

# The Wright Era (1896–1926)

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THE DEPARTMENT was founded on Ether Day, October 16, 1896, exactly 50 years after the famed ether operation. Dr. James Homer Wright (chapter 4) took over as head of the department on the same day, after the Trustees had sponsored his further training in Europe. He was initially appointed with the title of Resident Pathologist, then Director of the Clinico-Pathological Laboratory in 1898 and Director of the Pathological Laboratory in 1906. Dr. Wright appears to have been a quiet person who disliked public speaking and who did not tolerate substandard performance. Comments from his contemporaries portray someone with a gruff nature who spoke only briefly, but he had high standards and was an effective leader of the department, particularly in his earlier years.

The Wright years were a period of growth for the department, as the numbers of faculty, employees, tests types, and volumes increased. The department does not appear to have been affected in major ways by the First World War, although some affiliated faculty members went to war, and their teaching responsibilities were assumed by others. Teaching, particularly for practicing pathologists, however, was curtailed by the devastating influenza outbreak in the fall of 1918.

During this time the department was populated not only by pathologists and nonprofessional pathology employees, but also by internists

and surgeons in relatively large numbers. The house officers in Medicine and Surgery often performed many of their own chemistry and hematology tests, whereas faculty internists and surgeons also did research in the laboratory facilities of the department. This started the model of cooperation with the other clinical services that initially flourished under Dr. Wright, which characterized the department in its growth over the ensuing 50 years and continues today.

## LABORATORIES

Dr. Wright, in his first annual report to the Trustees, in 1898, summarized, “The chief purpose of this laboratory has been to give to the hospital the benefit of those modern microscopical, bacteriological, and chemical methods which are of such great importance in the diagnosis and study of disease.” The initial Clinico-Pathological Laboratory occupied two stories in the renovated, 90-by-25-foot Allen Street Building (figures 3.1, 3.2, and 3.3), which was connected to the building in which autopsies were performed (designated only as the “Pathology” building on old maps; figure 3.4). Dr. Wright commented:

Much study has been given to its arrangements and equipment, and it is generally regarded as a model hospital laboratory. It provides facilities not only for the routine laboratory work, done in connection with the work of the hospital



*Figure 3.1 The Allen Street Building. The sign over the door reads, “Enter here pathological laboratories—Pathology amphitheatre.”*



*Figure 3.2 One of the main rooms in the Clinico-Pathological Laboratory, Allen Street Building, 1898*



*Figure 3.3 James Homer Wright in the Clinico-Pathological Laboratory*

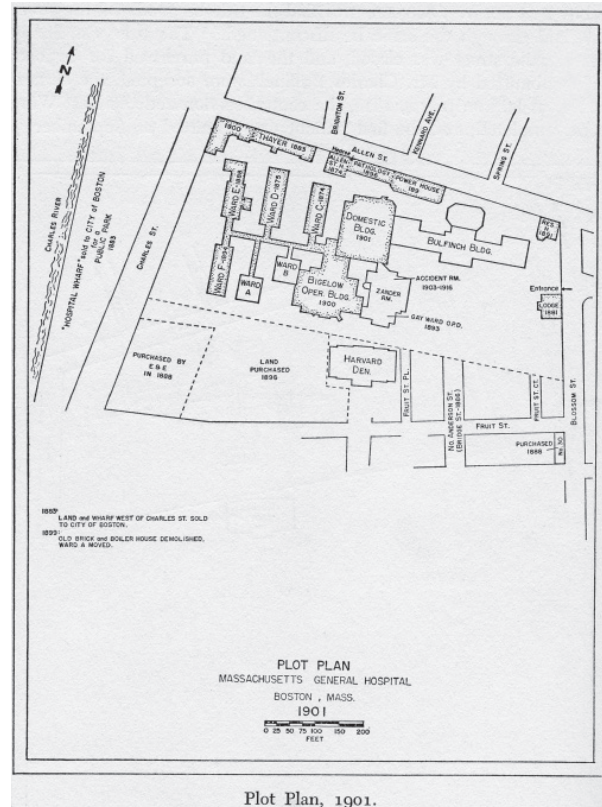
wards, but also for all the other forms of microscopical, bacteriological and chemical examinations and tests which have relation to clinical medicine and pathology. The work carried on is very diverse in character and requires all of the resources of the present establishment, for there are very few hospitals in which so much laboratory work is applied to the diagnosis and study of cases.

A description of the laboratory (including a semihumorous reference to Dr. Wright's office) was given in the Washburn history of MGH from 1900 to 1935, published in 1939 (1):

When the new building was opened in 1896 a suitable laboratory was, for the first time, provided to House Officers for their routine examinations of blood and body fluids. This room was on the second floor at the right, or easterly, side. On the opposite side was the room for the preparation of media, with a few

laboratory desks. Here were Dr. Oscar Richardson, soon to become Assistant Pathologist, and Louis S. Brown, Technician. On the third floor, westerly of the stairway, was a large room fitted with desks for microscopic work and used by the graduate House Officers and other Physicians working in the Laboratory. Beyond this, and over the arch through which entered the undertakers' wagons, was the Holy of Holies, the office of the director, Dr. Wright. In this last room were kept the invaluable records so carefully prepared and preserved—both the written record of autopsies and microscopic slides.

Nonetheless, even from the early days, space proved a challenge, and the laboratory underwent a series of expansions in its first 10 years. Within two years of its opening, the department had to move clinical chemistry to a “barn-like



*Figure 3.4 Plot plan of the MGH, 1901, showing the Allen Street Building attached to the old Pathology building*

loft in the adjacent power building” (2). In 1909 Dr. Wright still complained that “on account of the large number of persons working in the laboratory with the microscope, more working space, suitably lighted for such work, is much desired.” Moreover, as the teaching activities of the department grew and audiences swelled for the many presentations in the amphitheater, Dr. Wright would complain for many years that more space was needed. For 1918 he reported: “The conferences and courses . . . are held in the amphitheatre of the laboratory. The considerable number of (sometimes more than fifty) persons attending and the increasing demand for preserved specimens for teaching makes space for hanging hats and coats and for storage of specimens desirable.” In 1919 and 1920 he cited “sometimes about 100” persons attending each conference (see figures 24.3 and 24.5) and suggested that the hospital remove the paint shop from the building to allow Pathology more space.

With the formation of the new department, there was a mandate to bring clinical chemistry into the hospital proper; until that time, it had been performed in the HMS laboratory of Dr. Edward Stickney Wood (see chapter 1). Space was initially found in the main Laboratory Building, but this proved inadequate, and so the department expanded in 1900 to occupy three rooms in the upper floor of the new Power House building, adjacent to the Laboratory Building; a door was cut into the partition between the two buildings to facilitate communication. This allowed the old chemistry space to be used for photomicrography (including a dark room) and other activities. In 1901 the machine shop was moved from the basement level of the Laboratory Building, which “took away a source of great annoyance.”

