advantage for America. The solution of all scientific, social, and political problems takes less time over there than with us. This is why a trip to America is so stimulating. One can study over there what is happening for example with the women's movement, the temperance campaign, or the problems with domestic servants. One can see in the present over there what our future will be. I am tempted to go further into these questions, but I have already taken up too much of your time. Let me close with the hope that I have been able to dispel some of the prejudices that you might have acquired from the daily papers about *Dollarika*,[29] and that one or another of you might have become interested to cross the ocean yourselves. The more Germans visit America, the better it is for us. We can learn a lot from the Americans!

Original Notes

1. The apparatus is described and depicted in the *American Journal of Orthopedic Surgery*, August 1909, Page 57.

Original Illustrations

[Not reproduced in this volume.]
Figure 1: [Patient on a balanced scale]
Figure 2: Incorrectly designed corset (according to Lovett and Reynolds)
Figure 3: Correctly designed corset (according to Lovett and Reynolds)

Biographical Sources

Pitzen P, "Fritz Lange zu seinem 85. Geburtstag," *Zeitschrift für Orthopädie und ihre Grenzgebiete* 1949; 78:425-431.
Lange F, *Ein Leben für die Orthopädie*. Stuttgart: F. Enke, 1959.
Grosch G, "Fritz Lange," *Neue deutsche Biographie*. Berlin: Duncker & Humblot, 1982.

Publication Source

The *Münchener Medizinische Wochenschrift* [Munich Medical Weekly] merged with *Fortschritte der Medizin* [Progress in Medicine] in 1999, and is still published as *MMW – Fortschritte der Medizin*. Historical issues can be obtained through the Hathi Trust.

Translation Notes

1) According to Eiselsberg's autobiography, he and Lange returned to Europe on the same ship.
2) *Das Land der unbegrenzten Möglichkeiten* (*The Land of Unlimited Possibilities*) was the name of a popular book by economist Ludwig Max Goldberger, published in 1903.
3) In his autobiography, the author writes that he also visited Buffalo. He spent 4 weeks in Boston, where he performed numerous surgical procedures, but resented being asked to do so in other cities where he did not have time to participate in the pre- and post-operative care.
4) The outpatient clinic at the University Hospital in Munich was called the *Reisingeranium* in honor of surgeon Franz Reisinger (1787-1855) whose will had provided the funds to establish it.
5) Now known as the Widener Memorial School, it is today a public day school for disabled children in Philadelphia.
6) The *Mark* was the monetary unit of Germany, worth about $0.24.
7) Now known as the Cotting School, it has since moved to Lexington MA.
8) Now known as the Pappas Rehabilitation Hospital for Children.
9) For a description of the lever maneuver (*Hebelmanöver*) and other nonoperative methods see Lorenz A, *Ueber die Heilung der angeborenen Hüftgelenks-Verrenkung durch unblutige Einrenkung und functionelle Belastung*, Leipzig: Franz Deuticke, 1900.
10) "The doctors' cross," in the sense of a cross to be borne.
11) The author misspells the name as "Reynaulds." See Reynolds E, Lovett RW, "A method of determining the position of the centre of gravity in its relation to certain bony landmarks in the erect position," *American Journal of Physiology* 1909; 24:286-293.
12) See Goldthwait JE, "An anatomic and mechanical study of the shoulder-joint, explaining many of the cases of painful shoulder, many of the recurrent dislocations, and many of the cases of brachial neuralgias or neuritis," *American Journal of Orthopedic Surgery* 1909; 6:579-606.
13) See Cook AG, "A new form of shoemaker's last," *American Journal of Orthopedic Surgery* 1907; 4:235-239.
14) In 1912, Murphy (who was President of the AMA that year) published a six-part "Contribution to the surgery of bones, joints, and tendons" in *Journal of the American Medical Association* 58:985-

990,1094-1104,1178-1189,1254-1265,1345-1352,1428-1431. The last two sections discuss his procedures for ankyloses.

15) See Baer WS, "A preliminary report on the use of animal membrane in producing mobility in ankylosed joints," *American Journal of Orthopedic Surgery* 1909; 7:1-21.

16) The author actually says that describing them in detail "would be like bringing owls to Athens."

17) See Enderlen and Borst, "Beiträge zur Gefässchirurgie und zur Organ-transplantation," *Münchener Medizinische Wochenschrift* 1910; 57:1865-1871.

18) See Flexner S, Lewis PA, "Experimental epidemic poliomyelitis in monkeys," *Journal of Experimental Medicine* 1910; 12:227-255.

19) See Elsberg CA, "Clinical experiences with intratracheal insufflation (Meltzer), with remarks upon the value of the method for thoracic surgery," *Annals of Surgery* 1910; 52:23-29.

20) Müller F, "Amerikanische Reiseeindrücke," *Münchener Medizinische Wochenschrift* 1907; 54:2388-2390,2430-2434.

21) The author uses the German term *Professor Ordinarius*, which roughly corresponds to a full professor and department chairman.

22) The author distinguishes between *Hauptfach* (main specialty) and *Nebenfach* (peripheral specialty), here translated as "major" and "minor" specialties.

23) A *Dozent* roughly corresponds to an assistant or associate professor. One can also be a *Professor Extraordinarius*, which is a higher rank than *Dozent* but might also correspond to an associate professor (or a full professor who is not a department chairman).

24) The author says "in addition to actual orthopedic deformities," probably meaning "in addition to congenital deformities," reflecting the original meaning of the word "orthopedic" from Greek *ορθος* (straight) and *παιδεια* (children).

25) An obsolete term for rheumatoid arthritis.

26) A student completing the *Obersekunda* year in a German *Gymnasium* still has two more years before graduating.

27) Like so many others, the author misspells Johns Hopkins.

28) Seidl (1848-1913) was an architect responsible for many public buildings in Munich.

29) A derogatory portmanteau of *Dollar* and *Amerika.*

25

Wilhelm Nagel (1910)

Wilhelm Adolf Ferdinand Nagel was born in 1856 in the village of Højer, Denmark, which is today just north of the German border, but was part of Prussia and the German Empire from 1864-1920. He studied first in Denmark and then at several German universities, receiving his medical degree in 1879 from the University of Strassburg (today Strasbourg, France). After a few years of practice in Denmark, he moved to Berlin to train in obstetrics and gynecology, and remained there for the rest of his career. He rose through the ranks at the Charité Hospital, published several books and articles, and was named *Professor Extraordinarius* in 1896.

In 1910, at the age of 53, he traveled to America, in particular visiting the Mayo brothers in Minnesota, as described in the following pages. He was elected an Honorary Fellow of the American Gynecological Society in 1912.

In 1918, he applied to be Professor in Copenhagen, but was considered too old. He died in Germany in 1937.

Aerztliche Reisebilder aus Amerika
Berliner Klinische Wochenschrift 1911; 48:223-224

Medical travel images from America
Prof. Dr. Wilhelm Nagel, Berlin

As presented to the Society of Charité[1] Physicians on 19 January 1911

I. Rochester [Minnesota][2]

Slowly, with the usual delays, the "Great Western" train crept from station to station through the beautiful landscape of Minnesota. "Next station is Rochester," called the conductor. I was more than a little excited to see this town that all the world is talking about, and to meet the two extraordinary brothers, William and Charles Mayo, who have made it the focal point of modern surgery.

I was immediately struck by the sight of numerous taxis at the modest railroad station of this small western city with 6-7000 inhabitants, where the only policeman does his rounds with umbrella and rubber boots when it rains. A large part of the inhabitants and businesses of the city, including the taxis, make their living thanks to the activity of the two famous doctors. Every new arrival is immediately assumed to be a patient, and the first question of the coachman was whether he should take me directly to the hospital or first to the "doctors' office." When he heard that I was a "visitor," he knew what to do, and brought me to a hotel, where he said all of the doctors stay. The lobby of the hotel was indeed full of doctors, and reminded me of the atrium at the old Charité during an important event, except here they were comfortably seated in groups around large spittoons. For many years, Rochester has been a site of pilgrimage for doctors, who spend a week or two of their vacations here every year. There is hardly a doctor in America who has not been to the Mayos and learned from them. Each of them is courteously admitted to the operations, and each operating room has a special space for the observers. The operations take place in the mornings from 7:30 – 1:00, and the taxis are punctually available to transport the doctors there and back. In order to make their stay as productive as possible, the visiting doctors have created a society (Surgeons' Club, Rochester) that meets every afternoon from 3:00 to 5:00. A reporter chosen by the members reports on the operations from that morning, and then there is a free discussion. The two Mayos and their assistants regularly talk about different areas of scientific surgery, once or twice a week. Well-known outside doctors passing through Rochester are also asked to give lectures, and I was honored with such a request.

The other scientific facilities of the two Mayos, which I will discuss later, are also made available, so that the time in this small city, free of all distractions, can be very educational and stimulating.

My first stop was the "doctors' office," to present my letters of recommendation from some leading American colleagues. The "doctors' office" consists of a large waiting room surrounded by the examining rooms. The Mayos have provided a specialist for every associated subject, among whom the internist, Dr. Graham, rightfully enjoys an excellent reputation. Having worked with the Mayos for many years, he has had an abundant opportunity to see his diagnoses retrospectively confirmed or corrected at the operating table, so that he has a uniquely large clinical experience. The doctors have all the modern methods of investigation, including a complete radiology department. Non-operative management is not usually planned. A large proportion of the patients (100-150 new arrivals every day), who come from all parts of the country, have gone to Rochester because they have been advised to undergo surgery. In any case, every patient is thoroughly evaluated and then presented to the Mayos, who decide themselves whether an operation is necessary or not. Those who do not require an operation are promptly sent home.

Charity patients are unknown out there in the West, and all those seeking help are prepared to reimburse the doctors for their efforts. Thus, there is a special department in the office which takes care of all the financial arrangements – other than those of the hospital – and with the help of good connections it efficiently determines the financial status of each individual, which is used to set the fee for consultations or operations, without the Mayos themselves having to bother about it. The rich pay enough to offset those with lesser means, and nobody is turned away because he cannot pay an appropriate fee. Rich and poor are operated upon in their turn without preference.

The waiting room was full of patients of both sexes and all ages, and meanwhile I tried to imagine the two creators of this unique activity. After a short wait, the door of Dr. Charles Mayo's room opened, and I stood face to face with a middle-sized, calm, unpretentious man with friendly eyes. I was pleasantly touched. This man, I said to myself, lives for his work; he is cut from the same cloth[3] as our great scholars.

Dr. William Mayo, the older brother, is extremely industrious and allows himself little free time. During lunch he reads his incoming mail and dictates answers to a secretary sitting next to him; after that he goes right back to work. Medically, both brothers are equally skilled, but Will is the actual founder and leader of the institution, one of those personalities that always rise to the top in the freedom of America. If Will Mayo were a businessman, he would surely be a Harriman or a Carnegie, if he were a politician, he would be President. In the Pullman car that the Chicago Northwestern Railroad attaches for the use of the patients and visitors to the Mayos, I heard many interesting conversations about the Mayos. A big tycoon from Texas said that even businessmen could learn a lot in Rochester about efficient administration.

Saint Mary's Hospital, which admits the Mayos' patients, is purely private, belongs to the sisters of the Order of St. Francis, and is managed by them. It is a large three-story brick building located outside the city on a hill with a wonderful view in all directions. It was originally built for 45 beds but has gradually been enlarged and now has 300 beds, of which 200 are regularly occupied. It is particularly designed to admit surgical patients and is therefore perfectly hygienic. The costs are moderate, especially in comparison to other American private hospitals; a bed on the ward costs 32-56 *Mark*[4] per week, a private room 75 *Mark* or more.

On the ground floor, the Mayos have set up a pathology laboratory with complete instrumentation, and even a color photography apparatus, under the direction of Dr. L. B. Wilson. Wilson, a well-known researcher, also tries to make use of the gigantic amount of material for educational purposes, and is strongly supported by the generosity of the Mayos. Thus they have built their own library with a large reading room, in which journals in all languages are freely available, and next year they plan to build a separate laboratory building. In addition, the Mayos pay for their assistants to travel, whether to learn about a new method or discovery or to carry out studies. The four operating rooms with their equipment are located on the top floor. Next to them is a laboratory in which an assistant is always present during operating hours to establish an immediate diagnosis in doubtful cases. The assistant works so quickly that inside of a minute after the biopsy is taken the operator can be presented with a stained and mounted microscopic preparation.

In addition to the Mayos, the institution has two honorary partners (including their father) and 24 doctors and clinical assistants working there. All the anesthetics are administered by five ladies. In addition, there is Dr. Wilson in the laboratory with five scientific assistants, a photographer, and an illustrator.

The beds are always fully occupied, and although patients are discharged as soon as possible into the numerous convalescent homes in the city, there is still not enough space. "Out in the hotels there are 150 patients waiting for a bed to open up," Will Mayo told me.

In this institution, 7177 operations (about 20 per day) were performed during the previous year, and this year there will be significantly more. Among the 7177 operations were 3746 laparotomies (abdominal intraperitoneal operations) with a mortality of 1.8%: This included 292 operations on the stomach and duodenum, 1332 on the appendix, 589 on the liver, gallbladder, and pancreas, and 129 on the kidneys and ureters. The gynecological operations included 183 on the ovaries and adnexa (with one death), 34 total abdominal hysterectomies, 206 supracervical hysterectomies (with 5 deaths), and 41 vaginal hysterectomies (with one death). In one morning during my stay I saw the following: 3 goiter removals, 5 appendectomies, 2 gastrectomies, 1 uterine myotomy, 1 mastectomy for cancer, 1 gallbladder operation, 1 nephrectomy (for tuberculosis), 1 extraction of a kidney stone, and various minor operations. All the major operations were performed by the Mayos themselves, and the minor ones by the senior assistant. At the beginning of each operation, a bell rings to summon the visiting doctors. All four rooms are in simultaneous use. When one brother is away, the other uses two rooms alternately, so that he can move from one operation to another without interruption. In this case, the wound closure is entrusted to an assistant. It is hardly necessary to say that the asepsis is strict and consistent. The anesthetic is almost exclusively ether; the nurse anesthetists work very conscientiously and have an outstanding reputation, so that ladies from all regions of the United States go to Rochester to learn from them. Female assistance plays a much greater role there than with us. The Mayos themselves perform surgery only with women assisting; I could see that one of the older sisters was an excellent and thoughtful assistant.[5]

As I said, the operations take place during the morning, and it is only possible to do so many in the course of 4-6 hours without any sense of haste by having an experienced team organized in true American fashion simply and practically down to the smallest detail to avoid inefficiencies and unnecessary effort. Everything runs punctually, but so calmly and quietly that it seems like performing ten or twelve major complicated laparotomies in such a short time is the easiest thing in the world.

It is not surprising that the two Mayos in their present amazing activity exert a strong pull on doctors and the public. But people ask again and again, how was it possible to establish such a world-renowned practice in such a remote rural town? In the New World as well as the Old World the prospects for fame have previously depended on a large city, patronage, and an official position, yet here we see two simple rural practitioners, simply called "Will" and "Charlie," without any official position, without titles or ranks, indeed without any particular clinical training, working their way up to be the foremost representatives of modern surgery. What an encouragement for young doctors! An explanation is therefore worth seeking, but is not easy.

Good luck may have played a role, but primarily it was persistent good work. The father came as a physician and "self-made man" along with the pioneers in this region. Unfortunately, I did not personally meet the 90-year-old man, but I have a picture of him with his sons in front of me. His mighty head shows evidence of energy and intelligence; he was mostly interested in surgery and involved his sons in his practice even as boys, having them assist with his operations. After the usual period of study, the sons settled in Rochester, supported each other in practice and meanwhile carried out abdominal surgery on all the dogs and cats that they could find. When they had the means and time, the young men traveled on Saturdays to Chicago to enjoy the teaching of Fenger.[6] They tirelessly sought to be as good as possible, and their initial results must have been significantly better than those of other surgeons. The technique of the two Mayos is excellent in every way, but is not really different from that of other good operators. They operate carefully, gently, and without watching the clock. They have nothing to do with any "trickery," in which respect they compare very favorably with certain European operators.

Another factor has more than a little to do with their success, namely their personalities. Both Mayos are physicians in the best sense of the word, simple, humanistic, always friendly to rich and poor, but without being pushy, so that they gain one's complete trust. It is noteworthy that almost all doctors who themselves need an operation will go to the Mayos; there are hundreds every year.

Deep in thought about all that I had experienced here, I watched the buildings of the small city disappear behind the hills and trees. We doctors can truly be proud of such representatives of our profession as William and Charles Mayo, and be pleased that the much-maligned scientific medicine[7] has found a home such as Rochester (Minn.)!

Biographical Source

Aagard OC, "Wilhelm Nagel," *Dansk Biografisk Leksikon*, biografisk-leksikon.lex.dk, 2011.

Publication Source

The *Berliner Klinische Wochenschrift* [Berlin Clinical Weekly] merged with another publication to become the *Klinische Wochenschrift* in 1921. In 1992, the name was anglicized to the *Clinical Investigator*, and then in 1995 to the *Journal of Molecular Medicine*. Historical issues can be obtained through the Hathi Trust.

Translation Notes

1) The *Charité* was and is the most famous teaching hospital in Berlin. It has recently been the subject of a popular television series.
2) The Roman numeral "I." suggests that the author may have planned a series of reports from America, but there are no further related articles in the *Berliner Klinische Wochenschrift.*
3) The author actually says "carved from the same wood."
4) The *Mark* was the monetary unit of Germany, worth about $0.24.
5) This was probably the legendary Sister Mary Joseph. See Nelson CW, "100th anniversary of Sister Mary Joseph Dempsey," *Mayo Clinic Proceedings* 1992; 67:512.
6) Christian Fenger, the Danish-American surgeon who was Professor at the Chicago Medical College (the medical school of Northwestern University) and later at the Rush Medical College. See Chapter 2.
7) The author writes "*Schulmedizin*," literally "school medicine," which was a dismissive term used by homeopaths, naturopaths, and other advocates of "alternatives" to scientific medicine both then and in more recent history.

26

Théodore Tuffier (1913)

Marin Théodore Tuffier was born in 1857 in Bellême, France, and studied medicine and surgery in Paris, where he joined the faculty and became *Professor Agrégé* in 1889. He was renowned not only as a clinician and teacher but also as a researcher, contributing original ideas to thoracic, gastric, hepatobiliary, urologic, and other areas of surgery as well as to methods of local, spinal, and general anesthesia.

He visited America in 1913, at the age of 44, and worked extensively with Alexis Carrel to develop thoracic and cardiovascular surgical methods, including improved methods of positive pressure ventilation. The following pages are the record of a talk he gave in Paris after his return.

During the First World War, he served as a military surgeon with the French Army, and was promoted to Inspector General. He was later awarded the *Croix de Guerre* and the *Legion d'Honneur* for national service.

After the war, he continued to perform surgery, teach, and write on a broad range of subjects, reaching a lifetime total of 1,168 published articles. He made two other trips to America, and was elected an Honorary Fellow of the American Surgical Association in 1918. He died in 1929.

La chirurgie en Amérique. Son parallèle avec la chirurgie française.
Bulletin de la Société de l'Internat des Hôpitaux de Paris 1914; 11:45-62.

Surgery in America. Its parallels to French surgery.
by Dr. Tuffier

This presentation recalls my study trip to New York and my visit to fellow surgeons in America; your president has asked me to draw some conclusions that may benefit both of our institutions, our students, and our patients.

In earlier days, when a traveler returned from a distant country, he brought back some marvelous story, some picturesque adventure. Times have changed, and now you would have to look hard to find such an exotic country; the characteristic of our day is *uniformity*, resulting from the speed of communication. Ideas are exchanged so rapidly throughout the world that any discovery is immediately known, discussed, compared to past experience, and adopted, if appropriate, by the *consensus omnium*. So, you should not expect any extraordinary stories from me.

If, as in the oriental tales, the stroke of a magic wand suddenly transported one of us to the middle of an *operating room* in Paris, London, Berlin, Rome, or even further to Moscow, Constantinople, New York, or Chicago, it would be difficult for him to tell which country he was in simply from the appearance of the room. Having seen the operating rooms in all of these cities, I myself do not think I could. You see the same white walls with rounded corners, the same lighting from above and from the sides, the same observation stands, the same central table; furthermore, you are looking at the same silent men dressed in white linen, wearing caps, masks, and gloves, in the simplest and most international uniform you could imagine. This *uniformity* is the result of scientific data, as exact as a geometric or algebraic calculation, and therefore universal in the same way.

On the other hand, if you examine the *functioning* of the surgical services and their organization, this uniformity will quickly give way to discrepancies: Any organization, whether political, economic, or social will reflect the character of its community. We will see this from a simple glance at the *hospital and surgical organization* in America, the *teaching of surgery*, and the *operative technique*.

The hospital organization, the personal organization of the surgeon, the surgical organization, everything in America follows the principle of *autonomy*. Every school and every hospital has its own life, its own purpose, its own resources, its own personnel, its own administration, its own control, its own direction. How could it be otherwise? The autonomy of each hospital reflects the economic basis of the United States. Against the blue background of the American flag, symbol of an ideal as pure as the vastness of the ocean, the stars stand out distinctly, the same size and shape, their edges and angles clear and well-defined. It is not possible to increase their number without damaging their harmony; imperialism once tried to mix them together in a kind of nebula, but had to abandon this hopeless idea; they quickly resumed their fundamental individuality. This autonomy is not a deliberate fragmentation of a central power, it is the very history of these still independent States.

Our system is absolutely the opposite, it is born of our own economic past, of our ancient social history, it is an excessive *centralization,* whose power is extended every day. The hospitals of Paris are almost all controlled by the *Assistance Publique*. Provincial hospitals, with very few exceptions, are controlled by their municipal authorities. In Paris, some private initiatives, truly sincere and worthy of attention, have tried to break this omnipotence and establish free and autonomous hospitals, but have not succeeded.

Of the two systems involved, *which will be the most useful* in this twentieth century? Systems, gentlemen, are only as good as the men who direct them. *A single direction*, well understood and broad in scope, can certainly yield great successes. On the other hand, *hospital differentiation and autonomy* necessarily result in profound emulation; they allow progress to be experienced almost simultaneously. It is an immense practical and ongoing experiment where any new ideas are judged by their results. Progress can thus be combined with experience without compromising any vital interests, false steps have only a small effect on the budget and affect only a small part of the organization. This autonomy also explains why there is no single synthesis that we can call *American surgery*, but a set of men and doctrines that exemplify its modern science.

This independence, this diversity, this desire for improvement, this experimentation creates a *special state of mind* there; everyone is interested in hospital organization and questions of hygiene, preparedness, health, and comfort, and you can see the results of this social concern.

Do you know what private donations American hospitals received just in *1912*? Here are some figures: George W. Hooper gave the University of California 5,000,000 francs[1] for a Research Institute; Mr. Keith gave 750,000 francs. The Johns Hopkins University[2] of Baltimore received 1,000,000 francs for a urological clinic and 75,000 francs annually for its maintenance. Harvard received 250,000 francs to study chronic diseases. In New York, Columbia University received 7,500,000 francs from Crocker to study cancer; the Bellevue Hospital, 500,000 francs from Mrs. Helen Hartley Jenkins. Vanderbilt University received 5,000,000 francs from Mr. Andrew Carnegie for its medical school. These are just the largest. In the same year the official figures of the general administration of all the hospitals of Paris together recorded donations of 1,200,000.

I know we have our Lariboisière, our Beaujon, our Boucicaut, but they are quite rare.

Let us now *enter one of these hospitals*. We will be received there by one of the administrators, a *trustee*. This title, Gentlemen, is particularly valued by Americans. I have met financiers on Wall Street who are very proud to wear it.

If no trustee is present, one of the directors will receive us. You would be amazed at the demeanor and professional erudition of these directors, their courtesy is only an expression of their education, it is a personal factor; but their education, their general and special knowledge of everything relating to the construction, establishment, and operation of a hospital made a deep impression on me. They are real specialists: Above all, they are *eager for criticism*, because they are eager for progress, they look forward to your opinion and realize that a lesson is better than a compliment. To be a director of a hospital is a profession, it is to be a technical advisor.

The *surgical departments* generally occupy the ground floor rooms in the hospital. The newer institutions have comforts unknown to us: Patient lounges, widely-available electric power, sometimes each bed having its own wall socket, a considerable staff of nurses certainly double or triple that of our *infirmières*, without any luxury that would be inappropriate for a hospital, if you will excuse my saying so, or would be considered lavish or extravagant.

The *operating rooms* are not much different from ours; they have abandoned the large amphitheaters whose superimposed tiers we have inherited from the Greeks, and have smaller rooms equipped with movable steel platforms that can hold about thirty observers. It is interesting to note that even surgeons as careful as Cushing prefer to operate in one of these rooms instead of their official amphitheater. But the most important characteristic of this part of the hospital is the *multiplicity of operating rooms*, three, four, or five of them are *contiguous* in the old Johns Hopkins of Baltimore as well as in the modern clinics of Mayo or Cushing. Hence the Chief of Surgery can easily follow the work of his assistants, the staff can respond easily to all the requirements of the operators, and the students can move successively from one operation to another.

An equally striking observation is the *regularity* with which each operating room team works, nurses with perfectly aseptic technique, assistants, and auxiliary staff constitute a real team that has often worked together for years. This leads to the greatest *discordance* between our surgical organization and theirs; it is a big one. Whether in governmental, industrial, university, or hospital organizations, it is easy to imagine two systems: Either to *sacrifice individual interest for collective advancement*, or to inhibit this communal progress for the benefit of an *individual*. Our current French conception tends toward the latter. Scientific work, like surgical progress, is the result of a series of combined efforts in which continuity and co-operation are indispensable factors; where teachers and students have been collaborating for a long time, an operation is practiced more surely, and scientific questions are more maturely studied. Cushing remained assistant to his master Halsted for 17 years, Finney was also at Johns Hopkins for more than 10 years before becoming a professor there, the Mayos have assistants who are beginning to turn gray: their operating results and their research can only benefit from it. However, they teach only a *very small number of surgeons*.

On the other hand, consider that one of our surgeons changes his operating assistant *every six months*, and sometimes every *four months*. You can imagine that this is a great handicap. But also with the French system, think of the number of competent practitioners that come from our hands (and we know we are producing them every year) and compare this yield to the lesser output of the American method.

Only a *two-tier system* can remedy the drawbacks of both methods: The Chief of the Department has his permanent, long-term assistants who in turn educate and train the beginners.

In this staff of assistants and students, I have not used the word *interns*. This is because, Gentlemen, neither the title nor the function still exists in America or in Germany. To properly judge the *Internat*[3] to which I am proud to belong, and which I have the honor to be addressing today, one needs a certain perspective and complete objectivity, but then, I assure you, the judgment is one of unrestricted admiration. Preparing for your competition, the intellectual exercises which precision and clarity require for the conception and presentation of the entire pathology, constitutes a scientific culture, a unique method of medical education. Being the guardians, or rather the life of the hospital, the exchange of ideas during this common experience, the preoccupation with science, the daily examination of the patients, the decisions to be made while on call develop your surgical initiative, make you feel the weight of your responsibilities and constitute a *practical school* that is unmatched by any other institution in any country. It provides France with a core of unparalleled practitioners. The *Internat*, Gentlemen, is the cornerstone of French medical and surgical science, it maintains its honor, and in the difficult times we are going through, when anything new is often considered to be progress, we must cry to the public authorities: Please, don't touch it.

