

The Castleman Era (1952–1974)

DAVID N. LOUIS AND ROBERT H. YOUNG

DR. BENJAMIN CASTLEMAN was a dynamic and focused individual, and the Castleman years were of a similar nature for the department: *dynamic* in that much of Dr. Castleman’s charisma was conveyed to the department, invoking a sense of a “golden era”; and *focused* in the sense that the department clinical services included only anatomic pathology (autopsy, cytopathology, and surgical pathology).

The transition to Dr. Castleman as chief was also different from the prior two leadership transitions. Both Drs. Wright and Mallory had come from “the outside,” whereas Dr. Castleman had been in the department since his rotation as a Yale medical student, and he had been in the department as its first true pathology resident and then as a faculty member. Moreover, he had served as Acting Director for two years during World War II, and for a year after Dr. Mallory’s death—becoming the official chief of the department in 1953. Thus, the transition to Dr. Castleman was less of an upheaval than that from Dr. Wright to Dr. Mallory.

Dr. Castleman’s appointment was notable in another way, because he was Jewish. He had grown up in a religious household and had, at one time, studied with the famous Rabbi Joseph Soloveitchik of Boston. Anti-Semitism certainly existed in the hospital, but Anna Castleman (in 2009) recalled that physicians from the established Boston families were not anti-Semitic.

She remembered, with particular fondness, Dr. Oliver Cope, who had been from a Pennsylvania Quaker background and with whom her husband had had a long and close friendship as well as working relationship. Dr. Mallory himself had taken a relatively large number of Jewish physicians as residents, including Dr. Castleman, and was known as a very tolerant individual; his closest assistant, Edith Parris, was African American. Regardless, the appointment was a significant one: Dr. Castleman became the first Jewish Chief of Service at MGH.

As mentioned, the department had a scope under Dr. Castleman that differed from the breadth under Drs. Wright and Mallory. The clinical laboratories had already migrated away from functional Pathology involvement. Moreover, in 1952, at the start of Dr. Castleman’s tenure, Bacteriology was split away from Pathology and incorporated into the Infectious Diseases Division of the Medical Services, which had grown markedly as a specialty in the early antibiotics days that followed the close of World War II. The Blood Bank remained, as it had since its inception, in Surgery (see below). Thus, Pathology during the Castleman era was “Anatomic Pathology”—a focus actively encouraged by Dr. Castleman himself, who saw anatomic pathology as the true calling of the pathologist. Indeed, although he facilitated training of pathology residents in clinical pathology to conform to the

growing requirements of the American Board of Pathology, he required residents rotating in clinical pathology to participate in the two major anatomic pathology conferences each day and would discourage pathology residents from undertaking faculty careers relating to clinical pathology.

Dr. Castleman was closely involved in all the clinical activities of the department as well as in the teaching of residents. As he recounted in 1983 (1):

I personally believe that contact with one's Chief of Service is very important and I give almost two hours a day to actual participation with my staff. . . . The entire staff meets at 8:15 and for up to one hour I personally check all the gross material of the autopsies of the day before. This is a very popular exercise and almost every morning various members of the clinical staff, both house and members of visiting staff, appear to take part when their case is coming up. Every afternoon from 2 to 3, I personally check the interesting and problem microscopic slides of the surgical pathology specimens that have come through that day. These two hours each day give me an opportunity to actually know what is going on in the department and also give an opportunity to the various members of the department, who are working on research problems or who are assigned to bacteriology, hematology, or chemistry to return to the laboratory each day in the morning before they start their regular work and right after lunch before they start their afternoon's work.

It was also a period of significant growth. In 1951 there were 7 faculty, 7 clinical trainees, and 20 nonprofessional employees; by 1972 there were 15 faculty, 21 trainees, and 65 nonprofessional employees. In that time surgical specimens increased from 9,752 to 20,546 a year and autopsies from 687 to 952 a year. New clinical laboratories began in the department, notably Cytology

and Cytogenetics, and each of those experienced major growth.

The Castleman years also witnessed the beginnings of computerization and information technology, and their major effect on the laboratories. For example, in 1965 Dr. Castleman wrote: "The volume of work in the cytology laboratory under the direction of Dr. Priscilla D. Taft increased about 10 percent during the past year. With the help of Dr. G. Octo Barnett, data on each patient are now being entered in a computer. The purpose of this project is to make the diagnoses, especially those diagnosed 'doubtful' and 'positive,' more readily available for correlation with other studies in the follow-up of patients with cancer."

Indeed, Dr. Barnett, who started the Laboratory for Computer Sciences at MGH, was a pioneer in what would become laboratory information systems and played a major role in the development of multiple computer systems in the laboratories over the next few decades. For instance, in 1966 he implemented MUMPS (MGH Utility Multi-Programming System) in the Chemistry Laboratory, enabling it to be the first hospital laboratory in the nation to be computerized.

Nostalgia for the Castleman era continues to this day, as alumni wax eloquent about "BC" and the vigor he brought to the department. The interested reader is encouraged to view the hour-long *Alpha Omega Alpha Leaders in Medicine* video of Dr. Castleman being interviewed shortly before his death in 1982 (www.alphaomegalpha.org/leaders.html). The interview by Dr. Ronald Weinstein gives one an idea of Dr. Castleman's personality, convictions, and interests. He burst with pride at what his trainees had done, both in going on to prestigious positions in academic pathology and in endowing an annual United States and Canadian Academy of Pathology (USCAP) award in his name. One gets the sense that he was a demanding but highly effective Chief of Service.

LABORATORIES

Space remained a critical problem in the early Castleman years. In 1952 some research space was opened up on the fourth floor of the Domestic Building, sufficient for the Histochemistry Laboratory and the research laboratory of Dr. Agnes S. Burt (Russfield). The Histochemistry Laboratory, under Dr. Edgar Taft, used this space to work with the new Linderstrom-Lang cryostat to develop better techniques for rapid tissue preparation, and Dr. Robert Fennell used the laboratory to continue his studies of cervical cancer pathogenesis and cytology-histology correlation.

Clearly, Pathology needed new clinical space, but funding had not been sufficient to commence planning until 1953, when the hospital's Building Fund had grown large enough for the Trustees to authorize the design and construction of the new building. It was expected that ground would be broken in 1954. Edgar Taft, at that time one of the Assistant Pathologists, devoted about half of his time to planning for the new building. Dr. Castleman complimented him for his "excellent ideas and resourcefulness. He has been an excellent liaison between the staff and the administration, the architect and various manufacturers of equipment." Indeed, given that many of the administrative and anatomic pathology components of the department still reside in the Warren Building in 2011, Dr. Taft's input in this regard has been felt for decades.

It is worth noting, however, that such planning pertained only to anatomic pathology and related research, since the clinical laboratories, Blood Bank, and Bacteriology resided outside the department. This physical split of the anatomic from the clinical laboratories was in effect carved in bricks and mortar at this time, and the divide would remain through the rest of the twentieth century, only to begin to be remedied with the integration of the anatomic and clinical laboratories that was planned to follow the integration of the anatomic and clinical pathology faculty,



Figure 7.1 Artist's sketch of the Warren Building at the time of its opening, in a brochure for the opening ceremonies

which occurred under the tenures of Drs. Robert Colvin and David Louis in the 1990s and early 2000s.

The groundbreaking for the Warren Building (although it was at the time called the Medical Science Building) took place on November 8, 1954 (figure 7.1). In this year the family and friends of Edwin S. Webster, a former hospital Trustee, raised funds to set up the Edwin S. Webster Laboratory in the new building, which would be in the basement and devoted to the new technology of electron microscopy. A grant was obtained from the NIH to purchase the first electron microscope, a second grant was obtained in 1959 to acquire a second one, and a third was

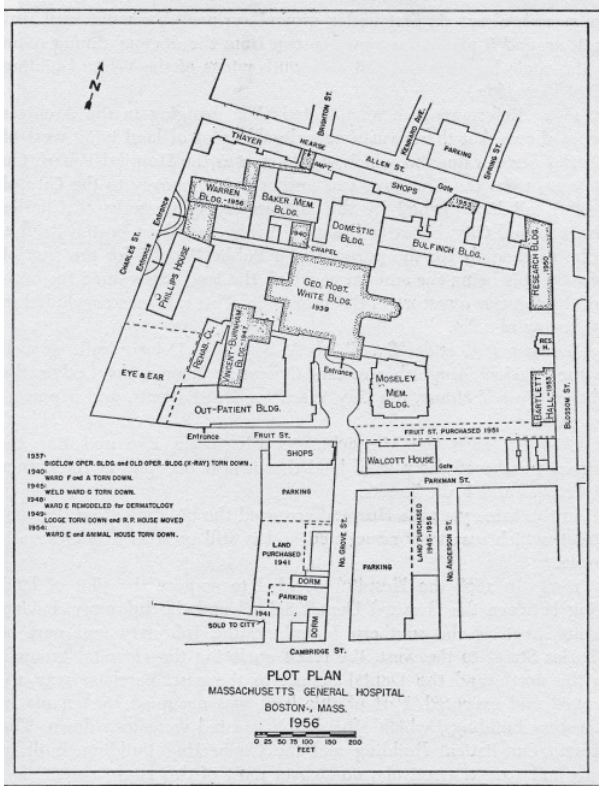


Figure 7.2 Plot plan of the MGH, 1956, indicating the location of the Warren Building (upper left)

purchased in 1965. The laboratory would continue as an integral part of the department for decades, expanding when it moved into the Cox Building in 1976; it was closed unofficially with the move of Pathology out of the Cox Building in 2000.

With construction having started in 1954, Dr. Castleman could write with nostalgia about the Allen Street Building (see figure 5.1), commenting that his annual report for 1955 would be “the last written in the present Allen Street Building.” After a review of the tenure of the department in that building, he remarked, “We in the Laboratory realize the high standard of the past, and hope that the new bricks and mortar will help us uphold this tradition.”

The department moved into its new quarters on September 21, 1956 (figure 7.2), which Dr. Castleman referred to as “D Day,” and he noted, “We could hardly wait for the paint to be dry.” A

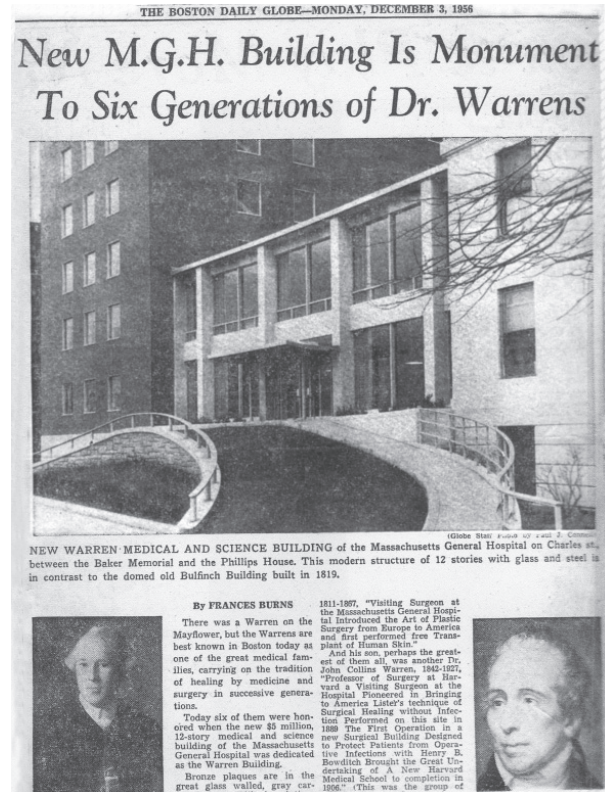


Figure 7.3 A Boston Globe article about the Warren Building published on December 3, 1956

ceremony for the opening of the Warren Building was held on December 3, 1956 (figure 7.3), attended by numerous dignitaries, including Dr. Wilder Penfield, the noted neurosurgeon from Montreal. The Right Reverend Robert P. Barry, in his comments at the dedication, spoke eloquently about the hopes that rested on the activities in the new structure: “The building not only houses the marvels of modern scientific equipment, brilliant doctors and scientists, but also your hopes and ours, that from the studies and investigations that take place within its walls, will emerge sources of knowledge to bring lasting benefit to mankind.”