The laboratories were, as mentioned above, nearly unique in North America. During the first annual meeting of the American Association of Pathologists and Bacteriologists, held in Boston in April 1901, Dr. Wright showed the laboratory to the attendees, and one session was

held in the laboratory amphitheater. A tour book written for physicians attending the 57th annual meeting of the American Medical Association in Boston in 1906 encouraged attendees to visit the MGH, including the pathology laboratories: “Descending now to the ground floor, and continuing along the tortuous corridor, one soon comes to a large tiled hallway, through which one passes to the newer portions of the hospital. Turning sharply to the right, one leaves the building, crosses the driveway and enters—the pathological laboratory. The latter is large and sunny, and complete in all its details. Its director, Dr. James H. Wright, or the assistant pathologist, Dr. Oscar Richardson, will show to visiting physicians the different rooms of the pathological laboratory, the animal room, the chemical laboratory, the morgue and the autopsy room. The laboratories were established in 1896, whereas the morgue and autopsy rooms, together known as the Allen Street House, date from 1875.” The guidebook also noted that “in this same building is the engine and dynamo room, from which all the heating and lighting is furnished, not only to the hospital, but also to the Massachusetts Charitable Eye and Ear Infirmary” (3).

By 1911 the amphitheater had been set up for projection of lantern slides, broadening its teaching role. In the same year the surgical pathology laboratory in the Bigelow Building was incorporated administratively into the Pathology department, to facilitate integration of surgical pathology with the main department (see below). In 1914 an animal house and experimental operating room were erected adjacent to the Allen Street House to facilitate the experimental work in the department (4).

The original Allen Street Building would be the central location of the expanding Pathology department over the next 50 years, until the opening of the Warren Building in 1956. Indeed, until quite recently, MGH patient charts were stamped “Allen Street” when a patient passed away—an ongoing historical reference to the

original location of the Pathology department. With this in mind, Lewis Thomas, the physician and writer, wrote a poem entitled “Allen Street” when he was an HMS student in the 1930s; a portion of the central set of verses reads:

*But let us speak of Allen Street—that strangest,  
darkest turn,  
Which squats behind a hospital, mysterious and  
stern.  
It lies within a silent place, with open arms it  
waits  
For patients who aren't leaving through the cus-  
tomary gates.  
It concentrates on end results, and caters to the  
guest  
Who's battled long with his disease, and come out  
second-best.  
For in a well-run hospital, there's no such thing as  
death.  
There may be stoppage of the heart, and absence of  
the breath—  
But no one dies! No patient tries this disrespectful  
feat.  
He simply sighs, rolls up his eyes, and goes to Allen  
Street.*

## THE PATHOLOGISTS

There were relatively few full-time pathologists at any point during Dr. Wright's tenure, although the department was full with medical students and many physicians pursuing research projects. Dr. Wright summarized the number of pathologists succinctly in a report from 1921:

On Ether Day, October 16, 1896, the Pathological Laboratory officially began its functions with a staff consisting of a pathologist and one technical assistant. Soon after this a chemist was added to the staff. The work carried on in the Pathological Laboratory and in the surgical laboratory in the Bigelow operating building was organized into the Pathological Department in 1911. The officers of the Department then were: director of the Pathological Laboratory, surgical

pathologist, assistant pathologist, assistant surgical pathologist, chemist, assistant in clinical pathology, assistant in clinical bacteriology, and medico-legal pathologist. With some minor changes these offices have been continued (4).

Nonetheless, Dr. Wright's succinct summary belies the fact that the Wright years were fairly dynamic in terms of faculty. A key addition was Dr. Oscar Richardson as an assistant in clinical pathology in only the second year of Wright's tenure. Dr. Wright was ably assisted by Dr. Richardson for his entire tenure, by Dr. Albert Steele as a bacteriologist from 1910 onward, by Dr. William Whitney as a surgical pathologist through 1916, and by Dr. Harry Hartwell as a surgical pathologist from 1911 onward (figure 3.5). Other faculty stayed for various periods. In particular, clinical chemists remained somewhat distinct from the rest of the faculty from the inception of the department, and there was considerable turnover in this area. The most notable of the clinical faculty are discussed below.

Dr. Oscar Richardson (1860–1940; figure 3.5, and see figure 2.4.3) was a businessman who married Anna L. Gove in 1882, and they decided together to pursue medical careers. (Anna Gove Richardson went on to an illustrious medical career, primarily at the Vincent Hospital, a gynecological hospital that merged with MGH in 1941.) Oscar Richardson joined the MGH Pathology department in 1896, while still a medical student; indeed, his earliest mention in the departmental annual reports is as “Mr.” Oscar Richardson. Richardson must have impressed Dr. Wright, because after graduation Richardson stayed in the MGH laboratory. He remained there and was affiliated with Harvard as an Instructor in Pathology for his entire career, retiring in 1925. He was appointed an Assistant in Clinical Pathology from 1897 to 1905, and Assistant Pathologist from 1905 through 1925. By 1903 he was doing “most of the bacteriological examinations requiring special knowledge” as well as most of the autopsies, and Dr. Wright's annual reports



*Figure 3.5* Earliest extant photograph of the Pathology faculty at MGH, mid-1910s.  
 Left to right: unidentified, Oscar Richardson, Otto Folin, Harry F. Hartwell (probable),  
 James Homer Wright, unidentified, unidentified (possibly Louis Brown).

over the years make it clear that Richardson did the vast majority of the clinical work, especially the bacteriology and autopsies—as well as a large teaching load—which allowed Dr. Wright time to focus on his research. In fact, when Richardson was away from the laboratory in 1914, Dr. Wright’s annual report is very brief, presumably reflecting the fact that Wright had to carry a large clinical load. Richardson was also the pathologist who helped Dr. Richard C. Cabot with most of the Clinico-Pathological Conferences (CPCs) in the early years (see figure 24.3), and he taught extensively in postgraduate courses in Medicine and Pathology, often with Dr. William H. Smith. An article written in a local newspaper to commemorate the Richardsons’ fiftieth wedding anniversary in 1932 commented that Oscar Richardson had “devoted himself to the development

of the pathological laboratory at Massachusetts General Hospital.” Richardson also served as Associate Medical Examiner for Suffolk County from 1913 to 1921, and was a poet, publishing two books of poetry in his retirement. Sadly, Oscar Richardson’s accomplishments have been “lost” to some extent amid the attention paid to James Homer Wright, but he appears to have been a major part of the clinical backbone of the department during the Wright years.

Dr. William Fiske Whitney (figure 3.6) was the original surgical pathologist at the hospital, and his involvement antedates the founding of the department. He was appointed Assistant Pathologist in 1888 and Pathologist in 1892. By 1901, with the Pathology department well under way, he restricted his activities to surgical pathology, primarily under the aegis of the surgeons,



Figure 3.6 William F. Whitney

and his appointment was changed to that of Surgical Pathologist. Dr. Whitney was clearly a gifted physician, essentially defining the role of a surgical pathologist in advance of the specialty's taking a clear form. In remembering him, two famous MGH surgeons, Drs. J. C. Warren and S. J. Mixer, captured his talents as well as the growing importance of surgical pathology: "The hesitating surgeon, knife in hand, uncertain whether to do a trifling operation or one terribly mutilating and severe, could always depend on the decision of his master mind and vast experience, and a great number of men and women today owe their intact bodies, or their lives, to his quietly spoken opinion" (5).

Upon Dr. Whitney's retirement in 1916, Dr. Wright wrote: "Dr. Whitney's long, faithful, and valuable services to the hospital are highly appreciated by all and his retirement is here recorded with much regret." Dr. Whitney also served as

the Curator of the Warren Anatomical Museum at HMS for the remarkably long time of 42 years (1879–1921), seeing the museum through two relocations, and was Acting Dean of HMS for some time in the 1880s.

