

# Cytopathology

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THE HISTORY OF CYTOPATHOLOGY at the Massachusetts General Hospital (MGH) is linked firmly with the beginning of the modern practice of gynecologic cytopathology. Dr. George Papanicolaou, working at Cornell Medical Center in New York City, is widely recognized as the father of gynecologic cytology, although the significant contributions of Dr. Aurel Babeş of Romania should also be noted. It took pioneers in the adaptation of the Pap smear technique, however, to further our understanding of its utility and role as the first widely used method of cancer screening. Much of that adoption and early refinement took place at the MGH.

Papanicolaou and Babeş first presented their classic papers on the use of cytologic specimens to diagnose cervical cancer in 1928, Papanicolaou at the Third Race Betterment Conference in Battle Creek, Michigan (1), and Babeş in the French literature (2). On January 5, 1928, the *New York World* reported that “although Dr. Papanicolaou is not willing to predict how useful the new diagnostic method will be in the actual treatment of malignancy, it seems probable that it will prove valuable in determining cancer in the early stages of its growth when it can be more easily fought and treated.” Although the method was promising, there was little interest in the medical community (including pathology) for this test, and Papanicolaou returned to Cornell, where he continued his own investigations related primarily to the cytologic changes in the female genital tract

associated with hormones. In 1939 Dr. Joseph Hinsey, the Chairman in the Department of Anatomy at Cornell, encouraged Papanicolaou, along with Dr. Herbert F. Traut, a Cornell gynecologist, to engage in a clinical trial of the cytologic detection of cancer in the female genital tract. These studies led to the landmark study by Papanicolaou and Traut, entitled “The Diagnostic Value of Vaginal Smears in Carcinoma of the Uterus,” which was presented publicly in March 1941 and published in the *American Journal of Obstetrics and Gynecology* in August 1941 (3). The beginnings of clinical cytopathology thus date to 1941.

## MGH CYTOLOGY: THE EARLY YEARS

The history of cytology at MGH also begins in 1941. The first events, however, took place not in the department of Pathology but in the Vincent Hospital (the Gynecologic Service at the MGH). An internist practicing at the MGH, Dr. Maurice Fremont-Smith (figure 19.1), who was highly interested in the relatively new concept of preventive medicine, approached Dr. Joe Vincent Meigs (figure 19.2), Chief of the Vincent Service and a prominent gynecologist, with the paper by Papanicolaou and Traut. According to a letter written by Dr. Priscilla Taft (see below) in 1993, Dr. Fremont-Smith had visited Papanicolaou’s laboratory in New York. Dr. Meigs greatly valued diagnostic tissue pathology and was known to review specimens from his patients routinely,



*Figure 19.1* Members of the Vincent Laboratory staff (1947) surround (seated, left to right) Ruth Graham, George Papanicolaou, and Maurice Fremont-Smith. (Photo courtesy of Dr. Maurice Fremont-Smith, grandson of the pictured Fremont-Smith)

both grossly and microscopically. He saw the potential for this new technology and assigned Ruth M. Graham (figure 19.1), a zoologist and medical technologist, to pursue the development and implementation of this technique in Boston.

Ruth Moore Graham was born in 1917 in Paris, Idaho, the daughter of a general medical practitioner. She received her bachelor's degree in zoology in 1938 from the University of Michigan. Following her graduation, she studied laboratory technology for a year at Simmons College in Boston. Her first position was at the Huntington Memorial Hospital, where she worked as a hematology technician on projects involving chemotherapy effects in leukemia. In 1940 she married Dr. John B. Graham, a newly graduated Harvard Medical School (HMS) physician, who subsequently trained as a gynecologist. The Grahams initially lived in San Francisco, where Ruth