A separate gala dedication ceremony for the Pathology department itself was held on December 15 of that year (figure 7.4), when the new laboratories were christened as the James Homer Wright Pathology Laboratories and the library on the second floor as the Tracy Burr Mallory

Library (figure 7.5)—both names used to the present day. The event was attended by such dignitaries as Dr. Fred Stewart of Memorial Hospital for Cancer and Allied Diseases in New York; Dr. William Boyd, Professor Emeritus of Pathology at the University of Toronto; Dr. Arthur Hertig, the Shattuck Professor of Pathological Anatomy at HMS; and Captain William M. Silliphant, the Director of the Armed Forces Institute of Pathology in Washington, D.C. A portrait of Dr. Tracy Mallory, which still resides in the library—now alongside portraits of Drs. Castleman, McCluskey, and Colvin—was unveiled by Dr. J. Howard Means of the Medical Service (see figure 6.5). The dedication, held on a Saturday, was preceded by a scientific session in which departmental faculty presented their work, and many departmental alumni returned for the event.

Pathology initially occupied the basement, first, and second floors of the Warren Building. An estimated 65 percent of this space was for routine diagnostics: surgical pathology, autopsy, neuropathology, and cytology. The remaining 35 percent was for research, space that the department had “woefully lacked” for a long time; the research was divided into experimental (animal) pathology, histochemistry, microchemistry, and electron microscopy. The research space was utilized primarily by members of the department, but Dr. Joseph Aub, the well-known physician-scientist, joined the Pathology research

laboratories on his retirement from the Medical Service in 1956.

Even in the first month, the department seemed to find the new surroundings inspiring even as it began to develop nostalgic feelings for the old building. Dr. Castleman wrote:

During the past month, it seems that all I have heard has been: It’s about time; it was a long time in coming; you certainly deserve it; what a contrast; and many other similar remarks. Although we lived in the Allen Street building for sixty years, we were really not unhappy there. To be sure, there were no modern appointments, but there was a homeliness and intimacy that only age can bring. The benches were always full of microscopic slides. There was a mustiness and flavor that seemed to insure the correct diagnosis! Studies that have become medical classics were carried out in those rooms under James Homer Wright and Tracy Mallory. I trust we can carry on in their tradition. (2)

And, over the first year, the new building proved a huge success: “Our first year in the Warren Building has fulfilled all our expectations. . . . Routine procedures are now carried out more efficiently, leading to better patient care. The department is beginning to catch up with the backlog of autopsy protocols and other material which had accumulated partly as a result of lack of space and personnel.”

Within a year of the new building’s opening, the department had about 100 members, a large department considering that it focused entirely on anatomic pathology. In 1959, when the American Associations of Pathologists and Bacteriologists and the International Academy of Pathology had a meeting in Boston, the department proudly showed off its new laboratories to the visitors—much as Dr. Wright had shown off the new laboratories when the American Association of Pathologists and Bacteriologists met in Boston in April 1901.

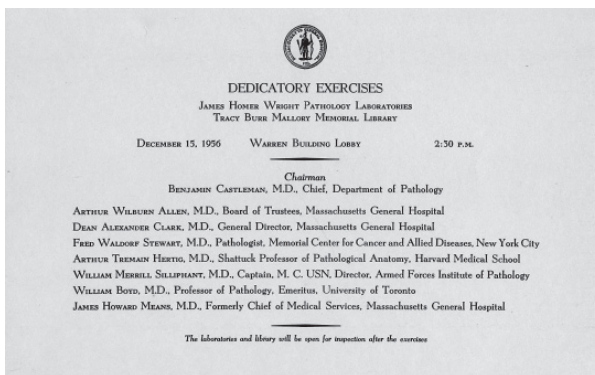


Figure 7.4 Agenda card from the Warren Building dedicatory exercises, December 15, 1956



Figure 7.5 The Tracy Burr Mallory Library on the second floor of the Warren Building, at the time of its opening in 1956. Note the portrait of Dr. Mallory, which still hangs in the library.

The rapid growth of the Cytogenetics Laboratory in the early 1960s occasioned a need for more space. In 1963 the laboratory moved into the Kennedy Laboratories on the ninth floor of the Burnham Building (eventually the Vincent Burnham Kennedy Building, before it was taken down to allow erection of the new Lunder Building scheduled for 2011). Here, Cytogenetics coordinated well with the nearby Neurology, Pediatric, and Gynecology services.

By the early 1970s space had once again become a challenge. Dr. Priscilla Taft, writing in 1972, said that crowding in the Cytology Laboratory complicated hiring and retaining employees as well as storage of materials. And Dr. Castleman added that similar conditions prevailed in the Histology and Neuropathology laboratories, “where the volume and personnel have also increased during the past 15 years. It is hoped that relief will be forthcoming!”

With construction of the Cox Building

(adjacent to the Warren Building) beginning at that time, the wing of the Warren Building basement housing the morgue and the Allen Street entrance had to be given up, which required a new entrance to be built in the Phillips House basement. This also necessitated movement of the Electron Microscopy Laboratory from the basement; one electron microscope was moved to White 3 and the other, with Dr. James Caulfield, to the Shriners Burns Institute.

By 1974 Dr. Castleman would point out that “the space for both patient care and research activities, which has not only not increased but has actually decreased since we moved into the Warren Building in 1956, is woefully inadequate.” He hoped that his successor as chief in 1974 would garner additional space for the department, and he had already worked with the Search Committee and the hospital administration to secure additional space in upper floors of the Warren Building.

THE PATHOLOGISTS

The faculty grew substantially during Dr. Castleman's years as chief (figures 7.6, 7.7, 7.8, and 7.9). By 1966 (figure 7.8) the faculty had doubled to 16 full-time pathologists (their distribution by their HMS ranks being one professor, four associate professors, four assistant professors, one lecturer, four associates, and two instructors).

In July 1952 both Assistant Pathologists, Drs. Robert Scully and Austin Vickery, were called to serve in the Army—"assigned to what is considered one of the best posts for pathologists, the 406th General Medical Laboratory in Tokyo." Dr. Robert Fennell, who was interested primarily in gynecological pathology and cytology, returned from the University of Tennessee for two years to fill one of the opened positions, and the other position was filled by a combination of Drs. David Kahn (doing work with the

Arthritis Group) and Dr. Edgar Taft (working with the Huntington Group in cancer research, "who had become nostalgic for routine pathology"). The year also saw some pathologists leave, most notably Dr. Louis Dienes, who retired from the position of Bacteriologist, which he had held since 1930. Dr. Winfield S. Morgan, who had just completed a three-year residency, left for a fellowship at Oxford, and Dr. Augustin Roque, who had been in the department for four years helping develop the Histochemistry Laboratory, left for additional training in London. Dr. Morgan would return a year later to continue his research, and to begin a long tenure in the department (see below).

In 1954 Drs. Scully and Vickery (chapters 9 and 10) returned, both having done research on war-related issues during their time in Tokyo, and both became involved in the areas of pathology that were to characterize their interests for many



Figure 7.6 MGH Pathology, 1954. Front row, left to right: Winfield Morgan, Richard Cohen, Robert Fennell, Agnes Burt Russfield, Benjamin Castleman, Edgar Taft, David Kahn. Middle row: Raymond Justi, Gustaro Mogalon, S. C. Ming, Remedios (Rose) Rosales, Fairfield Goodale, Alex Ritchie, Roy Byrnes. Back row: C. Viladarez, H. Robert Dudley, Gordon LaZerte, Leonard Atkins, James Peterson.



Figure 7.7 MGH Pathology, 1956. Front row, left to right: Winfield Morgan, Richard Cohen, Robert Scully, Ronald Sniffen, Benjamin Castleman, Austin Vickery, Edgar Taft. Middle row: Robert Richards, Sumner Zacks, Raymond Justi, G. Richard Dickersin, Dean Moyer. Back row: William Thurlbeck, Bradley King, Anne Thomas, Agnes Burt Russfield, James Davis, Martin Etchart.

decades: Dr. Vickery with the Thyroid Clinic and Dr. Scully with the Vincent Memorial Group in gynecology. With their return, Dr. Fennell left for Pittsburgh and Dr. Kahn for McGill.

Drs. Vickery and Scully would remain with the department for their entire long and successful careers; along with Dr. Castleman, they would largely define surgical pathology at MGH for much of the twentieth century. Particular attention should be drawn to the long-term relationship between Drs. Scully and Vickery. The two worked together, their offices very near each other, for more than five decades and were close friends; the two would direct Surgical Pathology together during the first part of Robert McCluskey's tenure. Both were superb pathologists as well as gentlemen—dedicated to their professions, their colleagues, and their trainees. Both also had wonderful senses of humor, warmly recalled by all who knew them (figure 7.10). The

stories are many, but two must suffice here as being representative:

SCULLY, WHILE SHOWING A CASE TO VICKERY: Vic [Dr. Vickery's nickname], if you were taking the board exams and saw this case, what would you call it?

VICKERY: Well, I'd call it a malignant tumor and most likely of gynecological origin.

SCULLY: And, Vic, what would you call it when you were taking the board exams for the *second* time?

VICKERY, WHEN TOLD BY A RESIDENT AT THE SURGICAL PATHOLOGY CONFERENCE THAT SHE THOUGHT THE ENDOCRINE TUMOR LOOKED MALIGNANT AT HIGH POWER: Well, whenever I get the urge to diagnose an endocrine tumor as malignant, I go and lie down on my sofa until the urge goes away [he had an old sofa in his office]. My advice to you, when you are at high

power and considering a diagnosis of endocrine malignancy: Get to a lower power *immediately!*

In the 1950s a number of other pathologists joined the department, some only briefly, such as Dr. Jane C. MacMillan (1950) and Dr. Anthony C. Allison (1956–1957). Some would go on to notable careers, including Drs. David Kahn (1952–1954), who became Chairman of Pathology at St. Mary’s Hospital at McGill; Agnes S. Burt Russfield (figure 7.11), 1954–1958, who would be productive in research on the pituitary gland; Fairfield Goodale; and Winfield S. Morgan. Dr. Goodale (figure 7.6), after his MGH training, spent 1955 to 1957 studying cardiovascular

pathology in London. He returned to the MGH in 1957 but left a year later for Dartmouth and then went to Albany, New York; in 1965, Dr. Goodale was appointed Chairman of Pathology at the Medical College of Virginia, and he subsequently became dean of the Medical College of Georgia and the Bowman Gray School of Medicine (3). Dr. Win Morgan (figure 7.12) was on the faculty from 1952 through 1962. He was an accomplished researcher—one of the first MGH pathologists to be involved in “basic” research, working on chromatographic approaches to understand liver proteins—and was awarded an American Cancer Society/British Empire Cancer Campaign Fellowship in 1951 for research in



Figure 7.8 MGH Pathology, 1966. Front row, left to right: Wallace Clark, E. P. Richardson Jr., Austin L. Vickery, Ronald Sniffen, Benjamin Castleman, Robert Scully, Edgar Taft, Richard Cohen, Irwin Roth. Second row: George Kwass, John Blennerhassett, Karoly Balogh, Sheldon Baddock, Hugh Wolfe, Priscilla Taft, Martin Flax, unidentified (higher), Jose Astacio. Third row: Juanito Billot, Norman Helgeson, Ronald Weinstein, Kilmer McCully, Kei Okagaki, James Daly, unidentified (higher). Fourth row: Roger Williams, Joel Umlas, Virgilio Sangalang (higher), Francisco Civantos, Gerald Nash (higher), Charles Huizenga, Albert Keller (higher), Richard Jaqua, James Galdabini, John Mason (behind Dr. Galdabini), James Caulfield.