Having considered the hospital and surgical organization in the United States, let us delve into *surgical life* itself, which still reflects the character of a nation very different from ours. Think of the time we lose between our visits to our hospitals, our patients in *maisons de santé*,[4] and our private consultations. This inefficiency does not square with a realistic concept of the value of time and especially of *the economy of activity* and human strength. All the hospitals, all the surgical departments are both *public and private*. They combine the community and hospital clientele, even in the most modern, most accomplished, and most traditional university clinics like that of Cushing at Harvard University or that of Murphy in Chicago, or Crile in Cleveland: Private and charity patients are all in the same hospital. The surgeons pass easily from one to the other: So much time saved! Arriving in his department in the morning, the surgeon can leave by 2 P.M., finished with all his operations.

Moreover, in order to be *economical for the patients*, he has his *office* in the center of the city: Two or three rooms furnished for consultations, equipped with all the apparatus for brief examinations, a record system that allows immediate search for a card corresponding to a given patient. And there is more. I have visited large buildings near Broadway, enormous 15-story buildings in which *there are only physicians, surgeons, and specialists*, so that you have not only hot water and electricity, but a *medical secretary on each floor*. Twenty or thirty doctors have their offices in the same building. Downstairs, a nurse sees you to the elevator and up to the fourteenth floor, you see successively appearing at each floor the blue and white uniform characteristic of American nurses. Consultations, information, everything can be instantly arranged. Nor is this specific to an innovative city like New York; in the West, in Cleveland, Crile and his colleagues have a whole floor of a very large building where the name of a doctor is inscribed on each door. The life of a surgeon in America thus has the advantage of simplicity and efficiency.

If we pass from the framework of current surgery to that of *scientific surgical research*, then the superiority of American laboratories is clearly affirmed. The leader is the *Rockefeller Institute.*

Of all the laboratories in Europe or America, the most justly famous is the Rockefeller Institute, which no surgeon passing through New York fails to visit. Its name evokes the image of pure science throughout the world. For Americans, it is a symbol, almost a sanctuary dedicated to the search for truth, and abstract truth, without any other concern. The discoveries coming out of this laboratory, a modest or even tiny building compared to others in New York, have enlightened and illuminated the whole world. This nation, usually focused only on "business," was at first astonished, but gradually transformed this surprise into personal pride, and now admiringly shares in the tributes paid to their scholars. The name of Rockefeller Institute seems to evoke in the American soul the feeling of a conquest in the world of thought. If we judge by the almost religious pomp with which it celebrates its scholars and their discoveries, it is almost as if this Institute is worshipped. It is indeed the center, the luminous focus of medical sciences in America, and excepting from the material point of view the new laboratories of the Mayo brothers in Rochester, nothing in the entire world can be compared to it.

Do not think it is a huge building, a luxurious "Marbridge Building,"[5] with many pavilions and complicated machinery. It is a simple, austere, decent six-story building on the bank of the East River.

The interior is essentially practical and a few scholars take their places there; it is true that their names are: Flexner, Carrel, Meltzer, and Loeb. Each of them has his complete laboratory, including his rooms for work, experiments, research, but the cooperation which exists between them is frequent, it is even weekly, and contributes to the power of the establishment, to the rapidity of the results obtained. Furthermore, at *lunch* at the Rockefeller in a real staff room, where masters and assistants mingle, I was able to feel the general spirit that animates all these men: It is Science, only Science. Not the little red, green, or purple ribbon, there are none; not the titles or honorary distinctions, "no one has the title of professor, and no one wants it," no hope of an appointment to the Academy or to the Institute, not even of advancement, nothing is to be hoped for from the vanities of this world, and their state of mind responds to the elevated principle that the philosopher recognizes as virtue, which if rewarded would cease to exist. In this new and distant refuge of a modern Port-Royal,[6] the passion for scientific truth is the only star towards which its followers walk and brings them closer to this ideal of perfection which must lead humanity towards real progress. It is more than enough to maintain the sacred fire and the ardor of the work of the men who inhabit it.

On the fourth floor is the *Department of Experimental Surgery*, which

Carrel directs. Above it is the roof of the building containing the operating room and animal facility. There is neither luxury nor wasted space; two rooms for the laboratory, above them three rooms for preparation and operations. A few assistants, only two or three, unusually American; a limited staff, *two women* as direct assistants, wearing black gowns, the only ones present during operations, a third as secretary, three men for animal care and maintenance of the rooms, that is all the staff available to our compatriot. But as soon as the action begins, as soon as an experience sets all these aides in motion, we feel them animated by such zeal, such a desire for success, we feel them so imbued with the spirit of their leader, that one quickly understands the value of the forces set in motion in this way and the key to success.

This, you will tell me, is merely *experimental surgery* which is only of peripheral interest. Gentlemen, let me stop you there – these are the most aseptic, the most painstaking, the most skilful operations that you can see performed in the United States. In this laboratory you will find the most scientifically intelligent care that I have ever seen given to surgical patients, namely the dogs of Carrel. The difficulty, the precision, and the dangers of the operations which are carried out there, and in which I participated for several weeks, are such that, if the operator were simply satisfied with the precautions and the care that we give to our own patients, the results would be compromised, the successes would be very rare, and this absolute confidence which excites the zeal of collaborators would quickly die out. It is not that the sterilization of dressing materials is done in a particular way, it is not that the hands are more antiseptic than ours, but there is, in the rigorous execution of each operating step, a series of very simple precautions to protect against any infection. Add to that the precision of the operation, the ideal hemostasis, the absence of any possible contamination, the meticulous anatomical reconstruction of the operated regions, the speed of execution and the perfection of the dressing, the attentive post-operative care (the animal surrounded in the operating room by a heating pad, and then placed in a cage ventilated with warm air which expels the anesthetic vapors more quickly); you will understand that there is a veritable school of surgical discipline there, the value of which is demonstrated by the successes of operations, and really, if after a visit here there is still an *antivivisectionist*, it can only be out of jealousy. There I saw these long and methodical operations of visceral exteriorization, these living things only consisting of viscera. But the most curious thing is certainly how *life is maintained outside the organism*. Every morning, 30 or 40 living tissues, often for many weeks, including a few specimens of heart tissue which continue to beat for several days, take their baths, undergo their toilet, receive their different diets according to their individual conditions and requirements, and are returned to their incubator. Their health records are scrupulously up to date.

If you now analyze the *elements of success* of this Rockefeller Institute, you will be led to the observation of two elements:

1. *The power to get things done.* I told you at the beginning about the modest staff available to the scientists and the simplicity of the buildings and laboratories, but for the objects of worship, for the success of the scientific effort, no expense is spared. Whatever apparatus is necessary is approved, or indeed the most recent version is ordered in advance, with confidence that all requests are made with a sense of intelligence and genuine need. Moreover, they needed to let the animals live for a long time *free in the open air,* so they bought a farm to house them. After twelve years, Carrel's laboratory, which is perfectly sufficient, seemed a bit old-fashioned to the administrators; their faithful secretary William James, Jr., informed our compatriot of this and asked him to please draw up plans for a new laboratory and before my departure its construction had been approved. How far this is from French administration! This is the spirit of initiative that includes these two inseparable elements: the *speed of design* and the *power of execution* and which is *one of the strengths* of this Rockefeller Institute.

2. The *intellectual value*. This is the entirely subjective dynamism of the men who compose it. And when I say that this second element is independent of the spirit of Rockefeller, I may be committing an injustice, because many universities have seen such intelligent men, have known them and have possessed them. But none of them has been able to attract or retain them.

Do not think that the resources of this establishment are infinite, its budget is one third that of the *Institut Pasteur*, and there is not a single laboratory in France that allows the efficient execution of modern experimental surgery and the observation of its long-term results. All my efforts in this direction have been in vain and have been officially declared useless. Thus, when I wanted to carry out a whole series of experiments to establish a method for surgery of the heart valves, I did not hesitate to cross the sea, and ask my friend Carrel for asylum. If I have had the satisfaction of bringing my experiments to a successful conclusion, I owe it to the resources of his laboratory, to his valuable collaboration, and to his guidance, and I am pleased to pay him a grateful tribute here.

Rockefeller's example has been followed, and the Mayos have just set up a laboratory whose modern methods are just as good as the New York laboratories.

But, you will tell me, we also have a research center capable of rivaling the Rockefeller, a center due to a private initiative, richly endowed, an independent establishment, the *Institut Pasteur*. Undoubtedly, the house of the *Grand Maître* is a scientific center which casts its light upon the world, its hosts are highly and justly renowned and above all praise; may they become even more so for the greater good of France. But they don't yet have an experimental surgery laboratory and so I cannot draw a parallel here.

If we go down one floor, we will enter Meltzer's laboratory, but before taking you there, let us look at the practical teaching of surgery in America.

Of this *surgical teaching*, I can only give you an overview, for two reasons: The first is that although I spoke about it often with my colleagues Gibson, Brewer, Murphy, Gerster, Ochsner, all so French at heart, I have only visited the two great universities: Johns Hopkins in Baltimore and Harvard Medical School in Boston. Having attended only a few insufficient examples, I cannot judge them all.

The truth is that this education has undergone a revolution and is in full creative evolution. It consists of and recognizes two levels: Instruction which gives the right to be called a "graduated" doctor and the power of *secandi per totam terram*[7] and a true school of practical or continuing education which bears the name of *post-graduate,* and it is there basically that the future surgeons of America are created. A national or even state educational standard did not exist, or barely existed, before 1905. A university opened, founded a hospital, carried out some education, and awarded diplomas; Murphy told me that there are still eight of them in Chicago, and to those who protested against the dangers of such institutions, they answered coldly and practically that the free competition of the universities guaranteed their value. If any of them were bad surgeons, no one would trust them and the university would lose its clientele. Everyone had a vested interest in doing well. And indeed the medical schools of Johns Hopkins and Harvard have no other origin. It was again private initiative which, frightened by this state of things where human life was at stake, undertook to sound the cry of alarm and bring about the necessary revolution. In 1905 it created the Council on Medical Education; then in 1910 the Carnegie Foundation for the Advancement of Teaching, under the presidency of Henry Pritchett, appointed its most remarkable collaborator, Abraham Flexner, and charged him with an investigation into medical education in America. Most private universities were substandard. The reforms were immediate, and as Gibson told us: "Within ten years, medical education will have nothing to envy at the best universities in Europe."

And Gentlemen, it is these ten years that we must use to attract to us this exodus of young surgeons whom America sends in countless numbers to the universities of Europe and whom you allow to go to German schools. Let those in charge pay attention to this information.

Currently the surgical background of a “graduate” includes 4 years of study, two of theory and two of surgical practice, including one in a dispensary and one in a hospital; but they have a means of improvement, namely the *post-graduate school*, an independent practical school, equipped with a considerable number of operating rooms and good laboratories, where the students can work not just for a few hours but all day, including 10-15 operations; that is what they can see in New York and Chicago, and they spend a few weeks there. Then they may go on study trips, may be noticed by a department chief, may become assistants, may show their professional and scientific skills, and may be selected for a hospital appointment.

However, although trusts have flourished in America, *monopoly* is always suspected and repudiated there. This year again the journal of the *Medical Association* applauds the limitation of the number of faculties and shows that of the 162 medical colleges of 1906 only 106 remain in 1913 and instead of 24 cities that had from 2 to 8 Faculties, the number is down to 8; but it does not favor the practice of large European cities to have only one faculty and one medical school. There are still 8 universities in Chicago, 5 in New York, 4 in Baltimore, 3 in Boston. What would they think if they knew that all attempts made in France to create competition are brutally and legally crushed?

We are long past such evaluations and competition, which are perhaps anemic but which give so many guarantees to French surgery. In the field of education we have a certain superiority.

Finally, let us see what is original about *operative technique*. Let us return, if you please, to the Rockefeller, on the floor below the Experimental Surgery Laboratory where I left you to talk about education. We enter what is called the *Experimental Biology Laboratory*.

I worked with Meltzer and Auer, and studied their famous mode of anesthesia which is known around the world. Meltzer is uniquely and fundamentally a physiologist. In coming to him, my aim was to evaluate the question of *intra-tracheal insufflation* and its *application to pulmonary surgery* during the opening of the pleura and pneumothorax: When I announced this last intention and this goal, they seemed very surprised and saw this as only an accessory application. Because, in fact, the admirable discovery of Meltzer was not at all for this purpose. Starting from the principle that the *carbonic acid contained in the blood* provokes the need to breathe, he wondered whether removing the carbonic acid from the blood would suppress the need to breathe, and whether by ventilating the lungs sufficiently, one could then realize the bold concept of *preserving life without any respiratory movement*.

To prove the possibility, he placed a small-caliber probe in the trachea, passing an almost continuous current of air through it. This air *expels the carbonic acid* from the bronchi and from the blood passing through the lungs; the animal thus ventilated ceases to breathe for hours and yet continues to live. When the insufflation is suspended, the carbonic acid produced and retained in the blood again causes respiratory movements and the animal returns to normal. Meltzer had me witness these facts in several experiments. His neighbor Carrel then showed me that instead of pure air one could insufflate a mixture of ether and atmospheric air and thus cause *anesthesia* without the animal having to make a single respiratory movement. All our experiments were made with this mixture. But it has another advantage; if you widely open the pleura, the lung retracts but you can maintain the *chemical functions of respiration by insufflation* without the lung distended, and finally if you increase *the speed* of the air current, or if you slightly *compress* the epiglottis you can redistend the collapsed lung and eliminate the pneumothorax.

Elsberg and then Peck built an apparatus fitted with an electric flywheel and proposed *anesthesia in all cases* by the Meltzer process; Peck at Roosevelt Hospital[8] did several hundred. I went to see this practice for myself. Should it supplant our methods of anesthesia? I do not think so. There is a particular difficulty in this process, namely *the introduction of the probe into the larynx*; it is always difficult, sometimes impossible, often traumatic. After having seen these difficulties, I believe that we must not accept the conclusions of Peck, and that we must reserve the admirable discovery of Meltzer and Auer for anesthesia during thoracotomy and lung surgery.

There is at present in America another procedure of *anesthesia* that I should tell you about, which is a brilliant conception of a physiological and almost philosophical order.

Almost everywhere, they administer anesthesia using ether drop by drop (Cushing, Mayo, Ochsner, Murphy), but Crile had an original concept that some of us know, since he gave an analysis of it in one of our French newspapers.

Here is the conception of Crile (of Cleveland): Ether or chloroform anesthetics intoxicate the nerve cell and suppress our sensitivity, our consciousness, our will. But if under these conditions, a *peripheral nerve is cut, crushed, or pinched*, the impulses caused by the trauma arrive at the cell which normally *transforms* the impulses into movement or psychological reaction. But because of the anesthesia, this transformation cannot occur and therefore, the impulses cause protoplasmic balance disorders in the cell which can go as far as its destruction: This is the cause of immediate or subsequent surgical *shock*. The distant functional disorders of the postoperative nervous system cannot have any other cause. To avoid this, with *general anesthesia* which annihilates consciousness, perform *local anesthesia in the path of the nerve* by injecting a substance which paralyzes it, such as stovaine[9] or novocaine at 0.25%, thus preventing the impulses from being transmitted to the central nervous system: The theory is physiologically reasonable, as you can see. According to Crile, it is therefore necessary to combine *local anesthesia with general anesthesia*. Indeed, I saw photographs of nerve cells before or after peripheral excitation in his laboratory; their appearance is clearly different and seem to conform to the theory.[10]

But let us continue. *Preoperative* anxiety, which often borders on terror, is in itself the cause of profound disorders in the nutrition of the nervous system. Crile avoids them by the preliminary injection of *scopolamine*, a veritable *anesthetic of consciousness.* He claims to bring patients to a remarkable euphoria in this way.

Finally, *post-operative* pain is a cause of debilitation for the surgical patient; Crile tries to protect his patients from it by infiltrating the operated region with a long-lasting analgesic *urea-quinine solution.*[11]

I have seen Crile's patients during and after the operations; his results are excellent, but they are perhaps due to a factor which his modesty made him fail to mention, namely his skill and his speed. What can we learn from this practice? From a *preoperative* point of view, my examination of patient psychology would define three categories, two of which do not fall within the domain of Crile's therapy: Some have *no terror* and *no anxiety* and indeed see the operation as an end to their suffering, and I think the great majority of our patients can be treated by a method that is much simpler and quite harmless, namely psychotherapy, the "Mind-Cure,"[12] simply the affirmation *of optimism*. You can bring the psyche of your patients back to perfect tranquility by a moral activity, and I consider this pre-operative time as an essential humanitarian function. There is a third category where the anxiety and anguish are such that no suggestion can reach them. In these cases, and in these cases only, morphine and scopolamine are indicated. This, I believe, is how French scholasticism can make use of Crile's theory.

Should regional anesthesia *during the operation* itself be added to general anesthesia in all cases? I believe that is excessive. In certain interventions where shock is to be feared, where the intervention requires the section of nerves that are important due to their size, like the sciatic, or due to their function, like the vagus or the celiac plexus, anesthetizing the nerve trunk with novocaine before cutting it seems like an excellent practice which I can certainly endorse. But, in the usual operations, I do not think it useful to add another toxin on top of ether.

And finally, *post-operative* pain. Is it always necessary to give the patient a urea-quinine injection? It means adding one more toxin to the series. I have not used it. Excessive post-operative pain caused by nervousness will not be suppressed by the urea-quinine, and if it is objectively due to the operation itself, there is most often a fault of technique which should be sought. Whether it is a laceration, or a crushed nerve, or tension in the closure, or interstitial hemorrhage, the operated area should be repaired. This, I believe, is the therapy for postoperative pain. All those who are willing to train themselves in the method which Halsted, another American, has so consistently defended, will protect their patients from the main cause of the pain and from the injection of a compensating toxin.

In surgical instrumentation and operative maneuvers, they do not present anything very special. However, let me tell you about Cushing, and introduce you to the Murphy clinic and the Mayo clinic.

The newest university service is that of Peter Bent Brigham Hospital at Harvard University which Professor Cushing directs with such distinction. It is a private and public hospital, provided with all the modern equipment. Cushing's practice seems as far removed from that of the Mayos as Boston is from Minnesota. If one could describe an American method, it is with him that one would have to look for it, because he is the faithful student in all respects of Halsted. He is a son of Johns Hopkins grafted onto Harvard University. I had seen Halsted and I had visited the university in Baltimore, which really is the mother of all medical-surgical universities in America, so when I observed Cushing's operations, I found all the methods, all the qualities, all the processes of the master. It is perhaps the surgery of the future, so you will allow me to dwell on it. Its principle is *precision*, its drawback is the *duration* of the operation. I saw Halsted operate, but he now operates very seldom. For these surgeons, an intervention, however complicated, must only damage a minimum of tissue and organs, hemostasis must be carried out with such perfection that in an hour and a half the patient has not lost even a spoonful of blood. The smallest vessels, arteries or veins, are precisely and separately tied, and the neighboring organs are protected from any trauma. The scalpel does not advance a millimeter unless everything has been identified, hemostasis is perfect. The sutures, which are made with extremely fine black silk, painstakingly reconstruct the tissues. The skin is sewn with the same thread, the same precision, the same care, and Cushing, following in this exactly the same technique as Halsted, still uses very thin sheets of silver in his dressings. All this takes too long, a single operation occupies a whole long morning, two hours, during which the patient is asleep with "drop by drop" ether, his arterial pressure, his pulse, and his breathing constantly recorded by the anesthetist. I must say, however, that throughout the operation we feel such peace of mind that its duration is not frightening, and when we see the patient postoperatively and his scars, we can only admire the result. This difference in surgical designs with these equal results leaves us wondering and indeed perplexed. Eclecticism must take precedence over absolutism; we should reserve the slow operating to certain cases whose true indications Cushing has found in these long and delicate operations on the pituitary, the trigeminal, the Gasserian ganglion, and the nervous centers. Most American surgeons are instead moving towards prudent speed.

With Murphy and with Ochsner the practice is different, dominated by clinical teaching and classical operational mastery. Oschner is a master surgeon, simple in his procedures, rapid in their execution. He operates with a bare head and bare hands.

Murphy in Chicago exemplifies teaching, by which I mean practical teaching of clinical and operative medicine. I have known him for 15 years, and think he combines the qualities of a first-rate surgeon with the eloquence and clarity essential to teaching. The Americans rightly regard him as one of the most important teaching personalities in their country. His department at Mercy Hospital is remarkably well organized and well attended. I attended his lectures and his operations in the large amphitheater where he lectures, where he has sought to unite teaching and the operating room. I have spoken there myself. It is equipped with all the modern devices for radiographic demonstrations, light projections, demonstrations on the blackboard, or transparencies. Numerous anatomical or anatomic-pathological preparations bear witness to his activity as a teacher. His wards and his pathological anatomy and experimental surgery laboratories constitute an entity that few surgeons, even in America, can put together. In the constant struggle for progress where the *Eastern States* seemed to hold the lead, New York, Boston, and Philadelphia now have well-equipped rivals in the *Central* *and Western* States, for whom their previous disdain may now be replaced by well-placed envy or at least by worthy emulation. Furthermore, frequent visits, meetings, and congresses often bring together surgeons from the United States of America and Canada.

Gentlemen, until now I have spoken to you only of collective institutions or university hospitals, but *individual initiative*, a kind of energy, is dominant in America and is found everywhere. Whether it is a question of studying the material needs of life, of an innovation in a branch of human activity, *above all in questions of moral or social initiative*, you see them *try everything* and *dare everything*. The pedagogical systems, the "Kindergarten" and the "Montessori" are severely tested; the fate of degenerates and the best way to manage the functional incapacities of the injured are the subjects of study commissions in every state. Finally in the field of the mind we see the greatest of their scholars, William James, passing from the physiology which he studies to the psychology which immortalizes it, but bringing into both sciences the experimental *method*. He owes his best ideas to this, and does not hesitate to entitle the most popular of his books *Varieties of Religious Experience*; he bases his career on the theory of pragmatism which is simply the triumph of individual initiative and experimentation. In this way, no fear of *extremes or improbability* stops him. Emerson has all the boldness of thought[13] and James deepens the study of the "Mind-Cure," this great thinker discusses with serenity and seeks with the most scrupulous attention what is best in the concepts of his followers.

The *surgical center where this personal initiative* really reaches its apex by the power and the boldness of its organization is in Rochester, Minnesota, at the clinic of the Mayo brothers. There the result really is almost miraculous. Much has been written about this establishment, Pozzi, Faure, and many others have described it, so I only want to mention a few particulars. It is 36 hours from New York, the distance from Paris to Budapest, quite far west, in a village barely inhabited a century ago by a few cowboys, where Mayo the father, then his two sons, established this *maison de santé*. It currently has 300 beds, and 20 to 30 operations are performed there every day. The annual total for 1913 was 10,048 operations on 8,478 patients, with an overall mortality of 1.5%, despite 611 operations on the stomach and duodenum, 225 on the intestine and 976 on the liver. Last October 23, I saw 36 major surgical operations on the same morning (I will spare you the program) performed by the two Mayos and three assistants. To establish their own laboratory, the most impressive in the world, the Mayos recently spent 2,500,000 francs.

Arriving in Rochester from Chicago is already an experience. As the train approaches the surgical center, it begins to look like a train for Lourdes. At the station people get off who are lame, one-armed, or have facial deformities, and all walk respectfully toward their place of deliverance. A hundred patients thus disembark each day at the Rochester station and go straight to the clinic. There are 60 doctors at their disposal. When their history has been very carefully recorded, when all the examinations have been carried out, when the doctors, specialists, and biologists have brought together all the elements capable of clarifying a diagnosis or of influencing the therapeutic direction, one of the Mayos reads the file, reaches a conclusion or sends it back for further information. To really appreciate the scientific way in which all these examinations are done, you have to spend a few afternoons in the laboratory and see that there are thirteen medical divisions, two radiologists working from 8 A.M. to 5 P.M., and four women employed just to classify patient records; these take up an entire hall where a clever method of information and filing makes it possible in two hours to establish statistics in any area of surgery and in two minutes to have the full history of any patient.

I should add that their *X-ray laboratories* contain more than 20,000 plates exactly classified with the history of each patient. In order to evaluate this system, I had only to express a wish to see X-rays of the lungs and kidneys and a head of the laboratory, Doctor Carman, came to show me on large light tables, which when deployed measured 25 meters, marvelous pictures making it possible to follow the history of the patients in question. And all these departments are still crowded, because I visited in the new laboratories a *dozen rooms* reserved solely for radiography and including the latest mechanical improvements. Modern surgery, to be truly scientific and practical, must comprise *three distinct elements*: The hospital which is the *center* of the building, and the laboratories and experimentation which are its *wings*. This is the Rochester formula where in its new buildings 25 separate rooms, admirably lighted and ventilated, are reserved for experimental surgery. Gentlemen, this scrupulously accurate description is in no way miraculous, it is only proof of what a constant and well-balanced will can do, capable of radiating over an entire continent, of attracting towards it those who are subject to it and of creating the admiration of colleagues around the world. I know of nothing comparable to the simplicity, cordiality, and energy of the two Mayos. But you may ask, what about their *technique*? I have nothing much to say, like them it is very simple, regulated, and precise. It leaves nothing to chance; an abdomen is never opened without being fully explored. No surprises are possible, no postoperative course is disturbed by some unrecognized lesion; and its *results* are the consequence, they are also reliable and favorable. So, for example, we struggle to accumulate 100 cases of gastric surgery, while the Mayos start by describing 1000 cases. Imagine the value of such an experience!

A young French surgeon could see there from 20 to 30 operations every morning, continue in the afternoon at the Rochester Club, where the operated cases are explained or discussed, and take part there himself, surrounded by all the scientifically known laboratory information. You can understand what a powerful school of practice this institution is becoming and why usually 100 to 120 surgeons from all over the world are attending this clinic. I was sorry to find so few French surgeons registered in the guest-book. I cannot recommend too strongly that our young colleagues visit this welcoming center of surgical interest.

What do we have that is similar?

Private initiatives in France: We certainly have nothing to compare with these formidable organizations and yet for some twenty years many establishments have been founded. All of charitable origin, these include the Gramont Foundation, the Rothschild Polyclinic, the Dispensary-Hospitals of the Red Cross, the private hospital and especially the Saint-Joseph Hospital which has no less than 161,325 days of treatment and 137,758 consultations for the year 1912, the hospitals of Bon-Secours, Calvaire, Saint-Michel, and those of the Philanthropic Society. These are so many surgical foundations; they constitute practical charitable establishments where surgery is very well done and renders the greatest service.