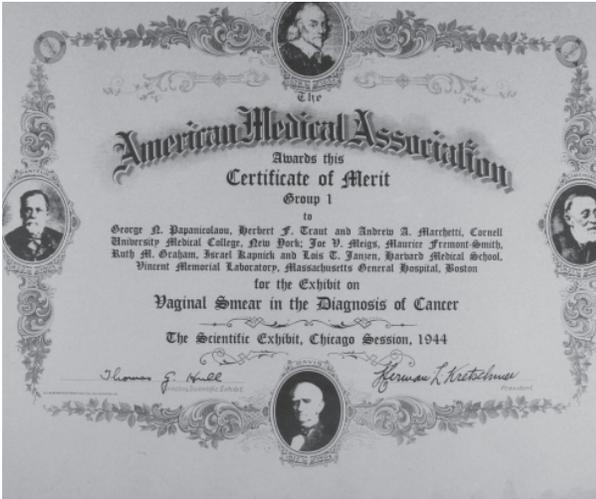
Graham worked in the coroner's office, gaining observational skills in autopsy pathology and learning histologic techniques. They returned to Boston in 1941, and Ruth Graham initially became a Research Assistant of Dr. J. H. Means in the MGH department of Medicine, where her research involved investigations on respiratory enzymes (4), until the following year, when she moved to the Vincent Laboratories.

In response to Dr. Meigs's assignment, Graham spent a week in the Papanicolaou laboratory at Cornell in New York City and then returned to Boston to implement the technique. The Gynecologic Cytology Laboratory was thus established in the Vincent Laboratories during 1942, and it most probably represents the second organized cytology laboratory in the United States, after Papanicolaou's one in New York.

The Vincent investigators quickly confirmed



*Figure 19.2* Joe V. Meigs, Chief of the Vincent Service (MGH archives)



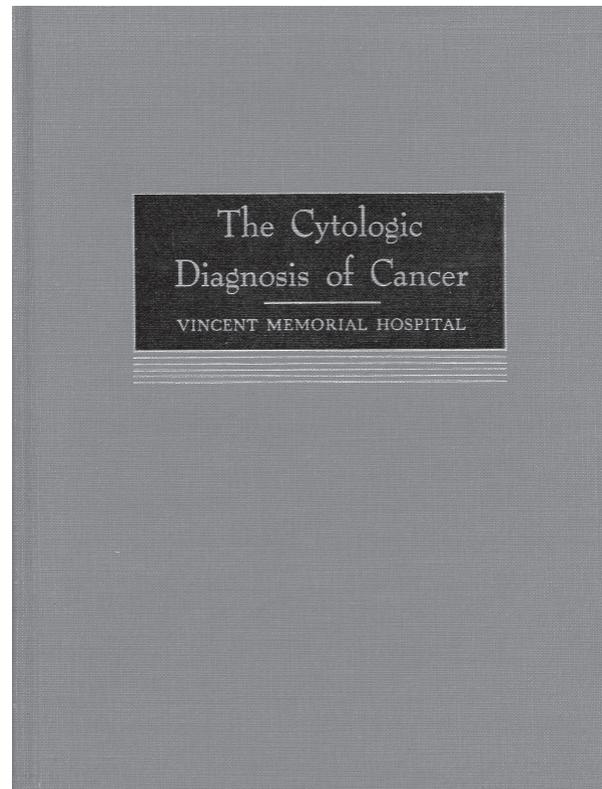
*Figure 19.3 Certificate of Merit from the American Medical Association received by the Vincent Laboratory and Cornell Medical Center in 1944 for work verifying the cytologic method for the detection of cervical cancer*

the original findings of the Papanicolaou and Traut study in a manuscript entitled “The Value of the Vaginal Smear in the Diagnosis of Uterine Cancer,” which was published in *Surgery Gynecology and Obstetrics* in 1943 (5), and in a larger study of over 1,000 patients in 1945 (6). The association with the Cornell Laboratory remained strong, and Meigs and Graham reportedly insisted on including Dr. Papanicolaou in a scientific exhibit they were asked to prepare for the American Medical Association meeting in Chicago during 1944. The exhibit was entitled “Vaginal Smear in the Diagnosis of Cancer,” and for their efforts the group (Papanicolaou, Traut, and Andrew A. Marchetti from Cornell and Meigs, Fremont-Smith, Graham, and Lois T. Janzen from the Vincent Laboratories) won a certificate of merit (figure 19.3).