Figure 7.9 MGH Pathology, 1973. Front row, left to right: James Daly, Stanley Robboy, Gerald Nash, Austin Vickery, Walter Putschar, E. P. Richardson Jr., Benjamin Castleman, Priscilla Taft, James Caulfield, Kilmer McCully. Second row: Beverly Borlander, Larry Minette, Karl Proppe, John Kaiser, Thomas Chesney, Robert Trelstad, James Galdabini, Max Goodman. Third row: Mark Weiss, Peter Howley, Jerry Kolins, William Cornetta, Daniel Symonds, Edwin Beckman, Jeffrey Ross, Wanda Szyfelbein. Back row: Susan Pitman, Richard Bradley, Richard Smith, Richard Geller, Anne McFarland, Jay Dubois, Walter Jung.

biochemistry at Oxford University and a Special Fellowship from the NIH in 1958 for biochemical research at the Wenner-Grens Institute in Stockholm. Dr. Morgan left in 1963 to become Professor of Pathology at Case Western University School of Medicine and Director of Pathology at Metropolitan General Hospital in Cleveland. In 1974 he became Professor of Pathology and Director of Surgical Pathology at West Virginia University School of Medicine and then served as chairman of that department from 1989 to 1996.

A major addition to the department in 1952 was Dr. Edgar B. Taft (figure 7.13), who served in the department until his retirement in 1984, for much of that time as Dr. Castleman's "right-hand man" (figure 7.14). He performed important

administrative duties, including running the clinical pathology residency and helping direct the MGH Research Office from 1966 until his retirement. He and his wife, the cytopathologist Priscilla Taft (see below), remained in touch with the department until their deaths.

Dr. Richard B. Cohen (figure 7.15) was a trainee in pathology from 1951 to 1954 and was a member of the faculty from 1955 to 1968. He performed research on the adrenal glands and testis with Drs. Ronald Sniffen and Fred Simmons, and he ran the innovative Histochemistry Laboratory (see below, under Research). Cohen left in 1968 to become Codirector of Pathology at Beth Israel Hospital, where he would remain until the end of his career. He was remembered by the late Dr. Harvey Goldman as "the final go-to person with



Figure 7.10 Austin L. Vickery Jr. (left) and Robert E. Scully, close friends with good senses of humor



Figure 7.11 Agnes S. Burt Russfield

the difficult slide and . . . always available to chat about the case and almost any other subject” (4).

Dr. Leonard Atkins (figure 7.16; also see chapter 16) joined the department in 1951 (first as a trainee and then on the faculty from the mid-1950s) and would remain affiliated with MGH Pathology for over 50 years. He did surgical and autopsy pathology in the department through the 1990s and also served as a medical examiner. Dr. Atkins did seminal work in cytogenetics. He set up the first bone marrow bank to look at the use of autologous marrow in patients who had received total body irradiation or high-dose chemotherapy. This work led in 1959 to preparation of chromosomal spreads and to a year at the University of Uppsala Institute of Genetics in 1962. Dr. Atkins’s pioneering development of cytogenetics at MGH is covered in the Cytogenetics section below and in the Cytogenetics section in chapter 13.

Dr. David Spiro (figure 7.17) was a faculty member from 1954 to 1960. He developed and ran the electron microscopy group at the Edwin S. Webster Laboratory (see above, under Laboratories) and did research on renal ultrastructure. When he moved to Columbia University in 1960, he wrote in his letter of resignation to the Dean of HMS: “I shall always be grateful to Harvard

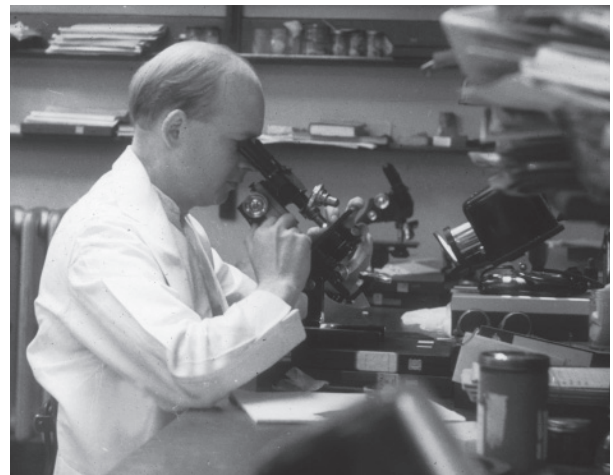


Figure 7.12 Winfield S. Morgan



Figure 7.13 Edgar Taft



*Figure 7.14 Benjamin Castleman and Edgar Taft
in the Mallory Library, late 1950s*



Figure 7.15 Richard Cohen

for the privilege of having served on its faculty and working with Drs. Hertig, Castleman and many other distinguished physicians and scientists too numerous to mention. I therefore leave Harvard Medicine and the Massachusetts General Hospital with great regret. However, I am looking forward to helping Dr. [Donald] McKay establish many of the Harvard ideals as regards the science and practice of pathology at Columbia University in New York.” Dr. Spiro trained a number of young MGH pathologists in electron microscopy, including Drs. Richard Collins and Richard B. Stenger; Dr. Stenger left in 1960 to develop an electron microscopy unit at the University of Cincinnati.

To replace Dr. Spiro, Dr. Castleman recruited Dr. James B. Caulfield (figure 7.18) from the Rockefeller Institute and the University of Kansas in 1959. Dr. Caulfield did research in electron microscopy, studying vascular changes in diabetic renal disease and in diabetic skin, and did work at the Shriners Burns Institute on preventing tissue damage after skin removal, relative to wound healing and oxygen toxicity, thus addressing the issue of pulmonary damage in burn patients. Dr. Caulfield also worked with the Myocardial Infarction Research Unit and became pathologist for the Atherosclerosis Center at MIT in 1971. He stayed at MGH through 1975, when he left to



Figure 7.16 Leonard Atkins

become Chairman of Pathology at the University of South Carolina.

In 1959, Dr. Castleman recruited Dr. Walter G. J. Putschar (chapter 12) from West Virginia. He was a devoted teacher and an expert on many aspects of pathology, most specifically bone pathology and paleopathology; he remained a member of the department through 1986. In his early years there, Dr. Putschar influenced Dr. Hugh Robert (“Bob”) Dudley (figure 7.6), who had joined the department in 1957. Dr. Dudley specialized in bone pathology and interacted extensively with the orthopedic surgeons. Unfortunately, he died suddenly in the fall of 1961 from

a subarachnoid hemorrhage at the age of 37, just after moving to become Chair of Pathology at Emory University. “His sudden death shocked the entire M.G.H. community and his many friends and classmates at the Harvard Medical School. Pathology has lost one of its most promising teachers,” Dr. Castleman wrote. A collection of books relating to musculoskeletal disease in the Mallory Library was dedicated in his memory; the plaque commemorating that dedication remains in the library to this day, and texts from the collection remain in the department.

In 1962 Dr. S. Irwin Roth (figure 7.8), who had trained at the MGH from 1956 to 1960, returned to the department after two years at the Armed Forces Institute of Pathology; Dr. Roth’s position at the AFIP was filled by another MGH pathologist, Dr. Wallace A. Jones. Dr. Roth’s research interests remained broad throughout his career, most notably focusing on squamate epidermis (his boa constrictor skin experiments were famous in the department in the 1960s!), the parathyroid glands (initially with Dr. Castleman), the cornea, and atherosclerosis. He was a faculty member until 1975, when he became the Chairman of Pathology at the University of Arkansas. After spending the 1980s and 1990s at Northwestern School of Medicine, Dr. Roth returned to MGH in 2001 on a part-time basis, continuing to teach residents and to work on

parathyroid disease and on bone phenotypes in mouse experimental models with the MGH Endocrine Unit.

Dr. William (“Whitey”) T. Thurlbeck (figures 7.7 and 7.19), originally from South Africa, finished his training at MGH in 1958 and focused on lung pathology, spending a year in England working in pulmonary pathology research. He rejoined the department from 1960 to 1961 but then left for McGill, where he became a full professor in 1966. Dr. Thurlbeck went on to a distinguished career in pulmonary pathology, mostly at the universities of Manitoba and British Columbia (chapter 16).

Dr. Martin H. Flax (figure 7.8, and see figure 23.2), who had trained with David Spiro, became a faculty member in 1960. Dr. Flax worked in experimental allergic diseases, combining light and electron microscopy with immunological approaches (chapter 23). He joined the Transplantation Unit in 1964 and began studies of graft rejection (renal, pulmonary, corneal). Dr. Flax left in 1969 to become the Chairman of Pathology at Tufts University. Also in the department in the 1960s was Dr. Hubert Wolfe (figure 7.20), who was a resident from 1960 to 1964 and a junior faculty member from 1964 to 1968. He worked with Dr. Richard Cohen in the Histochemistry Laboratory, initially investigating amphibian limb segmentation. He then studied splenic immunology



Figure 7.17 David Spiro



Figure 7.18 James Caulfield



Figure 7.19 William Thurlbeck

and spent 1968 in Sir Peter Medawar's department in London. When Dr. Flax left for Tufts in 1969, Dr. Wolfe moved with him. Both spent the remainders of their highly productive academic careers at Tufts. Another pathologist who moved with Dr. Flax to Tufts was Dr. Ronald Delellis, who had just completed his residency at MGH, and who went on to an illustrious career in endocrine pathology and as Vice Chair of Pathology at Cornell and at Brown.

Dr. John B. Blennerhassett (figure 7.8), from New Zealand, was a resident and fellow from 1962 through 1966; he had interests in lung, prostatic, and gastrointestinal cancers. It was Dr. Blennerhassett's review of MGH autopsy records while still a resident that provided supportive data to the Surgeon General's work illustrating the dangers of cigarette smoking (see below, under Autopsy). He moved to McGill University in 1966 but returned to MGH in 1969, when he did general surgical pathology but also focused on renal transplantation and pulmonary disease. Dr. Blennerhassett became Chairman of Pathology at the University of Otago in New Zealand in 1971. He was a popular faculty member, and Dr. Castleman noted in 1971: "The house staff and colleagues in the department and in the hospital at large will miss his astute reasoning, his infectious enthusiasm and his esprit. He had an unusual willingness and ability to teach, and his



Figure 7.20 Hugh Wolfe

outgoing, obliging nature became well known not only in the laboratory but at the many clinical unit meetings. We all wish him well." In his letter of resignation to the Dean of HMS that year, Dr. Blennerhassett wrote that "it is with very mixed feelings that I end my close association with the Hospital and Medical School. This has been an immensely valuable time. . . . It is to Dr. Castleman particularly, and to the members of his staff and residents that I owe the greatest debt of gratitude."

Dr. James J. Galdabini (figures 7.8 and 7.9) was a resident in the department from 1965 to 1969 and a member of the staff from 1971 to 1981. Dr. Galdabini was a superb diagnostic pathologist who had a special interest in gastrointestinal pathology. He served as Associate Editor of the Case Records from 1975 to 1981.

Dr. Kilmer S. McCully (figures 7.8 and 7.9), who had been a resident in 1959–1960 and a clinical and research fellow from 1965 to 1968, began work in the department culturing tumor cells. In 1968 he joined the faculty, and, as a result of two autopsies on children with homocystinuria, he developed a novel hypothesis linking homocysteine with atherosclerosis. Dr. McCully continued his original work in the department through 1979, when he became a faculty member at Brown University and chief at the Providence Veterans Affairs Hospital. Later in his career he

moved back into the HMS system as Chief at the Boston Veterans Affairs Hospital.

A number of trainees and faculty spent time in MGH Pathology in the 1960s before going on to careers in Boston-area hospitals. These included Drs. Wallace Jones (Hunt Memorial Hospital, Danvers), George Kwass (Hale Hospital), Sheldon Cooperman (Union Hospital, Lynn), Robert Harper (Memorial Hospital, Worcester), Lewis James (Memorial Hospital, Worcester), James M. Gibson (Tufts and Memorial Hospital, Worcester), Joel Umlas (Mount Auburn Hospital, Cambridge), and James J. Daly (Waltham Hospital). Dr. Daly (figures 7.8 and 7.9) stayed in the department for nearly 15 years, training as a resident until 1966 and then working with the Urology Service in the area of urological pathology before leaving in 1978 to head Pathology at Waltham Hospital. The department also had pathologists join from Boston-area hospitals; for example, Dr. Irwin Kline, who had directed Pathology at Cambridge Hospital from 1966, joined the department in 1968 to work on cardiac disease; he left MGH in 1969 to direct Pathology at Lankenau Hospital outside Philadelphia.