During Dr. Whitney's long tenure, the position of Assistant Surgical Pathologist was held by Dr. Channing Chamberlain Simmons from 1904 to 1907 and by Dr. Frederick Clinton Kidner from 1908 to 1910. Dr. Harry Fairbanks Hartwell (figure 3.5; and see figure 5.5), who had been an orthopedic surgeon at MGH for seven years, was appointed Assistant Surgical Pathologist in 1911 and was formally appointed Surgical Pathologist upon Dr. Whitney's retirement in 1916. He held the position of Surgical Pathologist for over 20 years, through 1938, and died in 1943. Dr. Hartwell did research on experimental syphilis. He was clearly a favorite of the entire department. Upon his retirement in 1938 Dr. Mallory wrote that Dr. Hartwell's "long experience was frequently of the greatest value to a predominantly youthful department, and his personality inspired warm regard in the younger men." A short obituary intended for the *MGH News* (but unpublished) by Dr. Lincoln Davis said of Dr. Hartwell: "His painstaking[ly] thorough and sound work in . . . surgical pathology was the basis for many a successful operation. He applauded the success of others. He asked little for himself. A fine steadfast character, a loyal son of Harvard and the MGH."

Dr. Franz Pfaff directed the Chemistry Laboratory from 1896 and participated in HMS teaching in clinical chemistry and pharmacology. He was academically productive and was one of the founding editors of the prestigious *Journal of Biological Chemistry*. His resignation in 1903 was "a serious loss to the Laboratory," although he continued at Harvard until 1912.

William Frederick Boos (figure 3.7) was the Clinical Chemist from 1906 to 1912. He had graduated from Harvard College in 1894 and HMS in 1901, and received a Ph.D. in chemistry from the University of Heidelberg in 1896.

After additional time studying and working in both Boston and Europe, he returned to Boston and the MGH in 1906 to take over the Chemistry Laboratory. He was also a practicing internist. His research interests were wide, and he did a number of early studies on nucleic acids. He also had notable expertise in toxicology and used those skills in medical examiner cases. In 1939 he published a book on toxicology for general audiences, entitled *The Poison Trail*; the jacket flap stated: “One of our best known toxicologists tells us the story of man’s constant struggle against his most insidious enemy. . . . He explodes many generally accepted beliefs, and points out many of the constantly increasing hazards from poisons little known to most of us that surround us in our everyday lives. . . . He tells us of the many ways in which poison is a boon to mankind, and of its use in the different activities that go to make up



*Figure 3.7 William F. Boos (Harvard University Archives, call no. HUP Boos, William [1])*

our civilization. He has fascinating anecdotes and case histories to illustrate the use or the misuse of a large number of poisons” (6).

Dr. Roger Kinnicutt was the first Assistant in Clinical Pathology, a position created in 1910; his duties were “to supervise and instruct the medical house pupils in their laboratory work and to make a complicated test of the blood in cases of suspected syphilis, which requires a special technique” (most probably the Wassermann test). Dr. Kinnicutt left this position after a year and was replaced by Dr. Francis Lowell Burnett, also for one year. Dr. Boos resigned in 1912, and the Chemical Laboratory was briefly run by Dr. Walter W. Palmer (later Professor of Medicine at Columbia University and Chief of Medicine at the Presbyterian Hospital in New York) and Dr. L. Harry Newburgh (later Professor of Medicine at the University of Michigan), with the help of Dr. Lawrence J. Henderson at HMS.

Dr. Otto Folin (figure 3.5 and chapter 20) was the titular Chemist from 1913 through 1922 and the Consultant Chemist from 1922 until his death in 1934. Dr. Folin was born in Sweden, but he moved to Minnesota in the early 1880s, completing his undergraduate studies at the University of Minnesota in 1892 and his Ph.D. at the University of Chicago in 1898. He moved to Boston in 1900, as a research biochemist at McLean Hospital, the physically separate psychiatric hospital that is part of the MGH. He became an Associate Professor of Biological Chemistry at Harvard in 1908 and the Hamilton Kuhn Professor in 1909. He was well known for his work in biochemistry and is recognized as an early leader in the field of clinical chemistry—perhaps most notably for the Folin-Wu method of measuring blood glucose (7). Dr. Folin apparently focused on his research at McLean and HMS; he nonetheless played a central role in the department, mostly through his recruitment and oversight of the remarkable activities of Dr. Willey Denis.

Indeed, it was Dr. Willey Denis (1879–1929) who ran the Clinical Chemistry Laboratory from



1913 through 1920. Notably, she was the first woman to be appointed to the professional staff of MGH. A highly talented chemist, she worked closely with Dr. Folin for many years. She moved back to her hometown of New Orleans in 1920 to join the faculty of the Department of Physiology and Physiological Chemistry at Tulane University. She died in New Orleans of cancer in 1929, having contributed 99 papers in the span of her career (8).

Dr. Albert E. Steele was the Bacteriologist from 1910 through 1926. He had trained at Boston City Hospital and at MGH and was hired to fill the newly created position of Assistant in Clinical Bacteriology. During his tenure he was heavily involved in therapeutics using killed bacteria (see below, under “Therapeutics”).

Dr. George Burgess Magrath, who was primarily the Suffolk County Medical Examiner for his career, was a Medico-Legal Pathologist in the department from 1909 to 1912. Toward the end this time (see below, under “Autopsies”), the Office of the Medical Examiner changed its policy on whether medicolegal autopsies could be done at hospitals, which decreased the number of postmortem examinations at the MGH.

**CLINICAL SERVICE**

The laboratory served both the inpatient wards and the Out-Patient Department. As such, it began with a fairly large number of diagnostic tests that were conducted on sputum, urine, blood, and “various other materials from the patients in the Hospital.” Dr. Wright realized early on that “these tests and manipulations are of great importance in the diagnosis and treatment of diseased conditions. In fact, in many conditions, the laboratory examination is the only method of arriving at a certain diagnosis.” He gave the example of tuberculosis: “Inasmuch as it is chiefly in the early stages of the disease that appropriate treatment may be successful, the practical importance of this laboratory test is obvious.”

Particular tests mentioned by Dr. Wright in 1898 include “the determination of the presence or absence of pathogenic bacteria in inflammatory processes and in other conditions connected with surgical operations; the application of the bacterial culture tests in cases of suspected diphtheria in the hospital wards; the testing of tissues and fluids for the presence of the bacillus of tuberculosis; and the microscopical diagnosis of tumors and neoplasms where there is a doubt as to whether they are benign or malignant, operable or inoperable.” Even within the first two years of its operation, the laboratory had enabled diagnoses of “a number of obscure or unusual forms of disease, including anthrax, glanders, and actinomycosis,” which enabled early treatment.

Within 10 years the laboratories were busy places, where many workers performed many tests. The representative case numbers for the Wright years, where available, are impressive:

	1914	1921	1925
Autopsies		130	150
Autopsy microscopical preparations	991	1,390	1,211
Surgical pathology specimens	1,866	1,879	2,212
Bacteriological examinations	2,590	3,260	2,828
Tuberculosis testing in guinea pigs	344	255	326
Syphilis testing on blood	7,496	15,400	16,291
Gonorrhea testing on blood	1,375	161	
Chemical examinations	102	3,662	

The diversity of clinical work is captured nicely in Wright’s 1899 summary:

The examination of the urine may also serve as an illustration of the importance of the laboratory in practical medical work. This examination is regarded as of so much importance that in this hospital it is made in the case of every patient admitted to the wards, and in many cases it is repeatedly made. By means of this examination of the urine, not only may a diagnosis of disease of the kidneys be confirmed, or the nature of an obscure or doubtful case

be rendered clear, but also information may be obtained as to the progress of the kidney disease and as to the probable duration of the malady. To the surgeon, the examination of the urine is of importance because it may give him timely warning that a certain case is not suitable for operation without grave risk on account of the existence of renal or other disease.