But these are incomplete establishments in the modern sense of the word. With the exception of Saint-Joseph's, which I think has become one of the first, if not the very first hospital of Paris due to its intelligent organization, these foundations lack the laboratories, *resources,* and *scientific equipment* that they need to progress, or even exist, because these are an essential part of the struggle for survival. It is this progress that the Mayos have understood with the practical sense of their country. They believed that their wonderful clinic would not progress if it were limited to current practice and they gave it a new life, an ability to grow, by creating a powerful means of research in their enormous laboratories equipped with all the most modern tools. Consider especially the worldwide reputation acquired by private laboratories for the *study of radium*. It is only due to the scientific value. At this time, I know of nothing else in America which can be compared to it. Abbe's service at Saint Luke's Hospital is the main representative of this therapy. Thus, private initiative will have to focus on scientific work in our country.

In short, our surgical education is generally equal to or superior to that of the American universities. Why then do all the professors in America *send their students to work in German services and laboratories*? We have to face the reality that we are being neglected by our colleagues from the New World. I took advantage of my stay in the American intellectual centers to examine this question, however painful it might be.

This neglect stems from several causes. First of all, the United States has been overwhelmed with German immigration. If you did not know that, you would quickly find out by reading the advertisements on the first *streetcar* that comes along: "New York is the largest German city after Berlin." This immigration is not a crowd or a herd, it is an army having its organization and its chiefs. From our particular point of interest, you should be aware that there is a "German Medical Society" in New York and Chicago. In the latter city, I was assisted at the meeting of the Chicago Medical Society by the *German Medical Society* of the same city for the reception of Schmidt with whom I was happy to have a public discussion of gastric surgery. In New York the German Hospital is magnificently equipped, and Willy Meyer has installed one of these colossal baronarcosis devices.[14] You can see that by their number and their organization they constitute a force. And meanwhile we haggle over a few thousand francs to finish the "Maison Française" in New York.

Read Barrett Wendell, the distinguished Harvard professor, who in his lectures of 1910 studied the *The France of Today*,[15] and you will find a celebration of how much the student owes to Germany. The dynamism of our intellectual abilities deserves to be considered at least as practical and certainly more invigorating. They would learn to attach these facts to systems, to general ideas which give man the culture without which he truly would have to combine science and humanity without understanding either their harmony or their forces. But these are weak arguments.

By closely questioning the most liberal minds, I have gotten a pretty good idea of their thinking: "We have no special sympathy for Germany or for the Germans, we only see the interest of our students and the benefit that our future surgeons can derive from time spent abroad. For us, their trip must above all be useful to them and, since you wish to see our young people stay in Paris, *tell us what you can teach them*. Don't tell us about the clarity and imagination of the French genius, we are familiar with these, but we are not talking about literature, we are talking about surgery and only surgery. In the morning, you receive them in your hospital departments, that is, until noon. But then what will they do? We don't want these young people to stay and take a few tedious or uninteresting courses. So tell us what they can do?" I argued in vain about the *Institut Pasteur*, but they pointed to the Rockefeller Institute, for which there is no need to cross the ocean; I pointed out to them the truly sincere and effective efforts which the Faculty of Medicine has shown in recent times, they acknowledge them but consider them applicable to beginners and not to *graduates*. "It is for them that we are seeking courses, demonstrations, and conferences." I admit that I was a little short of arguments. I would like to draw your attention to this state of mind. It is good to recognize our weaknesses, it is indeed the best way to correct them. If therefore we want to attract foreigners and, I repeat to you, they ask only to follow us, let us make the necessary effort; the spirit of France is in no way decadent, in no way underestimated, but its organization constitutes its inferiority and the obstacle to its scientific expansion.

Gentlemen, from this comparison establishing the relativity of surgical value in France and in America, it appears that we can do a lot to improve. Let us consider whether, using our own resources, we might swim upstream.

Excessive centralization is a weakness, this immense mechanism which constitutes general public assistance in France can only see the outlines; it embraces too many disparate elements, it is overloaded. However motivated, you might say it is tired out from the all the details, and grinds to a halt when it comes to innovations: The expense seems too great given the multiplicity of services. The fear of seeing one costly reform soon followed by another is the only factor that restrains its good intentions on the road to progress. Well, since we have to live with this centralization, since this is a social necessity that private initiative supports and relieves to a certain extent but cannot replace, since a revolution is impossible, Gentlemen, let us therefore try to evolve and make use of this powerful mechanism for our advancement, to *transform our weakness into a vastly expansive force*. Perhaps we can. Think of the general state of medicine and surgery at this moment, it is a *fragmentary state* that studies the segments of human pathology without sufficiently considering their relationships. It is a series of separate links. The illnesses of childhood, adolescence, and old age form separate chapters; the morbid processes are carefully distinguished from each other and despite all our efforts, the link has not yet been made which will combine all these states and which will show their interrelationships, and perhaps *their degree of causality* vis-à-vis each other, and more important, their *incompatibilities*. No doubt the history of a disease is the beginning of a clinical observation, but this history is only a description, which seems to me insufficient. How much more useful, more effective, and more fruitful would be a pathological past known in all its details, making it possible to follow a whole series of well-studied morbid states, well specified in their nature and their evolution, to make a *synthesis* of a pathological life. Then it is no longer a segment, it is the whole picture that we will have before our eyes and which will guide us. Could it not be that cancer is prepared by a series of morbid states starting in childhood which sensitize the subject until the moment when the terrible disease breaks out; could it not be that certain morbid states have an origin that the complete history of the patient would allow us to grasp; could it not be that there are certain incompatibilities between diseases, some preventing against others, or on the contrary sensitizing a subject for certain morbid states?

If there existed for each individual a *medical record*, a *pathological file* where his sociological past, his accidents, his morbid processes were all scientifically established, we would have there an eloquent dossier for the study of the relationships of morbid processes. Now, gentlemen, nowhere in the world can such a scientific problem, the solution of which can enlighten the whole of humanity, be posed and studied with more competence, more simplicity than in your hospital services in Paris, by the *Assistance Publique*. Its centralization will then become a benefit, it will not let a patient go out without a complete observation; it can if it wishes collect all these materials for an individual from birth until death. It will thus make it possible to establish formidable documents on the relationships of morbid states and at the same time it will have rendered the greatest service to science, it will allow us to resume the direction of medical progress. It will deserve the thanks of humanity.

Gentlemen, this is one way a scientific stay in America can suggest reforms in the Old Continent.

Biographical Sources

Tuffier T, *État actuel de la Chirurgie Intrathoracique*, Paris: Masson et Cie, 1914.

Gibson CL, "Theodore Tuffier, 1857-1929," *Annals of Surgery* 1930; 91:636-637.

Patel J, "Théodore Tuffier (1857-1929)," *Memoires de l'Académie de Chirurgie* 1961; 87:102-119.

Cousin MT, "Un anesthésiste d'avant-garde, le chirurgien Théodore Tuffier," *Annales de Chirurgie* 1999; 53:427-434.

Archives Nationales, Base de données Léonore. Accessed at leonore.archives-nationales.culture.gouv.fr., "Tuffier, Marin Théodore."

Publication Source

Bulletin de la Société de l'Internat des Hôpitaux de Paris (Bulletin of the Society of the Internship of the Hospitals of Paris) was published from 1904-1932. Historical issues were obtained by interlibrary loan.

Translation Notes

1) The *franc* was the monetary unit for France, Belgium, and Switzerland, and was equivalent to about $0.19.
2) The author misspells Johns Hopkins like so many even in America today. However, he (or a copy editor) makes an unusually large number of other misspellings like "Harward," "Halstead," "Rockfeller," "Metzer," "Guester," "Oechsner" (or "Oschner"), "Rosevelt," "Peter Ben Hospital," "Montesori," "Minesota," and "Enmerson" which have also been corrected in translation.
3) The *Internat* (Internship) of the hospitals in Paris was a uniquely French institution founded in 1802 and finally disbanded in 2005. See Fabiani-Salmon J-N, "Histoire de l'internat des hôpitaux (1802-2005)," *Bulletin de l'Académie Nationale de Médecine* 2022; 206:1269-1275.
4) French authors make a distinction between the *hôpital*, a charitable institution, and the *maison de santé*, which we might call a "private hospital" for paying patients.
5) The Marbridge Building was a stylish 11-story office building at Herald Square that had just opened in 1909. It is still there at 1328 Broadway.
6) In seventeenth-century France, Blaise Pascal and other scholars at the Port-Royal monastery developed an innovative philosophy of logic and education.
7) The authority "to perform surgery throughout the entire land."
8) The Roosevelt Hospital in New York, founded by a distant cousin of the presidents with that name, is now the Mount Sinai West Hospital.
9) Stovaine, also known as amylocaine, was the first synthetic local anesthetic, discovered at the Pasteur Institute in 1903. It is no longer in use.
10) Crile was a tireless investigator of surgical shock (see his *Blood-Pressure in Surgery* published in 1903), but decades would pass

before our current (still imperfect) understanding of shock evolved. The idea that nerve blocks would prevent shock persisted for some time, and has been partially revived by the current notion of pre-emptive analgesia (see Katz J, "George Washington Crile, anoci-association, and pre-emptive analgesia," *Pain* 1993; 53:243-245.

11) Crile advocated infiltration of a mixture of quinine and urea hydrochloride. See Crile GW, Lower WE, *Anoci-Association*, Philadelphia: W. B. Saunders, 1914.

12) The "Mind-Cure" (which the author spells "Mine-Cure" or "Mind-Curl") was a concept of William James, whose *Varieties of Religious Experience* was published in 1903 and is referred to again later in the article. See Duclow DF, "William James, Mind-Cure, and the religion of healthy-mindedness," *Journal of Religion and Health* 2002; 41:45-56.

13) Several authors have explored the intellectual relationships between James and Emerson, including Carpenter FI, "William James and Emerson," *American Literature* 1939; 11:39-57.

14) Meyer constructed an improved version of the Sauerbruch chamber and installed it in the German Hospital (today called the Lenox Hill Hospital). See Meyer HW, "The history of the development of the negative differential pressure chamber for thoracic surgery," *Journal of Thoracic Surgery* 1955; 30:114-128

15) Wendell B, *The France of Today*, 2nd Edition, New York: Charles Scribner, 1916.

27

René Leriche (1913)

Henri Marie René Leriche was born in Roanne, France in 1879, studied medicine at the University of Lyon, and continued there as a surgical trainee, during which time his teachers included Alexis Carrel and Mathieu Jaboulay. He also visited surgical centers in Switzerland and Germany.

In 1913, at the age of 34, Leriche was invited to visit Carrel in New York. He went on from there to Philadelphia, Chicago, Rochester (Minnesota), Montreal, Quebec, Boston, and Baltimore, where he was profoundly impressed by William Halsted. After returning to France, he published the admiring report on the following pages, and even considered emigrating to the United States himself.

The First World War intervened. Leriche became a front-line army surgeon, continued his correspondence with Halsted, and developed special interests in vascular surgery and pain management. He returned to America in 1921 and presented a paper on sympathectomy to the American Surgical Association, which elected him an Honorary Fellow the following year. In 1924 he was named Professor of Surgery at the University of Strasbourg, and he became Professor of Experimental Medicine at the *College de France* in Paris in 1937.

During the Second World War, he accepted an official position that required him to collaborate with the German occupation, which damaged his postwar reputation in France, but he was honored internationally by his students and colleagues. He was elected an Honorary Fellow of the American College of Surgeons in 1949, and visited the United States a total of six times. After several years of illness, he died in 1955.

L'œuvre de William Halsted
Lyon Médical 1914; 122:1014-1019.

The work of William Halsted
by R. Leriche

Halsted is the breast cancer surgeon; at least that is what the whole world thinks. One could just as well say that he is the man of exophthalmic goiter, of parathyroid grafts, of the treatment of aneurysms by metal banding of the arteries, or of many other things.

Actually, these are only particular things that an active surgeon has done. It is elsewhere that we must look for the work of Halsted.

For those who have been to the *Johns Hopkins Hospital,* two things stand out: Halsted has created a *method of surgery*, and he has been able to inspire *disciples*. This is what gives his clinic such a vivid originality, and when you have seen this admirable organization up close, you understand why Baltimore has so rapidly become the cradle of contemporary surgery in the United States. That is what I would like to demonstrate here.

The Halsted method is a special way of looking at surgery and a special way of performing it. Many of its details have passed into the public domain, others are outdated, but if we consider that this method has been in operation since 1889, we can agree that there is indeed some merit in having created it from scratch almost twenty-five years ago!

It was inspired at first by a biological concept, because the surgical heirs of the spirit of Claude Bernard are in Baltimore: As it is taught there, surgery must be above all an experimental science; surgical pathology must constantly rely on experimentation to progress, just as there must be experimentation before and after any new operative attempt; surgery is just *applied biology*. Ollier, Arloing, Tripier, and others had taught this well before we observed it elsewhere, but the tradition had been lost: French surgeons who spend most of their time preparing for competitive examinations have forgotten that this is the only way that surgery can further enlarge its field of action and achieve mathematically certain results, which must be the ultimate objective of operative practice. In Baltimore, on the contrary, there is an intimate fusion between surgery and physiology. The education of the students is above all biological and the future surgeons work in an experimental surgery laboratory, in contact with living things, unlike ours who are always confronted with death in a dissecting room. Therefore, their dominant thought is the cult of life, and it is instilled in them even more clearly every day by seeing Halsted's method of operating.

Halsted in fact laid down the principle that in order to reach its highest potential, the surgical act must be as respectful as possible of life, not only of human life (this goes without saying but is not a truism), but moreover of the *life of the tissues*, the first implied by the second.

Respecting the life of the tissues means first of all not contaminating them, even slightly; furthermore not traumatizing any part of them; it is to handle living matter with delicacy, without roughness caused by the love of speed, without unnecessary injury or distortion; it is to perform meticulous preventive hemostasis at every step, because anemia leads to shock, to clamp and tie the smallest vessels just like the large ones, with ligatures including a minimum amount of tissue and not a clump of cells.

In short, an operation scrupulously methodical in its technique, an operation without half-hearted asepsis (half-hearted by the entourage, the secondary staff, the assistants), a meticulous and precise operation, slow and bloodless. For this to be possible, a perfect, complete, and just sufficient anesthesia is required: Ether given drop by drop by an expert anesthetist provides for this.

Furthermore, in the performance of the operation, nothing should be left to chance: There is nothing approximate in experimental biology and *any operation performed must be a physiological experiment* in which the expected result must be mathematically obtained. Halsted created a special method so that there is never room for unexpected contingencies, a method that he had never published until last year [1], but that he had rigorously followed since 1889, when his operating rooms were opened.

Here are the main points:

First of all: *The systematic use of rubber gloves*. In recent years, rubber gloves have gone around the world; now they are generally used for aseptic surgery. *Halsted introduced them into his department in 1889* [1] to protect a nurse against carbolic acid which was damaging her hands; little by little everyone started using them, first the assistants, then the operators, and as early as 1899, Bloodgood was able to show by the statistics of radical repair of hernias what the sterile glove had done for operative safety.

Next, the *absolute avoidance of catgut for aseptic surgery*, because it is difficult to sterilize, and its replacement with fine silk. Since French catgut is now excellent, this prohibition does not apply to us, but there is another side of the question. The silk that Halsted uses is an extremely fine black thread, wound on small glass spools that are held in the hand. Very fine ligatures are made with it, imperceptible knots which only minimally disturb the life of the tissues, whereas the usual large knots are troublesome foreign bodies. You might say that silk does not resorb and a resorbable thread is preferable. I do not disagree, and personally I only use fine catgut, but the fact remains that with *equal asepsis* the finest thread is still the best, and what Halsted asks of silk, no catgut could give him. Indeed, he almost always performs hemostasis by transfixion with very fine needles: An isolated vessel, however small, is transfixed by a thread and tied like a hernia sac. If it cannot be isolated in the wound, it is ligated with a figure-of-eight suture, which always ensures the most perfect hemostasis, the desired goal.

And indeed when Halsted operates, nothing bleeds, nothing oozes; at every stage, the wound is clean and dry.

Another thing: *He avoids running sutures*; it is an unreliable technique in which a man's life depends on a single point that can break or slip. With *separate sutures placed very close* nothing of the sort is to be feared: It is safer, and everything must be sacrificed for safety.

Moreover, this seemingly excessive meticulousness has further advantages: The extreme rigor in the incision of the tissues then allows their *anatomical reconstitution* and the *absolute elimination of drainage.* A correct operation is one that leaves no trace: In the peritoneal cavity no adhesions, no starry whitish spots; in the superficial planes, normal layers, muscle apposed to muscle, aponeurosis to aponeurosis, sheath to sheath without fibrous patches, you might say without a scar. It is no sham. I saw Carrel, who combines French brilliance with Halsted's rigor, explore a dog's neck without being able to find the anatomical traces of two previous operations!

To achieve the restoration of tissues, Halsted recreates the layers, still with the same silk and the same fine needles. At the end, cellular tissue is apposed to cellular tissue, and the skin is apposed to the skin basically without any need to suture it. And indeed, Halsted simply places *"the epithelial stitch," obviously without ever draining,* a tiny epidermal suture left in place for 48 hours, which gives the same aesthetic result as the most successful of our intradermal sutures.

The post-operative dressing is inspired by the same biological concern: We will find it outdated, since we no longer use antiseptics, but it is interesting because of the concept that inspired it. Someone from Lyon once established that silver prevents the development of mold. Many authors have shown that it inhibits certain microbes. Therefore, Halsted applies very thin sheets of silver to his suture line which adhere to the skin and make, in the truest sense of the word, a non-caustic antiseptic dressing.

And this completes the essentially biological operation of Halsted.

At first glance, you may consider all this unnecessary: But those who think about it more deeply will understand; this method contains something superior; it respects and worships life; it avoids shock; it ensures the maximum vital result and functional result; it has proven itself; it is the method of the future.

If you think that the man who conceived it is a complicated personality, you would be wrong: Halsted is the simplest man, absolutely the simplest that you could meet. He follows the method he has created as a routine; he never talks about it; at first, he seems to think that everyone has always done it that way, it seems so normal to him.

And it is because he is like this, very simple and very straightforward, that Halsted has been able to gather disciples around him and keep them at his side, although most of them have long since become masters. His only thought was to nurture them in his own concern for disinterested work, in this cult of physiological surgery, a precise science and not a lucrative profession, to help each of them develop to the maximum in a particular field, to encourage them to rapidly acquire superiority through the originality of their research, applying the rigorous rules of his conscientious method. So, each of them has an individual personality. They are still with him, just as they were ten years ago; on his service, operating on the same day, you can see Young, Finney, and Bloodgood, to mention only the oldest. Until recently, you would also have seen Cushing, Halsted's pride and faithful disciple of 17 years, who only thinks of spreading his master's ideas, and who, in spite of this close relationship, is certainly the most penetrating, the most original, the apex, intellectually speaking, of American surgeons.

You can now understand what I said earlier, and how a principal part of Halsted's work is his incomparable group of disciples, which admirably illustrates the truth of the well-known phrase: "The value of a professor is measured by the quality of his students."

Original Notes

1. W. S. Halsted, "The employment of fine silk in preference to catgut and the advantages of transfixing tissues and vessels in controlling hemorrhage. Also an account of the introduction of gloves, gutta-percha tissue and silver foil," *Journal of the American Medical Association*, Vol LX, No. 15, 12 April 1913, pp. 1119-1126.

Biographical Sources

Leriche R, *Souvenirs de ma Vie Morte*, Paris: Éditions du Seuil, 1956.

Jarrett F, "René Leriche (1879-1955): Father of vascular surgery," *Surgery* 1979; 86:736-742.

Rutkow IM, Rutkow BG, Ernst CB, "Letters of William Halsted and René Leriche: 'Our friendship seems so deep'," *Surgery* 1980; 88:906-825.

Kieny R, "René Leriche and his work as time goes by," *Annals of Vascular Surgery* 1990; 4:105-111.

May AM, May AG, *The Two Lions of Lyons*, Rockville MD: Kabel Publishers, 1992.

Publication Source

Lyon Médical ceased publication in 1985. Historical issues can be obtained by interlibrary loan.

28

Other European Surgical Visitors

Of course, many other surgeons from Europe visited America during this time without publishing a contemporaneous report of their experiences. This chapter will identify some of them through other sources, and future historians will probably discover that one or more actually did write something that might enhance the impressions of the previous chapters.

Furthermore, reports already published in the English language have not been included in this collection. Joseph Lister himself visited America in 1876,[1] and even before that John Eric Erichsen of London had reported that American hospital construction used "every appliance that modern science can suggest in the way of securing efficient ventilation, cleanliness, and warmth" and commented on the "high standard of operative skill" throughout the country.[2] In 1888, the Lancet reported that the first Congress of American Physicians and Surgeons "was largely fortified by many European practitioners of eminence, and especially by our own countrymen."[3]

Indeed, British surgeons could travel around America and read the American literature without any significant linguistic difficulties, so there was no great incentive to publish individual experiences. During the time period addressed in this study, I found fewer reports from visiting surgeons about American surgery in English than there were in other European languages. In 1897, a London orthopedist, Dr. Noble Smith, wrote briefly about "an Englishman's views" of American orthopedics, but in an American journal.[4] Dr. Hamilton Whiteford of Plymouth published a short monograph about American surgery in 1906, having visited Drs. Gibbon, Finney, McArthur, Ochsner, Murphy, and Mayo.[5]

The previous chapters also do not include a 1908 report from the orthopedic surgeon Max Böhm of Berlin, who had spent three years as an orthopedist at the Massachusetts General Hospital in Boston,[6-7] since an English translation was published in the *Boston Medical and Surgical Journal* (now the *New England Journal of Medicine*) and is therefore easily available.[8]

Some European surgeons traveled to America before 1914, but only wrote about their experiences at a much later date. This group includes autobiographies by such prominent figures as Adolf Lorenz,[9] Ferdinand

Sauerbruch,[10] and August Martin.[11] Although interesting, these do not qualify as contemporaneous reports, and in any case the first two have already been translated into English.

The largest group of European doctors to visit America was probably the "Fourteenth German Medical Study Tour" in 1912.[12-13] A *Komitee zur Veranstaltung aerztlicher Studienreisen in Bade- und Kurorte* (Committee for arranging medical study trips to spas and health resorts) had previously led as many as 350 physicians and family members to visit some of these popular European establishments. In 1911, the group changed its name to the *Deutsches Zentralkomitee für ärztliche Studienreisen* (German central committee for medical study trips) and organized a six-week excursion to North America for 247 doctors, mostly from Germany.

The focal point of the Fourteenth Study Tour was the International Congress on Hygiene and Demography, taking place for the first time outside of Europe, in Washington on September 23-28, 1912.[14] The published transactions of that meeting list the names of all participants, and these can be referenced against the membership of the Deutsche Gesellschaft für Chirurgie (German Surgical Society) and other sources to identify at least 28 with a surgical specialty. The Fourteenth Study Tour also visited New York City, Philadelphia, Atlantic City, Chicago, Niagara Falls, Toronto, Montreal, and Boston; a subgroup (including most of the surgeons) skipped part of the Washington meeting to travel ahead and spend a long day with the Mayo brothers in Minnesota (as documented by the photograph on the cover of this volume), rejoining the rest of the tour in Chicago. In each city, hospital visits were combined with sightseeing and receptions by local German-American organizations.

The minutes and reports of some regular meetings provide a relatively objective screen at least for other prominent visitors, and those identified or identifiable as European surgeons will be presented in tabular form at the end of this chapter. In addition to the transactions of the 1912 International Congress on Hygiene and Demography (CHD) mentioned above, the following sources were systematically searched for the years 1893-1914:

Minutes of the American Surgical Association (ASA):[15] The table excludes the meeting in April 1914 that was held in conjunction with the *Société Internationale de Chirurgie*, since this will be specifically described in Chapter 30.

Minutes of the American Gynecological Society (AGA): These were published as part of its annual *Transactions*.

Transactions of the Congress of American Physicians and Surgeons (CAPS): This was a joint meeting held every three years including the two societies above plus other American specialty societies. Honorary members of any of these societies who attended in person were recorded in the transactions, as were any guests.

Scientific programs for the surgical sections of the AMA: During this time, separate scientific sessions were held at the annual meetings of the American Medical Association devoted to surgery, gynecology, orthopedics, laryngology, and ophthalmology. The programs were published in the *Journal of the American Medical Association* a few weeks after the annual meeting each year, including the names of presenters.

Mayo Clinic archives: Information was provided by the Mayo Clinic archives, including the minutes (1906-1908), registration book (1908-1914), and captioned photographs of the "Surgeons' Club."[16] In addition to these archival materials, some European visitors prior to the establishment of the Surgeons' Club are recorded in the published history by Helen Clapesattle,[17] and her references to news items in the Rochester (MN) *Post and Record* were verified using the online newspaper archive maintained by the Minnesota Historical Society.

Minutes of the German Medical Society of the City of New York (GMS): This information was provided in the archives of the society held at the New York Academy of Medicine, and in some cases was also published in the *New Yorker Medizinische Monatsschrift* or recorded in the official history of this organization (now called the Rudolf Virchow Medical Society).[18]

Undoubtedly there were many more in addition to those whose visits can be documented by one or more of the sources cited. Heinrich Neumann of Vienna attended an International Otological Congress in Boston in 1912, which is recorded because of the negative reaction to some relatively mild opinions he expressed to a newspaper reporter.[19] Carl Beck (Chapter 3) states that Hermann Tillmanns was at the Congress of American Physicians and Surgeons in 1903 (although Tillmanns does not appear on the program or the list of attendees); references can be found elsewhere that Tillmanns was in America at this time. Andrea Majocchi (Chapter 19) refers to "Hahn of Breslau" visiting the Mayo brothers in 1905: This was probably Bernhard Hahn, who read a paper about the negative-pressure chamber in Breslau before the Chicago Medical Society that year.[20]

Finally, two visitors from the last year of this study deserve special mention: Rickman Godlee, the nephew and biographer of Joseph Lister, was invited to receive an honorary fellowship at the first convocation of the American College of Surgeons (ACS) in November, 1913, using the occasion to communicate the best wishes of the Royal College of Surgeons of England and to invite the ACS to meet in London in 1914.[21] A few weeks later, Felix Landois of Breslau arrived to work with William S. Halsted at the Johns Hopkins Hospital, as part of a resident exchange that would send George Heuer to work with Hermann Küttner in Breslau, demonstrating that at least this American surgical service was considered comparable to one of the leading universities of Germany.[22-23]

Notes

1) Rutkow I, "Joseph Lister and his 1876 tour of America," *Annals of Surgery* 2013; 257:1181-1187.
2) Erichsen JE, "Impressions of American surgery," *Lancet* 1874; 2:717-720.
3) "The Washington Congress of Physicians and Surgeons," *Lancet* 1888; 2:826-827.
4) Smith N, "An Englishman's views of orthopedic surgery as practised in America," *Transactions of the American Orthopedic Association* 1897; 10:205-209.
5) Whiteford CH, *Glimpses of American Surgery in 1906*, London: Harrison and Sons, 1906.
6) Böhm M, "Erinnerungen an Amerika," *Berliner Klinische Wochenschrift* 1908; 45:1570-1573.
7) Bucholz CH, "Six years' experiences at the Medicomechanical Department of the Massachusetts General Hospital," *Journal of the American Medical Association* 1914; 63:1733-1739.
8) Boehm M, "Reminiscences of America," *Boston Medical and Surgical Journal* 1909; 160:41-46.
9) Lorenz A, *My Life and Work; the Search for a Missing Glove*, New York: C. Scribners's Sons, 1936.
10) Sauerbruch F, *A Surgeon's Life*, London: Andre Deutsch, 1953.
11) Martin A, *Werden und Wirken eines Deutschen Frauenarztes*, Berlin: S. Karger, 1924.
12) Neid T, *Ärzte und Naturwissenschaftler auf Reisen. Reiseberichte aus der Deutschen Medizinischen und der Münchener Medizinischen Wochenschriften 1890-1930*, Dissertation, Martin-Luther-Universität Halle-Wittenberg, 2012.
13) Neid T, Helm J, "Medizinische Forschungsreisen vor 100 Jahren: Die 14. Deutsche Ärztliche Studeinreise nach Nordamerika und Kanada im Jahr 1912," *Deutsche Medizinische Wochenschrift* 2012; 137:2729-2731.