Other pathologists who spent relatively short amounts of time as faculty members in the department in the 1960s and early 1970s, following their training, included Drs. Victor J. Rosen (who went on to a career in forensic pathology, including serving as a consultant to the *Quincy, M.E.* TV series of the 1970s and 1980s), F. Daniel Foley, Albert Keller, and Robert Hershberg.

A group of trainees from the late 1950s and 1960s formed an MGH–South Dakota connection. Dr. Karl H. Wegner trained as a resident from 1959 to 1962. A descendant of a former South Dakota governor and U.S. senator, he returned to his home state after his training at MGH, where he set up a pathology laboratory and subsequently employed two MGH trainees, Drs. John Barlow and Richard Jaqua. The laboratory group Dr. Wegner led came to cover much of the state, flying regularly around South Dakota and adjacent states to do frozen sections and give conferences. Dr. Wegner became the Chairman of Pathology and then the Dean at the University of South Dakota School of Medicine.

Many trainees and junior faculty who were in the department in the 1960s and early 1970s



Figure 7.21 Philip Clement



Figure 7.22 Ronald Weinstein

went on to important academic careers, including Drs. Philip B. Clement, Robert B. Colvin, Harold F. Dvorak, Gerald Nash, Jeffrey Ross, Robert Trelstad, and Ronald Weinstein. Dr. Clement (figure 7.21) trained at MGH from 1970 to 1975, the last year serving as a fellow in gynecological pathology with Dr. Scully. Dr. Clement (chapter 16) went on to become a professor at the University of British Columbia and described a number of new entities in gynecological pathology. Dr. Colvin (chapters 23 and 25) focused on renal pathology and became Director of the Immunopathology Unit following Dr. Dvorak's departure in 1979. He became the fifth Chief of Pathology at MGH, serving from 1991 to 2006. Dr. Dvorak (chapter 23), an immunopathologist, rejoined the department in 1969 after two years at the NIH and succeeded Dr. Flax as head of the Immunopathology Unit. After ten productive years heading the unit, he left in 1979 to become Chairman of Pathology at Beth Israel Hospital, succeeding another MGH pathologist, Dr. David Freiman. Dr. Nash (figure 7.9), who specialized in pulmonary pathology, left MGH in 1974 to join the University of Southern California, and

subsequently became Chairman of Pathology at Baystate Medical Center in Springfield, Massachusetts, a Tufts University-affiliated hospital. Dr. Ross (figure 7.9), after working at the University of Massachusetts, became the Chairman of Pathology at Albany Medical College in 1989. Dr. Trelstad (figure 7.9) was a member of the department from 1966, when he came as a resident, until 1981, when he left to become Chairman of Pathology at Rutgers University/Robert Wood Johnson Medical School. Dr. Trelstad did research on collagen and developmental biology and directed the pathology research laboratories at the Shriners Burns Institute between 1975 and 1981. Dr. Weinstein (figure 7.22), who worked on red blood cell ultrastructure as well as with the Neurosurgical Service on research issues, became the Chairman of Pathology at Rush University in Chicago and later at the University of Arizona.

Dermatopathology (chapter 18) was also quickly becoming a departmental strength and, notably, was housed in Pathology rather than in Dermatology. In 1962, Dr. Castleman recruited Dr. Wallace H. Clark Jr., who built a strong dermatopathology group with an emphasis on

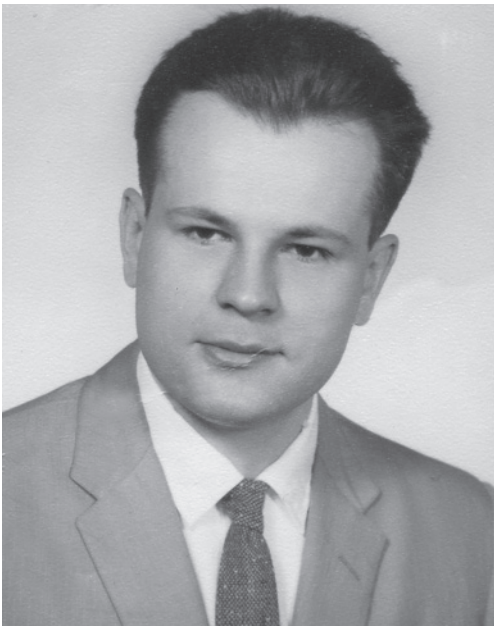


Figure 7.23 Karoly Balogh



Figure 7.24 Max Goodman

melanoma research. Dr. Clark left for Temple University in 1969 but returned to Harvard later in his career when he joined Beth Israel Hospital. When Dr. Clark left, Dr. Joel Umlas returned to the department to work in dermatopathology, but he left in 1970 for a long career at Mount Auburn Hospital in Cambridge and extensive local and national work in blood banking. Dr. Martin C. Mihm Jr., who had been in charge of research and teaching in dermatology at the U.S. Public Health Service Hospital in Staten Island, joined the staff in 1971. Dr. Mihm wrote seminal melanoma classification papers with Dr. Clark. He went on to publish many important papers in the field and to train innumerable dermatopathologists in his long career at the MGH (chapter 18).

The Neuropathology group (chapter 17) was remarkably active during the Castleman years, although Dr. Castleman apparently viewed the Neuropathology group as being somewhat outside the department and more in the purview of Neurology. (When one of the present authors, David Louis, a neuropathologist, talked with Anna Castleman in 2009, she joked that her husband would be very much surprised that a neuropathologist had been chosen to head Pathology!) Neuropathology was directed during this time by Dr. E. P. Richardson Jr. (chapter 11), who joined the department in 1949 and remained active until his death, in 1998. Dr. Richardson was joined by two remarkable neurologists who were superb neuropathologists: Drs. Raymond D. Adams from 1951 and Dr. C. Miller Fisher from 1955. This triumvirate of neurology-neuropathology, over the next few decades, taught legions of academic neurologists and neuropathologists. The list is too long to give here in full but includes such notables as Drs. Betty Q. Banker, Elliott Mancall, Henry deF. Webster, Arthur K. Asbury, Byron A. Kakulas, Karl Erik Astrom, Richard Baringer, and Herbert H. Schaumburg—some of whom joined the neuropathology staff for periods of time in the 1960s and 1970s.

Several pathologists continued to specialize

in head and neck pathology in association with Massachusetts Eye and Ear Infirmary (MEEI). After the “long and faithful service” of Dr. Werner Mueller, in 1962, Dr. Castleman “influenced” Dr. Karoly Balogh to accept the position as Director of the Otolaryngology Pathology Laboratory at the Eye and Ear Infirmary. Dr. Balogh (figure 7.23) had been a fellow at MGH from 1958 to 1962 and did research in histochemistry, particularly as applied to ototoxicity. He served as the primary ear, nose, and throat (ENT) pathologist at MEEI until 1968, when he moved to chair Pathology at University Hospital, affiliated with Boston University; he subsequently moved back into the HMS system at Deaconess and Beth Israel Hospitals. Dr. Max Goodman (figure 7.24), who had trained at the Mallory Institute of Pathology, took over Dr. Balogh’s position at MEEI in 1968; he remained at MGH and MEEI until his death in 1996. Dr. Goodman had in 1961 joined Dr. Bob Dudley at Emory and acted as head of the Emory department for a year after Dr. Dudley’s sudden death; he then moved to University Hospital in Boston before coming to MGH.

The cytopathologists at MGH during the Castleman years were Ruth M. Graham, who served in the Vincent Gynecology Laboratories as a clinical cytological pathologist from 1953 to 1956 (chapter 19), Dr. Robert Fennell and Dr. Priscilla D. Taft, who was the first dedicated cytopathologist in the Pathology department, heading Cytopathology from 1957 to 1984. The Cytopathology fellowship was named after her in 1992.

CLINICAL SERVICE

Surgical Pathology

Between 1951 and 1972 the number of surgical specimens per year increased by 110 percent, from 9,752 to 20,546. And, as a result of the increasing volume and the increasing specialization of the medical and surgical services, subspecialty pathology expertise grew in the department.

Subspecialization had already characterized certain services, notably Neuropathology,

Dermatopathology, and ENT Pathology. Neuropathology, both autopsy and surgical, had been housed separately since Dr. Kubik had joined the department in 1926. The 1950s and 1960s witnessed a flowering of neuropathology under Drs. Richardson, Adams, and Fisher, the strong emphasis being on medical (rather than surgical) neuropathology, as a result of neurologists spending one of their three clinical training years in the Neuropathology Laboratory. Dermatopathology had developed under Dr. Walter Lever in the 1940s, but primarily within Dermatology rather than Pathology. In 1962 Dr. Wallace Clark joined the department from Tulane University in New Orleans. A pathologist, Dr. Clark had already gained expertise in dermatopathology. In collaboration with Dermatology, he set up his research laboratory in that department, collaborating with Dr. Thomas B. Fitzpatrick, but he did his clinical work in Pathology. He held two weekly conferences in dermatopathology that involved the two departments. In 1965, Dr. Clark established the Pigmented Lesion Clinic at the MGH Tumor Clinic, which was an important clinical development that brought together physicians from different disciplines to treat and study pigmented skin lesions. Dr. Clark was a pioneer in the field of dermatopathology (chapter 18) and began an era of extraordinary clinical and research productivity in the field. He left in 1969 to go to Temple University. The separate hospital status of MEEI set up the situation in which a specific pathologist had focused on ENT pathology. The relationship between MEEI and MGH Pathology became closer in 1962, when Dr. Karoly Balogh took over from Dr. Werner Mueller; at this time arrangements were made for the processing and diagnosis of tissues to be carried out at MGH, which continues to this day.

It was clear to Dr. Castleman that other areas of medicine also needed subspecialty pathologists, both for clinical and research purposes. He wrote in the early 1970s: "Like other fields of medicine in a large teaching hospital, pathology

has need for specialists. We are fortunate that each member of our staff, in addition to being a generalist, does have a special field of interest, and thus most of the clinical services and their units are fairly well covered by pathologists experienced in those specialties." Early examples, mostly from the 1960s and early 1970s, were Dr. Robert Scully, gynecologic; Dr. Austin L. Vickery Jr., endocrine; Dr. Gerald Nash, pulmonary; Dr. Robert Colvin, renal; Dr. James Daly, urologic; Dr. James Galdabini, gastrointestinal; and Drs. H. Robert Dudley, Walter Putschar, and Alan Schiller, bone. Particular expertise grew around nearly all aspects of endocrine pathology, partly as a result of the extraordinary breadth and depth of clinical work and research in endocrinology on the Medical and Surgical services at MGH. When the highly successful endocrine pathology postgraduate course began in the mid-1960s (see below), the department could boast of having individual expert faculty to cover the thyroid (Dr. Austin Vickery), ovary (Dr. Robert Scully), testis (Dr. Ronald Sniffen), adrenal (Dr. Richard Cohen), parathyroid (Dr. Castleman and Dr. S. Irwin Roth), pituitary (Dr. Agnes Burt Russell), and thymus (Dr. Castleman). Nonetheless, the Surgical Pathology Service itself and the resident rotations in surgical pathology kept all these specimens unified under the rubric of Surgical Pathology until 1996—with the exception of neuropathology, cytology, and dermatopathology cases; from the mid-1970s, gynecological cases; and from the mid-1980s, hematopathology.

As Dr. Albert Keller, who was a resident in the department in the early 1960s, remembered, the department had certain go-to guys for subspecialty diagnosis. Dr. Scully was renowned as an overall superb diagnostic surgical pathologist: "Bob Scully was the go-to-guy for most things, and it was great to have someone who knew the answers! . . . Of course we went to Austin Vickery for thyroid, and then there was our international star Wally Clark for skin. For bone we had Walter Putschar (to us 'the Pooch'). He was so good, that

I still call out from the microscope, when I use one of his teachings . . . ‘The Pooch is speaking to me!’”