Another example of the kind of work done in the Laboratory, as a part of the daily routine, is the microscopical examination of the blood in various ways and for various purposes. This is a subject that has developed only within the last decade and it is still growing. It is only by means of this examination that a satisfactory and definite diagnosis of certain diseases particular to the blood may be made. Thus, for example, the finding of the malarial parasite in a drop or two of the patient's blood by means of the microscope is, in many cases, the only sure and certain way of determining the existence of malarial infection; and of distinguishing malarial fever and other febrile conditions, in which the treatment is radically different. In typhoid fever the blood test is often of the greatest value in confirming the diagnosis. This test is one of the latest contributions of bacteriology to practical medicine [see discussion of Dr. Mark W. Richardson, below]. . . . In surgery, the microscopical examination of the blood is also of acknowledged usefulness; for by the observation of an increase in the number of the white or colorless corpuscles of the blood the suspicion of an acute inflammatory condition of some of the internal organs may be confirmed and appropriate measures resorted to. . . . This laboratory test is made in all cases in which the symptoms are indefinite, especially in cases of suspected appendicitis or similar conditions.

The bacteriological examination of pathological fluids and other material from the patients is also an important function of the Laboratory. In many instances the results of such examinations are of great usefulness in recognizing the

nature of the disease, so that the proper methods of treatment may be adopted early. This may be illustrated by the well-known culture test in cases of sore throat which occur from time to time in the wards. As a result, these cases, in their beginning, cannot be differentiated into those that are due to infection with the diphtheria bacillus and those that are not, except by means of the culture test.

The laboratory, from early on, also served as a central resource for other health care facilities in the area. For example, the laboratory did testing for the Boston Lying-In Hospital, the Channing Home, and the House of the Good Samaritan, as well as specimen examinations and autopsies for other hospitals, such as the Massachusetts Eye and Ear Infirmary.

### *Bacteriology*

As reflected in Dr. Wright's summary, bacteriology and other tests relating to infectious diseases were the most essential clinical functions of the department in its early days. Diagnostic testing initially focused on blood and urine examinations, but it expanded to include cerebrospinal fluid by the end of Dr. Wright's tenure. As knowledge of additional microorganisms increased, diagnostic tests were developed and subsequently implemented in the clinical laboratories. For example, in 1915 the number of bacteriological tests increased by nearly 70 percent over the preceding year (from 2,665 to 4,480); special attention was given to diphtheria and typhoid fever in Dr. Wright's annual report. Cultures were already common, jumping to about 3,000 a year by the mid-1920s—although these numbers were low compared to the large volumes that accompanied the beginning of the antibiotic era in the 1940s.

Other common bacteriological testing included guinea pig assays, in which guinea pigs were inoculated with material from patients suspected of having tuberculosis and then sacrificed and examined histologically if they became symptomatic. This would remain a common

diagnostic procedure in the department for many decades, and guinea pig inoculation was the key procedure for establishing the diagnosis of tuberculosis in the first patient autopsied after the opening of the department in 1896 (see below). High-volume testing also centered on evaluation of blood for evidence of syphilis and gonorrhea; volumes for these tests varied over the years, depending on whether most testing was done in the hospital or in state laboratories, and also varied by technique.

### *Clinical Chemistry*

Clinical chemistry, although a part of the department, appeared distinct within the laboratories; whereas the microscopical and bacteriological work was undertaken by the primary pathologists, the clinical chemistry was carried out by different faculty; these faculty members were also highly interactive with chemists at HMS and those internists who spent time in the laboratory doing research projects (see below).

The role of clinical chemistry continued to grow. Unfortunately, when Dr. Franz Pfaff took a position at Harvard University itself in 1904, his position was not filled until 1906; in the interim period, “only a limited amount of work in physiological chemistry” was performed, and Dr. Wright asked for the laboratory funds to be increased so that “work in this important but expensive field of investigation may be carried on in the Laboratory in an efficient manner.”

The laboratory was reopened in the fall of 1906 under Dr. Boos’s directorship, and in 1907 he reported: “In the chemical laboratory chemical examinations of physiological and pathological specimens from patients have been carried out in a large number of cases. They include lead and arsenic determinations, analysis of urinary calculi, examinations of organs for the presence of exudates, transudates, etc.”

Toxicology was a major activity of the lab; there were new developments in the detection of lead, arsenic, mercury, cyanide, alcohol, and

other toxins in human fluids and tissues, perhaps most notably in the setting of syphilis treatment with Salvarsan (originally called 606). The work in clinical chemistry grew steadily over the years under Dr. Boos, and in 1909 he wrote that “more and more questions of special diagnosis and treatment are reported to the chemist for chemical and pharmacological study.” He also illustrated the central role played by the chemist in identifying cases for further study: “The House Officers . . . keep the chemist well informed . . . concerning the cases which may offer suggestions for laboratory study. . . . Thus, an old man with chronic cardiac disease, for example, passes a sugar-free urine with a specific gravity of 1070, which Dr. Boos is asked to explain. The unusual specific gravity proves to be due to clinical magnesium poisoning. Dr. Boos has had the opportunity of observing three such cases. Their clinical importance has led him to undertake an experimental investigation of the conditions governing the absorption from the intestine of magnesium sulphate in solution.”

The Chemical Laboratory was taken over by Dr. Folin in 1913 as Consulting Chemist, and Dr. Denis was appointed Assistant Chemist. Dr. Wright wrote that year that the two new appointees had “reorganized the Chemical Laboratory and put it in good working shape.” As Dr. Joseph C. Aub recalled, “By 1915 blood chemistry was being done extensively in the very good chemical laboratory that Willey Denis ran, and I remember her feeling of dissatisfaction with the medical House Officers who, she said, did not have enough scientific interest to allow her to accumulate specimens. She said the dermatologists were the ones who really cooperated with her” (1).

Under Dr. Denis’s directorship, there was tremendous expansion of clinical chemistry testing. By her second year in the laboratory, 1915, she had brought the number of clinical chemistry tests per year to 531; by her last full year as director, 1919, that number had risen to 2,542, and there was an increase in diversity as well (e.g., 256 for lead and

1,621 for “sugar” in 1921). In 1921 the position of Assistant Chemist was taken by Harriett I. Cole for a period of about one year. Soon after, Dr. James L. Stoddard was appointed Chemist, holding the position through 1929 and supervising the setup of a new Chemical Laboratory on the third floor of the Bulfinch Building, the east wing having been reconstructed in 1925 (1).

Clinical chemistry was increasingly performed on cerebrospinal fluid (CSF) as well, the emphasis being on detecting neurosyphilis. In 1922 the neurologist Dr. James B. Ayer, who had been working in the department on a variety of projects of neuropathological interest, expanded the study of CSF to include certain routine examinations (total protein and colloidal gold) and other special tests (gum mastic and quantitative sugar). The numbers of these tests in the laboratory in 1922 were 1,375 total protein, 908 colloidal gold, 374 gum mastic, and 228 quantitative sugar. By 1924 the number of spinal fluids examined was 2,016.