14) *Transactions of the Fifteenth International Congress on Hygiene and Demography: Washington, September 23-28, 1912*. Washington: Government Printing Office, 1913.

15) Sparkman RS, Shires GT, editors, *Minutes of the American Surgical Association*, Dallas: Taylor Publishing Co., 1972.

16) MHU-0729 Physicians' and Surgeons' Club Records. By permission of Mayo Foundation for Medical Education and Research. Courtesy of the W. Bruce Fye Center for the History of Medicine, Mayo Clinic, Rochester, Minnesota.

17) Clapesattle H, *The Doctors Mayo*, Garden City NY: Garden City Publishing Co., 1943.

18) Hoffmann KF, "The history of the Rudolf Virchow Medical Society in the city of New York," In: Berberich J, Lax H, Stern R, editors, *Rudolf Virchow Medical Society 100th Anniversary Jubilee Volume*, Basel and New York: S. Karger, 1960, Pages 12-47.

19) "Desirability of universal necropsies," "A German critic of American medical methods," *Boston Medical and Surgical Journal* 1912; 167:344-345, 371-372.

20) Hahn DB, "The clinical experiences with Sauerbruch's operative cabinet," *The Illinois Medical Journal* 1905; 7:309-315.

21) "The First Convocation," *Yearbook of the American College of Surgeons* 1913;1:19-25.

22) Rutkow IM, Hempel K, "An experiment in surgical education - the first international exchange of residents," *Archives of Surgery* 1988;123:115-121.

23) Hempel K, "Als die anderen von uns lernten: Enge deutsch-amerikanische Chirurgen-Kontakte schon zu Beginn dieses Jahrhunderts," *Chirurg* 1992;31:1-9, 17-28, 45-50.

Table for Chapter 28: European surgeons identified as participating in meetings of the American Surgical Association (ASA), American Gynecological Association (AGA), Congress of American Physicians and Surgeons (CAPS), Congress on Hygiene and Demography (CHD), American Medical Association (AMA), German Medical Society of New York City (GMS), or the "Surgeons' Club" sponsored by the Mayo brothers in Minnesota. In the Mayo records, "M" denotes an entry in the minutes, "R" denotes an entry in the register, "P" denotes an entry in the caption of a photograph, and "C" denotes a mention in the book by Helen Clapesattle.

1888		
Annandale, Thomas	Edinburgh, Scotland	ASA,CAPS
Durham, Arthur E.	London, England	ASA,CAPS
Esmarch, Friedrich von	Kiel, Germany	ASA,CAPS, GMS
Harrison, Reginald	Liverpool, England	ASA,CAPS
Hewitt, Graily	London, England	ASA,CAPS
Horsley, Victor A. H.	London, England	CAPS
MacCormac, William	London, England	ASA,CAPS
Priestley, William O.	London, England	ASA,CAPS
Wells, Thomas Spencer	London, England	ASA,CAPS
1891		
Bryant, Thomas	London, England	ASA,CAPS
Chiene, John	Edinburgh, Scotland	ASA,CAPS
Durham, Arthur E.	London, England	ASA,CAPS
Harrison, Reginald	London, England	ASA,CAPS
Hoffa, Albert	Würzburg, Germany	CAPS
MacCormac, William	London, England	ASA,CAPS
Marsh, Howard	London, England	CAPS
1894		
Lutaud, Auguste	Paris, France	AGS
1895		
Jacobs, Charles	Brussels, Belgium	AGS
Linn, Thomas	Nice, France	AGS

1896		
Chauveau, Léopold	Paris, France	AGS
Segond, Paul	Paris, France	AGS
1897		
Walla, Béla	Budapest, Austria	AGS
1898		
Krause, Hermann	Berlin, Germany	GMS
1900		
Lobstein, Ernst	Heidelberg, Germany	ASA,CAPS
Simon, Otto	Heidelberg, Germany	ASA,CAPS
1901		
Mayo-Robson, Arthur	Leeds, England	ASA,MayoC
1902		
Haab, Otto	Zürich, Switzerland	AMA
1903		
Griffith, John E.	Bristol, England	CAPS
Kehr, Hans	Halberstadt, Germany	CAPS
Lorenz, Adolf	Vienna, Austria	AMA,GMS
Luc, H.	Paris, France	CAPS
Mikulicz-Radecki, Johann	Breslau, Germany	ASA, CAPS, GMS,MayoC
Moynihan, Berkeley	London, England	MayoC
Munch, Francis	Paris, France	MayoC
1904		
Hoffa, Albert	Würzburg, Germany	AMA,GMS
Pozzi, Samuel	Paris, France	ASA
1905		
Hirschberg, Julius	Berlin, Germany	AMA
1906		
Ballance, Charles A.	London, England	ASA
Ballance, Hamilton	London, England	ASA

Carrel, Alexis	Lyon, France	MayoC
Chiene, John	Edinburgh, Scotland	MayoM
Dührssen, Alfred	Berlin, Germany	AGS,AMA, GMS
Grimmsdale, Harold B.	Liverpool, England	MayoM
Helling, Edvin	Gothenburg, Sweden	MayoM
Rosthorn, Alfons von	Heidelberg, Germany	AMA
Stiles, Harold J.	Edinburgh, Scotland	MayoMC
Stokes, Henry	Dublin, Ireland	MayoMC
Thompson, Alexis	Edinburgh, Scotland	MayoMC
Trendelenburg, Friedrich	Leipzig, Germany	AMA,ASA, MayoC
Turner, George Grey	Newcastle, England	MayoM
Whiteford, Hamilton	Plymouth, England	MayoM

1907

Gluck, Thermistocles	Berlin, Germany	AMA
Hess, Carl	Würzburg, Germany	AMA
Jones, Robert	Liverpool, England	ASA,CAPS, MayoM
Killian, Gustav	Freiburg, Germany	AMA,CAPS, GMS
Kocher, Albert	Bern, Switzerland	AMA, MayoM
Koellreutter, W.	Freiburg, Germany	GMS
Küster, Ernst Georg	Marburg, Germany	AMA,ASA, CAPS,GMS
Paterson, Herbert J.	London, England	MayoM
Schmieden, Viktor	Bonn, Germany	ASA,GMS, MayoMP

1908

Barbour, Freeland	Edinburgh, Scotland	MayoM
Budisavljević, Julius	Innsbruck, Austria	GMS
Carmichael, E. Scott	Edinburgh, Scotland	MayoM
Chipault, Antony	Paris, France	AMA
Clairmont, Paul	Vienna, Austria	MayoM
Greensdale, T. B.	Liverpool, England	MayoR
Kay, Thomas	Glasgow, Scotland	MayoR
Lane, W. Arbuthnot	London, England	MayoR

Martin, August	Berlin, Germany	AGS,AMA, GMS
Moynihan, Berkeley	Leeds, England	AMA,ASA, MayoM
Paterson, Peter	Glasgow, Scotland	MayoR
Pfannenstiel, Hermann J.	Kiel, Germany	AGS,AMA, MayoM
Renton, J. Mill	Glasgow, Scotland	MayoR
Sauerbruch, Ferdinand	Marburg, Germany	AMA,GMS
Stiles, Harold J.	Edinburgh, Scotland	MayoR
Waldenström, Johan Henning	Stockholm, Sweden	MayoM
Zogbaum, Wilhelm	Kristiania, Norway	MayoR
1909		
Barnard, Anna I.	London, England	MayoR
Bastianelli, Raffaele	Rome, Italy	MayoR
Elsaesser, Armin	Bern, Switzerland	MayoR
Friedrich, Paul L.	Marburg, Germany	AMA,ASA, GMS,MayoR
Gray, H. M. W.	Aberdeen, Scotland	MayoRP
Guleke, W. Nicolai	Strassburg, Germany	ASA,MayoR
Hofmeier, Max	Würzburg, Germany	AGS
Kean, J. G.	Edinburgh, Scotland	MayoR
Lane, W. Arbuthnot	London, England	ASA
Laurent, O.	Brussels, Belgium	MayoR
Lyle, R. P. Rankin	Newcastle, England	MayoR
Majocchi, Andrea	Milano, Italy	MayoR
Makins, George H.	London, England	MayoR
Paling, Albert	London, England	MayoR
Pearson, C. Yelverton	Cork, Ireland	MayoR
Pearson, William	Dublin, Ireland	MayoRP
Pozzi, Samuel	Paris, France	AGS,MayoR
Spencer, Herbert R.	London, England	AGS
Willan, R. J.	Newcastle, England	MayoR
Young, Alfred S.	Glasgow, Scotland	MayoR
1910		
Crerar, J. W.	Maryport, England	MayoR
Dickie, William S.	Middlesbrough, England	MayoR
Eiselsberg, Anton von	Vienna, Austria	ASA,CAPS

Lange, Fritz	Munich, Germany	CAPS
Mygind, Holger	Copenhagen, Denmark	AMA
Nagel, Wilhelm	Berlin, Germany	MayoR
Pringle, J. H.	Glasgow, Scotland	MayoR
Turnbull, Arthur	Glasgow, Scotland	MayoR
Venters, Isabel	Edinburgh, Scotland	MayoR

1911

Bachrach, D. Robert	Vienna, Austria	MayoR
Björkenheim, Edv. A.	Helsingfors, Finland	MayoR
Borelius, Jacques	Lund, Sweden	MayoR
English, T. Crisp	London, England	MayoP
Erhardt, Erwin	Munich, Germany	MayoR
Essen-Möller, Elis	Lund, Sweden	MayoR
Gibson, Alexander	Edinburgh, Scotland	MayoR
Jerusalem, Ernst	Vienna, Austria	MayoR
Oehlecker, F.	Hamburg, Germany	MayoR
Stiles, Harold J.	Edinburgh, Scotland	AMA
Törnquist, G.W.	Vadstena, Sweden	MayoR

1912

Abel, Rudolf	Berlin, Germany	CHD
Aguilar, Florestan	Madrid, Spain	MayoR
Berry, F. May Dickinson	London, England	MayoR
Berry, James	London, England	MayoR
Brigel, O.	Stuttgart, Germany	CHD,MayoP
Brunner, Franz	Munich, Germany	CHD,MayoP
Bursche, Emil	Warsaw, Russia	CHD,MayoP
Dawson, Bertrand	London, England	MayoR
Eckstein, H.	Berlin, Germany	CHD,MayoP
Engel, Hermann	Berlin, Germany	CHD,MayoP
Fielitz, H.	Halle, Germany	CHD,MayoP
Fränkel, Arthur	Berlin, Germany	CHD,MayoP
Gebele, Hubert	Munich, Germany	CHD,MayoP
Graser, Ernst	Erlangen, Germany	CHD,MayoP
Groely, N.	Östersund, Sweden	MayoR
Heigl, Richard	Coblenz, Germany	CHD,MayoP
Henrici, Karl	Schwetzingen, Germany	CHD,MayoP
Hoeftmann, Heinrich	Königsberg, Germany	CHD
Jaffé, Karl	Hamburg, Germany	CHD

Kayser, Anna	Härnösand, Sweden	MayoR
Kayser, Fritz	Härnösand, Sweden	MayoR
Kroner, Max	Brandenburg, Germany	CHD
Leidel, Hans	Dresden, Germany	MayoR
Lind, Erik	Östersund, Sweden	MayoR
List, Erwin	Danzig, Germany	MayoR
McConnell, Adams Andrew	Dublin, Ireland	ASA
Müller, Georg	Berlin, Germany	CHD
Müllerheim, Robert	Berlin, Germany	CHD
Oetiker, Fritz	Wengen, Switzerland	MayoRP
Partsch, C.	Breslau, Germany	CHD,MayoP
Pollak, Josef	Graz, Austria	CHD,MayoP
Reinach, Oskar	Brandenburg, Germany	CHD
Robinson, Frederick W.	Huddersfield, England	MayoR
Rovsing, Niels Thorkild	Copenhagen, Denmark	AMA,ASA
Sober, E.	Hannover, Germany	CHD
Thost, Arthur	Hamburg, Germany	CHD
Unger, Paul	Leipzig, Germany	CHD
Unruh, H.	Wismar, Germany	CHD,MayoP
Vossius, A.	Giessen, Germany	CHD
Walthard, Max	Bern, Switzerland	CHD,MayoP
Weber, Wilhelm	Dresden, Germany	MayoP
Zurhelle, Erich	Bonn, Germany	CHD,MayoP

1913

Backer-Grøndahl, Niels	Kristiania, Norway	MayoR
Carlow, W.W.	Edinburgh, Scotland	MayoR
Dods, I. G.	Dublin, Ireland	MayoR
Dundon, J.	Cork, Ireland	MayoR
Fraser, John	Edinburgh, Scotland	AMA
Fuerbringer, Ralph O.	Marburg, Germany	MayoR
Gould, Eric Pearce	London, England	MayoR
Inglis, Elsie Maud	Edinburgh, Scotland	MayoR
Jowers, Reginald F.	Brighton, England	MayoR
Knight, Boyce W.	London, England	CAPS
Luden, Georgine	Munich, Germany	CAPS,MayoR
Schlesinger, E. G.	London, England	MayoR
Thompson, Alexis	Edinburgh, Scotland	ASA,CAPS
Tuffier, Théodore	Paris, France	MayoP
Wortmann, H.	Westfalen, Germany	MayoR

1914

Abderhalden, Emil	Halle, Germany	AMA
Böhler, Lorenz	Tetschen, Austria	MayoR
Collinson, H.	Leeds, England	AMA
Corner, F. M.	London, England	AMA
Dempsey, Alex J.	Belfast, Ireland	MayoR
Landois, Felix	Breslau, Germany	AMA
Shamoff, V. N.	St. Petersburg, Russia	MayoR

29

Non-European Surgeons and European Non-surgeons

Although most foreign surgical visitors to America in the years 1893-1913 were from Europe, there were some from other parts of the world. Brief publications by D. Murray Morton of Melbourne[1] and François H. Wessels of Cape Town[2] give similar impressions to those recorded in earlier chapters. Visitors recorded by the "Surgeons' Club" in Rochester (MN) included several from Australia, New Zealand, Latin America, and Japan.

A much larger group excluded from this study were other European biomedical colleagues who did not practice surgery. European medical science was still the undisputed leader, and Americans in non-surgical fields were less able to impress their European colleagues by technical or procedural innovations. However, the same effects of European immigration were taking place, American postgraduate students were bringing back the latest knowledge from their training in Europe, and America was beginning to make its own clinical and scientific contributions in other areas of biomedicine. Previous authors have described some of the non-surgical as well as the surgical visitors from Europe during this time.[3-6]

A scan of the sources mentioned in the previous chapter produces many famous names of non-surgical biomedical scientists who visited America during this time, including Herrmann von Helmholtz in 1893, Wilhelm von Waldeyer in 1901 and 1904,[7] Paul Ehrlich and Theodor Escherich in 1904, Carl von Noorden in 1905 (and 1912)[8], Friedrich von Müller[9] and Carl Ludwig in 1907, Robert Koch in 1908, and Sigmund Freud in 1909. And these are just some of the most famous.

The largest group of European doctors to visit America was probably the "Fourteenth German Medical Study Tour" of 1912, described in the previous chapter.[6,10] This six-week excursion to North America, featuring the International Congress on Hygiene and Demography in Washington,[11] included 247 doctors, most of whom were not surgeons. Several participants subsequently published reports of their experiences.[12-15]

In addition to the short-term visitors, there were also many immigrants who had received their medical degrees from European universities but did not specialize in surgery, and are thus outside the scope of this study. An estimate of the total number of these can be obtained from a directory published by the American Medical Association in 1909,[16] which indicates where each physician's medical degree was obtained (in most cases presumably prior to immigration, although it may include some native American citizens who traveled to Europe for their medical education). Those listed as European medical graduates are categorized by country of education and state of residence in the table at the end of this chapter.

The European medical graduates recorded in the 46 United States at this time generally followed the geographic distribution of other immigrants from their respective countries, and it is likely that most of them practiced primarily among their former compatriots. There is a striking predominance of graduates from German-speaking universities (mostly in Germany itself), confirming Carl Beck's statement that "Hundreds of significant names could be added" in addition to the immigrant physicians that he mentioned by name.[17] The small number of graduates from the British Isles is rather surprising.

Compared to the overall number of physicians, the immigrants with a European education are a very small proportion. However, in addition to the surgeons mentioned in a previous chapter, several others became prominent in their adopted country. Abraham Jacobi in New York deserves special mention, since like Carl Beck he published several "letters from America" for German readers,[18] and later became the only foreign-born President of the American Medical Association.

There were undoubtedly many other visitors and immigrants from Europe and elsewhere during this time, including some who practiced surgery, and perhaps even some who published articles or other reports about their experiences. Future additions to those identified in this study can only strengthen the conclusion that they collectively and in some cases individually had a profound influence on the development of American medicine and surgery.

Notes

1) Wessels FK [sic], "Impressions of surgical teaching and technique in the United States of America," *St. Bartholomew's Hospital Journal* 1902; 9:136-139.
2) Morton DM, "Impressions of surgical work in Great Britain and America," *Australian Medical Journal* 1910; 15:79-89.

3) Bonner TN, “German doctors in America – 1887-1914,” *Journal of the History of Medicine and Allied Sciences* 1959; 14:1-17.
4) Lesky E, “American medicine as viewed by Viennese physicians,” *Bulletin of the History of Medicine* 1982; 56:368-376.
5) Schlich T, “’One and the same the world over’: The international culture of surgical exchange in an age of globalization, 1870-1914,” *Journal of the History of Medicine and Allied Sciences* 2016; 247-270.
6) Neid T, *Ärzte und Naturwissenschaftler auf Reisen. Reiseberichte aus der Deutschen Medizinischen und der Münchener Medizinischen Wochenschriften 1890-1930*, Dissertation, Martin-Luther-Universität Halle-Wittenberg, 2012.
7) Waldeyer W, “Erinnerungen an die Weltausstellung in St. Louis Mo. 1904,” *Deutsche Medizinische Wochenschrift* 1905; 31:30-31,68-69,110-111.
8) Müller F, “Amerikanische Reiseeindrücke,” *Münchener Medizinische Wochenschrift* 1907; 54:2388-2390,2430-2434.
9) Noorden Kv, “Amerikanische Reiseeindrücke,” *Neue Freie Presse* 1912 (Dec.6-7); 17346:1-4, 17347:1-4.
10) Neid T, Helm J, “Medizinische Forschungsreisen vor 100 Jahren: Die 14. Deutsche Ärztliche Studeinreise nach Nordamerika und Kanada im Jahr 1912,” *Deutsche Medizinische Wochenschrift* 2012; 137:2729-2731.
11) *Transactions of the Fifteenth International Congress on Hygiene and Demography: Washington, September 23-28, 1912.* Washington: Government Printing Office, 1913.
12) Pröbsting A, “Von der ärztlichen amerikanischen Studienreise,” *Deutsche Medizinische Wochenschrift* 1912; 38:1991-1992,2132-2134.
13) Jaffé K, “Reiseeindrücke und Erinnerungen von der 14. Aerztlichen Studienreise,” *Münchener Medizinische Wochenschrift* 1912; 59:2463-2464.
14) Galli [G], “Allgemeine Eindrücke von Amerika, gelegentlich der 14. deutschen ärztlichen Studienreise,” *Münchener Medizinische Wochenschrift* 1913; 60:139-141.
15) Müller R, “Hygienisches aus Nordamerika,” *Münchener Medizinische Wochenschrift* 1913; 60:417-419,475-478.
16) *American Medical Directory*, Chicago: American Medical Association Press, 1909.
17) Beck C, “Der Einfluss deutschen Aerztetums in Amerika,”

Münchener Medizinische Wochenschrift 1904; 51:1792-1793.

18) Jacobi A. “Amerikanische Briefe,” *Deutsche Medicinische Wochenschrift* 1899; 25:816-818.

Table for Chapter 29: Physicians with medical degrees from European universities practicing in the United States in 1909, tabulated by state of residence and country of origin.

Graduates of European universities	CT,MA ME,NH RI,VT	NY	DC,DE, MD,NJ, PA	AL,FL, GA,MS, NC,SC TN,VA	IN,OH, KY,MI, WV	IL	MN,ND, SD,WI	CA	Other States
English/Scottish/Irish	4	9	1	0	0	0	0	2	2
German/Austrian/Swiss	28	203	70	8	70	90	72	70	126
Italian	36	132	55	2	11	20	2	10	13
French/Belgian	3	26	8	2	5	3	4	10	13
Scandinavian	4	4	0	0	0	5	48	3	13
Russian	9	38	6	1	6	15	3	2	5
Other European	5	11	3	3	1	8	1	4	10
Total physicians (000)	10.3	14.1	17.0	16.4	22.5	9.7	5.9	4.3	32.6

30

Fourth Congress of the International Surgical Society, New York, April 1914

The peak of European interest in American surgery during the early twentieth century occurred in April 1914, when the International Surgical Society (*Société Internationale de Chirurgie*) held its meeting in New York City.

William W. Keen and the American Surgical Association (ASA) had tried to interest Europeans in an international surgical society as early as 1896;[1] the *Deutsche Gesellschaft für Chirurgie* (DGCh, German Surgical Society) supported the idea,[2] but the Royal College of Surgeons of England "declined to take any part in the matter, as they regard it beyond their power, since they are only a body for the purpose of licensing to practice surgery and for the care of the Hunterian Museum."[1] In view of the latter response, the ASA decided not to pursue the matter. However, Keen himself was invited to become an Honorary Member (*Ehrenmitglied*) of the DGCh in 1902, the first American so recognized.

Later in 1902, Antoine Depage and fellow Belgian surgeons succeeded in establishing the *Société Internationale de Chirurgie* (SIC, International Surgical Society).[3] Membership in the SIC required recommendation by a national surgical society (i.e., the ASA for Americans), so this was a fairly exclusive group, which met in Belgium in September of 1905 and 1908, conducting its business primarily in the French language. Roswell Park led the American delegations of 13-15 ASA members, who invited the society to meet in America either in 1911 or 1914.

The *Société Internationale* met again in Belgium in September 1911, and decided that its 1914 meeting should be scheduled in New York City.[4] Speaking for the American delegation, Charles L. Gibson of New York warned that the city might still be uncomfortably hot in September, and added that tickets on the ocean liners would be less expensive in the spring. European surgeons must have known that the German Surgical Society always held its Congress in Berlin at Easter time,[5] but the conflict was not mentioned when the scheduling was discussed (in French) at the business meeting. Henri Hartmann of Paris did "*proteste energeusement*" against a springtime date, but no German spoke up, and the delegates voted 55-23 for the week after Easter, April 13-16, 1914.[4]

Drs. Gibson and J. Peter Hoguet of New York, and Lewis L. McArthur of Chicago led the American effort in 1914 to produce a memorable experience for the visitors, with headquarters at the elegant Hotel Astor on Times Square.[6] The American Surgical Association (ASA) arranged to have its annual meeting at the same location immediately prior to the SIC Congress, and invited the European visitors to participate. The Americans set up tours of New York hospitals and the Rockefeller Institute for Medical Research, along with an active social program. Arrangements were also made through the Thomas Cook company for a 12-day tour of other American surgical centers via special train. Dr. Keen was present to see the realization of his idea, but sadly Dr. Park had died just a few weeks before.

"Nearly 100 eminent European surgeons and their wives" crossed the Atlantic for the congress, according to the *New York Times*.[7] Many traveled together on the Hamburg-America ocean liner *Imperator*, at that time the largest passenger ship in the world. The following week, a summary in the *New York Medical Journal* revised the total to "Over a hundred eminent European surgeons, many of them accompanied by relatives."[8] The table at the end of this chapter lists the European surgeons who were recorded as present in the SIC minutes,[6] in the ASA minutes,[1] or in other reports.[7-14] The SIC minutes record that 102 surgeons and family members took part in the *Voyage Circulaire en Amerique*;[6] in addition to those who published their experiences (Chapters 31-33), other individuals can be identified in the Mayo Clinic Archives, from the Guest Book of Mayowood (home of Charles H. Mayo)[15] or from a photograph taken at a luncheon for the wives of the visiting surgeons.[16]

The European visitors toured New York City during the Easter weekend.[7-8] An excursion on the yacht *Aphrodite* sailed up the Hudson River, during which Drs. William J. Mayo and Richard H. Harte did their best to answer questions in several languages, most frequently French. Some of the wives were disappointed to learn that they had missed the traditional Easter fashion parade on Fifth Avenue; they did notice some elegant dresses about town, and some said New York was the "Paris of America." The hosts had also arranged a guided tour of the Metropolitan Museum of Art and tickets to "Peter Pan" at the Empire Theater.

Carl Henschen of Zürich told a *New York Times* reporter that the most impressive thing he had seen in America was "the vast democracy of everything," from the subways up to the private clubs. "In the hospitals I have visited," he reported approvingly, "patients in the free wards are treated with the same skill and care the millionaire receives."[7]

William Mayo welcomed guests formally at the opening of the Congress on Monday, April 13th, and acknowledged that Americans "owe to Europe a debt of gratitude, for we started scientifically from the shoulders of Europe."[6] The scientific presentations all followed the assigned themes of amputation, peptic ulcer, or transplantation, and were delivered in German (7), French (4), and English (3). Alexis Carrel reported on the immunologic limitations of transplantation. The other two English-language presentations were by Mayo and the British-educated John Fairbairn Binnie of Kansas City.