The subspecialized expertise drew faculty members into major roles nationally and internationally in defining and refining classification schemes—another tradition that continues to this day. Faculty began to be involved with authoring fascicles for the Armed Forces Institute of Pathology (AFIP) series, running committees for the World Health Organization (WHO) classifications, and chairing and participating in other international classification efforts. For example, in 1955, Dr. Castleman completed the *Atlas of Tumor Pathology* fascicle on tumors of the thymus gland, which was one of a number of AFIP fascicles written by members of the department over the ensuing decades (see Appendix). Dr. Scully served in 1967 as chairman of the group designing an international WHO classification of ovarian cancers. The work represented the beginning of departmental involvement in the WHO classifications, which also continues to this day (see Appendix).

Cytology

Once the utility of the Pap smear had been demonstrated, cytology emerged quickly as a discipline of anatomic pathology sui generis (chapter 19). In 1960 publicity surrounding the value of routine yearly cervical cytology resulted in increases in the number of cervical smears examined. Nonetheless, Dr. Priscilla Taft remained the single full-time cytopathologist from January of 1957 through 1974 (when Dr. Wanda Szyfelbein joined the staff).

In 1971, toward the end of the Castleman years, Dr. Taft summarized the growth of Cytology, but also its practical challenges:

In January 1957 I became director of the cytology laboratory, and the laboratory was moved from Vincent I to Warren I into 475 square feet of space, 130 in my office and 345 in the large

adjoining room. The staff consisted of six technologists and a secretary, and 10,141 specimens were processed that year. By 1966, the volume of work had increased to 17,225 specimens, and the floor space had been increased by approximately 70 square feet. In 1971, 23,069 specimens were processed, and 13 people now work in 415 square feet of space. Crowding exacerbates minor problems so that at times it has been difficult to obtain and keep personnel. Storage is becoming a problem because of increased volume and lack of space.

The need for separate laboratory processing and for dedicated faculty ensured that cytology would be distinct from general surgical pathology. And the complexity of the operation would generate the need for a laboratory information system in 1965, as discussed above.

Cytogenetics

As part of his work supported by the Atomic Energy Commission to establish a bank for bone marrow specimens in the late 1950s, Dr. Leonard Atkins began to use “chromosome squash preparations in search of the chromosomal abnormalities in various disease states.” The significance of the technique was quickly appreciated, and by 1960 clinical cytogenetics had begun:

Because of the current increasing interest in genetics, Dr. Atkins is being bombarded with requests to study the chromosome patterns of patients with congenital abnormalities, leukemia and other diseases. Our association with the state mental institutions at Wrentham and Taunton has provided him with a wealth of material. He has just completed the study of an infant with multiple congenital anomalies associated with trisomy of an acrocentric chromosome; there is only one other such case reported. It is hoped that further examination of such chromosomal abnormalities may lead to a better understanding of the effect of specific chromosomes upon the human phenotype.

The service grew rapidly, quickly becoming the largest in New England and one of the largest in the country. During Dr. Atkins's year and a half in Sweden in the early 1960s, Dr. Priscilla Taft covered the clinical duties. In 1964 there was a marked increase in service volumes, primarily from the Children's Service at the hospital. By 1966 the number of cases had risen to 381—251 from MGH and 130 from other institutions; by 1967 the number had climbed to 506. In 1969 the number was 633, more than half of these being from outside MGH, including much of New England; the volume of material handled was the largest in the Boston area and probably one of the largest in the country. Dr. Atkins then began working with Dr. John Littlefield of the Pediatric Genetics Unit on genetic counseling. As a result, the volume in Cytogenetics rose further: by 1970 it was 723, 60 percent coming from outside. The following year there were 790 specimens, cytogenetic studies on amniotic fluid samples amounting to over 100 cases. Thus, MGH Pathology was home to one of the most cutting-edge approaches to genetic diagnosis, enabling a new diagnostic discipline to develop by applying novel technologies to a pressing clinical need.

Autopsy

Between 1951 and 1972 the number of autopsies per year increased by more than 35 percent, from 687 to 952. Autopsies were a huge component of the department's activities during Dr. Castleman's tenure, although during the later years the numbers already reflected the downward trend that was to affect autopsy performance for the next few decades. In fact, during the plateau of autopsies during the Castleman era, autopsy volumes were on the order of 1,000 per year, peaking at 1,251 cases in 1963. Autopsy tissues constituted a large percentage of the clinical and teaching materials, and the daily "organ recital" at eight o'clock in the morning featured most of the senior pathologists along with the trainees, and

there was input from faculty such as Drs. Castleman and Putschar.

The autopsy files of the hospital—which had been so carefully kept since Dr. Wright's initial efforts to do so—proved of importance for research as well, most notably studies of the association between lung cancer and smoking in the early 1960s. In 1963 Dr. John Blennerhassett, the Chief Resident, pored over the records of 5,300 MGH autopsies performed between 1896 and 1930 and another 5,000 performed between 1956 and 1961 to generate data for the U.S. Surgeon General. Only 17 cases of lung cancer were found in the earlier, 35-year period, compared to 172 cases over the later, five-year period. The figures showed a tenfold increase for death secondary to lung cancer in contrast to an only 1.7-times increase in deaths from all other types of cancer. These data contributed to the Surgeon General's campaign to inform the public of the danger of cigarette smoking, providing a powerful confirmation of Dr. Wright's original belief in the importance of these records.

Bacteriology

In 1952, with the retirement of Louis Dienes, the Bacteriology Unit of the Pathology Laboratory, which had been physically separate from the rest of the department for a few years, was separated administratively and placed under the Infectious Disease Group in Medicine. Dr. Thomas Paine was put in charge for a year, followed by Dr. Lawrence Kunz, who served in this role for more than 30 years, until 1983, during a period of extraordinary expansion of laboratory testing in infectious diseases. The remarkable story of this growth is covered in a separate chapter focusing on Microbiology (chapter 21). Unfortunately, from the perspective of Pathology, it represented a winnowing of what had been a key part of the department in the Wright and Mallory years and what would eventually become a cardinal component of Clinical Pathology. Microbiology, subsequently expanded to include all facets of the

specialty, did not rejoin the department officially until late in Dr. McCluskey's tenure, although residents training in Clinical Pathology rotated through these laboratories during the entire time that it was outside the administrative oversight of Pathology.

Outreach

Dr. Castleman felt strongly that the department should play a role in supporting pathology services regionally, work that he had begun under Dr. Mallory. As chief, he was active in developing outreach activities further. As he wrote in 1962, summarizing his earlier successes in the area:

The Pathology Department was one of the first departments in the hospital to establish an association with a community hospital. In 1941 Dr. Castleman became the pathologist to the Emerson Hospital in Concord, Massachusetts, a post that he still holds. In 1946 we undertook the pathological examinations for the Brockton Hospital and continued this service until 1959, when because of the increase in size of the hospital we arranged for Dr. Richard Dickersin, who had just finished his residency training at MGH, to become their full-time pathologist. In 1949, a close affiliation with the Memorial Hospital in Worcester began when Ronald Sniffen, one of our graduates was appointed pathologist at that hospital, where for many years we had rotated a member of our resident staff. Dr. Robert Harper, one of our recent graduates has just joined Dr. Sniffen as his associate. During the war we helped a few small community hospitals, including the Lawrence Memorial Hospital in Medford. A few years ago an association was established with the Beverly Hospital by appointing Dr. Robert Fienberg to our Associate Staff. This year we have added another tie with a community hospital by arranging for Dr. Sheldon Cooperman, who has just finished his residency, to become pathologist to the Winchester Hospital. For the coming year Dr. George Kwass, an Assistant in Pathology,

will become Director of Laboratories at the St. Vincent's Hospital in Worcester. These liaisons are helpful to the community hospital because when in need of help these young pathologists are able to bring their problems to our large staff of experts in the pathology laboratory. Also, the MGH gains from the association because the problem cases are often referred to the MGH, and many members of our clinical staff are called in as consultants. Each of these young men are given MGH and Harvard appointments and they usually spend one day a week in our laboratory performing a specific job and assist in teaching at the Harvard Medical School. All of these activities are certainly attractive incentives for these positions, which would otherwise be difficult to fill. We are prepared to continue this policy of providing any community hospital within reasonable distance of Boston with a similar service.

Beginning in 1967, the department would extend the services to the Soldiers' Home in Chelsea. At this time the MGH-trained pathologists who populated regional hospitals shared difficult cases with the pathologists at MGH, which in turn served to provide interesting cases for residency training. Some, like Ronald Sniffen, spent a considerable amount of time in the MGH department, teaching medical students and residents. In 1970 Joel Umlas left to begin a long career at Mount Auburn Hospital, while maintaining close ties with MGH, including continued sign-out in Dermatopathology. In 1970 the department took on the anatomic pathology service of Somerville Hospital, and it was providing services to two additional state institutions, the Fernald School in Waltham and the Paul A. Dever Hospital in Taunton. By 1972 Castleman would point out that the three full-time pathologists at Worcester's Memorial Hospital were MGH alumni.

Some of these physicians maintained lifelong affiliations with the MGH department. For example, Dr. Robert Fienberg (chapter 16), upon

retiring from the Beverly Hospital, spent many years teaching residents at MGH, where he was fondly remembered in the late 1980s for his pressing interest in Wegener's "pathergic" granulomatosis. Richard Dickersin returned to the department full-time and ran the electron microscopy laboratory for many years, stepping down from the active clinical staff in the late 1990s.

Moreover, the outreach activities reached a significant percentage of departmental cases. As can be seen from the following numbers, many outside cases came to MGH for processing and interpretation. For example, in 1955 the breakdown of MGH versus outside cases was:

	MGH	Outside	Total
Autopsies	668	238	906
Surgical specimens	8,734	2,875	11,609
Cytologic smears	5,361	4,340	9,701

By 1965 the division of MGH versus outside cases was:

	MGH	Outside	Total
Autopsies	970	192	1,162
Surgical specimens	13,893	2,508	16,401
Cytologic smears	8,134	7,678	15,812

By 1971 the last year for which Dr. Castleman provided the breakdown in his annual report, the division of MGH versus outside cases was:

	MGH	Outside	Total
Autopsies	823	196	1,019
Surgical specimens	17,931	2,431	20,362
Cytologic smears	11,823	11,246	23,069

Neuropathology also began long-standing associations with some of the state hospitals in the area, such as the Myles Standish State School, the Wrentham State School, and the Fernald State School, and brains from these institutions provided material for important studies of developmental abnormalities of the nervous system, as well as valuable materials for teaching of residents and fellows.

Dr. Castleman also involved the residents—sometimes in a not entirely voluntary way—in the outreach activities, often asking them to do autopsies at outlying hospitals. Though they were reimbursed, the reimbursement was modest. Naturally, there were mixed responses from the residents; some were very positive and others not. As Dr. Albert Keller recalled: "We were poor residents raising families on \$2,400 per year, so when Ben offered the plum of \$50 for doing an autopsy at Emerson Hospital, we vied for the honor!" Others, however, felt that the process of driving to an outside hospital with autopsy tools to perform an autopsy and then to return with fresh organs in buckets (in the back of one's car) was something short of an honor.

TEACHING

Dr. Castleman recognized the importance of training expert pathologists, both for the hospital and for the discipline of pathology in general. In 1952 he wrote:

It is well known that there is a great dearth of pathologists throughout the country. This scarcity is not because fewer men are choosing pathology as a specialty, but because the demand has increased. Most hospitals of 100 beds or more are seeking full-time pathologists to be in charge not only of pathologic anatomy, but of all branches of clinical pathology including bacteriology, chemistry, hematology, blood bank, and cytology. The pathologist often is the only full-time physician in the hospital. In order to help meet this demand and to prepare men for the American Board of Pathology in both pathologic anatomy and clinical pathology, the Trustees have approved a four-year residency program, which includes in addition to pathological anatomy rotation through the various clinical pathological laboratories. The program is sufficiently elastic, however, to enable those residents who prefer to limit themselves to pathologic anatomy and research, to do so.



Figure 7.25 Departmental conference with faculty and residents, 1956; Benjamin Castleman is enjoying the conversation.