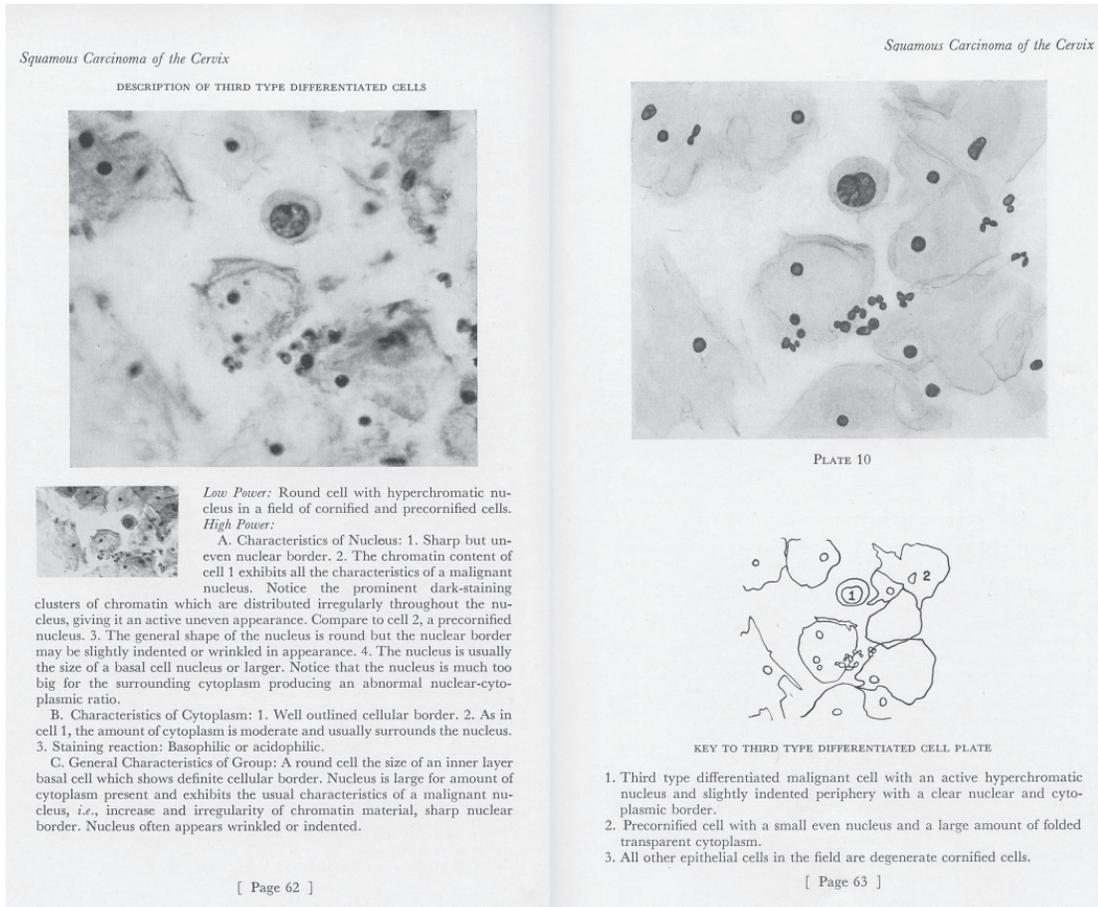
One famous anecdote illustrates how cytology was cemented into routine practice at the Vincent Lab. Dr. Meigs performed two hysterectomies (one for leiomyomas, the other for endometriosis) on patients who also had preoperative vaginal smears that Graham read as positive for carcinoma. When the specimens were removed and

grossly examined, a stir was created because no gross evidence of carcinoma was present in either cervix. Upon histologic examination, however, both specimens were indeed found to have squamous carcinoma in situ, proving Graham correct (4). A further study performed by Graham and Dr. John J. McGraw, a research fellow in Pathology (and hence the first official pathologist at the MGH to practice cytopathology), was published in 1948 showing the accuracy of the cytology specimen in comparison to the corresponding biopsy for cervical squamous carcinoma (7).