The highlight of the SIC meeting was the Presidential Address on "War Surgery," by Antoine Depage of Belgium.[8,17] Lewis Pilcher, editor of the *Annals of Surgery*, later recalled that the topic came as a surprise to most of the audience "for nothing was farther from the thought of the scientific world at that moment than War."[18] However, Depage, along with his wife Marie, a nurse by training, had been part of a surgical mission organized by neutral Belgium during the Balkan Wars of 1912-13, in which Serbian nationalists had rebelled against the rule of the Ottoman Empire. In his address, Depage warned that "in the countries of Europe the general military service is becoming universal, in such a way, that a number of combatants unparalleled before, are to be foreseen in future wars." He credited American surgeons with their contributions to military surgery from the Civil War, but he especially upheld "the ideas of peace and civilization, that the United States personify throughout the whole world."[17]

In addition to the formal sessions during the week, the Europeans visited several New York hospitals and were particularly impressed by an anesthesia machine that delivered a mixture of ether and oxygen intratracheally under positive pressure.[6,19] At the Rockefeller Institute, Carrel demonstrated his cardiac and transplant operations on experimental animals (work that had already been recognized with the Nobel Prize in 1912)[20] and James B. Murphy presented his early research on tumor immunology (the importance of which would not be generally recognized for many years).[21] Monday evening there was a banquet, Tuesday evening a "grand gala" at the Metropolitan Opera, and Wednesday evening a reception hosted by Dr. and Mrs. Depage at the home of Mr. and Mrs. Henry Phipps on Fifth Avenue, starting at 10:00 P.M.[6-8]

At the business meetings of the Society, it was agreed that the next meeting should be in Paris three years later, and that Dr. Keen should be the President for that Congress.[6] The two members from Warsaw (at that time part of the Russian Empire) petitioned to have a separate Polish national committee, but the Society leadership thought it should only recognize established national boundaries. The motion was defeated with only three favorable votes (the two Poles and Fernand Verchère of France, but apparently none of the three members from semi-autonomous Finland, which did have a national committee in the SIC even though it was also part of the Russian Empire).

During the same week, the *Deutsche Gesellschaft für Chirurgie* convened in Berlin. Its President, Wilhelm Müller of Rostock, welcomed the attendees on April 15. "However," he continued,

> I regret that a number of colleagues whom we always especially enjoy seeing here have been led astray by the concurrent meeting of the International Surgical Congress in New York, including even four members of our Executive Committee, who could not resist the lure of seeing a considerable part of American surgery during the next four weeks. It was suggested to us at the end of last year that in order to avoid the conflict we might postpone our Congress until about seven weeks later [Pentecost], especially since there have been postponements four times in the past. However, at our general meeting in 1906 we had decided that we would no longer allow the postponement our Congress for the benefit of newer societies.[22]

William S. Halsted was one of only two Americans attending the DGCh meeting that year, presented (in German) a paper on aneurysms,[23] and was inducted as an Honorary Member. At that time, the *Deutsche Gesellschaft* had only eight other honorary members living, including Keen and Theodor Kocher; Halsted considered this honor the "greatest pride" of his eminent career,[24] and spent most of his time in Berlin with his friend Kocher: "We were constantly together except at breakfast, being invited to the same houses and when not dining out, taking the evening meal quietly together at the Hotel Adlon …"[25]

Meanwhile, back in America, the ISS conference concluded on April 16 with polite thanks from the French delegation and three loud cheers from the Germans.[14] Many of the European visitors departed from New York that evening on their special train tour. The group spent the next day in Philadelphia, observing surgical procedures at two hospitals, and visiting the College of Physicians and its museum, Independence Hall, and other local sites, with a grand luncheon hosted by the Van Rensselaer family. The following day was spent entirely at the Johns Hopkins Hospital in Baltimore, after which a day of rest (Sunday) was kept free for touring Washington, D. C.

The train, with Pullman sleeping-cars, departed Sunday evening for

Chicago, arriving in time for a banquet with the local welcoming committee at the Blackstone Hotel on Monday evening April 20th. Tuesday was spent with Drs. McArthur, Murphy, Kanavel, Andrews, Rosenow, Bevan, Lewis, Sippy, Hornsby, Plummer, Halstead, and Preble, observing operations and presentations. Another overnight train trip to Minnesota allowed the group to visit the Mayo brothers; they arrived in Rochester at 7:00 A.M. and saw 60 operations between that morning and the next, with discussions and presentations in the afternoons and a dinner at the home of Charles Mayo. One more overnight in the Pullman cars brought them back to Chicago, where they spent Friday with Dr. Ochsner at the Augustana (Swedish) Hospital and Dr. Harris at the Henrotin (Belgian) Hospital.

Another overnight train journey brought the visitors to Niagara Falls; they had originally intended to stay in Buffalo, but because Roswell Park was no longer alive the itinerary had been redrawn to include Montreal. Sunday was primarily a day of rest there, although some of the group also visited the Montreal General Hospital and the Royal Victoria Hospital.[26] The day culminated in a banquet at the Montreal Hunt Club, but then it was back to the train for the journey to Boston.[6]

The travelers arrived in Boston at 7:00 A.M. on Monday April 27th, where the local surgeons had arranged a full day of operations starting at 8:00 for them to observe at the Massachusetts General Hospital (where they were also shown the old operating room where ether was introduced), Peter Bent Brigham Hospital (where Harvey Cushing was now Chief of Surgery), Boston City Hospital, Children's Hospital, Carney Hospital, and Free Hospital for Women. They were given a guided tour of Harvard University and another banquet at the Copley Plaza Hotel.[27] More operations were scheduled for observation the following morning. That afternoon, the travelers returned to New York and the *Imperator*, where they finally had time to rest; their favorable impressions of the busy *Voyage Circulaire* are reflected in the reports in the next section.

Meanwhile, hundreds of American surgeons were already making plans to cross the Atlantic in July for the Clinical Congress associated with the American College of Surgeons. The newly-formed ACS had been invited to hold its convocation in London, and many participants intended to follow this with visits to the famous clinics on the continent. The long-awaited era of peer-to-peer exchange between European and American colleagues seemed to have arrived. The Americans had no idea that their meeting in London would make them eyewitnesses to the final days of peace in Europe.[28]

Notes

1) Sparkman RS, Shires GT, editors, *Minutes of the American Surgical Association*, Dallas: Taylor Publishing Co., 1972.
2) Bergmann Ev, "Dritter Sitzungstag," *Verhandlungen der Deutschen Gesellschaft für Chirurgie* 1896; 25:75-76.
3) Liebermann-Meffert D, White H, *A Century of International Progress and Tradition in Surgery*, Heidelberg: Kaden Verlag, 2001.
4) Depage A, Mayer L, editors, *Troisième Congrès de la Société Internationale de Chirurgie*. Bruxelles: Hayez, 1911.
5) "Statuten der Deutschen Gesellschaft für Chirurgie," *Verhandlungen der Deutschen Gesellschaft für Chirurgie* 1911; 40:LIII-LVII.
6) Mayer L, editor, *Quatrième Congrès de la Société Internationale de Chirurgie*, Bruxelles: Hayez, 1914.
7) "Surgeons will open big congress to-day," *New York Times*, 13 April 1914, Page 6.
8) "The International Surgical Association, Fourth Triennial Congress," *New York Medical Journal* 1914; 99:797-801,855-858.
9) "World's surgeons in session here," *New York Times*, 14 April 1914, Page 5.
10) "Tell the marvels of plastic surgery," *New York Times*, 16 April 1914, Page 5.
11) "Zum Chirurgenkongreß - 'Imperator' bringt Aerztegesellschaft aus Europa mit," *New-Yorker Staats-Zeitung*, 10 April 1914, Page 9.
12) "Surgeons in World Congress show wonders of science and aid to cripples by mechanical artificial limbs," *New York Herald*, 14 April 1914, Page 7.
13) "Surgeons tell of revamping stomachs by cut and cover system of operations," *New York Herald*, 15 April 1914, Page 24.
14) "Magic of surgery makes beautiful faces for those marred by accidents," *New York Herald*, 16 April 1914, Page 22.
15) MHU-0618 Charles H. Mayo Papers. Mayowood Item 01. Mayowood Guest Book. Cited with permission of Mayo Foundation for Medical Education and Research. This book, which Dr. and Mrs. Mayo used for the rest of their lives at Mayowood, was presented to them by Professor Carl Garrè and his wife Else with this inscription:

    Mayowood Farm
    With all its charm
    Where "sunshine" we met
    We'll never forget!"

16) MHU-0729 Physicians' and Surgeons' Club Records. Photographs (with caption) MHU-0729_F523abc. Cited with permission of Mayo Foundation for Medical Education and Research.

17) Depage A, "War surgery," *Annals of Surgery* 1914; 60:137-42. While the German Army was marching into Belgium and France, this August issue of the *Annals of Surgery* was entirely devoted to English translations of the main presentations from the April SIC Congress in New York.

18) Pilcher LS, "The influence of war surgery upon civil practice," *Annals of Surgery* 1919; 69:565-74.

19) Connell K, "A new ether-vaporizer: A preliminary report on the technic of intrapharyngeal insufflation anesthesia," *Journal of the American Medical Association* 1913; 60:892-894.

20) Hamilton D, *The First Transplant Surgeon: The Flawed Genius of Nobel Prize Winner, Alexis Carrel*, New Jersey: World Scientific, 2017.

21) Silverstein AM, "The lymphocyte in immunology: from James B. Murphy to James L. Gowans," *Nature Immunology* 2001; 2:569-571.

22) "Erster Sitzungstag," *Verhandlungen der Deutschen Gesellschaft für Chirurgie* 1914; 43:1.

23) Halsted WS, "Der partielle Verschluss grosser Arterien," *Verhandlungen der Deutschen Gesellschaft für Chirurgie* 1914; 43: 349-67.

24) MacCallum WG, *William Stewart Halsted: Surgeon*, Baltimore: Johns Hopkins Press, 1930.

25) Rutkow IM, "William Halsted and Theodor Kocher: 'An exquisite friendship'," *Annals of Surgery* 1978; 188:630-637.

26) "Editorial," *Canadian Medical Association Journal* 1914; 4:519-520.

27) "Foreign surgeons touring in Boston," *Boston Daily Globe*, 28 April 1914, Page 16.

28) Clark DE, "The lights go out in Europe during the 1914 Clinical Congress," *Bulletin of the American College of Surgeons* 2021; 106(6):27-32.

Table for Chapter 30: European surgeons identified as participating in the 1914 Meeting of the American Surgical Association (denoted ASA if recorded in the minutes), the Congress of the Société Internationale de Chirurgie (denoted SIC if recorded in the minutes), and/or the Post-Congress Tour. "G" indicates an entry in the guestbook for a dinner at the home of Charles H. Mayo, and "W" indicates that the surgeon's wife was in a photograph taken at a luncheon the next day. Some participants were only identified in newspaper reports or other publications.

Böhler, Lorenz	Tetschen, Austria	TourGW
Doberauer, Gustav	Komotau, Austria	SIC
Koller, Sigmar	Neutetschen, Austria	ASA,SIC,TourG
Ranzi, Egon	Vienna, Austria	ASA,SIC,TourGW
Salzer, Hans	Vienna, Austria	SIC,TourGW
Schloffer, Hermann	Prague, Austria	SIC
Schuller, Arthur	Vienna, Austria	TourG
Sparmann, Richard	Vienna, Austria	ASA,SIC
Ullmann, Emerich	Vienna, Austria	SIC,TourG
Zahradnický, František	Nemecky-Brod, Austria	SIC
Depage, Antoine	Brussels, Belgium	ASA,SIC,TourGW
Hertoghe, E.	Antwerp, Belgium	
Lambotte, Albin	Antwerp, Belgium	SIC,TourGW
Lorthioir, Jules	Brussels, Belgium	ASA,SIC,TourGW
Mayer, Léopold	Brussels, Belgium	ASA,SIC,Tour
Willems, Charles	Ghent, Belgium	SIC
Bloch, Oscar	Copenhagen, Denmark	ASA,SIC,TourG
Dauber, J. H.	London, England	ASA,SIC
Fairbank, H. A. J.	London, England	
Greer, William Jones	Newport, England	SIC
Jordon, Alfred Charles	London, England	
Moynihan, Berkeley	Leeds, England	
Robertson, Leon	Stratford, England	
Bonsdorff, H. von	Helsinki, Finland	ASA,SIC,TourGW
Faltin, Richard	Helsinki, Finland	ASA,SIC,TourG
Granberg, P. W.	Vyborg, Finland	SIC

Dehelly, Georges	Le Havre, France	ASA,SIC
Durand, M.	Lyon, France	
Hartmann, Henri	Paris, France	ASA,SIC,TourG
Lecène, Paul	Paris, France	
Michon, Édouard	Paris, France	SIC,TourG
Morestin, Hippolyte	Paris, France	ASA,SIC,TourG
Proust, Robert	Paris, France	ASA,SIC,Tour
Robineau, Maurice	Paris, France	SIC,TourG
Verchère, Fernand	Paris, France	SIC,TourG
Villard, Eugène	Lyon, France	
Brüning, August	Giessen, Germany	
Franke, Felix	Braunschweig, Germany	ASA,SIC,TourG
Garrè, Carl	Bonn, Germany	ASA,SIC,TourG
Jurasz, Antoni	Leipzig, Germany	SIC,TourG
Kraske, Paul	Freiburg, Germany	ASA,SIC
Kümmell, Hermann	Hamburg, Germany	ASA,SIC,TourGW
Lexer, Erich	Jena, Germany	SIC,TourGW
Neuber, Gustav	Kiel, Germany	SIC
Payr, Erwin	Leipzig, Germany	
Rehn, Eduard	Jena, Germany	SIC,TourG
Rehn, Ludwig	Frankfurt, Germany	ASA,SIC,TourG
Ritter, Carl	Posen, Germany	SIC,TourG
Schlange, Friedrich	Hannover, Germany	SIC,TourW
Sonnenburg, Eduard	Berlin, Germany	SIC,Tour
Steinthal, Karl	Stuttgart, Germany	ASA,SIC,TourGW
Tschmarke, Paul	Magdeburg, Germany	SIC,TourG
Tölken, R.	Zwickau, Germany	TourG
Witzel, Oskar	Düsseldorf, Germany	SIC,TourG
Kuzmik, P. von	Budapest, Hungary	
Manninger, Vilmos	Budapest, Hungary	SIC,TourG
Ceci, Antonio	Pisa, Italy	
Gangitano, Carlo	Naples, Italy	SIC,TourG
Lerda, Guido	Turin, Italy	TourG

Bierens de Haas, J. C. J.	Rotterdam, Netherlands	SIC,TourG
Frank, N. Hermann	Zwolle, Netherlands	ASA,SIC,TourG
Goedhuis, J.	Deventer, Netherlands	SIC,TourGW
Koch, Carl F. A.	Groningen, Netherlands	ASA,SIC,TourGW
Koch, E.	The Hague, Netherlands	SIC,TourG
Renssen, W.	Arnhem, Netherlands	SIC,TourGW
Rotgans, J.	Amsterdam, Netherlands	SIC,TourGW
Rutgers, M.	The Hague, Netherlands	SIC,TourG
Schoemaker, J.	The Hague, Netherlands	SIC,TourG
Van Lier, E. H.	Amsterdam, Netherlands	SIC
Van den Berg, W.	Groningen, Netherlands	SIC
Van den Horn – Van den Bos, J. J. L.	Nijmegen, Netherlands	SIC,TourG
Van der Hoeven, J.	Zutphen, Netherlands	SIC,TourG
Westerman, C. W. J.	Haarlem, Netherlands	ASA,SIC,TourGW
Henriksen, Paul	Skien, Norway	ASA,SIC,TourG
Nicolaysen, Johan	Kristiania, Norway	ASA,SIC,TourG
Bastos, Henrique	Lisbon, Portugal	SIC
Gentil, Branco-J.	Lisbon, Portugal	SIC
Leonté, Anastasievici	Bucharest, Romania	SIC,TourG
Bornhaupt, Léo	Riga, Russia	SIC,TourG
Guinsbourg, Leon	St. Petersburg, Russia	SIC
Kryński, Leon	Warsaw, Russia	SIC
Sapiezhko, Kirill M.	Odessa, Russia	SIC,TourGW
Silberberg, J. W.	Odessa, Russia	ASA,SIC,TourG
Zawadzki, Alexandre de	Warsaw, Russia	SIC,TourG
Soubbotitch, Voislav	Belgrade, Serbia	ASA,SIC,TourG
Gonzalez, Arturo	Madrid, Spain	
Henschen, Carl	Zürich, Switzerland	ASA,SIC,TourGW
Russ, Clara	Basel, Switzerland	
Zollinger, Fritz	Zürich, Switzerland	TourG

31

Robert Proust (1914)

Robert Emile Sigismond Léon Proust was born in Paris in 1873, the son of a prominent physician. He studied medicine in Paris, receiving his degree in 1900 and initially specializing in urology under Félix Guyon. He gradually moved toward gynecology, wrote an influential textbook, and became an assistant to Samuel Pozzi at the Broca Hospital, although continuing to practice general and urologic surgery.

He worked with Marie Curie on the medical applications of radiation therapy, especially for cervical cancer. He had additional interests in anthropology and literature, and encouraged the literary career of his older brother Marcel.

Robert Proust first visited America in 1906, at Pozzi's suggestion. The following pages describe his impressions of an American tour after the International Surgical Society meeting in New York in April 1914, when he was 40 years old.

He was a dedicated military surgeon during the First World War. After the War, he returned to the Broca Hospital as Professor of Gynecology. After Marcel Proust died in 1922, with much his great work *À la Recherche du Temps Perdu* still unpublished, Robert became his brother's literary executor. He died in 1935 after a busy day of operating.

Impressions d'Amérique
La Presse Médicale 1914; 22(*Volume d'annexes*):725-729,773-777

Impressions of America
R. Proust, Associate Professor, Hospital Surgeon

Following the Congress of the International Surgical Society, a number of surgeons from several countries have just spent three weeks on a very interesting scientific trip through the United States.[1]

This trip was particularly pleasant due to the charming hospitality of our American colleagues. I am happy to express my thanks here for the generous welcome shown to us on so many occasions, which will always be an indelible memory.

The timing of the Congress had been chosen so that many of us (who had crossed the Atlantic together on the *Imperator*) could also attend the meeting of the American Surgical Association, to which we had been cordially invited, and where several European surgeons made interesting presentations, including Professors Hartmann, Kümmell, and Rehn.

What struck us most about the American Surgical Association was the quality of the presentations and the considerable amount of work accomplished in just three days.

This Association includes surgeons from all parts of the United States; it holds its meeting each year in a different city. This year, New York had been chosen to coincide with the Congress of the International Surgical Society.

I will not say anything here about the International Surgical Society Congress itself, since others are better able to give an interesting report. I will simply mention the perfect manner in which the discussions were held by our president, Professor Depage, after he had delivered a fine address on war surgery at the inaugural session.

Every evening the members of Congress were received in a most friendly way by the American surgeons, and I do not have space to thank all those who have been so hospitable. However, I will especially mention Dr. Gibson, along with the American delegate Dr. McArthur and his faithful secretary Dr. Hoguet, who did so much to create such a welcoming atmosphere in New York.

One of the most interesting features of the Congress this year was the arrangement for a joint scientific tour immediately after the closing of the last session. This innovation allowed us in a few days to see many things which would normally have required a much longer period of time.

Traveling together also allowed us to exchange our impressions, to compare our opinions, and to develop more and closer relationships among the different members of the group; it was really an *œuvre internationale*.

We saw so many things, so interesting and diverse, that despite taking notes along the way, I have difficulty putting every detail in its place.

I cannot try to give a general description of American surgery, but will refer the reader to the excellent articles of Pozzi [1] and Tuffier [2]. I would simply like to give readers of *La Presse* a picture, or perhaps I should say a kaleidoscope, of what we saw.

We left New York on Thursday, April 16th. Our trip was organized by the Cook company and, as all things in America are done both on a large scale and with great comfort, we were provided with a special train for the entire time.

Our first stop was Philadelphia. There we were able to admire the Jefferson Hospital, a very recent construction in which we particularly noted the many examination rooms in the outpatient department. This is a general trend in America today. The construction of doors using a kind of conglomerate cement was also notable, both from the point of view of cleanliness and of non-flammability.

We saw Deaver operate at the University Hospital, with his well-known mastery.

After leaving the operating room, we admired the surroundings of Philadelphia. We were received at lunchtime by Mrs. van Rensselaer who offered us princely hospitality at Camp Hill;[2] then we went to visit the admirable art collection of Mr. Widener,[3] which contains some very fine Rembrandts, including the famous *Mill*; an entire cabinet by Van Dyck, some Corots, and a very fine Raphaël, whose ensemble is so perfect that it can only be compared to the finest of the great European galleries. This visit, so interesting from an artistic point of view, was saddened by the terrible memory which hangs over this house: Mr. Widener's son and grandson died in the sinking of the *Titanic*.

The same evening we left for Baltimore, where the next day was spent visiting Johns Hopkins Hospital,[4] which I will describe in a future article.

From Baltimore we set out again for Washington. Of the stay in Washington, I will say little; it was mostly a day of rest dedicated to visiting the city, but without any surgical importance.

We went from there to Chicago. The evening of our arrival, we were received for dinner by all the surgeons of the town. Many toasts were offered, in particular by Verchère for France and Rehn for Germany.

Early the next morning, we went to Mercy Hospital to see Murphy, and first were presented with a series of arthroplasty operations, completing an earlier presentation that we had already admired at the American Surgical Association meeting in New York. Apparently, Murphy had intentionally showed us the results before letting us judge the operation itself, because we then attended a very interesting arthroplasty of the hip. The operation is appealing and brilliant, but one might initially have some skepticism that such a brutal intervention might result in permanent ankylosis. However, having seen the marvelous functional results that Murphy showed us in patients operated on several months and even several years previously, we can conclude that, with rigorous asepsis, arthroplasty by interposition of pedicled and non-resorbable flaps seems to be a method worthy of attention by surgeons at this time.[5]

We also saw an operation by McArthur, who showed us brilliantly how aponeurotic remnants can be used to repair the inguinal canal.

From Chicago we traveled, again by our special train, to Rochester, which was really the goal of the trip. We were very kindly received at the station by the two Mayo brothers, who had come to meet us at 6:30 A.M.; after a light breakfast with delicious grapefruits, we went at 8 A.M. to Saint Mary's Hospital, where the following procedures took place, distributed among the six operating rooms:

Operating room No. 1 (C.H. Mayo). – Exophthalmic goiter: ligature. Exophthalmic goiter: thyroidectomy. Subtotal abdominal hysterectomy. Gastroenterostomy for duodenal ulcer. Watkins operation for prolapse.

Operating room No. 2 (W.J. Mayo). – Obstruction of the pylorus; Stomach carcinoma; Obstruction of the main bile ducts; Nephrectomy; Mayo-Kraske operation.

Operating room No. 3 (E.S. Judd). – Adenoma of the thyroid; Double inguinal hernia; Appendectomy; Exploration of the stomach, gall bladder and appendix; Exploration of the gallbladder, stomach, duodenum and appendix; Total abdominal hysterectomy; Suprapubic prostatectomy.

Operating room No. 4 (Beckman). – Exophthalmic goiter: thyroidectomy; Subtotal abdominal hysterectomy; Gallbladder, appendectomy; Lower lip epithelioma; Hemorrhoids.

Operating room No. 5 (Balfour). – Exophthalmic goiter: thyroidectomy; Right femoral hernia; Appendicitis; Cholecystitis; Exploration of the stomach and duodenum; Dilation and curettage; Varicocele; Inguinal hernia.

Operating room No. 6 (M.S. Henderson and Carl Fisher). – Entropion of the right eye; Deformity of the nose; Removal of cervical lymph nodes.

What struck us above all was the perfection of the organization, the rigorous method with which the operations followed each other in each room, but without any concern for excessive speed. There is no loss of time, but never seems as if the operator is trying to finish hastily, and this applies equally well to the two Mayo brothers and to Judd or the other assistants.

The Mayo brothers perform very careful surgery, and it is clear that everything has been studied and evaluated from the point of view of the perfection of the operative result.

Their technique is very precise but also very eclectic. As a result of their numerous surgical journeys, the Mayo brothers have taken from each country, from each operator, the details which seemed to them the most interesting. However, this eclectic technique is still very simple. The Mayo brothers make the reasonable judgment that there is improvement only if there is simplification.

One of the types of operation which has benefited the most from the combination and simplification of the methods generally employed seems to me to be the gastrectomy, as performed by W. Mayo. It really gives an impression of absolute perfection.

For clamping the stomach where it is to be divided, the Mayos use the Payr clamp, since it grips so strongly that it cannot slip. This allows the stomach to be cut absolutely flush with the clamp; then the few mucous remnants are cauterized, and a final scrub with a compress leaves the edge absolutely clean and neat; there is nothing left except inside the jaws of the clamp.

Asepsis is thus ensured by avoiding contact of the mucous membranes with the operative field; moreover, it facilitates closure of the stomach, which W. Mayo executes in a very appealing manner; before removing the clamp, he makes an overlock in the manner of Hippocrates, taking each of the gastric walls alternately with a U-shaped stitch, passing each time over the clamp before reaching the opposite side of the stomach. This overlock, immediately tightened as the clamp is released, closes the gastric cavity and apposes the mucous edges while inverting them.

The Mayos are looking for simplification, but also for maximum security; thus in general for gastrointestinal operations, and especially for gastroenterostomy, they add inverting sutures to a surprising degree. In an ordinary gastroenterostomy, they not even satisfied with two layers: A seroserous and a full-thickness, as Hartmann has taught us. In general, they create three layers, because once the first seroserous sutures have been placed, before opening the mucosa, they incise the other layers and suture them to each other, then a third layer is required for the mucosa.

When I add that in general they reinforce the seroserous closure with individual sutures, the considerable security offered by such an anastomosis is apparent. We could perhaps criticize this technique for complexity or loss of time, but with a standardized method like theirs, the loss of time is minimal and the results seem truly excellent.

I had been to America, and in particular to Rochester, eight years ago. I found Saint Mary's Hospital much enlarged this year; instead of the two operating rooms which I had seen, and three at the time of Professor Pozzi 's second trip to Rochester, there are now six. Operative activity is thus much greater both because it takes place in these six rooms and because the thirty operations that we saw performed on our first day are the daily routine of the clinic. As an indication, here is the list of operations that were carried out the following day:

Operating room No. 1 (C.H. Mayo). – Exophthalmic goiter: ligation; Exophthalmic goiter: thyroidectomy; Subtotal abdominal hysterectomy; Gallbladder; Duodenal ulcer; Mayo surgery for prolapse.

Operating room No. 2 (W.J. Mayo). – Gallbladder; Exploration of a carcinoma of the stomach; Pyloric obstruction; Intermittent hydronephrosis; Mayo-Kraske operation.

Operating room No. 3 (E.S. Judd). – Thyroid adenoma; Abdominal tumor; Chronic perforated ulcer; Gallbladder; Abdominal tumor exploration; Vaginal hysterectomy; Hemorrhoids.

Operating room No. 4 (Beckman). – Bone transplantation for tuberculosis of the lumbar vertebrae; Exophthalmic goiter: thyroidectomy; Appendectomy; Cholelithiasis; Ovarian cyst; Epithelioma of the lip; Tonsillectomy.

Operating room No. 5 (Balfour). – Exploration of the appendix and the umbilical region; Pelvic tumor; Exploration of the gallbladder and pancreas; Cholecystitis; Gastric ulcer; Rectosigmoid carcinoma: preliminary colostomy and exploration; Tuberculosis of the glands of the neck: injection with alcohol.

Operating room No. 6 (M. S. Henderson and Carl Fisher). – Amputation of the right foot; Calcaneal exostosis; Double hallux valgus; Tonsillectomy and adenoidectomy.