Thus, with the length of training increased and formalized, the number of residents grew. At the close of Tracy Mallory's tenure, there had been seven residents and six fellows. By 1966 there were 10 residents, six research trainees on training grants, and 10 clinical or research fellows. By 1972 there were 21 house staff, including the clinical residents and fellows. One of the reasons for this growth was that Dr. Castleman himself was closely involved in the teaching, participating for two hours each day in resident teaching conferences (see above). As a result, as he put it in 1961, "This personal teaching of the house staff has paid off in that applications for appointments come in droves." In addition, the residents were clearly dedicated to their duties, including those on the autopsy service. Fifty years later, Dr. Robert B.

McFarland (resident 1957–1959) recalled doing an autopsy on his wedding day!

Dr. Castleman was always extremely proud when his trainees ("the boys," as he called them) went on to achieve full professorships and became department chairs. He wrote that "the laboratory is proud to have had a role in the training and developing of these pathologists and is obviously pleased that they have accepted these prestigious positions" and that "we are, of course, very proud of the fact that 26 of our alumni of the last 25 years were appointed to full professorial chairs, and that 15 of them are or were chairman of departments at their university." It is unfortunately not possible to include here a comprehensive list of all of the trainees during the Castleman era. Omitting those already mentioned as having had a role

on the faculty, a list would include the following pathologists, in approximate chronological order of their training and with some of their future positions: Si-Chun Ming (Beth Israel Hospital, then vice chair at Temple University); Benjamin D. Canlas Jr. (Chair of Pathology at the University of the Philippines); Wilbur A. Thomas (chair at the University of Mississippi, the University of Arkansas, and Albany Medical Center); Robert O'Neal (chair at Baylor, the University of Oklahoma, and the University of Mississippi); Alexander Ritchie (Chair of Pathology in Toronto); Sumner Zacks (Brown University); G. Richard Dickersin (Brockton Hospital and then MGH; see chapter 13); Jónas Hallgrímsson (Chair of Pathology at the University of Iceland); Stanley Cohen (Chair of Pathology at Hahnemann University and then University of Medicine and Dentistry of New Jersey); Stanley Robboy (MGH, Chair of Pathology at University of Medicine and Dentistry of New Jersey, then Director of Anatomical Pathology at Duke; see chapter 13); N. Scott McNutt (Dermatopathology at Cornell); Vivian Pinn (Howard University, National Institutes of Health [NIH]); Alan L. Schiller (MGH and chair at Mount Sinai in New York; see chapter 13); Peter M. Howley (NIH, then Chair of Pathology at HMS); M. Elizabeth Hale Hammond (MGH, then University of Utah), John C. Long (MGH); John L. Farber (University of California at San Francisco, NIH, and Thomas Jefferson University); Philip B. Clement (University of British Columbia); Charles G. Huizenga (Concord Hospital and MGH); and David Page (Vanderbilt University).

The attention that Dr. Castleman paid to teaching was legendary (figure 7.25; also see figures 15.6 and 16.4). As Dr. Al Keller recalled in 2009:

What halcyon years! Ben Castleman was the best chief ever, we were convinced: He was there every morning in the basement at 8 AM for autopsy gross review, also known as the Organ Recital. Every afternoon at 2 he was in the first-floor conference room for surgical

micro review, diagnosing from the screen! I remember the carbon-arc projector, operated by a resident, buzzing as you drew out the arc of electricity. He fostered such a feeling of togetherness, and that learning pathology was a serious and honorable duty. My ideal of a holiday party is still the ones given for the residents' families by Ben Castleman—a turkey at one end of the table, a ham at the other, and resident-friends to share good cheer!

The holiday parties were well remembered. They were, during the Castleman years, usually held in the Mallory Library, and Dr. Castleman took pride in preparing the punch. In 2009 Anna Castleman remembered that one of the hardest changes for her husband after he stepped down as chairman was getting used to someone else making the punch.

The training program itself also underwent changes over the Castleman years. With Ronald Sniffen, who had left the department to join Memorial Hospital in Worcester, Dr. Castleman set up a four-month resident rotation, both to help with coverage in Worcester and to provide general laboratory instruction for the residents. And, at the MGH, given the requirements from the American Board of Pathology, rotations began in 1952 in the Chemistry, Bacteriology, and Hematology laboratories for those residents who wished training in Clinical Pathology as well as Anatomic Pathology. Dr. Castleman encouraged this training, although he apparently never felt that Clinical Pathology training was of the same importance as Anatomic Pathology training, and he discouraged the appointment of faculty-level pathologists in the clinical laboratories. Moreover, he insisted that the residents rotating through the clinical laboratories return twice daily to the department for the two key anatomic pathology conferences: the morning “organ recital” at eight o'clock and the afternoon surgical pathology conference (the “Outs” conference). The Clinical Pathology training rotations underwent a number of changes over the



Figure 7.26 Vivian Pinn

Castleman years and were overseen during much of the time by Dr. Edgar Taft.

Clinical fellowships blossomed during the Castleman years. For example, neuropathology, under E. P. Richardson Jr., became a renowned training program, attracting high-quality academic neurologists and generating seminal contributions to our understanding of neurological diseases. Training for physicians and technologists in exfoliative cytopathology began in 1958 under Dr. Priscilla Taft.

That year Dr. Edgar Taft obtained the first NIH Training Grant for the department, designed to allow trainees the opportunity to acquire research training in association with their clinical training in Anatomic Pathology. Near the end of his tenure, Dr. Castleman reflected on the importance of this training grant and on research training in general, linking time spent on the grant to the likelihood of a career in academic pathology:

Since 1958 we have been very fortunate in having an NIH research training grant to support four trainees per year. Its recipients obtain

a basic training in anatomic pathology and in addition join one of the research units in the department or one of the investigators in another hospital laboratory. The purpose of this grant is to train academic pathologists. It is of interest to compare this small group of trainees with the entire group of residents over this period; 80 percent of the 30 research trainees are now in academic pathology, whereas 53 percent of the 70 regular house staff are in academic pathology.

Research fellowships were popular, and many who went on to become successful scientific researchers spent time in the department, learning the pathological basis of disease or doing research themselves (or both), in the 1950s and 1960s. Others who did fellowships in the department had illustrious careers in academia and the government. For example, Dr. Louis Sullivan was a pathology fellow from 1960 to 1961; he went on to a career in hematology at Boston City Hospital and Boston University School of Medicine, was then founding Dean at Morehouse School of Medicine, then Secretary of Health and Human Services for President George H. W. Bush from 1989 to 1993, and then became President of Morehouse School of Medicine. Vivian Pinn (figure 7.26) finished her pathology training at MGH in 1970, including research training in the Immunopathology Unit (chapter 23). In 1982, after spending some years in pathology at Tufts, Dr. Pinn became Chair of Pathology at Howard University—only the third woman to chair an academic department of pathology and the first African American woman to do so. Then, in 1991, she moved to the NIH to direct the Office of Research on Women's Health.

The Castleman period also began the tradition, which continues strongly to the present day, of foreign fellows rotating through the department for periods ranging from a month to a few years. Much of this would be spurred by the growing reputation of the department resulting from the wide dissemination of the Case Records

in the years following World War II, as well as the increasing ease of international travel—which Dr. Castleman (chapter 8) and other faculty took advantage of to lecture widely around the world. As early as 1953, Dr. Castleman wrote that six of the 96 foreign residents and fellows at MGH were in Pathology, hailing from China, the Philippines, New Zealand, Guatemala, Colombia, and Brazil. In 1957 he noted visitors from India, Brazil, and the United Kingdom. In 1961–1962 he commented on nine foreign fellows, from Japan, England, Mexico, India (2), Jamaica, Israel, Iceland, and Argentina. In 1972 he added up the numbers: there had been 34 fellows from 21 countries. One particular example was Dr. Stanley (Bill) Brooks, a native of Jamaica, who was a fellow in the MGH Department of Pathology in 1962. After training in Boston, he returned to Jamaica to finish his training. In 1972 he became Chief of Pathology at the University of the West Indies. He also obtained a Fulbright Scholarship to study at the University of Chicago and at the Bone and Joint Hospital (Hospital for



Figure 7.27 Jónas Hallgrímsson

Special Surgery) in New York. It was said of Dr. Brooks: “Throughout his career he was considered an excellent pathologist.” Later, the Professor Stanley Brooks Memorial Prize in Pathology was established at the University of the West Indies. Another prominent guest was Dr. Vulimiri Ramalingaswami, the founding Chair of the Department of Pathology at the All India Institute of Medical Sciences in New Delhi, who visited a number of times.

The department also began having more senior pathologists from abroad visit the department, such as Dr. Erwin Uehlinger from Switzerland and Dr. Jan Mellgren from Sweden in 1958, and Dr. Victor Harrison from the United Kingdom in 1959. By 1960 the numbers of foreign professors visiting the department grew; they came from the United Kingdom, India, Australia, South Africa, Germany, Sweden, and Finland, including Dr. Lynne Reid of the Brompton Hospital in London (who went on to become the Pathologist-in-Chief at Children’s Hospital in Boston). In 1961 there were visitors from Germany (Dr. Erich Letterer of Letterer-Siwe disease fame), the United Kingdom, Belgium, Israel, and Iceland. Dr. Jónas Hallgrímsson of Iceland (figure 7.27) spent four years in the department, leaving in 1965, and eventually becoming the Chair of Pathology in Reykjavik; he maintained connections with the department over the next four decades. The years 1962 and 1963 saw additional large groups of foreign visitors, including a second visit from Dr. Nils Ringertz of the Karolinska Institute in Stockholm. He visited again in 1966 and published extensively in the field of brain tumor pathology, including one of the early seminal grading schemes for gliomas.

As mentioned above, this period also saw the increasing travel of MGH faculty to distant parts of the world to teach. Dr. Castleman felt that this was an important activity, and he encouraged the staff to travel, recording their many trips faithfully in his annual reports. He kept a detailed scrapbook of his travels that included many pictures

of his visits to various places in the world. As he described a trip of Dr. Austin Vickery's in 1970 to Miami, these distant teaching exercises "spread the gospel."

These years also witnessed the establishment of formal predoctoral, post-sophomore year fellowships for medical students possibly interested in careers in pathology. The goal was to provide medical students with the opportunity to find out "what a pathologist actually does—something that a student rarely discovers." Two students were taken each year; they spent about half of their time on clinical duties and half on a research project. The program was initiated for HMS students, but it was extended eventually to other medical schools; it continued into the 1990s. Over the years it provided the initial training for many successful academic pathologists, including some who became leaders in the field. One of the first two students was David Korn, who later served as an intern and resident in the department before going on to an illustrious career, becoming the Chair of Pathology at Stanford, the Dean of the Stanford Medical School, Senior Vice President at the American Association of Medical Colleges, and eventually Vice Provost for Research at Harvard. Another graduate of the program who later became a chair of pathology was Harold (Hal) Dvorak (see below). Dr. J. Michael Bishop, who won the Nobel Prize for Physiology or Medicine in 1989 for the discovery of oncogenes, was a graduate of the program as well. As Dr. Bishop later recalled in his Nobel Prize speech, he had been "rescued" by the pathologists at MGH after his first two years of medical school at Harvard:

I entered Harvard Medical School knowing nothing of research. But during my first two years there, I was awakened to research by new-found friends among my classmates. . . . I sought summer work in a neurobiology laboratory at Harvard but was rebuffed because of my inexperience. My interest in practicing medicine declined. I became ambivalent about

continuing in medical school, yet at a loss for an alternative.

Like Peyton Rous, I was rescued by pathologists. Benjamin Castleman offered me a year of independent study in his department at the Massachusetts General Hospital, and Edgar Taft of that department took me into his research laboratory. There was little hope that I could do any investigation of substance during that year, and I did not. But I was riotously free to read and think, which led me to a new passion: molecular biology.

When Dr. Richard Cohen summarized the activities of the Histochemistry Laboratory for the MGH's publication *The News* in December 1962, he listed J. Michael Bishop among those who had contributed to the success of the laboratory.