The arrival of Dr. David Linn Edsall at MGH as Chief of the East Medical Service in 1912, however, marked a turning point for the clinical chemistry laboratories (and may have been one element that led to the eventual schism between Dr. Wright and hospital leadership; see below). Dr. Edsall began the process of developing many clinical research laboratories outside the Pathology department. This process accelerated in the 1920s; Dr. James Howard Means succeeded Dr. Edsall as chief in 1923. As Dr. Means related in the mid-1930s:

The early laboratory space was perhaps bizarre, and certainly disseminated. The weird location of the metabolism and cardiographic laboratories has been mentioned. Most other activities were on the third floor of the power house, connected with the Pathology Laboratory, where Dr. Willey Denis then held sway as Chemist to the Hospital.

Dr. Edsall keenly felt the need for a suite of

medical research laboratories close to the medical wards. In 1917, he was able to get them. With the building of the Moseley Memorial, the Administration vacated the row of rooms along the front of the first floor of the East Wing of the Bulfinch Building. Dr. Edsall succeeded in securing these for laboratories. The adult metabolism laboratory was moved here, also Dr. Talbot’s pediatric metabolism laboratory. A small chemistry laboratory was fitted up, primarily for the study of diabetes. . . . Rooms were also devoted to hematology and immunology. Collectively the new space was given the name of the Medical Laboratories. They were the research laboratories of the Medical Services. Their opening was an event of some importance. As soon as the War was over in 1919 they became very active.

The changes that this was to bring to Pathology are discussed in chapter 5. Although started as research laboratories, these facilities would go on to assume clinical laboratory responsibilities, and the expansion of clinical laboratories outside Pathology would continue for decades.

### *Surgical Pathology*

The examination of tissue itself, that is, surgical pathology, was becoming a recognized discipline by 1896, but it was years before it developed fully and superseded autopsy pathology in the broad field of anatomic pathology (9). As the name suggests, surgical pathology grew initially in surgical departments in many institutions, the MGH being one such example. Dr. William Whitney, the first surgical pathologist at MGH, began in the Surgery department in 1888. Indeed, Surgical Pathology at MGH remained partly under the Surgical Services until at least 1911. To quote again from Dr. Wright’s report to the Trustees of 1899:

Another function of the laboratory is to decide upon the nature of tumor growths, or similar diseased conditions of various parts of the

body, in cases where there is a doubt concerning the nature of the disease. This is done by the microscopical examination of small pieces of the diseased tissue, and it is made possible by reason of the fact that certain pathological conditions of any part of the body always have their own microscopical structural characteristics which enable a specialist in microscopy to distinguish between conditions which, in their gross appearances, are very much alike. Thus, in cases of suspected cancer, the microscopical examination is often the only sure method of immediately determining the truth. The importance of this to the patient, as well as to the surgeon, will be obvious, when one considers that a definite knowledge of the nature of the case may enable the latter to decide whether an operation is advisable or not, or whether an extensive or only a limited operation is indicated. It may also be a means of recognizing serious conditions at an early stage, when there is better chance of a cure.

Interestingly, in addition to performing surgical pathology at the hospital, pathologists would take part in house calls. In the 1800s those able to afford home care avoided hospitals. Dr. George S. Richardson, in reviewing the life of his grandfather Maurice Howe Richardson (1851–1912) for the *MGH Surgical Newsletter* (Richardson, personal communication to R. E. Scully), adapted an account by John Homans, who was Richardson's surgical assistant from 1904 to 1908, of such a surgical house call: "Several automobiles would take the full surgical team to the scene: the operating nurse . . . with the sterile instruments and 'dry goods' she had prepared; the assistant, latterly an ENT specialist like Dr. F. E. Garland or his associate; and often Dr. W. H. [*sic*] Whitney, 'a pathologist, expert in the rapid gross and microscopic examination of tumors and other tissues.'"

As mentioned above, until the middle of Dr. Wright's tenure, Surgical Pathology remained

administratively separate from the main Pathology department and was under the supervision of the surgeons. The first surgical pathologist, Dr. William Whitney, was appointed in 1888 "to hold himself in readiness at all times to make such pathological examinations and investigations as shall be required by the Visiting Surgeons and Physicians." He was the pathologist engaged primarily in surgical pathology at the formation of the department eight years later. His offices were initially in the 1867 Operating Building, then in the basement of the 1900 Surgical Building, and subsequently upstairs in the Surgical Building. In 1922 Surgical Pathology was moved back to what had been the old and new "Glass Rooms" (former operating rooms) of the 1867 Operating Building, which was connected by a corridor to the newer Operating Building. Dr. Whitney's responsibilities included demonstrating the specimens removed during surgery and, later, performing intraoperative microscopic consultations using quick freezing and other techniques.

The MGH recognized the value of tissue microscopy early on, in part because of the invention of an improved microtome by Dr. Charles S. Minot, Professor of Histology and Human Embryology at HMS, and Francis Blake, one of the Trustees of MGH. This device enabled tissue sections to be cut as thin as one micron. Blake donated two Minot-Blake microtomes to the department in 1898. This proved important for the development of surgical pathology at the hospital, and also for investigative studies. Indeed, the combination of the two powerful technologies of the microtome and photomicrography (see below) were to prove essential in investigative work over the next many decades.

Another important development concerning tissue diagnosis was the introduction of intraoperative consultations, particularly in the form that came to be known as "frozen section" (10). The oldest approach was to examine cells scraped from the cut surface of an organ. Years before the advent of the cryostat, however, Dr.

Wright showed that brief boiling of the specimen in formalin yielded material adequate for rapid cutting and staining. In addition, a method for quick-freezing of a specimen for subsequent histological examination using carbon dioxide had been developed in 1896 by Dr. Samuel J. Mixer at HMS, in conjunction with the department at MGH. In 1901, Dr. Wright wrote:

The increasing demands for the microscopical examinations of tumors and other material with reference to diagnosis, and the recognition of the importance of promptness in the carrying out of such examinations, made it extremely desirable that some method be devised for preparing this material for microscopical examination whereby the time, labor and attention necessary for making such preparations might be greatly reduced, while the results would remain as good as with the methods in use.

As a result of much experiment a method was devised which has admirably fulfilled the requirements of practical work. It has so greatly facilitated the microscopical examination of diseased tissues in general in the Laboratory and has proven of such great practical value in this important part of the work of the Laboratory. . . .

With this method it is now easy to obtain, if desired, preparations entirely adequate for microscopical diagnosis, within a few minutes, from nearly every kind of material that is submitted for examination. In the frequent doubtful cases of malignant disease it thus enables a diagnosis to be made with the microscope, during surgical operations, more easily, more quickly, and more surely than with any method hitherto proposed.

Thus, the role of surgical pathology was clearly understood early on at the MGH, and that understanding would form the basis of its flowering under Drs. Mallory and Castleman as well as its continuation as a remarkable strength at the hospital to this day.

### *Autopsy*

Autopsies were also a “very important function” (to quote Dr. Wright) of the laboratory, including the associated microscopic and bacteriological evaluations in many cases. Dr. Wright pointed out that the extensive workup of autopsy cases “entails a large amount of work on the part of the pathologist and his assistants, but it is believed that in this way valuable data will be accumulated for use in the advancement of medical science”—once again emphasizing the initial intended role of the department to further medical knowledge.