It generally continues in this way, so that we can count on about a thousand operations per month. This considerable increase in activity in the space of eight years would be of enormous interest by itself; but there something more that deserves the attention of all surgeons: The "Mayo Clinic."

The "Mayo Clinic" is a new foundation which includes two things: On the one hand, a series of examination rooms which together constitute the Mayo consultation service. It is there that the patients are examined by a series of doctors who each create a record of the pulmonary examination, the state of the kidneys, urine, X-rays, examination of the bladder if necessary, etc., so that when the patient is examined by the Mayo brothers, all the required information has already been gathered. This is only an extension of the service as I had seen it operate in the past, and as it has been so wonderfully described by my master, Professor Pozzi.

The second part of the "Mayo Clinic" includes all the laboratories and the experimental surgery department. We were truly overwhelmed by the considerable effort that such a work represents. The classification, organization, and enhancement of the innumerable findings accumulated by the Mayo brothers during their active surgical life, the creation of special laboratories for the study of each department of pathological anatomy, the collection of microscopic photographs, preparations, and drawings relating to each of the cases, are an astonishingly complete collection of scientific documentation. It is an effort comparable to the marvelous institutes we have seen in America, but created exclusively by surgeons, for surgery, so that by supervising the arrangements themselves in their smallest details, they have created a wonderfully adaptable facility.

If I wanted to cite examples of these prodigious collections of kidney tumors, ovarian tumors, stomach cancers, etc., I would need many pages to go into the details of classification, to show the wealth of clinical observations associated with the anatomic-pathological findings and the operative results. I will simply say that young surgeons from any country could complete their education in such a rich and well equipped research center.

This same abundance of documentation is found in the radiography department, which not only has excellent equipment - especially for obtaining and examining stereoscopic images – but also has a collection so vast that it is very easy to study any lesion, even the rarest, on which some information is desired. If we add that besides these laboratories, X-ray rooms, cystoscopy rooms, bacteriology laboratories, and operating rooms for animals, there are huge photography workshops, drawings, libraries, classrooms, and projections, it is apparent that a real university has arisen in this city of Rochester, created largely by the activity of the Mayos.

We left Rochester with admiration and astonishment at how much had been accomplished.

Our president Depage summed up our opinion wonderfully by saying that Rochester was now truly a surgical Mecca where every surgeon should come to make a pilgrimage.

[p. 773]

Now I would like to present the most memorable points of our visit to the Johns Hopkins Hospital in Baltimore and to Cushing's service in Boston.

I had seen the Johns Hopkins Hospital eight years ago; but it was then vacation time, and although I got a general impression, I could not appreciate the prodigious activity of this institution. This time everything had been planned so that in a short space of time we could admire its extraordinary resources.

Here is a list of the operations we attended in the morning:

April 18, 1914 at Johns Hopkins Hospital.

9 to 10 A.M.,	Dr. Kelly: Gynecological operations.
10 A.M.,	Dr. Finney: Pyloroplasty .
10:45 A.M.,	Dr. Baer: Arthroplasty.
11:30 A.M.,	Dr. Follis: Herniotomy.
12 P.M.,	Dr. Young: Prostatectomy.
12:45 P.M.,	Dr. Bloodgood: Demonstration of cases of cancer of the tongue.

Concerning Kelly, I will simply remind you of his well-known mastery; he had made a presentation at the Congress about a very difficult fibroid, removed in a way that was both brilliant and safe.

I will dwell for a moment on the pyloroplasty that Finney performed for us.

We know that under this term, formerly used to designate a simple autoplastic operation of the pylorus, Finney today performs a juxta-pyloric gastroduodenostomy made in such a way that the old orifice of the pylorus is incorporated into the new opening. This results in a considerable enlargement of this orifice as well as a perfect evacuation of the contents of the stomach into the duodenum. Finney has just published his technique recently in the journal *Surgery, Gynecology & Obstetrics*,[6] and I was very impressed by the skilled conduct of this operation, which I only knew theoretically.

Young insisted on showing us one of the conservative prostatectomies that he still performs, making him one of the last advocates of the perineal method. I must say that the precision of his technique and the perfection of his excision continue to make the perineal prostatectomy in his hands very attractive, although I myself continue to favor Freyer's operation,[7] except for cancer (which was the diagnosis in this case).

During this great morning operating session, it seemed that all these surgeons were primarily concerned with two things: First, the healing and health of their patients; and second, the need for self-effacement, to present the work not as their own but as part of the overall activity of the Johns Hopkins Hospital. This remarkable scientific solidarity, worthy in all respects of respect and admiration, is one of the things that struck us the most in our journey through America; whether in New York or in Philadelphia, or in Boston, or in Chicago, or in Rochester, everyone wanted to show us not so much what he could do as what could be done along with his colleagues; this impression of unity is a real strength that honors our colleagues in America.

During the luncheon that was provided to us at Johns Hopkins Hospital after this operating session, we discussed what the relationships could be between those of us who had come from Europe to admire these great and superb efforts, and the surgeons who were pleased to show us the immense resources of this incomparable institution.

It would take a whole series of articles to describe the laboratories of Johns Hopkins Hospital; it would take one whole article to examine the new psychiatric pavilions which have just been built on the most modern specifications, thanks to the munificence of Mr. Phipps. I will only mention here, among the things that struck us the most, the way in which the anatomy of the central nervous system is presented to students:

Serial sections of the bulbar region, for example, are selected 10 at a time, so as to indicate transitions already visible, but not too different; the slightly schematic and very enlarged drawing of each of these cuts is made by means of variously colored inks, on glass plates; these glass plates are perfectly transparent except for the fine lines of the design, and are placed one on top of the other, overlapping very slightly on the previous one, and the set of 10 plates is mounted and fixed in a single frame.

The result is a superposition of sections that can all be read at the same time, thanks to the transparency of the glass; they give, at first sight, the impression of being drawn within a thick pane of glass; it is a true reconstruction which, in an elegant form, allows one to get an idea of the continuity and the complexity of the neural axis. For the cerebellum, the cerebrum, and the spinal cord, one thus manages to have true projections in space, which hold the attention of the student and are at the same time an excellent means of study.

The afternoon was devoted to teaching. This was the program:

2:15 P.M., Dr. Cullen: Embryology of the umbilical region.
2:30 P.M., Mr. Brödel: The teaching of artistic anatomy.
3:15 P.M., Dr. Rowntree: Functional exploration of the liver and kidneys.
3:45 P.M., Dr. Geraghty: Application of functional exploration in surgery.
4:00 P.M., Dr. Howell: The mechanisms of blood clotting.
4:30 P.M., Dr. Marshall: A new method of assaying urea.

Without going into the detail of each of these presentations here, I will simply mention the frequent use of projections, which means that no description is ever given without it being immediately illustrated: The preparation of this pictorial teaching is so perfect that the illustration never waits for the description, nor does the description wait for the illustration. I confess that I had come to America more in favor of teaching at the blackboard than by using projections, but that after the various lectures which I attended in the United States, I have returned very much in favor of projection, as long as there are suitable arrangements for it to be an integral part of the lesson.

Although anatomy still plays a major role in the intellectual training of students at Johns Hopkins Hospital, I was pleased to see that for future surgeons they consider physiology to be of equal importance, and indeed surgeons in the United States seem much more attracted to physiology than surgeons in Europe. This is, I believe, a very important point.

In physiology, Abel gave us a very striking demonstration of what he calls the "artificial kidney." As you know, this interesting experiment consists of diverting the blood of a dog from the femoral artery and returning it through the femoral vein after it has gone through the apparatus. This "artificial kidney" consists of a series of celluloid tubes through which blood circulates, having been anticoagulated by the addition of an appropriate fluid. During this long journey, most of the matter normally contained in urine is filtered from the blood through the celluloid, so that the liquid in which these tubes are immersed becomes itself a kind of urine, and in particular the elimination of drugs can often be strikingly demonstrated for students. When I add that there is a kind of balance between the functioning of the kidney of the animal subjected to this experiment and the functioning of its artificial kidney, we can realize the great physiological value of this device and the way thus opened for future research, both in regard to urinary purification and detoxification of the blood.

From Baltimore, as described in the previous article, we traveled to Chicago and Rochester. From Rochester, we returned to Chicago – where we were able to admire Ochsner's masterful surgery – and visited Niagara Falls. We had an extraordinarily cordial meeting in Montreal, our next stop. Professor Gangitano (from Naples) gave a marvelous address; speaking of the devoted care given to the sick of all races in the splendid hospitals of Canada and the United States, he said that there is only one pain, and only one homeland: "Una dolore, una patria."

From there the route led to Boston. I myself saw only one thing in Boston: It was Cushing's service, and despite all the good things I thought about it before, this visit was for me a real revelation, and one of my greatest impressions of America.

I cannot add much to the portrait of Harvey Cushing that many of us know. His outgoing nature, his great activity, his astonishing self-control, make him an eminently sympathetic type of man, especially suited to be a surgeon. Specifically, I saw him perform an exploratory operation for a tumor of the cerebellopontine space and an intracerebellar exploration. The way he approached the cerebellum, and how all the parts of this delicate neurosurgery took place, were, I repeat, a revelation.

Cushing is a slow surgeon; you might say he pushes the concern for slowness, not as far as to be an affectation, but to establish a method. It is a deliberate slowness, which is accompanied by extreme meticulousness. He performs neurosurgery as if it were eye surgery, and I believe that this is the main cause of his numerous successes; it is a mathematical surgery; everything is calculated, weighed, measured, and this micrometer surgery gives an impression of assurance, security, and confidence in the outcome; it is quite extraordinary.

For these operations on the cerebellum, Cushing employed his table that has been previously described in the *Journal de Chirurgie*, which enables the patient to remain, without fatigue, lying on his stomach, resting on the upper thorax and on his head. In this somewhat special situation, anesthesia is ensured by etherization with Connell's apparatus.[8] It is an etherization by insufflation, not by tracheal insufflation, which is reserved for surgery of the pituitary gland, but it is an insufflation which is done through a series of orifices that pierce the anesthesia mask, and through these orifices a little ether is entrained by a current of air under slight pressure. The part of the patient's face covered by the mask is thus bathed in a constant manner by a minimum of ether vapors suspended in a constantly renewed current of air. The result is excellent, because after anesthesia for 2½ hours, the patient woke up very quickly.

Following the operation, the patients are generally left in the same position in which they were anesthetized. Cushing is of the opinion that there is an advantage in keeping it unchanged for several hours after the intervention, and during this time, a battery of electric heating lamps is arranged all around the head of the patient. I spoke with the patient after this long operation, and it was apparent, thanks to all these precautions, that there was no sign of shock.

Regarding the approach to the cerebellum itself, we generally know Cushing's technique. However, I will specifically mention the marvelous skill with which he handles his pellets of wax for venous hemostasis in the walls of the diploë or the sinuses, and also his use of the instrument that he calls the "giant rongeur forceps," which allows him to easily cut the bony rim of the occipital crests. This is a large and strong pliers whose external appearance is somewhat reminiscent of the old Collin pliers, intended for cutting metal pins.

Another very interesting point is the following: If the cerebrospinal fluid pressure becomes elevated during the procedure, which did occur and was apparent upon raising the cerebellum, Cushing makes a small special trepanation and passes a tube that punctures the posterior end of one of the lateral ventricles. This creates a safety valve through which the cerebrospinal fluid can escape if necessary during the operative manipulations. It alleviates the fear of dangerous elevations of the cerebrospinal fluid during the most extreme maneuvers.

This same search for perfection is found in the organization of Cushing's service, and I would need more space to describe his marvelous teaching, his meticulous records, and the admirable collection of documents which he possesses, especially on neurosurgery.

On Cushing's service, I had the opportunity to see Dr. Cheever perform a blood transfusion using Kimpton's method [3]. In this type of transfusion, the blood does not flow directly from the donor's artery into the recipient's vein, but is temporarily collected in a glass container whose internal walls are carefully coated with Vincent's mixture of stearin, paraffin and petroleum jelly in the proportions of 1:2:2.[9] This glass container, stoppered at its upper part, curved, tapered, and terminating in a cannula at its lower part, gives exit on the side to a short lateral tube at the level of which a cautery bulb pump can be mounted. The vein, and not the artery, of the donor having been isolated, a small opening is made there which makes it possible to introduce the cannula; the venous blood then gradually fills the graduated container. When the amount of blood deemed useful for the transfusion has thus been obtained, the cannula is released from the vein and the tube is quickly brought to the side of the patient, one of whose veins in the antecubital fossa is exposed. The tapered end of the blood container is introduced into it, and the cautery bulb pump, activated, quickly introduces the few hundred cubic centimeters which have been extracted into the circulation of the patient. One or two lateral stitches close the venous incisions of the donor and of the recipient. Everything is done quickly, simply, cleanly. An important point, which must require some dexterity, is the heating of the tube over a lamp, so as to liquefy and spread the paraffin mixture.

In Cushing's department, they are very satisfied with this way of carrying out transfusion, which is obviously far simpler than direct transfusion and which, if it does not alter the blood, nor cause it to coagulate, will definitely become a method of the future.

Back in New York, we were again very kindly welcomed by Carrel who, at the time of the Congress, had already shown us his laboratory at the "Lying-in Hospital."[10]

His laboratory at the Lying-in Hospital is interesting because it is the first practical application of grafts preserved in cold storage at a hospital. Much of the grafting material is provided by newborn children, and a small room, very well set up, allows for aseptic application. This is how I saw, with excellent success, a transplant performed on a lieutenant of the fire brigade of New York, who had a serious hand burn.

Thanks to the kindness of Carrel, we were able to admire the astonishing research of James B. Murphy, at the Rockefeller Institute. This relates to the tumors that he grafts onto allantoic membranes. Murphy has shown that if, at the same time, a fragment of spleen or bone marrow is grafted, this fragment exerts an effect preventing the development of the tumor. It seems that the embryo, since it does not have a lymphatic system, cannot defend itself against the foreign body which is the tumor, but that it can do so if artificially supplied with one by grafting, just as it will when its lymphatic system is already developed at a later stage.[11]

We also saw Noguchi who showed us his preparations and his cultures of treponemes, and Meltzer, in whose laboratory we were given a complete demonstration of intra-tracheal insufflation. And finally, we were introduced to Flexner, the soul of this wonderful Rockefeller Institute.

Carrel had already spent much time with us during the Congress, but had to limit himself to demonstrations of arterial suture. However, during our second stay in New York, he was kind enough to show his French friends his new experiences with heart surgery.

We know that experimental valvular surgery is quite in its infancy; I believe that when Carrel operated for us, it was the seventh or eighth intervention of this type that he had made.

The beginning of the operation consists of a transverse incision of the thorax, widely opening the two hemi-thoraces left and right. It is first of all an obvious demonstration, if it were still needed, of the perfection of the anesthesia and the maintenance of oxygenation using the method of Meltzer. When the excursion of the lung is reduced sufficiently, the pericardium appears very clearly between the two pleurae. After very carefully packing each of the pleurae with sterilized drapes of very fine silk, the pericardium is opened, the heart is exposed, and a clamp, the jaws of which are lined with rubber, is placed on the pedicle of the heart. Since this completely arrests the circulatory system, the time available to the operator is strictly measured: Carrel estimates that we can have three minutes, but that this is a maximum that it is better not to reach; and, in fact, from the moment when the clamp is placed, in the somewhat impressive silence which follows this act so simple in appearance, but so serious in its consequences, an assistant calls out every fifteen seconds to remind the operator how little time remains. In two and a half minutes, Carrel had incised the arterial wall, exposed the valves, cauterized them, and closed the wall with a fine running stitch. The clamp is immediately removed, but the heart is at first a little “stunned.” Then Carrel, very gently and methodically, massages the heart gently and simultaneously increases the intra-tracheal pressure; the lungs distend, oxygenation improves, the heart begins to beat more strongly, and soon everything is back to normal. The chest wall is quickly closed; the dog, still asleep, is put back in a special cage that is constantly ventilated with a hot air blower, a precaution intended to combat any postoperative shock. Carrel kindly allowed me to stay with him for a long time after the end of the operation, and I was able to see the dog gradually waking up and appearing completely normal. During this time, Carrel showed us the dogs that had undergone the same operation a month before, and which now were running around freely, with the most robust appearances of health.

Carrel also showed us his admirable live tissue cultures. One of the most remarkable comes from a fragment taken almost two and a half years ago now and of which my master Professor Pozzi gave an initial description to the *Académie de Médecine* two years ago [4].

The culture of tissues, their transplantation, and the differentiation of the various cell lines are the questions that seem to fascinate Carrel at the present time.

It was the perfect end to a most interesting journey.

Original Notes

1. Pozzi – "A surgical trip to the United States," *Bull. de la Société de l'Internat des Hôp. de Paris*. June 1909, p. 166.
2. Tuffier – "Surgery in America. Its parallels with French surgery," *Bull. de la Société de l'Internat des Hôp. de Paris.* February 1914, p. 45.
3. See A. R. Kimpton – *The Boston Med. and Surg. Journal*. Vol CLXIX, No.22, pp.783-786, November 27, 1913, and *The Journal of the American Medical Association*, November 1, 1913, Vol LXI, p.1628.
4. Since the writing of this article, Professor Pozzi, in a new communication, described the current state of this culture to the *Académie de Médecine* on 9 June 1914. (See *La Presse Médicale,* No. 46, 10 June 1914, p. 443.)

Original Illustrations

[Not reproduced in this volume.]
Figure 1. – The Jefferson Hospital in Philadelphia.
Figure 2. – Saint Mary's Hospital in Rochester, Minnesota.
Figure 3. – The Johns Hopkins Hospital in Baltimore.
Kimpton vessel for blood transfusion.
Kimpton vessel full of blood.

Biographical Sources

Speck R, "Robert Proust – an eminent doctor in the shadow of his famous brother Marcel," *World Journal of Urology* 2001; 19:285-291.

De Costa C, "Dr Robert Proust: A gynaecologist's contribution to world literature," *European Journal of Obstetrics & Gynecology and Reproductive Biology* 2013; 170:47-49.

Publication Source

La Presse Médicale is still published. Historical issues are obtainable through the Internet Archive.

Translation Notes

1) There is also a description (in French) of this *Voyage Circulaire en Amerique* at the end of the official report of the *Quatrième Congrès de la Société Internationale de Chirurgie*, Bruxelles: Hayez, 1914.
2) The author actually writes “Court Hill” (in English), but surely means “Camp Hill,” which was the country home of the van Rensselaer family about 15 miles outside of Philadelphia.
3) The author misspells the name “Widmer.” Rembrandt’s *Mill* and other items from the Widener collection are now in the National Gallery of Art in Washington.
4) Like many others, the author says “John Hopkins” initially, but later in the article correctly says “Johns Hopkins.”
5) The author is referring here to John B. Murphy, as opposed to James B. Murphy of New York, who is mentioned later. While John B. Murphy was President of the American Medical Association in 1912 he had published a six-part “Contribution to the surgery of bones, joints, and tendons” in the *Journal of the AMA* (58:985-990,1094-1104,1178-1189,1254-1265,1345-1352,1428-1431). The last two sections discuss his procedures for ankyloses.
6) Finney JMT, Friedenwald J, “Thirteen years’ experience with pyloroplasty,” *Surgery, Gynecology and Obstetrics* 1914; 18:273-284.
7) Suprapubic transvesical prostatectomy.
8) See Connell K, “A new ether-vaporizer: A preliminary report on the technic of intrapharyngeal insufflation anesthesia,” *Journal of the American Medical Association* 1913; 60:892-894.
9) See Vincent B, “Blood transfusion in infants by means of glass tubes,” *American Journal of Diseases of Children* 1911; 1:376-381.
10) The Lying-In Hospital (E. 2nd Avenue, 17th-18th Street), was an autonomous women’s hospital donated by J. P. Morgan. It merged with New York Hospital in 1932, dropping the name, and has today been converted into condominiums called Rutherford Place.
11) It would be many years before James B. Murphy’s work was widely appreciated. See Silverstein AM, “The lymphocyte in immunology: from James B. Murphy to James L. Gowans,” *Nature Immunology* 2001; 2:569-571.

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Eduard Sonnenburg (1914)

Eduard Sonnenburg was born in Bremen in 1848, and studied medicine in Heidelberg and Jena. He served as a medic in the Franco-Prussian War of 1870. After graduation, he became a surgical assistant first in Strassburg (which had become part of the German Empire as a result of the war) and then in Berlin, where he was an assistant to Bernhard von Langenbeck. He became an Associate Professor and was acting chief after the death of Langenbeck until the arrival of Ernst von Bergmann, and then was chief at the Moabit Hospital in Berlin starting in 1890.

Sonnenburg practiced general surgery including burns, orthopedics, and urology; he was best known for his studies and writings about appendicitis.

At the age of 66, he headed the German delegation for the New York meeting of the International Surgical Society, and visited several American centers as part of the post-congress tour. He recorded his experiences in the following report.

A few weeks after this article was published, he had a recurrent kidney hemorrhage from which he did not fully recover, and he died in 1915.

Von dem IV. Kongreß der Internationalen Gesellschaft für Chirurgie und dem Kongreß der American Surgical Association New York, April 1914
Deutsche Medizinische Wochenschrift 1914; 40:1433-1435

From the Fourth Congress of the International Surgical Society and the Congress of the American Surgical Association New York, April 1914 [1]
by Eduard Sonnenburg

Having attended the Congress of the International Surgical Society in New York as the Delegate for Germany, I feel it is my duty to give a brief report about the Congress, about the American Surgical Association meeting that immediately preceded it, and about the status of surgery in America.

It may have seemed risky to have the Congress of this new International Surgical Society in America, but the number of participants and the program exceeded all expectations. About 100 surgeons from Europe were present – some with their wives. Most had crossed on the *Imperator*. Germany was represented by 16 members [2]; then came Holland with 13; France, Austria, and the other countries followed. More than 100 American members were there.

The excellent organization and the lavish hospitality of the Americans, even outside the Congress, allowed us to become acquainted with the American surgeons, their activities, and their institutions; after the meeting, we were able to travel from New York to the scientific centers of America: Philadelphia, Baltimore, and Washington, continuing on to Chicago, Rochester (Minnesota), Montreal in Canada, and Boston. In each of these cities, a committee had been formed to receive us.[1]

The International Congress was under the excellent and very skilled leadership of Depage (Brussels); on the first day he presided himself, on the second day Sonnenburg (Berlin), and on the third day Hartmann (Paris). For the subjects of the presentations and discussions, I refer you to the detailed report of Dr. Tölken, which has already been published [3].[2] Despite the different languages, participation in the discussions was very good. The presentations and discussions about duodenal ulcer and transplantation were especially engaging. On the latter topic, Lexer's well-illustrated talk generated particular interest. Depage opened the International Congress with a well-considered address on "War Surgery."

Since we arrived early in New York, we had the great advantage of also attending the meeting of the American Surgical Association, which took place on Thursday, Friday, and Saturday before the International Congress began, under the chairmanship of William Mayo. The American Surgical Association is organized in a different way than, for example, the German Surgical Society. It is different particularly because it has only a limited number of members; acceptance is exclusive, so that the hundred surgeons who constitute the society may be considered only the best-known and most deserving. Others who have been introduced by a member can also participate in the discussions. Of course, the criteria for presentations are not as strict as with us; however, since the presentations are all from excellent, experienced surgeons – naturally leading to very lively discussions – the American Surgical Association offered an excellent insight into the current thinking of our colleagues in almost every area of surgery. I should add that most of the surgeons are remarkably skilled debaters, so that this meeting was as engaging and interesting as you could imagine, and an excellent preparation for the tour we made later. The meeting continued through Friday and Saturday. Thoracic surgery was the subject of the morning sessions, which brought out new things especially in the experimental cardiac surgical studies of Carrel and case reports of heart operations. William Mayo, Charles Mayo, Murphy, Brewer, Gibson, Willy Meyer, Armstrong, Lilienthal, and others were the main speakers. On Saturday, they discussed the restoration of ankylosed joints of the extremities using pedicles of fascia and fat (Murphy) and a whole series of other interesting topics (Rodman, Kammerer, Gerster, Ochsner, Beck, Binnie, Coley, McArthur, Hoguet, and others).

But the presentations at the Congress were not the only way to hear the ideas of leading surgeons from the different parts of America; they were also expressed through the operations that the New York colleagues performed in their splendid hospitals, and finally on the tour of the cities mentioned above we could not have hoped for a better view of the practice and thinking of American surgeons. It is difficult to single out the most important thing from the abundance of experiences. To be sure, we were dealing with the elite of American surgery, but things seem to be going well generally with the scientific and technical training of surgeons. Anyway, the American newspapers alone cannot give you an accurate picture of the accomplishments and education of surgeons and the status of their science. As everywhere in America, the capability of surgeons depends upon the details of their work; surgeons are no exception in this respect. Almost every surgeon has a special area of interest: For example, Charles Mayo in the area of hyperthyroidism; William Mayo, Willy Meyer, and Gibson in abdominal surgery; Murphy also in the management of the joints, likewise Baer (Baltimore) and others;

Young is known for his prostatectomies, Cushing (Boston) for his excellent operations on the skull and brain.

In order to understand surgical practice in America, it is necessary to be aware of some general considerations, and especially the circumstances under which they are working: First, the patients. Since there is no public medical system and no insurance for workers (which we sometimes overdo), the workers who get sick are always eager to return to work as soon as possible to earn money. This explains why a worker who loses a limb is willing to purchase a functional prosthesis that may cost 1000 *Mark*[3] or more. The prostheses (arm and leg) made in America that were demonstrated at the Congress can replace a missing limb amazingly well using clever mechanics. The worker knows that in many cases an operation will restore function more quickly than non-operative management; they do not want to let a problem get worse during a course of non-operative treatment that may last for years but will quickly agree to an operation. The special characteristics of Americans, their readiness to try something, their decisiveness, their optimism, and their good humor, which the surgeon also possesses, all tend toward a decision for surgery. This explains why surgeons are often able to manage diseases at an early stage, and also explains why early operation, for example in appendicitis, first became accepted in America, and that they have fewer cases of acute appendicitis, because the appendix is removed for the slightest indication, before it results in an attack. The frequency of appendicitis is now exceeded by that of duodenal ulcer. The symptoms that were earlier attributed to appendicitis are now in part the same as for duodenal ulcer. Again, they have accumulated a huge number of cases.