In terms of standard HMS medical student teaching, Dr. Castleman estimated that approximately 2,000 hours of MGH Pathology faculty time was spent on it each year. In 1963 the department began a special summer program for medical students, whereby seven first- and second-year students rotated through the laboratories that summer. And in 1964, with a change in the way third-year medical students were taught, "48 students now spend twelve weeks in a course called 'Introduction to the Clinic' and each student has had the opportunity to attend 12 of our early morning conferences. Thus before going on the wards each student was exposed to gross anatomical pathology, a subject that was not well covered in the past." Moreover, once the Health Science and Technology (HST) program was begun in the early 1970s—a combined medical school program between HMS and MIT—MGH pathologists played major roles. Alan Schiller and Walter Putschar ran a course titled "Biomedical Materials" in one of the first years that HST admitted students, and Dr. Schiller ran the HST "Bone and Soft Tissue" course through the 1970s.

Major advances were made in the area of

postgraduate medical education as well. Most notably, in 1964 the department began a four-day postgraduate course on the pathology of the endocrine glands, capitalizing on the remarkable strengths in endocrine pathology at the hospital. The course was a tremendous success and continued for many years. Within a few years, attendance had to be limited to 50, and each year there was a long waiting list. The Case Records continued as a major teaching vehicle of the department. Like so many other things during Dr. Castleman's tenure, they became closely associated with him. His reputation as "Castleman of the CPCs" followed him wherever he went on his travels around the world. Of note, however, is the fact that he would be the last of the MGH Pathology chairs to direct and edit the CPCs personally.

RESEARCH

Benjamin Castleman's focus was on diagnostic anatomic pathology and its effect on clinical care, but he recognized the importance of basic research as well as clinicopathological research. He clearly excelled in the latter, but he is less clearly recognized as a strong proponent of the former. Nonetheless, he was a strong advocate for both translational and basic research—although he suggested in his writings, and his legacy has been, that basic research must necessarily take a second place to clinical excellence in a hospital pathology department. As he wrote in 1966: "Although in recent years the emphasis in many university pathology departments has been on the biochemical and molecular biologic aspects of disease, it is important to bear in mind the fact that hospital pathology laboratories have, in addition, the responsibility of patient care and thus the necessity of expert knowledge of anatomic pathology. Fortunately, our department is large enough to permit a balance of the research effort with the patient-care activities so that neither discipline suffers in the training of our residents, a situation that is not prevalent in many university pathology departments."

An interesting and entertaining story about Dr. Castleman's support of research was related to David Louis by Dr. David Korn. When Dr. Win Morgan returned from his research fellowship in Stockholm, he wanted to set up a laboratory to do chromatography, which required a cold room. When Dr. Morgan asked Dr. Castleman for a cold room, the latter replied that it would not be a problem, that the department already had a cold room: the morgue! Dr. Morgan set up the chromatographic apparatus in a corner of the morgue, separated by a curtain from the area in which the bodies were kept, and the apparatus worked. But attempts to find a technician to do the research were not successful, owing no doubt to the macabre work environment.

When the department moved into its new quarters in the Warren Building in 1956, the dedication ceremonies were accompanied by a scientific session, in which faculty presented their work. Dr. Castleman was extremely pleased with that occasion and with the opportunity to have his faculty members present their research the following year to the MGH Scientific Advisory Committee (SAC). In this instance the presentations included Dr. Scully on skeletal muscle ischemia, Dr. Cohen on histochemistry, Dr. E. Taft on liver disease in rats and humans, Dr. Vickery on nucleic acids and on autoradiography in thyroid pathology, Dr. Spiro on the ultrastructure of the glomerulus in renal disease, Dr. Atkins on the departmental bone marrow bank, Dr. Harry Webster on the ultrastructure of experimental neuritis, and Dr. Alexander Kenny on parathyroid extracts. The SAC was laudatory:

The Scientific Advisory Committee, in the due course of its scheduled annual meeting, was given the opportunity to visit the Laboratories of Pathology, and to hear presentations of some of its research activities. These were impressive, not only for their individual excellence, but also as examples of the dynamic potentialities of this, the oldest of the medical sciences. Through the original and appropriate utilization of

techniques and knowledge generated by the younger disciplines of biochemistry, biophysics, and physiology, Dr. Benjamin Castleman and his associates in the Pathological Laboratories are contributing in an exemplary manner to the resurgence of a truly experimental pathology.

Along with the growth of research funding from the NIH and other agencies, grant funding in the department grew quickly, about 20-fold in the first 10 years of Dr. Castleman's tenure. In 1951 research grants had amounted to \$17,000, whereas the total exceeded \$400,000 in 1961. By 1966 the department could boast that "support for 12 research projects, 2 training grants and 7 fellowships amounted to just over half a million dollars." In 1972 research funds from the National Institutes of Health, American Cancer Society, and American Heart Association were about \$600,000. Neuropathology research blossomed during this time, as many neurologists and neuropathologists worked together over the next few decades on a wide variety of nervous system disorders, most notably demyelinating diseases, vascular disorders, childhood diseases (this area being augmented by the relationships with the state hospitals; see above, under Outreach), brain tumors, and nutritional disorders, particularly those relating to alcoholism. Much of the work was directed by Drs. Raymond D. Adams and C. Miller Fisher, in addition to Dr. Richardson.

A radioisotope laboratory was opened in 1959, under the direction of Austin Vickery, primarily for the study of thyroid neoplasia. In 1962 he was joined by E. Dillwyn Williams, a research fellow from the United Kingdom; Dr. Williams went on to a distinguished career in endocrine pathology in the United Kingdom, eventually becoming Sir Dillwyn and heading the Department of Pathology first at Cardiff and then at Cambridge University; he returned to MGH as the Putschar Lecturer in 1988.

The Histochemistry Laboratory run by Drs. Richard Cohen and Edgar B. Taft in the 1960s was a central laboratory for research. It had

started in 1952 as a laboratory of Pathology in the Domestic Building, near Bacteriology, but had moved to the first floor of the Warren Building in 1956. Many histochemical innovations came from work done in this laboratory, and it proved a powerful training ground for highly successful academic pathologists. For example, in 1964 alone, there were four fellows, including Drs. Harold Dvorak, Hubert Wolfe, and John Blennerhassett.

A number of basic scientists were members of the department during the Castleman years, including Dr. Alexander D. Kenny, who joined in 1957 from the HMS Department of Pharmacology and did research on parathyroid extracts; Dr. Lorna Langer (later Gilmore), who joined in 1957 from the Huntington Laboratories and was a steroid biochemist working on the adrenal gland; and Dr. Barbara H. Sanford, who was a research fellow at MGH from 1963 to 1965 and on the faculty from 1965 to 1972, who extended Dr. Joseph Aub's work on cell surface differences between normal and neoplastic cells, immunogenetics, and tumor immunity.

As mentioned above, Dr. Leonard Atkins began to use "chromosome squash preparations in search of the chromosomal abnormalities in various disease states" in the late 1950s. Dr. Atkins was a pioneer in both the clinical (see Clinical Services, Cytogenetics, above) and research applications of cytogenetics. The laboratory performed early work on correlating chromosomal abnormalities with clinical phenotypes, on normal human meiosis, and on DNA synthesis.

Dr. Castleman's tenure also witnessed the development and growth of the Immunopathology Unit. Looking back in 1973, he wrote, "Recognizing the importance of immunologic thought and technology in the understanding and treatment of many diseases, I established in 1959 an Immunopathology Unit within our department, designed to serve as a focus of teaching, research and diagnostic expertise in this field." This laboratory group had many illustrious

research accomplishments over the years and also influenced clinical care in a major way through the applications of immunohistochemistry, immunofluorescence, and flow cytometry. Because of the long-term scope of its activities in the department, including its contribution to clinical care since the 1980s, this unit is covered in a separate chapter (chapter 23).

THE CLOSE OF THE CASTLEMAN YEARS

In his final report to the Trustees in 1974, Dr. Castleman, with characteristic humor, commented: "In last year's report, which I had expected to be my last, I summarized the activities of the department during the past 25 years. Hopefully, my successor will be appointed before next year's report is due!"

His summary of most of his own tenure, written to the Trustees in 1972, is worth quoting in detail, as it presents a firsthand overview of the changes that he had overseen during his years as chief:

Over the past 20 years the patient care activities and the teaching program have greatly increased, and with our move into the Warren Building the research done in the department was expanded in many directions.

	1951	1972
Autopsies	687	952
Surgical Specimens	9,752	20,546
Cytology Specimens	8,319	24,759
Cytogenetics Specimens	287 (1960)	881
Staff	7	15
House Staff	7	21
Nonprofessional Staff	30	65

PATIENT-CARE ACTIVITIES

Probably very few members of the staff realize that the Pathology Department is closely interwoven with the other departments in the hospital. This interrelation, begun during Dr. Mallory's regime, has continued and broadened in scope. At the present time members of the

pathology staff attend a wide variety of service and specialty-unit staff meetings, demonstrating gross and microscopical material with clinico-pathological correlation. Each week there are 15 to 20 such meetings. Three units with which the laboratory has a close affiliation are the Neurology and Dermatology Services and the Otolaryngological Department at the Massachusetts Eye and Ear Infirmary.

The neuropathology laboratory, established within the Department of Pathology in 1926 under Dr. Charles S. Kubik and supervised since his retirement in 1951 by Dr. Edward P. Richardson, Jr., was officially named the Charles S. Kubik Laboratory of Neuropathology in 1961. Its major activity has been to define pathologic processes in the nervous system, to relate the tissue changes to clinical phenomena and to use the insights thus gained in the teaching of residents and fellows in the neurological sciences as well as in pathology. In view of its prominence as a training center this laboratory has been the recipient of a training grant under the National Institute of Neurological Diseases continuously since 1961, and its trainees now occupy prominent posts as neuropathologists and neurological scientists in many parts of the United States and abroad. Among its many research activities have been better definition and understanding of several white-matter diseases of the brain including the first clear identification of progressive multifocal leukoencephalopathy as a distinct entity complicating neoplastic and other chronic diseases, definition of the pathological histology of myelopathy in pernicious anemia, and studies of cerebral disorders in infancy and childhood, the last made possible by affiliation with two of the state schools for the mentally retarded.

Although dermatopathology had been emphasized in the department in the 1940's by Dr. Walter Lever, a former member of the Dermatology Service, it became a more specialized unit in 1962 with the arrival of Dr. Wallace

H. Clark, formerly professor of pathology at Tulane University, and a closer liaison with the Dermatology Service was effected. The unit has recently been expanded under Dr. Martin C. Mihm, a graduate of both the Dermatology and the Pathology Services. This unit now provides teaching, consultative service, and opportunities for research to residents in both dermatology and pathology as well as to residents in the Harvard-affiliated hospitals. The material accumulated in the Pigmented Lesion Clinic developed by Dr. Clark led to a classification of malignant melanoma that has now been accepted throughout the world.

In 1962, on the retirement of the pathologist for the Otolaryngological Service of the Massachusetts Eye and Ear Infirmary, arrangements were made for our laboratory to process their surgical specimens, and one of our staff, Dr. Karoly Balogh, became the pathologist for the MEEI. This liaison has been well coordinated and provides an opportunity for our resident staff to be exposed to this type of pathological material. Dr. Balogh resigned in 1968 to become pathologist to the University Hospital and was succeeded by Dr. Max Goodman.

In 1942 Dr. Joe V. Meigs and Dr. Maurice Fremont-Smith set up an exfoliative cytology laboratory under the direction of Ruth M. Graham in the Gynecology Service. In 1950 the Cytology Laboratory became incorporated in the Department of Pathology, although it remained physically in the Vincent Building until January, 1957. At that time Dr. Priscilla D. Taft became its director, and the Cytology Laboratory joined the rest of the Department of Pathology in the Warren Building. Service and teaching are the most important concerns of the laboratory. The number of specimens processed has tripled. Numerous physicians have received training in exfoliative cytology for periods of one month to a year or more. Technicians were trained under an apprenticeship system until 1967, when the Cytology Laboratory joined

with those of six other Boston hospitals to form a cooperative school, the Boston School of Cytotechnology, which last year became associated with Northeastern University. . . .