Perusal of the first autopsy performed in the department, on October 19, 1896, exemplifies Dr. Wright’s assertion. The report, written out in beautiful longhand (see figure 15.1), reads:

Acute miliary tuberculosis involving the liver, lungs and spleen

Chronic tuberculosis of the cervical, mediastinal, bronchial, clavicular, axillary and mesenteric lymphatic glands

Chronic localized tuberculosis of the lungs, left upper lobe

Ascites, Hydropericardium, Hydrothorax

Acute pleuritis

Miliary abscess of kidney.

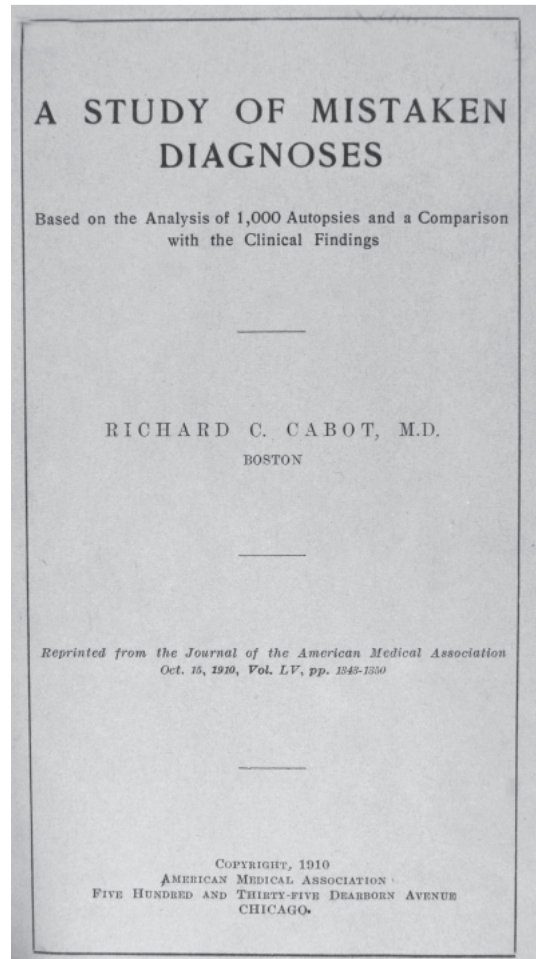
A note was added that “a guinea pig was inoculated subcutaneously from a portion of a yellow nodule taken from the neighborhood of the trachea.” On November 5, 1896, an addendum was appended: “A guinea pig inoculated subcutaneously with a piece of a caseous lymphatic gland at the time of the autopsy, was found gasping today and was killed. The animal showed marked emaciation and some enlargement of inguinal lymphatic glands which on section were grayish translucent but not caseous. In the liver a large area of necrosis about 1 cm in all directions was found. . . . Tubercle bacilli in small number demonstrated in one of the glands of the inguinal region by coverslip.”

A particularly vexing aspect of performing autopsies in the early years was the lack of refrigeration. This was solved by 1902, however, when a “refrigerating apparatus” was placed in the morgue. In addition, the inventive MGH Trustee Francis Blake devised a special piece of equipment that facilitated handling of the bodies in connection with the refrigeration device, allowing one person to transfer bodies in the morgue.

By 1905 the numbers of autopsies had increased greatly, largely because of an increase in the percentage of autopsies performed on patients who had died in the hospital. From 1897 until 1904 autopsies had been performed in about 30 percent of deaths, but the number jumped to 70 percent in the second half of 1905. This was attributed to the successes of the Assistant Resident Physicians in obtaining permission for autopsies. The changes resulted in an increase from an average of 155 per year during 1897–1904 to 300 in 1905. Demonstrating the importance of autopsies in furthering medical knowledge, Dr. Richard Cabot published a paper in 1910 entitled “A Study of Mistaken Diagnosis Based on the Analysis of 1,000 Autopsies and a Comparison with Clinical Findings” (figure 3.8) (11).

Within a few years, however, the number of autopsies had decreased, to 163 in 1912 and 118 in 1914, principally because the percentage of autopsies performed on patients dying in the hospital had decreased. In addition, as mentioned above, the policies of the medical examiner had changed, preventing the hospital’s Pathology department from performing medicolegal autopsies. The lower numbers continued for years, and Dr. Wright commented, “This decrease in the proportion of cases in which an autopsy was permitted is to be regretted, for it hampers the progress of medical knowledge among the physicians, surgeons and students who frequent the Hospital and also lessens the value for medical research of the clinical records of the Hospital.”

Nearly all of the 4,200 autopsies performed in the department in the first 25 years of Dr.



*Figure 3.8 1910 paper by Richard Cabot demonstrating the value of the autopsy in clinical correlation*

Wright’s tenure were done by Drs. Wright and Richardson. In the early 1920s other pathologists also began to perform autopsies, including Drs. William A. Hinton and George A. Buckley. Dr. Hinton went on to an illustrious career at HMS, developing the widely adopted Hinton test for syphilis (chapter 15); he was the first African American professor at HMS.

### *Therapeutics*

Even before the advent of blood banking and its general incorporation into Pathology, the department was involved in therapeutic applications. The first and most notable was the introduction in 1907 of the work of the British bacteriologist

Sir Almroth E. Wright, who used killed bacteria as subcutaneous injections to treat infections with those same bacteria. Given the expertise of the Pathology Laboratory in culturing bacteria, the work proceeded largely as an outgrowth of the Pathology department. “Most of these patients came to the Laboratory rather than to the Out-Patient Department to receive injections, because those who administer the treatment require the facilities of a well-equipped bacteriology laboratory close at hand, and spend much of their time and energy in obtaining cultures of the patient’s own infecting bacteria and in preparing special material for injection from these.” The lab was initially directed by Dr. Harry Hartwell, and other physicians involved in the treatments included Drs. Roger I. Lee, Roger Kinnicutt, E. C. Streeter, R. M. Green, and T. W. Harmer. In 1908 nearly 500 patients were treated, including some from the Boston Lying-In Hospital. By 1910 a special position of Assistant in Clinical Bacteriology had been created for this work and taken by Dr. Albert E. Steele. Nonetheless, the number of patients treated dropped to 383 in 1909 and 220 in 1910, a decrease that was “due to clearer knowledge . . . of the limitations of the applicability of this mode of treatment to only certain kinds of cases.” The numbers continued to fluctuate but generally dropped over the years (to only 30 in 1934)—but it is noteworthy that this practice continued in Pathology for about two decades.

Dr. William Boos, the chemist, was also involved in therapeutics, using “certain recent advances in pharmacology to the treatment of hospital cases,” which included studies on digitalis, the use of Salvarsan for treating syphilis, and the treatment of toxins, the latter being a particular interest of his.

### TEACHING

By 1900 it was recognized that the laboratory and its faculty would be important for the teaching of HMS students. The collection of specimens

for teaching purposes was a major activity over the years, particularly as a result of work by Drs. Oscar Richardson and Harry Hartwell, and James Ayer for neurological specimens. Early on, Dr. Wright joined with Dr. Reginald Fitz (then Professor at HMS), who was giving clinical lectures to the students, to present a course in laboratory diagnosis. He was quickly joined by Dr. Oscar Richardson, who would continue to teach Harvard students extensively over his career at MGH. Dr. Franz Pfaff also gave lectures to selected students in chemistry. All these lectures expanded over the years, involving many faculty familiar with laboratory diagnosis, including Drs. A. K. Stone, G. S. Badger, Walter Bailey, and F. T. Lord. By 1907 the teaching of medical students had extended to include special rotations by fourth-year students. Moreover, it was thought essential for rotating medical students to spend time viewing the autopsies, and as early as 1905 “a special room in the Laboratory has been assigned for the laboratory work of those students of the Harvard Medical School who are studying in the wards of the Hospital. Special opportunities are given to these students to gain knowledge from the autopsies, which are of the greatest educational value to them.”