It is understandable that given the opportunity for early operations mentioned above their statistics will be favorable. This is also true, for example, for tumors that are discovered at an early exploratory laparotomy and can be removed at a favorable stage. Clearly, the clinical symptoms at an early stage are not as definite, so that the diagnoses must be made with some doubt, and when compared to the thoroughness that is usual in Germany, one may get the impression that the indications are sometimes looser in America. But this is not true. It has nothing to do with unscientific practice by American surgeons; they just do more exploratory laparotomies than we do – because the patients want them to. Thus, for example, on the operating schedule at the Mayo Clinic it says: "Explore stomach, gallbladder, and appendix; Explore gallbladder, duodenum, and appendix." The exploratory laparotomy often has to do with a differential diagnosis between duodenal ulcer, appendicitis, or gallbladder disease. You have to see the surgeons in their clinics to correct the criticism you may have made earlier, that they operate without proper indications. You will be convinced that all of their interventions are well-considered and for the benefit of the patient. The Americans operate carefully, usually not too fast or hastily, with anatomic precision, making small incisions, and avoiding every unnecessary injury to the tissues, protecting the muscles. They still like the cigarette drains, vascular suture is done with ordinary straight needles. The management of ankylosed joints with implantation of sterile animal membranes (Baer's Membrane) is also interesting.[4]

The reputation of a surgeon in America depends primarily upon his successes. The flow of patients from far and wide is measured by successes. This explains how many who began as general practitioners – since there are no titles or other external distinctions in America – after a few years can be considered among the leading and best surgeons without any particular specialized training. It is sometimes amazing what a colossal number of patients a busy surgeon may have, which they can barely manage on their own. I will mention that fortunately the aseptic and hygienic arrangements are excellent everywhere in America, and that every doctor uses ether as a safe anesthetic. (With ether anesthesia, only the pulse and breathing are monitored; the eyes are covered with pieces of rubber.) It is true that we saw some hospitals that did not have the strict adherence to asepsis that we are used to, although as far as we could tell the results were still excellent. I had the impression that since rubber gloves were introduced the other principles of asepsis have been somewhat disregarded.

Surgeons in America have hospitals with luxurious facilities such as we in Germany generally do not enjoy. This is because many hospitals owe their foundation and maintenance to private donations. The operating costs are partly met by private patients, whose rooms, comfortably furnished with bathrooms, etc., cost 30-100 dollars per week. Even the older hospitals, like the one in Baltimore, have been renovated to meet all the requirements. However, Ochsner and Murphy in Chicago do not have such luxurious hospitals. The enthusiasm that American surgeons have for their profession, more than in other lands, can be explained by how comfortably they can get around with the help of numerous elevators, even to the wards on the 14th floor; the reliability of electrical power for lighting and machinery that is unequalled in any other country; the well-educated nurses of high social status, who also assist with anesthesia and operations; the staff of well-trained doctors who, although they change places more often than ours, provide excellent support to the surgeon; and the typewriters, phonographs, and stenographers that make their work easier. On the other hand, many institutions and clinics change their chief of surgery periodically. This does not always reflect on the quality of the service but may be due to personal or political circumstances, the wishes of the donor, etc.

Most of the hospitals have affiliated scientific institutes and laboratories. Everywhere they are working diligently in the areas of pathology, bacteriology, biology, and experimental surgery. Recently, for example at the Rockefeller Institute, they have added infirmaries where they can immediately try out the experimental results on patients. Thus, surgical work has become much more scientific than was the case several decades ago, and although they began by standing on the shoulders of European researchers, they are now independent practical and academic physicians.

In Europe it is difficult to conceive of the large sums that have been donated by wealthy Americans for hospitals, clinics, etc. For example, a wealthy American gave two million dollars just for the operating rooms at Mount Sinai Hospital in New York. As a result of this lavish donation, it is no surprise that almost everything is beautifully constructed out of marble. Saint Luke's Hospital,[5] a gift of Vanderbilt, is also made of marble. New York has 42 hospitals. At the General Memorial Hospital,[6] Coley demonstrated the management of inoperable sarcoma with the "mixed toxins" of erysipelas and *Bacillus prodigiosus*;[7] in the Hospital for Ruptured and Crippled,[8] Walker and Hoguet demonstrated the radical repair of hernias; in the Rockefeller Institute, Carrel demonstrated his famous new experimental work; and in the Roosevelt Hospital,[9] Brewer demonstrated new methods of fracture management. In New York alone there were so many demonstrations, patients, and methods to see that there was scarcely time to see everything during our stay. The Johns Hopkins Hospital in Baltimore is exceptionally interesting, along with its medical school that is the equal of the great and famous Harvard Medical School in Cambridge/Boston. In Baltimore are Halsted, Kelly, Baer, Young, and others; in Boston Cushing, Warren, Watson, Mixter, and Elliot, the last being the famous Senior and Rector. The facilities of the radiology laboratories are exceptionally wonderful; for example, they are able to take 50-60 pictures of a single patient to verify the diagnosis of duodenal ulcer. Thus, it is no surprise that we found the quality of radiographs to be excellent everywhere. – The hospitals are sometimes very tall; the German Hospital[10] in New York has ten stories; its private inpatient rooms should be splendid. In Philadelphia, the wonderful anatomic collections and the library of the College of Physicians are remarkable.

I would like to mention at this point that the gratitude of wealthy patients to their surgeons is often expressed in a way that is unusual for us. Both in Baltimore and in Boston, famous surgeons have their own hospitals, built for millions of *Mark* by grateful patients.

The hospitals often have excellent ventilation systems, for example in Baltimore – also they have open wards on the roofs and in the connecting corridors, which have similarly been introduced in our newest hospitals. I will add that the Johns Hopkins Hospital[11] in Baltimore has a beautiful and practical pavilion for psychiatric patients, donated by Mr. Phipps, with 600 beds and 70 assistants. – I spent a lot of time with the Mayo brothers in New York, and learned about all their facilities, their operating methods, etc. These outstanding men are the sons of a general practitioner who performed surgery in the town of Rochester (Minnesota). Through their own efforts, without any additional support, the sons created a model hospital (St. Mary's Hospital, with Catholic sisters) that has become world-famous. Unfortunately, at the last minute I was unable to make the anticipated visit to Rochester; I will therefore supplement my own knowledge with the personal report of Dr. Tölken.

"Rochester is a little country town; it has only one paved main street, so that after a rainstorm the others were in terrible shape. The surrounding area is nice, with rolling hills and many woods, like many parts of Thüringen.[12] American country houses made of wood contain a surprising amount of space and are well furnished. The town has 8000 inhabitants and is said to have 2000 automobiles! They seemed to think that a 10-minute walk from the hotel to the hospital would be an inconvenience. The visitors from the Congress, having spent the night on the train, were not given the opportunity to wash or shave at a hotel. They were not taken to their hotel rooms, but were immediately brought to the clinic to see the operations. The famous organization made a strong impression on the visitors. The four-story "diagnostic clinic" contains 60 special assistants and 160 other employees. Every day they examine 100 to 120 new patients. The large waiting room is like a hotel lobby. Everything is equipped with the most elegant and modern arrangements. Once the patient has completed the standardized, factory-like evaluation, which is very thorough and complete, he is admitted to the hospital, which only has 300 beds. After the operation, usually on the 5th to 8th postoperative day, he goes to one of the three hotels belonging to the Mayos, to one of the sanatoriums, or to a private lodging. They operate every day from 8:00 A.M. to 1:00 P.M. in six small operating rooms with six surgeons, who are all technically excellent; William Mayo is the best and most elegant. They average 25-30 cases per day, with a printed program for the numerous observers who are always present and have a "Surgeons' Club" with its own clubhouse, daily discussions about the operations, and lectures (sort of a continuing education course). All the

Mayos' operations are done under simple and skillful ether anesthesia. All the patients come from a distance, so there are naturally no acute cases. The bulk of the operations involve the stomach, bowel, appendix, gallbladder, rectal cancer, and above all goiter and hyperthyroidism; in addition, there are kidney and gynecologic laparotomies. There are almost no breast, head, or extremity operations, according to the annual report. The whole organization of the operative service, asepsis, and technique are quite excellent, and they have splendid results. It should pointed out that, as everywhere in America (and already mentioned), there are many exploratory laparotomies: 'Exploration gallbladder, duodenum, appendix'. Also, the people here are eager to go back to work as soon as possible; if their pain does not go away in eight to ten days, they demand an operation and do not want to hear any more about non-operative management." Thus Dr. Tölken also reports that Mayo has to remove some minimally abnormal gallbladders and appendices, because he says the patients insist on it; otherwise, they will just run to the next surgeon and have him remove the organ.

In Boston, Cushing operates at a completely new, well-equipped hospital,[13] which has 130 nurses for only 200 beds; he does almost exclusively craniotomies; he does not operate very fast, but with unusual precision and with painstaking hemostasis and asepsis.

As you know, blood transfusion has been widely used in America, especially for pernicious anemia, severe hemorrhage, and septic conditions. Carrel has been using transfusions from the mother to the child in Barlow's disease,[14] with apparently good results. He uses a direct anastomosis of the donor's radial artery to the recipient's femoral vein by vascular suture, ligates the vessels after the transfusion is complete, and excises the anastomotic site. However, others omit the preliminary test for hemolysis and simply use a specially constructed cannula. In Chicago, Percy showed some of our members a blood transfusion from son to father using his own instrumentation. A 750 cc glass cylinder is coated internally with paraffin; the narrow point is inserted into the cephalic vein of the donor and the blood is sucked out by mouth through some tubing.[15] Then the point is inserted into the cephalic vein of the recipient. The blood does not coagulate at all, and the entire procedure only takes two or three minutes. (Report of Dr. Tschmarke.)

The opening of the International Surgical Society Congress was attended by Surgeon-General W. C. Gorgas of the United States Army, representing the President of the Union. Gorgas is famous for his successful campaign against the epidemics and fevers in the region through which the Panama Canal was built. His sanitation of this area afflicted with malaria and other fevers made it possible to complete this gigantic project, which the French failed to do in part because so many of their workers were laid up with fever. The military doctors are very respected in America because of their diligence and success in the area of sanitation.

It is difficult to specify the most important things among the abundance of what we saw and experienced. I will only add that our interactions led to genuine friendships with American colleagues, that we were able to become acquainted with the land and its people, that we were shown the possessions and art collections of the billionaires, so that the participants in this wonderful journey will look back on it with great pleasure. Surgery has developed very powerfully in America, and in the future it would be a good thing for us to send our students to America; they can learn much there.

The General Session of the Congress of the International Surgical Society in New York closed on 15 April 1914. The next Congress will take place in Paris under the chairmanship of the famous surgeon W. W. Keen of Philadelphia.[16] Dr. Willems (Ghent) is again President of the International Committee, the faithful General Secretary Dr. L. Mayer (Brussels) and the worthy Treasurer J. Lothioir will remain in their offices. The General Session has authorized the countries to enlarge their memberships. Having been re-elected as Delegate for Germany, I would be pleased to accept new applications.

The following topics have been placed on the agenda for the Fifth Congress of the International Surgical Society in Paris for 1917:

A. Surgery of the heart and blood vessels, including thromboses and emboli. Blood transfusion.
B. Management of tumors using X-rays and radium.
C. Blood tests and biological reactions in surgical disease.
D. Fractures of the lower leg and ankle.
Addendum: Diagnosis and management of tetanus.

Original Notes

1. Address to the Berlin Surgical Society on 22 June 1914.
2. Drs. Franke, Garrè, Jurasz (representing Payr), Kraske, Kümmell, Lexer, Neuber, Rehn Sr., Rehn Jr., Ritter, Schlange, Sonnenburg, Steinthal, Tölken, Tschmarke, Witzel.
3. *Deutsche Medizinische Wochenschrift* Nr. 23-25.

Biographical Source

Mühsam R. Eduard Sonnenburg. *Deutsche Medizinische Wochenschrift* 1915; 41:774-775.

Publication Source

The *Deutsche Medizinische Wochenschrift* [German Medical Weekly] is still being published. Historical issues are obtainable through the Hathi Trust.

Translation Notes

1) There is also a description (in French) of this *Voyage Circulaire en Amerique* at the end of the official report of the *Quatrième Congres de la Société Internationale de Chirurgie*, Bruxelles: Hayez, 1914.
2) This report is in the *Deutsche Medizinische Wochenschrift* 1914; 40:1197-1199,1245-1247,1293-1295. It is basically a German translation of information contained in the official report mentioned above.
3) The *Mark* was the monetary unit of Germany, worth about $0.24 at that time.
4) See Baer WS, "Arthroplasty with the aid of animal membrane," *American Journal of Orthopedic Surgery* 1918; 16 (old series): 171-199.
5) Now the Mount Sinai Morningside Hospital.
6) Originally founded as the New York Cancer Hospital, this institution was then called the General Memorial Hospital and has evolved into the Memorial Sloan Kettering Center.
7) See Coley, "The treatment of inoperable sarcoma by bacterial toxins," *Proceedings of the Royal Society of Medicine* 1909; 3(3) (Surgical Section):1-48. *Bacillus prodigiosus* is now called *Serratia marcescens*.
8) The Hospital for Ruptured and Crippled is now called the Hospital for Special Surgery.
9) The Roosevelt Hospital in New York, founded by a distant cousin of the presidents with that name, is now the Mount Sinai West Hospital.

10) Now the Lenox Hill Hospital.
11) The author initially gives the name correctly, but then, like many others, says "John Hopkins."
12) Thüringen is a relatively rural part of eastern Germany which includes the cities of Erfurt, Jena, and Weimar.
13) The Peter Bent Brigham Hospital, now the Brigham and Women's Hospital.
14) Barlow's disease was a name for infantile scurvy.
15) Oral suction was indeed used to produce negative pressure for the phlebotomy, through a long tube remote from the blood, as better described by Percy NM, "A simplified method of blood transfusion with report of six cases of pernicious anaemia treated by massive blood transfusion and splenectomy," *Surgery, Gynecology & Obstetrics* 1915; 21:360-365. In the article Percy does recommend preliminary testing for hemolysis.
16) The Fifth Congress in Paris did not take place until 1920.

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Léopold Mayer (1914)

Léopold Alexandre Mayer was born in Brussels in 1877. He studied medicine at the Université Libre de Bruxelles, graduating in 1901. He trained in surgery with Antoine Depage, and assisted Depage in the foundation and administration of the Société Internationale de Chirurgie (SIC, International Surgical Society). He was appointed Professor Agrégé at the Institut Médico-Chirurgical in 1905, and Professor Agrégé at the Université Libre in 1911.

In 1914, at the age of 37, he traveled to America for the Fourth Congress of the SIC, and afterward visited several surgical centers along with other SIC members, reporting on this tour in the article which follows.

A few days after this article was published, the German army invaded Belgium, and occupied it until 1918. Mayer was able to preserve the archives and structure of the SIC during this time, while continuing to practice general surgery and surgical oncology. He did the same during the second German occupation of 1940-1944.

He was awarded the Belgian *Légion d'Honneur* for national service. He was elected an Honorary Fellow of the American College of Surgeons in 1946, and President of the SIC in 1947. He died in 1955.

Impressions d'Amérique. Notes recueillies au cours d'un voyage chirurgical aux Etats-Unis et au Canada.
Journal Médical de Bruxelles 1914; 19:413-422

Impressions of America. Notes collected during a surgical trip to the United States and Canada
by Dr. L. Mayer

Lecture with slide projections [not included in published article], delivered at the Society of Medical and Natural Sciences of Brussels, 6 July 1914

Gentlemen,

As you know, the International Society of Surgery held its Fourth Congress this year in New York, from April 13 to 16, under the chairmanship of Professor Depage.

Following the congress, we had organized an excursion through the United States and Canada, in which about a hundred Europeans had the opportunity to visit the principal surgical centers of North America.[1]

After an excursion of 8000 kilometers over three weeks, I would not presume to make any definitive judgments about the hospital and scientific institutions of America [1]; but, thanks to the chivalrous hospitality extended to us by our American colleagues, and above all to their extraordinary talent for organization, we were able to see many new and interesting things in a very short time, and I thought a brief account of this trip might be of some interest to you.

If I make a point of presenting this to the Society of Sciences rather than to the Society of Surgery, it is precisely because I was struck by the fact that in America surgery is less clearly separated from the other branches of the healing art than in Germany or France. On several occasions we heard lectures or communications on subjects whose immediate relationship to surgical practice is hardly apparent.

For example, in the amphitheater of Mercy Hospital[2] in Chicago, I was rather surprised to hear Dr. Kanavel give us an anatomical demonstration of the different foramina of the base of the skull, and to have Dr. Lewis dwell at length on the origins and treatment of articular rheumatism; similarly Dr. Rosenow, at the Presbyterian Hospital,[3] showed us a series of experimental studies showing the streptococcal origin of certain affections of the digestive tract.[4] During our stay in Baltimore, the Americans were likewise eager to convince us that their laboratory work is in no way inferior to their surgical practice.

But before taking you through the main cities of the United States, I would like to give a quick overview of the work of the Congress, which was the occasion for this remarkable journey.

We may be tempted to say that congresses are only pretexts for parties and banquets, but at least this time, we can demonstrate that the society actually achieved its goal, namely to foster the progress of science by elucidating various surgical issues.

Three questions had been placed on the agenda, specifically chosen because they were areas in which the Americans had acquired a particular reputation.

The first question related to the *technique of amputations*. The various speakers showed that all efforts should, on the one hand, be aimed primarily at extending the field of conservative surgery, and on the other hand, at improving prosthetic devices. Autogenous vaccine therapy, early mobilization of stumps, removal of the tourniquet, have met with warm supporters; Bunge's procedure seems most favored for securing a painless stump of the leg; Binnie's articulated arms have achieved great success in returning upper limb amputees to near perfect function.[5]

One of his patients in particular, although both arms had been amputated, managed to write legibly, to smoke a cigarette, to pick up pins from the ground, to cut his own meat, and to drink and eat without any assistance. All movements of the forearm and fingers are possible (pronation, supination, rotation). He shakes hands with the greatest energy and can use each finger independently.

What is most remarkable in these devices is the simplicity of their construction, the whole mechanism residing in a set of pulleys moved by three cords.

The second question related to *ulcers of the stomach and duodenum* and was of particular interest because of the differences of opinion between European and Anglo-American surgeons.

All agreed that the diagnosis of stomach ulcer and duodenum cannot be made with the absolute precision that it had been assumed a few years ago, and warned against errors of interpretation due to the Roentgen rays, without diminishing their considerable importance.

It is quite certain that, radiographic examination of the stomach usually makes it possible to determine that one is in the presence of a cancer or an ulcer, as you can see in the pictures here, but it also true that radiography, especially for the hourglass stomach, has often led to erroneous interpretations.

There was also enthusiastic agreement about the inaccuracy of statistics on mortality from medically treated stomach ulcers, because these do not take into account perforations, hemorrhages, and subsequent malignancies.

A clear trend has also emerged in favor of resection, possibly in two stages, of indurated ulcers of the stomach, the carcinomatous nature of which seems increasingly obvious, and in favor of the systematic non-exclusion of the pylorus after gastroenterostomy, provided the connection is made in the right place.

Hartmann, in particular, has clearly shown, by a series of very interesting experiments, that, even when the pylorus is open, food passes through the newly formed orifice, provided that it is wide and is located in the gastric antrum.

On the other hand, there was continued disagreement about the relative frequency of stomach and duodenal ulcers: All of the American surgeons find 3 duodenal ulcers for 1 gastric ulcer, while German, French, and Swiss surgeons find 1 duodenal ulcer for 8 or 10 stomach ulcers. I should point out, however, that in a communication about perforated ulcers, Gibson (of New York) noted a marked predominance of gastric ulcers, as in Europe.

Before the congress, European surgeons thought that this numerical difference was simply based on a different definition. You know that William Mayo considers everything below the pyloric vein to be duodenal, and everything above it to be gastric. Since there are frequent anomalies, it seemed rational to suppose that the lesions that we call pyloric ulcers are called duodenal ulcers by the Americans, and thus we could find an easy way to agree. However, we discovered that this is not the case. During our trip, I myself saw about twenty duodenal ulcers, that is to say, more than I will see in a year here. It is therefore certain that they really are more frequent over there, and I think that the cause of this difference resides above all in the very particular diet to which the stomachs of Anglo-Americans are subjected and that we must blame cocktails, frozen drinks, lemonade, raw tomatoes, spicy dishes, various condiments, oyster soup, and other originalities of the American cuisine.

The third question, concerning *grafts and transplantations*, made it possible to clarify the current state of this subject which was still cluttered with a host of inaccurate data. The works of Lexer, Morestin, Murphy, and Villard have shown the considerable progress made in reconstructive surgery and in arthroplasty by grafts of hair, cartilage, bone, vascular, and fat tissue. On the other hand, the researches of Carrel and Ullmann have established that organ transplants, apart from autograft, are currently of no practical value.

Here are some photographs taken from Dr. Morestin's report which clearly document the admirable results obtained with conservative surgery and autografts.

There are various points about American hospitals that I would like to review. First I will discuss the buildings themselves, then I would like to say a few words about the administration of American hospitals, their medical and nursing staff, and their populations; finally, I will briefly mention a few techniques which impressed me in the surgical departments, some of which deserve to be imitated here.

I. Construction of American hospitals

All the American hospitals that I had occasion to visit in New York, Philadelphia, Baltimore, Chicago, Rochester, Boston, and Canada, are built with multiple levels for the same reason that has required the Americans to erect their other buildings in this way.

In Europe, as you know, the opposite type is currently favored, and the new hospitals, such as those of Saint-Gilles[6] and Jette[7], are built according to the model of separate pavilions as especially introduced by the Eppendorf Hospital[8] in Hamburg. In the eyes of the Americans, this model has the disadvantage of requiring a very considerable area of land for a relatively small number of beds and of requiring general services (kitchen, heating, ventilation, etc.) which are very expensive and very complicated. The considerable cost of land in the United States and the practical spirit of the Americans have led them to pursue the opposite course, which consists in raising hospitals to a height, so as to put 250 to 300 beds on a rather restricted site. As you know, the same is true for all their buildings, and what is most striking on arrival in New York is indeed the size of these large buildings, such as the banks, the trading houses, and the Broadway offices.

I show you here the view that we have of the port of New York, and the immediate impression of its imposing character.

One of the largest of these buildings, the Woolworth Building, is 792 feet high, 58 stories, with 3000 windows, 8000 electric lights, and 28 elevators which, placed end to end, would cover a length of three and a half miles; the view from the top of the tower extends for a radius of 40 miles.

Without reaching such enormous proportions, American hospitals tend toward this type of construction, so it is not uncommon to find operating rooms on the sixth, seventh, or eighth floor; indeed, the new German Hospital in New York has twelve floors.

In New York, whose population is more than three million, and whose length is equivalent to the distance from here to Antwerp, the number of hospitals is forty-two. The main ones are the Roosevelt Hospital[9], the New York Hospital[10], Mount Sinai Hospital, Bellevue Hospital, the Memorial General Hospital[11], and finally the German Hospital[12], which have mostly been renovated in recent years or have added new wings. They are all provided luxuriously with marble, the walls of all the corridors are covered with it and most of the operating rooms are in white marble from the floor to the ceiling. A generous donor gave two million just for the Mount Sinai Hospital operating room!

The fear of fires, which are frequent in New York, has excluded the use of wood in the new constructions, which are built entirely out of iron or reinforced concrete. Since there is still concern about fires, we saw everywhere outside fire escapes or ramps by which the patients could be quickly evacuated.

The facades are also cluttered with ventilation galleries for aerotherapy treatments, which is a considerable concern for the Americans since it is the basis of their treatment of pneumonia and septicemia. I admit that I was quite surprised to see patients with a fever of 40° and severe pneumonia lying shivering in the open air, despite the cold. It is an interesting approach, but I would not want to imitate it.

Most operating rooms in American hospitals have tiered lecture halls for students who sometimes attend operations in large numbers. At the Presbyterian Hospital in Chicago, I counted 500 auditorium seats. The careful construction made it possible to counter the disadvantages of the presence of such a large number of people from the point of view of the risks of asepsis, at least to some extent.

The operating rooms generally have wide bay windows for illumination and are well equipped with electrical apparatus for night operations, lanterns for light projection, etc.

Almost all hospitals have lecture halls and reading rooms, well-stocked libraries, well-equipped X-ray and clinical research laboratories, and there is almost always a section for the private patients of the hospital's surgeons, who are thus separated from the general ward. This is a point to which we shall return later.

The hospitals of New York are scattered throughout all parts of the city and are generally quite far apart due to the large expanse of the city. They are interconnected by rapid and numerous means of transportation, below and above ground. The latter, called "elevated," pass in most avenues at the height of the second floor of the houses, at a dizzying speed and with a deafening noise.[13] On all the lines, even on the electric tram lines, there are express trains, which, in the underground passages, require great attention if you do not want to wind up ten kilometers beyond where you wanted to go. The Americans have perfected all the means of transportation, from the ferryboats, which are like rafts that can transport whole trains from one bank to the other of the great rivers, to the railways, some of which are formidable, like those of the Pennsylvania Railroad and New York's Central Station. The latter, established in the heart of New York at a cost of 900 million francs,[14] has three floors of superimposed platforms and 36 tracks. The station in Washington has 200 meters of facade, a huge waiting room built like the baths of the Emperor Diocletian with all the refinements of the most modern comfort, including lockers available to travelers.

This gigantic character notable in all American constructions is also found in the hospitals.

Although New York has several schools of medicine, I did not see there, properly speaking, a university in the sense that we attach to this word, and I did not visit any interesting laboratories except for the Rockefeller Institute. It was in the latter that Carrel has made his sensational experiments. For example, I saw him transplant, with an irreproachable technique, a piece of the carotid artery from the right side to the left side without any ill effects on the animal.

He also showed us dogs in which he had, a few days before, incised, sutured, or resected a mitral valve by cardiotomy, and which were doing wonderfully. The first animals in which he had done it had died, but by perfecting the asepsis and by performing a cardiac puncture to aspirate the air introduced during the operation, he managed to obtain consistent success.

He also showed us transplantations of an entire extremity with a perfect operative result and survival of several weeks. Unfortunately, like all heterogeneous transplants, these limb grafts always end up being rejected. Carrel hopes to overcome this by distracting the receptors with an experimental infection.

The Rockefeller Institute is set up very luxuriously and has a farm in the countryside for the maintenance and breeding of dogs, of which a hundred are still undergoing experiments. To avoid eye fatigue due to the sustained attention required for these very delicate operations, Carrel and his assistants wear black gowns and operating masks and also use black fabrics for the operating field and compresses. Upon entering his operating room, the appearance of all the staff in "balaclavas" is a bit frightening.

Carrel puts the animals to sleep using intratracheal anesthesia with ether, following the method of Auer and Meltzer, and after the operation they are placed in a cage under a current of very warm air for half an hour, to prevent hypothermia.

We also admired under the microscope embryonic heart tissue cultured in an incubator for more than a year, which even after this lapse of time still proliferated and retained its contractility.

Having been very busy with the congress, I was not able to devote much time to visiting the New York hospitals, which they undoubtedly deserve, and I will not dwell on them any longer.

Our next stop was *Philadelphia*, a less formidable but much more pleasant city, which has two large hospitals, the Pennsylvanian and the Jefferson Hospital. In addition, part of the university hospital has been rebuilt recently and has very nice sterilization and X-ray facilities. In this city, our attention was briefly diverted by a visit to the "College of Physicians," a sort of doctors' clubhouse, furnished with extraordinary luxury, ten conference rooms, and a library of 150,000 volumes equipped with iron doors having leaded contacts which would close automatically in the event of a fire. It also has a very fine collection of anatomical specimens and a fine museum of wax models and anomalies.[15]

From Philadelphia we reached *Baltimore* in two hours by Pullman and unfortunately we were only able to stay there one day.

I say "unfortunately" because I had the impression that, of all the cities I visited, Baltimore is, along with Boston, certainly the one where the scientific spirit is the most developed in the United States.