In 1957 Dr. Leonard Atkins, under a grant from the Atomic Energy Commission, originated a bone-marrow bank for use in the event of atomic bomb casualties, and the bank was later used for storage of autologous marrow, obtained during remission, for treatment of leukemic patients. This involved bone-marrow culture and led to chromosome preparations and ultimately in 1959 to the establishment of the Cytogenetics Laboratory. This unit now has a larger volume of specimens to study than any such laboratory in the state, providing service not only for the MGH, but also for most of the hospitals in metropolitan Boston. The definitive diagnosis of mongolism, the detection of translocation carriers, and the finding of chromosome abnormalities associated with congenital abnormalities have been among the practical aspects of the work of the laboratory. In collaboration with the Fernald School the Cytogenetics Laboratory has participated in a study of amniocentesis fluid for prenatal detection of chromosome abnormalities.

Included in the category of patient-care activities is our service to numerous community hospitals. The Department of Pathology was one of the first departments in the hospital to establish an association with a community hospital. . . .

TEACHING

Teaching of the pathology house staff and fellows in training was augmented considerably during this 20-year period. In 1952 training in clinical pathology was made available by rotation through the Chemistry, Bacteriology, and Hematology Laboratories, enabling these resident pathologists to be eligible for certification by the American Board of Pathology and later for positions in hospital laboratories.

In addition to an hour-long conference every morning on the post-mortem examinations of the previous day and another conference in the afternoon on the daily surgical specimens, there is at least one other informal teaching exercise every day or evening. Foreign fellows and medical students taking a pathology elective participate in these exercises. Visiting professors, many from foreign countries, give an added flavor and diversity to the teaching. In addition to monthly electives, in 1956 the post-sophomore fellowship was introduced, and until the recent change in the Harvard Medical School curriculum, two to four students spent a year between their third and fourth years in the laboratory, dividing their time between patient-care, pathology and research. This program has been one of the best methods of recruiting medical students to enter the field of pathology. Of the 18 students who joined this program, currently 6 are pathologists, 9 are in academic institutions, and 2 are professors and chairmen of departments of pathology. With the introduction of the block system in the teaching of pathology at the Medical School all members of our staff and many of our house staff have participated in teaching at HMS. A recent survey has shown that annually about 2,000 hours of teaching students are supplied by our full-time staff, with our house staff contributing approximately the same amount of time. The members of the staff participate in the many postgraduate courses given in the hospital by various clinical services. In 1964 we introduced a course on the Pathology of the Endocrine Glands, which is given in the Countway Library and is limited to 60 physicians. This course has proved very popular, and each year there is a long waiting list. Another aspect of our postgraduate teaching is the large number of lectures and slide seminars that our staff members are asked to conduct at medical schools and national meetings both in the United States and in foreign countries. This is especially true of Dr. Robert

E. Scully, whose clinicopathological investigations and talents in gynecological pathology are being acknowledged by the many invitations he receives throughout the world. A corollary of our lecture tours and visiting professorships in various foreign medical schools has been to provide the opportunity in our laboratory for trained pathologists from foreign universities to learn our methods of training in patient-care pathology, teaching, and research. A few of these fellows became members of the resident staff, and several now hold university chairs. During the past 22 years there were 34 such fellows from 21 countries. . . .

Perhaps the greatest impact of the laboratory on medical teaching throughout the world has been effected by the clinicopathological conferences, published weekly in the *New England Journal of Medicine*, as the Case Records at the MGH. The case method of teaching in medicine was germinated by Walter B. Cannon when still a medical student in the 1900's, was implemented by Dr. Richard Cabot beginning in 1910 and flowered under his direction for 20 years, and was expanded to involve the entire MGH staff and became more clinicopathologically oriented under Dr. Mallory in the 1930's and 1940's. During the past 20 years under my direction the cases presented have become increasingly complex in terms of both clinical work-up and multifaceted disease entities, and the number of cases presented has been reduced to one per week to allow more complete discussion and more audience participation. . . .

Having traveled in many countries, I have seen at first hand the widespread impact of the Case Records in both undergraduate and postgraduate teaching. . . . Many of our staff members returning from foreign travels have ruefully reported that they are better known for their CPC discussion than for their research! . . . I repeat, the evidence is overwhelming that our CPCs have become a tradition and serve as teaching exercises all over the world.

RESEARCH

Before we moved into the Warren Building in 1956 the research carried on in the old Allen Street Building was primarily clinicopathological correlation and was not supported by outside funds. Nevertheless, important papers dealing with the pathology of the parathyroid and thymus glands, renal biopsies in hypertension, malignant lymphoma, aortic dissection, pulmonary embolism and infarction, Mikulicz's disease, and many others have been published from work done in our old building. This type of clinical research based on careful observations and often with new technics, has continued, with the emergence over the years of new clinicopathological entities, such as pulmonary alveolar proteinosis, mediastinal lymph-node hyperplasia, several distinctive ovarian tumors, chemodectoma of the lung, and clear-cell carcinoma of the vagina arising in young women who had been exposed to stilbestrol *in utero*. The last tumor is the first example of transplacental carcinogenesis in humans. In addition to new disease entities important advances in the pathology and function of the thyroid gland were made by Dr. Austin L. Vickery, Jr., and of the ovary and testis by Dr. Scully. In 1967 Dr. Gerald Nash and Dr. Blennerhassett, in collaboration with Dr. Henning Pontoppidan of the Department of Anesthesiology, demonstrated that many patients who died after mechanical ventilation had pulmonary lesions consistent with oxygen toxicity, and partly as a consequence it is now standard practice throughout the world to monitor closely the dose of oxygen during mechanical ventilation. Other highlights of our accomplishments in research include studies of Dr. Agnes Russfield on the correlation between the cytology of the pituitary gland and hormone assays in neoplasia, assessment of testicular biopsies in patients with infertility by Dr. Sniffen, and functional examination of the post-mortem heart to determine the

competence of the valves by Dr. Richard Kelly and Dr. Fairfield Goodale.

With the move into the Warren Building, space for more sophisticated research became available, and outside support was obtained. At the present time our research funds, derived from the National Institutes of Health, the American Cancer Society, and the American Heart Association, amount to roughly \$600,000 per year, \$400,000 in research grants, \$100,000 in research career development awards and fellowships, and \$100,000 in training grants. Our histochemical unit, begun in the old building, expanded, and during the 15-year direction of Dr. Richard B. Cohen many fellows now holding academic positions were trained in this facility. In his laboratory histochemical technics were devised for the demonstration of oxidative enzyme systems and applied to the study of intermediary metabolism.

An important addition to the research facilities was the establishment of the Edwin S. Webster Laboratory to house the first electron microscopy laboratory for human pathology in New England under the direction of Dr. David Spiro. His first major effort was to delineate the various alterations of the glomerulus in a number of human diseases. These efforts culminated in criteria that enabled electron microscopists to make firm diagnoses of many human renal diseases in their earliest states. His investigations of heart muscle led to a definition of the conformance of cardiac muscle to classic length-tension curves as seen in skeletal muscle. This property of cardiac muscle is the basis of one of the leading theories of heart failure, i.e., decrease in contractile strength of the muscle when overstretched and on the "descending limb" of the length-tension curve. During his five-year tenure before resigning to become a professor at Columbia University many of our residents and fellows were trained in this new technic. Dr. James B. Caulfield took over

the direction of this unit in 1961 and demonstrated renal glomerular changes in prediabetic patients and further noted that dermal elastic tissue of prediabetics and diabetics is severely altered. Continuing work on cardiac diseases, Dr. Caulfield has defined the major cause of cardiogenic shock and the secondary myocardial lesions induced by this syndrome. Recently, Dr. Caulfield moved his laboratory to the Shriners building, where he is investigating ground substance in wound healing. Dr. Ronald S. Weinstein and Dr. N. Scott McNutt, pathology research trainees using the equipment in the Mixer Neurosurgical Laboratory, applied high resolution electron-microscopy technics to the study of normal and neoplastic cell membranes. They discovered a striking decrease in the number of "nexus" cell junctions in carcinomas of the cervix and found that this deficiency arises as the epithelium undergoes malignant transformation. Since these junctions function as mediators of intercellular communication in normal tissues, the decrease may partially explain the abnormal behavior of tumors. Dr. Sanford I. Roth investigated the ultrastructure of normal and diseased parathyroid glands, complementing my original light-microscope studies. He has demonstrated the form of the secretory product, the secretory cycle in the chief cells, and the independence of the control of parathyroid-hormone synthesis and secretion. The chance finding by Dr. Kilmer S. McCully at autopsy of accelerated arteriosclerosis in two patients with homocystinuria resulting from two different enzymatic disorders led to the experimental production of arteriosclerosis in animals given homocysteine derivatives. Cell cultures from other patients with one of these types of homocystinuria were then found to elaborate an abnormal highly sulfated matrix, accounting for the prominent accumulation of matrix in the walls of arteries involved by early arteriosclerosis. Investigation of these cell cultures led to the discovery of a metabolic

pathway for sulfate ester synthesis from homocysteine requiring ascorbic acid and controlled by pyridoxine. The search for a homocysteine derivative with growth-stimulating properties culminated in the discovery and chemical synthesis of an oxidized homocysteine derivative mediating the action of pituitary growth hormone that he has called trophosine.

Recognizing the increasing importance of immunologic thought and technology in the understanding and treatment of many diseases, I established in 1959 an Immunopathology Unit within our department, designed to serve as a focus of teaching, research, and diagnostic expertise in this field. Under the able direction of Dr. Martin H. Flax this unit formed close liaisons with clinicians in other units, such as the Renal Transplant Unit, with improved patient care as a consequence. In addition, Dr. Flax made fundamental contributions toward an understanding of the pathogenesis of autoimmune thyroiditis. His investigative activities created a tradition of intellectual excitement that was passed on to his successor, Dr. Harold Dvorak, when Dr. Flax became professor and chairman of the Department of Pathology at Tufts University Medical School in 1970. From its inception this unit has attracted several pathology residents annually for periods of research or clinical training in immunopathology, and more recently it has also attracted residents from other specialties. Dr. Dvorak's research has been concerned with the morphology and pathogenesis of cellular hypersensitivity. He has described a new form of lymphocyte-mediated immunologic response characterized by the presence of large numbers of basophilic leukocytes, which apparently have a prominent role in such diverse entities as viral infection, contact allergy, and tumor and graft rejection in both animals and patients.

Since 1958 we have been very fortunate in having a National Institutes of Health research training grant to support four trainees per year.

Its recipients obtain a basic training in anatomic pathology and in addition join one of the research units in the department or one of the investigators in another hospital laboratory. The purpose of this grant is to train academic pathologists. It is of interest to compare this small group of trainees with the entire group of residents over this period; 80 percent of the 30 research trainees are now in academic pathology, whereas 53 percent of the 70 regular house staff are in academic pathology. We are, of course, very proud of the fact that 26 of our alumni of the last 25 years were appointed to full professorial chairs, and that 15 of them are or were chairman of departments at their university.

On October 29, 1971, a reception and dinner were held in honor of Benjamin Castleman at the Harvard Club. Over 200 alumni and department members attended; attendance was increased by members of the American Society of Clinical Pathologists who were in town for their annual meeting. As Dr. Castleman himself recalled, “It was a heartwarming evening marked by many happy recollections of past events. It was indeed a memorable occasion of nostalgia and homage.”

It turned out, however, that a successor was somewhat slow in coming. Although Dr. Castleman had planned to step down as chief in late 1972, it would not happen until 1974. In addition, between January and August 1972, he served as Acting General Director of the hospital, between the directorships of John Knowles and

Charles Sanders. In his annual report for 1973, with his characteristic humor he referred to himself as a “lame-duck Chief of Service”; but later in his same report he commented on a variety of nonprofessional staff who had stepped down after many years of service: “Longevity seems to be the rule in our department.” Indeed, it would be for him: he continued in the department and the hospital (including advising the General Director of the hospital) until he passed away in 1982, a remarkable period of over 50 years since he had come to work with Tracy Mallory in 1931.

In 1982 another event occurred to honor Dr. Castleman’s contributions: the creation of the Benjamin Castleman Professorship of Pathology at HMS. Just two weeks before he died, Dr. Castleman attended the ceremony making Dr. McCluskey, his successor, the first incumbent of the Castleman Professorship. The professorship has subsequently been held by the two next Chiefs of Pathology at MGH: Dr. Robert B. Colvin and Dr. David N. Louis.

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