Continuing medical education for practicing physicians was also an early and lasting activity of the department. For example, the autopsy room proved a valuable place for surgeons to practice operative techniques, a practice that has continued over the years.

In 1908 “courses in pathological anatomy and clinical pathology for graduates in medicine were given by Dr. Oscar Richardson; Drs. W. H. Smith and R. I. Lee cooperating in the latter course. Eighteen physicians attended these courses. It is worthy of note that most of them came from outside the city and several from other states.” By 1911 a course in pathology had been attended by 50 physicians and was “regarded as highly successful.” Even during World War I, attendance remained good at these courses.



Importantly, the Clinico-Pathological Conferences of the MGH (the “Case Records” published in the *New England Journal of Medicine*; chapter 24), also began during the Wright years, initially as informal teaching exercises. From the start, the conferences were well-attended and well-received; Dr. Wright claimed as early as 1918 that “the circulation of the ‘Case Records’ reporting the weekly clinico-pathological exercises held in the laboratory has greatly increased during the year.” In his annual report for 1905, Dr. Wright wrote, presciently: “An important innovation in the instruction of medical students and physicians, begun in the latter part of the year, is a weekly demonstration in the Laboratory of post-mortem material accumulated during the week. This demonstration is conducted by Dr. J. H. Wright and Dr. Oscar Richardson in cooperation with Dr. R. C. Cabot who discusses the clinical aspects of the cases.”

### RESEARCH

Dr. Wright was highly productive in terms of his academic output, and he is credited with a number of major discoveries and publications (chapter 4). Here it is sufficient to note that he had broad interests in tissue pathology and bacteriology, and in the overlap between the two. Perhaps his most notable discoveries were identification of the megakaryocyte as the cell of origin for platelets (for which he won the Boylston Medical Prize from Harvard Medical School in 1908), the nature of neuroblastoma and its characteristic rosettes (Homer Wright rosettes), the cell of origin for multiple myeloma, demonstration of the role of spirochetes in syphilitic aortic aneurysms, and clarification of actinomycosis (for which he won the Samuel Gross Prize of the Philadelphia Academy of Surgery). Equally important, he developed the blood stain for which he is remembered (the Wright stain) and coauthored with Dr. Frank B. Mallory the hugely influential textbook *Pathological Technique: A Practical Manual for Workers in Pathological Histology and Bacteriology*,

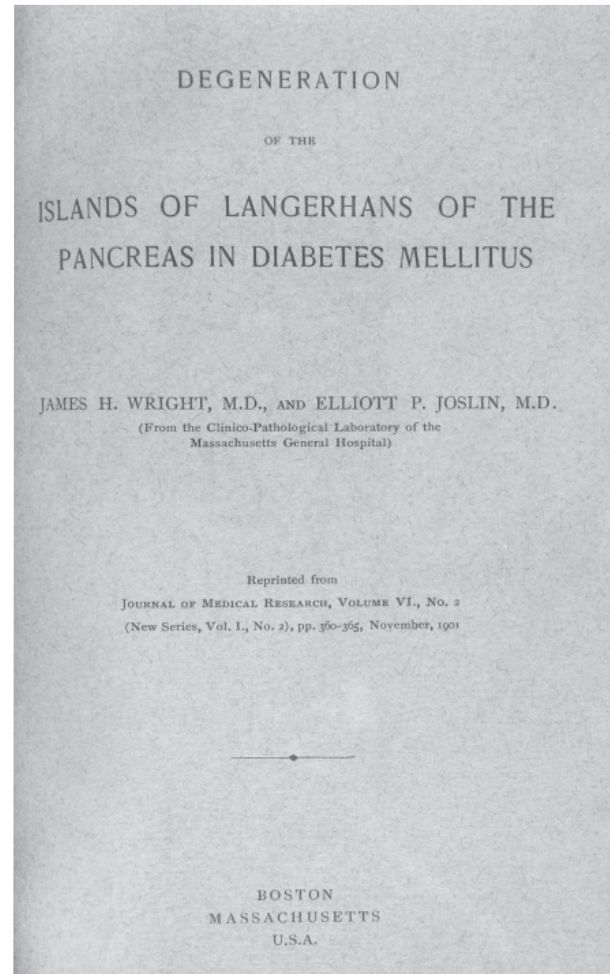
*including Directions for the Performance of Autopsies and for Clinical Diagnosis by Laboratory Methods* through many editions.

During Dr. Wright’s tenure, research in the department was primarily clinicopathological in nature, reflecting the direction of most medical research at the time. In addition to accommodating projects carried out by the pathologists themselves, the laboratories were designed to be “core” facilities for other physicians to pursue projects. Typically, internists and surgeons would enlist for certain periods, often a few years, to carry out research studies using the laboratory resources, sometimes with the help of the pathologists and chemists but sometimes on their own. The charge for a working place in the laboratory was \$25 for a year and \$15 for half a year in 1900. These charges generated \$415 in 1900, \$400 in 1901, \$450 in 1902, \$460 in 1903. The numbers suggest the presence of at least 16 physicians rotating through the laboratory each year for research purposes, and Dr. Wright commented in 1903 that 25 other physicians worked in the laboratory over the course of that year, and 17 in 1915. Clearly, this proved an extraordinarily productive and interactive approach, as attested to by the large number of important publications that emerged from the laboratories during this period. Moreover, the approach also clearly helped launch the careers of many physicians who would go on to distinguished academic careers.

One important aspect of pathology research, and later pathology teaching, was the emerging discipline of photomicrography. Dr. Wright and the hospital recognized this at an early stage; as a result, in 1898 Dr. Wright could report that “a very complete outfit for photo-micrography has been acquired by the laboratory under a special appropriation by the trustees of the hospital. On account of the great utility of this branch of photography as a means of recording and illustrating the results of investigations done in the laboratory, much time has been devoted to its study with very satisfactory results.” The laboratory

came under the guidance of Louis S. Brown (see figure 21.1), who would oversee photomicrography in the department for 24 years, until his death in 1920. (Brown had originally come to the hospital as a boy suffering from osteomyelitis, then had joined the staff as an orderly on the South Surgical Service in the 1890s, and in 1896 had become the first Technician in Pathology.) Photomicrography was to play important roles for the department. By 1900 the photomicrography setup had been expanded (when clinical chemistry moved to an adjacent building), and during the year it generated “a large number of negatives and lantern slides . . . for use in illustrating . . . lectures in the Hospital.” By 1902 many photomicrographs had been produced for illustrations in Dr. Richard C. Cabot’s book on hematological diseases. The following year, Dr. Frank Mallory of Boston City Hospital used the MGH photomicrography laboratory (since it was the only such facility in town at the time) to illustrate his 1904 paper titled “Scarlet Fever. Protozoon-like Bodies Found in Four Cases.” On the occasion of Brown’s death in 1920, Dr. Wright would state: “The excellence of the photographs made by him to illustrate publications on bacteriology and pathology by workers in this and other institutions is widely recognized and has importantly contributed to the scientific reputation of the hospital.” By 1923 the photographs taken numbered 750, with 1,500 prints; by 1924 it was 850 plates with 1,600 prints.