The *Johns Hopkins Hospital*[16], whose name you will surely recognize, is indeed a center of higher education whose effects radiate throughout the world, and what we saw here exceeded the most optimistic forecasts.

The photographs that I am showing you, taken from the annual report, allow us to judge the importance of the buildings of the Johns Hopkins Hospital and also of the luxury and elegance of the new buildings erected especially for sick children and for the psychiatric clinic.

We have Kelly, the dean of American gynecologists, skillfully resecting a huge uterine fibroid, then demonstrating his method of direct cystoscopy. Finney demonstrated to us his procedure of gastroduodenostomy for a pyloric ulcer adherent to the gallbladder. He recommends preparing the patient for three days with sterile meals and gastric lavages with carbolized water.[17] Baer did a hip replacement operation with pig bladder interposition,[18] and Young did a perineal prostatectomy for cancer. Out of 750 cases, he claims never to have had incontinence.

The afternoon was devoted to experimental demonstrations in the university laboratories, which are located close to the hospital.

We first saw Abel demonstrate his ingenious device that works like an *artificial kidney.*[19] This consists of celluloid diffusion tubes contained in a large glass cylinder filled with water. One end of the diffusion tubes is fitted to the femoral artery of a dog and the other end to the contralateral femoral vein. On the inlet tube, a T-tube constantly mixes the blood with a hirudin solution[20] to prevent clotting. The amino acids and all the diffusible products, sugar, urea, etc., are thus removed from the blood. While the apparatus is in operation, the kidneys are almost completely at rest, and the experiment can continue for sixteen hours without harm to the animal.

Dr. Howell then presented a summary of his work on blood coagulation, paying tribute to the research of our eminent colleague Dr. Bordet.[21] He believes that thromboplastin neutralizing antithrombin, prothrombin, calcium, and fibrinogen leads to the formation of clots; he therefore sees the possibility of hastening or arresting coagulation. In the circulating blood, coagulation does not take place as a result of the excess of antithrombin which is neutralized at the exit of the vessels by thromboplastin in the red corpuscles and the tissues. He was able to extract this substance in its pure state and demonstrated to us its procoagulative effect.

To give us the opportunity to recover from the fatigue of these very busy days, our American colleagues had arranged for us to spend Sunday in *Washington*, the capital of the United States, where we did not have to think about surgery and where I will only mention the lavish constructions of the Library of Congress and the Capitol which also give that impression of abundance which we have had everywhere in America.

This library, which contains nearly a million and a half books, where the rarest marbles, paintings, and sculptures are profusely displayed and whose collections of lithographs and old engravings are unique, also has a remarkable administration.

The service is done with astonishing speed and tranquility. When you ask for an item, the employee marks the exact time of the order with a stamp on the form and, less than five minutes later, the book reaches you by means of a small elevator. The click-clack of pneumatic tubes and elevators is the only noise that can be heard in the huge reading room.

Washington, which is the seat of government and the official residence of the President and the ambassadors accredited to the United States, is a majestic city where one is not oppressed with the skyscrapers of New York, where everywhere there are wide and spacious avenues among the palaces of all the official agencies.

It is a characteristic of the United States that each of the capitals of the different states where the legislature is located and where the governor lives, is also an insignificant city with almost no commercial or industrial development.

After this Sunday of rest, twenty-four hours on the train brought us to the second American powerhouse, Chicago, where, as in New York, there are a very great number of hospitals, almost all old and built on the same model. They are the least beautiful of those we have had the opportunity to visit, and most of my friends preferred to visit the world-renowned slaughterhouses, which might be a model for the organization of certain surgical services. We had the pleasure of finding a hospital founded by one of our compatriots, the Henrotin Hospital,[22] and several Belgian doctors, who assured us that there was a sizeable Belgian colony in Chicago and who gave us a charming welcome.

I must mention here the beautiful work of Murphy on osteoplasty and arthroplasty, of which I am showing you some photographs that clearly document the admirable results which this surgeon has achieved. He showed us a whole series of patients operated on over a long time, in particular for ankylosis of the hip, knee, elbow, shoulder, and temporo-mandibular joint, admirably cured with perfect functioning.

We also saw Dr. Bevan treat an aortic aneurysm by introducing six meters of sterilized steel wire into the aneurysmal sac, and he assured us that, out of 150 cases thus treated by electrolysis after introduction of steel wire, the results had been very satisfactory.

Dr. Sippy[23] demonstrated an original process for dilating esophageal strictures. He has his patients swallow a long thread which emerges through the anus and by means of which he then draws ivory olives of increasing size. He thus achieves the same result as with retrograde dilation, but without having to perform a gastrostomy.

Finally, Dr. Ormsby showed us a large number of images of blastomycosis affecting various organs, a condition that seems quite common in the United States.

At St. Luke's Hospital, McArthur operated on a case of hernia using an original procedure which consists in taking a thin strip from the aponeurosis of the oblique muscle and using it as suture material. He also showed us a series of patients in whom autogenous vaccine therapy seemed to have given very good results.

From Chicago we arrived in one night on the Pullman train to *Rochester*, through the beautiful region of the great lakes.[24] We stayed two days and there admired the spirit of organization of the American executed most completely, where a hospital has been arranged like a great industrial establishment.

Here is a view of Saint Mary's Hospital, which has 220 beds and is surrounded by sanatoriums and clinics for convalescent patients. More in the center of this small town of two thousand inhabitants, is the *Mayo Clinic*, a building completed just two months ago by the Mayo brothers for outpatients and therefore corresponding to what we call a "policlinic" in our country. It is a seven-story cubic building, designed for an average of 500 consultations per day. On the ground floor are huge waiting rooms arranged in the form of winter gardens, with great taste, and the administration offices. A profusion of bells and electric lights allows everyone to see whether or not the main doctors are in the building. In the basements are the dressing and bandaging rooms. On the first floor are the otorhinolaryngology, ophthalmology, and dermatology consultations; on the second floor, the gynecology and urology consultations and the x-ray department, where an average of 150 x-rays are taken every day. On the third floor are the library, reading rooms, lecture halls, and the doctors' private offices. On the fourth floor is the Museum of Pathological Anatomy, which contains thousands of items from the 60,000 operations performed up to the present time by the Mayo brothers, whose statistics for the last year reported 8,500 operations. On the fifth floor are a photography workshop, a *studio* run by two artists, and the statistical office which employs a dozen secretaries who are constantly in contact with the postoperative patients to find out if they are satisfied with the result of the intervention. On the sixth floor there are physiology and experimental research laboratories, cages for dogs and monkeys that communicate with the outside by small special elevators, operating rooms for animals, installed with the same concern as our most sophisticated operation, and laboratories for biological research, generally directed by female doctors of medicine. All these departments communicate with each other by telephones, elevators, etc., and employ about 150 people, mostly doctors.

At Saint Mary's Hospital, there are six small operating rooms located next to each other, in which simultaneously operate Charles H. and William J. Mayo, E. S. Judd, and three other assistants, Drs. Beckmann, Balfour, and M. S. Henderson. Each of them does an average of four or five operations a day, so that overall the average number of operations at Saint Mary's Hospital is 30 per day.

Mirrors inclined at 45° placed above the operating tables allow the spectator to follow all the phases of the intervention without approaching the table.

In the corridor which unites the different rooms, a lighted board constantly indicates the operation being carried out in each of the rooms and a bell system signifies when each of the surgeons begins to operate. In this way, we were able to attend the most interesting parts of the various interventions, and to see about fifty major operations performed during the two days.

I cannot even begin to describe the techniques of the Mayo brothers, who have such a universal reputation; to do that, I would have to devote a special conference just to this subject.

After passing through Chicago for a day and spending half a day visiting Niagara Falls, we returned through *Montreal*, whose customs and still very French character were a pleasant surprise.

There are five major hospitals in Montreal: The General Hospital, the Royal Victoria Hospital, the Montreal Maternity Hospital,[25] the hospital for contagious diseases, and the Protestant hospital for the insane. All of these hospitals are closely connected to McGill University. The General Hospital is designed for 120 patients. The operating room amphitheater has 350 seats and the outpatient clinic receives about 60,000 patients per year. The Royal Victoria Hospital, located on a hill near the University, enjoys a magnificent view of the city and the St. Lawrence. It was founded in 1887, with major gifts from Lord Mount Stephen and Lord Strathcona who each donated $5 million. Opened in 1894, it is designed for about 300 patients. It consists of five main buildings joined by stone bridges and arranged around a central administration building. The otolaryngology consultations, as well as the bacteriological laboratory, radioscopy, radiography, chemistry, and experimental pathology were particularly nice. It has two large operating rooms with an amphitheater for 250 students and six adjoining rooms for anesthesia and preoperative preparation. All these rooms have their walls of white marble and are equipped with all the most modern perfection.

Our last stop was *Boston* whose Harvard University is one of the most famous in the United States, and whose large Massachusetts General Hospital is known throughout the world. We were first shown the room where Morton, in 1846, first administered ether. The six operating rooms, clustered around a central corridor, allow the different surgeons to operate simultaneously, while reducing the cost of sterilization and dressings to a minimum.

Besides the Massachusetts General Hospital, there are a series of other more modern hospitals in Boston, in particular the Peter Bent Brigham Hospital which is a university hospital very recently constructed and directed by Harvey Cushing, whom we saw operate on a tumor of the cerebellum, a Gasserian ganglion, a cerebral tumor, and a pituitary tumor.

The Children's Hospital cost $200,000 and is set up for 65 babies under 2 years of age. When I visited, it only contained about twenty newborns cared for by about fifteen nurses, which puts the price of a bed at fifty thousand francs. Marble has been lavished there with even more luxury than in other hospitals -- including on the roof, where white marble balustrades have been installed as balconies.

To give you an exact idea of the abundance of cases offered for our admiration, I reproduce here the program of operations which was given to us for the second morning spent in Boston.

International Surgical Society
Boston, Tuesday, 28 April 1914.
Hospital Clinics and Demonstrations

MASSACHUSETTS GENERAL HOSPITAL.
Tuesday, 9.00 AM Operations.
Gasserian Ganglion. Dr. S. J. Mixter.
Varicose Veins, Hernia and Varicocele. Dr. H. Williams.
Tumor of abdominal wall. Dr. C. A. Porter.
Renal Calculus. Dr. Hugh Cabot.
Salpingitis. Dr. D. F. Jones.
Resection or oil-injection of knee-joint. Dr. E. G. Brackett.
Epithelioma of Lip. Dr. R. B. Greenough.
Tuberculous Epididymitis. Dr. Hugh Cabot.
Cholelithiasis. Dr. Farrar Cobb.
Umbilical hernia. Dr. Farrar Cobb.
Chronic Appendicitis. Dr. Lincoln Davis.
Carcinoma of stomach. Dr. C. A. Porter.
Musculospinal Paralysis. Dr. C. A. Porter

BOSTON CITY HOSPITAL.
Tuesday, 8.30 AM Operations.
1. Dr. J. B. Blake. For fracture of the patella.
2. Dr. F. B. Lund. For transverse fracture of the femur; plating.
3. Dr. F. J. Cotton. For ankylosis of elbow.
4. Dr. F. B. Lund. For oblique fracture of femur; Parham and Martin's band.
5. Dr. Paul Thorndike. For stone in the bladder.
6. Dr. W. E. Faulkner. Sacral anesthesia for hemorrhoids.
7. Dr. F. B. Lund. For tuberculosis cervical adenitis.

Demonstrations.

Dr. F. J. Cotton:

1. An operation for talipes cavus.
2. Artificial impaction for fracture of the neck of the femur.

PETER BENT BRIGHAM HOSPITAL.

Tuesday, 9.00 AM Operations.

9.00 AM Trans-sphenoidal Pituitary Operation. Dr. Harvey Cushing.

11.00 AM Gasserian Ganglion Operation for Neuralgia. Dr. Harvey Cushing.

CHILDREN'S HOSPITAL.

Tuesday, 9.00 AM Operations.

Orthopedic Service – Dr. R. W. Lovett.

9.00 AM Club foot.

9.30 AM Tendon transfer.

10.00 AM Congenital dislocation of hip. Machine reduction.

10.30 AM Knock-knee.

General Surgical Service.

9.00 AM Undescended Testicle and Hernia. Dr. C. G. Mixter .

9.30 AM Hare lip. Dr. W. E. Ladd.

10.00 AM Ankylosis of jaw. Dr. J. S. Stone.

10.30 AM Inguinal Hernia. Dr. J. S. Stone.

CARNEY HOSPITAL, SOUTH BOSTON.

Tuesday, 9.00 AM Operations.

9.00 AM Chronic Appendicitis. Dr. Bottomley.

9.30 AM Duodenal Ulcer. Dr. Bottomley.

10.00 AM Goiter. Dr Mahoney.

FREE HOSPITAL FOR WOMEN.[26]

Tuesday, 7.15 AM Operations.

7:15 AM Dr. Graves. Curette. Trachelorrhaphy.

8.00 AM Dr. Graves. Trachelorrhaphy. Hysterectomy.

9.00 AM Dr. Graves. Hysterectomy for Pelvic Inflammation.

9.30 AM Dr. Graves. Hysterectomy for Pelvic Adhesions.

10.00 AM Dr. Graves. Hysterectomy for Fibroid.

10:30 AM Dr. Graves. Amputation of Cervix and Hysterectomy for Procidentia.

7.30 AM Dr. Hutchins. Plastic and Celiotomy for Retroversion.
9.00 AM Dr. Pemberton. Plastic and Celiotomy for Retroversion.
10.00 AM Dr. Wadsworth. Hemorrhoids.

II. Administration.

In America, there are no public assistance administrations, as is the case in Belgium and France. The vast majority of hospitals are private institutions founded by generous donors and maintained by private grants. Each hospital is governed by a board of directors made up of the principal donors, who admire and respect the doctors and surgeons attached to the hospital, as we all were pleased to feel.

The credit of these hospitals is essentially unlimited, since when their subsidies are exhausted, they appeal to new donors by means of posters, and this apparently never fails. In each of these hospitals there are usually three to four beds for the indigent, but many large cities do not have hospitals as we understand it.

In recent years, New York and Chicago have built some communal hospitals for the poor, but the number of beds at their disposal is quite insufficient and many large communities have none.

Private hospitals admit only paying patients, often at low rates of course, but the truly destitute, when they are sick, are as much to be pitied as when they are healthy.

Along with unimaginable luxury, there is indeed terrible poverty, and these two extremes often jostle each other strikingly. The suburbs of New York and Chicago, for example, offer distressing pictures in this respect.

The esteem in which the boards of directors hold their "Hospital Staff" has become apparent to us on many occasions by the extravagant lunches that have been provided to us by the hospital administrations, especially in Chicago, Baltimore, and Montreal.

III. Staff

The appointment of chiefs of surgery and medicine in most American hospitals is exclusively by the board of directors, usually made up of major donors. Although not required, they usually follow the advice of their associated university, with which they maintain an extremely courteous relationship. Deputies and aides are mostly appointed by department heads for indefinite terms. In all hospitals, there are resident doctors, interns, and externs on roughly the same basis as in French hospitals.

What struck us above all was the large number of nurses in all American and Canadian hospitals; their number varies from one nurse to two or four patients and their residence is always the object of special attention. In most of the nursing schools adjoining hospitals, there are classrooms and conference rooms, reading rooms, and large dining rooms where nurses are generally served at small tables for two or four. Their role is also much more active than with us. Thus, in almost all hospitals, anesthesia is entrusted to religious or lay nurses whose names appear in the list of hospital staff at the same rank as that of assistant doctors, with the designation of anesthetists. Other nurses direct the radiology or clinical research laboratories. The duration of their training courses is generally three years, and the color of their uniforms indicates the degree of advancement of their studies: Pink, blue, white.

Another peculiarity struck us: it is that in several hospitals there are both nuns and lay nurses, some in charge of administration, cooking and general management, and others assigned to the care of sick. As far as I have been able to judge, there is a most cordial understanding between the two groups and, in particular at Saint Mary's Hospital in Rochester the sisters and nurses offered us a lunch where there seemed to be the most perfect cameraderie between them.

The education of nurses is very comprehensive. Each hospital has an independent school and strives to provide its nurses with the most perfect instruction.

In Montreal, for example, we were shown a special kitchen where the nurses learn how to prepare the different diets with the special appliances for making ice cream, and the different gas and steam cooking systems. Each student must spend three months in this kitchen service.

The "nurses' home" of the McGill hospitals, which is one of the finest, cost $300,000.

It is also the nurses who keep the observation records, and here again the practical spirit of the Americans is manifested by the fact that during the operations, the nurse anesthetist continuously records all the events of the operation at the same time as the events of anesthesia, so as not to waste time.

Nurses' salaries are relatively high, as are all salaries in the United States, where simple typists commonly earn $80 a month.

IV. Population

As mentioned earlier, the population of most hospitals in America is not exactly the same as ours in the sense that the truly indigent admitted entirely free are quite exceptional.

On the other hand, there is in all hospitals a section for paying patients of different classes, with more or less luxurious rooms, some provided with independent bathing and toilet rooms, as in our big hotels, and the price of these varies, sometimes costing up to $100 a week, not including care and treatment.

Most hospitals are always crowded with patients and, in the surgical departments, I was struck by the willingness of the patients to let themselves be operated on.

The composure of the Americans manifests itself here in a very particular way. As soon as they have a little stomach ache, they get operated on rather than undergo cures, to save time, and as a result the operating statistics are generally excellent because all the diseases are operated on at an early stage. For example, I have rarely seen such small stomach cancers operated on, or peptic ulcers as little advanced as there. This is the reason why certain surgeons, such as the Mayo brothers, have been able to obtain a mortality of less than 1% for all of their abdominal operations.

This composure is also seen in the ease with which these patients fall asleep. Although all the anesthesia is done using ether, the patients go to sleep peacefully and I have never seen either a period of excitement or incidents of narcosis.

V. Technique

Asepsis and disinfection care are essentially the same in the United States as here: Autoclave, rubber gloves, etc., with few peculiarities. The operating field is everywhere disinfected by the rapid process of tincture of iodine and the patients are generally not prepared the day before but are shaved and disinfected immediately before the operation.

The disinfection of hands and instruments is done as at home and the asepsis, in general, seemed very careful to me.

Anesthesia, as I just said, is always done by means of ether, which is usually administered using an ordinary mask onto which the ether is dispensed drop by drop by letting it flow directly from the zinc vials in which it is contained.

It is rare for patients to receive an injection of morphine or a similar drug before the anesthetic.

Thanks to the meticulous care of oral antisepsis and warming of the patient, bronchitis and post-operative pneumonia are very rare. However, in the evening and the day after the operation I often observed elevations of temperature, which I believe are due to irritation of the respiratory passages by the ether.

In certain hospitals, I saw a special apparatus used, which is run by electricity and automatically delivers ether mixed with air or oxygen [2].[27] It is connected to a Nelaton catheter which is inserted into the trachea of the sleeping patient as far as the bifurcation of the bronchi, so as to carry out anesthesia under positive pressure in an extremely simple manner. This very simple process, devised by Auer and Meltzer, does away with the very expensive devices that you have all heard of, such as the Sauerbruch pneumatic chamber, which costs 12,000 *Mark*,[28] or the devices built by Brauer or by Danis and myself, and which could not compete with this very simple method for operations in the chest, in which the rise in atmospheric pressure makes it possible to combat the collapse of the lung when the thorax is opened.

I have seen the quite frequent use, particularly in Gibson's department, of suction procedures by means of an air tube connected to drains or metal tubes to quickly evacuate the contents of a gallbladder or a ovarian cyst, instead of blotting them, which always takes a very long time.

This process is applied in some hospitals to constantly aspirate pus as it forms in a wound, so that the dressings remain almost dry; it is very clean and very simple.

Dressings are almost always done with adhesive tape. The use of binders is exceptional. For drainage and tamponade, they almost always surround the gauze with very thin, sterilized rubber, which avoids adhesions and reduces discomfort when the packs are removed. It is the same material that is used to make "cigarette drains," used everywhere in America and which we would certainly benefit from using too.

One last observation that I would like to emphasize is blood transfusion, which is quite common over there. Instead of suturing the artery and the vein of the donor and the recipient, as is done in France, one simply draws half a liter of blood from the cephalic vein of the donor by means of a waxed glass tube and immediately injects into the cephalic vein of the recipient.

This process is especially recommended by Percy[29] and the surgeons of Chicago; it seemed to me very simple and worthy of imitation. Before this procedure, of course, it is first necessary to make sure that the two bloods do not produce hemolysis.

I apologize, Gentlemen, for having required your attention longer than is customary for our society.

I hope at least to have given you the impression that surgery in the

United States has followed their admirable development in other fields of human activity and that a scientific journey to America is truly worth the inconveniences of the crossing. You will no doubt agree with me that our American colleagues have earned our unending gratitude by the tireless effort they have demonstrated to allow us to see in a minimum of time a maximum of novelties of the highest interest. Even before the opening of the International Congress, the Europeans arriving on the *Imperator* had had the good fortune to be guests at the meeting of the "American Surgical Association," and we had thus been able to meet Gibson, McArthur, the Mayo brothers, Armstrong, Murphy, Hoguet, Harte, Ochsner, Keen, and other leading American surgeons.

The general assembly held in New York on April 15 elected Keen, of Philadelphia, as President of the next congress, which will take place in Paris in 1917.[30]

Here is the list of questions that will be discussed:

A. Surgery of the heart and large vessels, including embolisms and thrombosis; blood transfusion.
B. Treatment of tumors by X-rays and radium.
C. Blood analysis and biological reactions in surgical conditions.
D. Leg and ankle fractures.

Annex: Diagnosis and treatment of tetanus.

Original Notes

1. See also on this subject: Tuffier, La chirurgie en Amérique. Son parallèle avec la chirurgie française, February 1914, p. 45; Pozzi, Une voyage chirurgical aux Etats-Unis. (*Bull. de la soc. de l'int. des hôpitaux de Paris*, June 1909, p. 166.); R. Proust, Impressions d'Amérique. (*La Presse médicale*, no. 49 Paris, 20 June 1914.)
2. An apparatus for measuring and mixing anesthetic and other vapors and gases by Karl Connell (New York).

Biographical Sources

Liebermann-Meffert D, White H, *A Century of International Progress and Tradition in Surgery: An Illustrated History of the International Society of Surgery*, Heidelberg: Kaden Verlag, 2001.

Plarr's Lives of the Fellows online; livesonline.rcseng.ac.uk. Royal College of Surgeons of England, 2023.

Publication Source

The *Journal Médical de Bruxelles* is now called the *Revue Médical de Bruxelles* and is still being published in French with English abstracts. Historical issues can be obtained by interlibrary loan.

Translation Notes

1) Mayer also edited the official report of the *Quatrième Congrès de la Société Internationale de Chirurgie* (Bruxelles: Hayez, 1914) which includes a similar description (in French) of the *Voyage Circulaire en Amerique*.
2) Mercy Hospital in Chicago just closed in 2021.
3) Now part of Rush University Medical Center.
4) Kanavel was indeed studying the skull base (see "Osteoplastic closure of the trifacial foramina," *Journal of the American Medical Association* 1914; 63:1245-1248). However, Rosenow's research at the time actually involved streptococcus as a cause of rheumatic arthritis (see "The etiology of acute rheumatism, articular and muscular," *Journal of Infectious Diseases* 1914; 14:61-80). The author calls the other presenter "Dr. Bewys", while the official report mentioned above says that "Dr. Bewis" spoke about gastroenterostomy for pyloric stenosis in infants. The author is probably confusing Rosenow's presentation with a talk by Dean DeWitt Lewis, who was also on the staff of the Presbyterian Hospital (and would later succeed Halsted as Professor at Johns Hopkins). See Lewis D, Grulee CG, "The pylorus after gastro-enterostomy for congenital pyloric stenosis," *Journal of the American Medical Association* 1915; 64:410-412.
5) At the Congress, John Fairbairn Binnie of Kansas City had summarized current management of leg amputations, including the contributions of Bunge, and his talk was published a few weeks later (*Annals of Surgery* 1914; 60:160-165). His demonstration of patients with upper-extremity prostheses, which were manufactured by the Carnes Artificial Limb Company of Kansas City, is recorded

in the official Congress report, Pages 494 and 497-498. See also Binnie JF, *Manual of Operative Surgery*, Philadelphia: P. Blakiston's Son & Co., 1913, Pages 1138-1139.

6) Saint-Gilles was then a new hospital in suburban Brussels. It is now part of the Iris hospital system.

7) Now part of the University Hospital system in Brussels.

8) One of the largest hospitals in Germany, then and now.

9) The Roosevelt Hospital in New York, founded by a distant cousin of the presidents with that name, is now the Mount Sinai West Hospital.

10) Now the Weill Cornell Medical Center.

11) Originally founded as the New York Cancer Hospital, this institution was then called the General Memorial Hospital and has evolved into the Memorial Sloan Kettering Center.

12) Now the Lenox Hill Hospital.

13) There were indeed elevated trains in New York City at this time. They were all removed by the middle of the twentieth century.

14) The *franc* was the monetary unit for Belgium, France, and Switzerland, and was equivalent to about $0.19.

15) The Mütter Museum, still interesting to visit today.

16) Mayer makes the common mistake of calling it the "John Hopkins Hospital."

17) Water containing carbolic acid (phenol) as an antiseptic.

18) See Baer WS, "Arthroplasty with the aid of animal membrane," *American Journal of Orthopedic Surgery* 1918; 16(old series):171-199.

19) See Abel JJ, Rowntree LG, Turner BB, "On the removal of diffusible substances from the circulating blood of living animals by dialysis," *Journal of Pharmacology and Experimental Therapeutics* 1914; 5:275-316,611-623. For a more recent historical perspective, see Gottschalk CW, Fellner SK, "History of the science of dialysis," *American Journal of Nephrology* 1997; 17:289-298. Mayer misspells Abel's name "Abbe."

20) A natural anticoagulant derived from leeches.

21) Jules Bordet (1870-1961), Belgian physician and immunologist, was awarded the Nobel Prize in 1919.

22) Closed in 1986.

23) The author writes "Lippy" but is clearly referring to Bertram W. Sippy.

24) Minnesota has many beautiful lakes, but other than Lake Michigan

(visible from Chicago), none of the actual Great Lakes would have been seen on the excursion to Rochester.

25) Merged with the Royal Victoria Hospital in 1926.

26) Now part of the Brigham & Women's Hospital.

27) See Connell K, "A new ether-vaporizer: A preliminary report on the technic of intrapharyngeal insufflation anesthesia," *Journal of the American Medical Association* 1913; 60:892-894.

28) The *Mark* was the monetary unit of Germany, worth about $0.24.

29) See Percy NM, "A simplified method of blood transfusion with report of six cases of pernicious anaemia treated by massive blood transfusion and splenectomy," *Surgery, Gynecology & Obstetrics.* 1915; 21:360-365.

30) The Paris meeting of the Société Internationale de Chirurgie planned for 1917 did not take place until 1920, under very different circumstances. Two days after this article was published, the German Army invaded Belgium, and the world changed forever.

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