Another important early realization was that the laboratory generated abundant data that, if carefully recorded, could be of use for future reference. Multiple improvements were made over the years to enhance laboratory record keeping. Dr. Wright opined that “such records are invaluable to investigators of the pathology, localization, and statistics of disease . . . and constitute an extensive storehouse of facts and observations concerning disease that is becoming more and more valuable and more frequently drawn upon for facts and figures by workers in special lines of



*Figure 3.9* 1901 paper by J. Homer Wright and Elliott Joslin describing degeneration of the islets of Langerhans in patients with diabetes

clinical and pathological inquiry, both in this and other cities.” So important was the work of organizing the departmental records that Dr. Wright engaged in this activity himself over the years and kept many of the records in his own office.

Many physicians and surgeons, as mentioned above, rotated through the Clinico-Pathological Laboratory, undertaking projects either on their own or in collaboration with the pathologists and chemists. Many of these individuals went on to important careers, and the number of papers that emerged from this approach was astounding. Some of the more notable are summarized in the following paragraphs.

Dr. Elliott P. Joslin, who had been a house officer on the West Medical Service at MGH in 1895, began work in the laboratory within the first two years of the founding of the department. He initially examined the role of bile in fat digestion, but he went on in as early as 1900 to begin his work on diabetes mellitus (“A study of ‘acidosis’ in a case of diabetic coma”). Despite beginning a private practice in the Back Bay of Boston in 1898, Joslin continued to work in the MGH pathology laboratories. In 1901 he and Dr. Wright published a seminal paper demonstrating degeneration of the pancreatic islets of Langerhans in patients with diabetes (figure 3.9) (12). Joslin was the first physician in the United States to specialize in diabetes. In 1952 his group became the Joslin Clinic, the first clinic dedicated to the treatment and study of diabetes, which continues to this day as the largest diabetes center in the world.

Dr. Mark Wyman Richardson, who had graduated from HMS in 1894, also began work in the laboratory in the first two years of its existence, and for many years he did pioneering work on the best methods for diagnosing typhoid fever. Dr. Richardson was prolific in this area, publishing eight articles on the subject in 1897 and 1898 alone. He went on to serve on the board of public health and the state medical society and as a medical examiner, and he also published papers on inoculation against typhoid fever. Tragically, his two sons died of poliomyelitis in the summer of 1909; he subsequently supported research in their honor, including work on the transmission of poliomyelitis.

The list of names and topics associated with the department during the Wright years is impressive, including A. H. Gould (genitourinary pathology); William Boos (nucleic acids, in addition to his work on the purification of digitalis for clinical use and on intravenous catheter delivery of Salvarsan); C. C. Simmons (tumor cell culture); Beth Vincent, surgeon (coagulation, pioneering work in blood transfusion and banking;

chapter 22); J. B. Ayer, neurologist (neuropathology; chapter 17); Robert B. Greenough, surgeon (breast pathology); Roger I. Lee (coagulation and blood transfusion; chapter 22); Richard Cabot, founder of the CPCs (autopsy and clinicopathological reports; chapter 24); Henry A. Christian, subsequently first Physician-in-Chief at Peter Bent Brigham Hospital (myeloma, stomach cancer); Joseph Aub (endocrinology); Arthur M. Greenwood (dermatopathology; chapter 18); Ernest A. Codman, surgeon (gastrointestinal ulcers and bone pathology; chapter 16); William H. Smith (pulmonary and cardiovascular diseases); and Joseph Lincoln Goodale (head and neck pathology; chapter 16). Particular attention should be drawn to the work of George Minot (see also chapter 20) on blood diseases, including pernicious anemia, for which he won the Nobel Prize in 1934. Minot credited the irascible but knowledgeable Wright with setting his investigations in the correct direction, as Paul de Kruif, the microbiologist and writer, recalled Minot’s telling him:

Minot was an admirer of the great pathologist, Dr. James Homer Wright, who, when asked what he thought was at the bottom of this fearful thinning of the blood, roared impatiently: “Dammit, Minot, can’t you see it’s the bone marrow that’s sick?” Minot kept bothering Dr. Wright. “But what do these megaloblasts”—young immature red blood cells that refused to develop—“what do these megaloblasts mean in these pernicious anemia patients?” “What ails you?” asked Wright. “Can’t you see the bone marrow is chock-full of cells that can’t grow up? If we only knew how this happens! Can’t you see pernicious anemia bone marrow’s like a tumor; embryo stuff overgrowing the marrow fat, overgrowing everything . . . but not developing. But get out! What the devil do you bother me for?” (13)

Minot thanked Wright in his Nobel Prize speech of 1934: “In accepting this honor I give

recognition to those men who have taught me how science provides the means by which human suffering may be alleviated and who have aided me to understand fundamental knowledge and clinical problems: such men as the late James Homer Wright . . .”

Dr. Edward D. Churchill, who became Chief of the Surgical Service in 1931, summed up the early years of surgeons doing investigative work in the Pathology Laboratories:

In the early years of the century, pathologic anatomy held the ascendancy in the interest of the Surgical Staff. It is not surprising, therefore, to find the younger members of the Surgical Staff at that time clustered about Dr. J. Homer Wright in the Laboratory of Pathology during their spare hours. Here was Dr. Robert B. Greenough laying the foundation for an illustrious career in cancer surgery; Dr. Lincoln Davis studying the chancroid bacillus; Dr. Hugh Williams staining the flagellae of the tetanus bacillus; Dr. Wyman Whittemore evaluating the newly announced Wassermann reaction; Dr. Beth Vincent with Dr. Roger I. Lee studying blood coagulation and eventually perfecting the Vincent tube for direct transfusion. These and many other contributions emerge from the Pathology Laboratory as contributions of the Surgical Staff. (1)

In the 1920s Dr. Edward P. Richardson, then Chief of the Third and West Surgical Services, had developed primary research laboratories in the surgical departments, ending the era in which most academic surgeons did their research in Pathology. Combined with Dr. David Edsall's earlier successful push for laboratories within the Medical Services, the Wright era therefore represented the end of the Pathology department's being the primary location for research by internists and surgeons. Nonetheless, the department would remain an integral place for collaborations between the other clinical services and pathologists, as it does to this day.

## THE END OF THE WRIGHT ERA

After 1910 there was a decline in Dr. Wright's academic output, which may have reflected a divide between him and some of the more prominent MGH clinicians. It has been suggested that the appointment of Dr. David L. Edsall as Chief of Medicine at MGH in 1912 caused the rift, since Edsall pursued the establishment of both clinical and research laboratories at MGH outside the department of Pathology. It may also have been that Wright's failure to establish a residency training program may have drawn criticism from other senior MGH clinicians. With the shift in medical research away from strict morphology and toward physiology, "interest in pathology flagged. Where hordes of volunteer workers had been available, paid assistants become necessary. As technical methods became standard, more and more of the work was passed down to non-medical technicians. Clinical contacts became fewer, research faltered and even the plant and equipment were allowed to deteriorate till the need for radical reorganization became apparent in 1925." Moreover, the death of Dr. Wright's wife in 1923 left him depressed (chapter 4), and this may have affected his work. Although the direct reasons for its decision are not clear, the hospital requested Dr. Wright's resignation in 1925, and he turned leadership of the department over to Dr. Mallory in 1926.

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