In 1947 Dr. Sommers H. Sturgis was appointed Chief of the Vincent Laboratories, and the unit moved to new quarters. Also in 1947 Graham published her first reports on the effects of radiation on cells in the vaginal smear (8, 9). These



*Figure 19.4 Monograph entitled The Cytologic Diagnosis of Cancer; the first textbook of cytology, which was published by Ruth Graham and the Vincent Laboratory staff in 1950*



*Figure 19.5 Two pages from The Cytologic Diagnosis of Cancer showing photomicrographs and hand-drawn illustrations*

and subsequent studies indicated that specific morphologic patterns of cells were prognostic and thus could guide which patients received or did not receive radiotherapy. This work was initially accepted and reproduced by other investigators in Europe and Mexico, but, in the end, definitive studies showed that these parameters were not prognostic. This would become a source of conflict in Ruth Graham's professional career: the individual discounting her work was one of her close associates at MGH, Dr. Robert Fennell (see below), when he was later working at the University of Pittsburgh (10).

In the 1948 Vincent annual report Dr. Meigs wrote, "Mrs. Graham has really placed our Laboratory in a very strong position. . . . The Smear

Laboratory is established . . . as a routine procedure." Ruth Graham and her colleagues in the Vincent Laboratories published in 1950 the first comprehensive textbook of cytology, *The Cytologic Diagnosis of Cancer* (11), under the sponsorship of the American Cancer Society, which was rapidly emerging as a force in the promotion of the cytologic method of screening for cervical cancer (figure 19.4). By this time the laboratory was not only processing vaginal smears, but was also examining exfoliative specimens from numerous other body sites. Thus, in addition to reviewing the investigations in gynecologic cytology, this monograph covered exfoliative cytology of other sites, including the respiratory, gastrointestinal, urinary, and body cavity systems. The

monograph is beautifully illustrated with both microphotographs and drawings detailing specific fine structures, and the accompanying text supplies descriptions necessary for understanding the importance and context of identified features (figure 19.5).

### THE TRANSITION TO PATHOLOGY, 1949–1956

In July 1947 Dr. Robert H. Fennell Jr. came to MGH Pathology (figure 19.6, and see figures 5.8 and 7.6). He was educated at the Medical College of Virginia and trained in pathology at Grady Hospital in Atlanta and subsequently at the MGH. He reported, in letters penned in 1993 and 1996, that at that time there was “no particular contact (by Pathology) with the OB/GYN Department” (12, 13). Dr. Fennell spent time in the Vincent Cytology Laboratory in April 1948, learning from Ruth Graham and the technologists. Shortly thereafter, Graham and her husband left for positions in Portland, Oregon. In 1949 the laboratory was transferred administratively to Pathology, and Dr. Tracy B. Mallory appointed Dr. Fennell Director of the Vincent Laboratories and Assistant in Pathology (a position he held while completing his clinical pathology postgraduate training). Because of lack of space within Pathology, the Cytology Laboratory physically stayed in the Vincent Building until the Warren Building was completed in 1956. In the 1949 MGH Pathology annual report, the transfer of responsibility for the laboratory was described as “recognition of the change in status of exfoliative cytology from a research project to an established diagnostic method.” The 1950 annual report noted that the laboratory successfully completed its first year under Dr. Fennell, and exfoliative cytology is described as “indispensable in the diagnosis of certain forms of cancer and it will continue to be an essential division [of the Pathology department].” In that year there were a reported 5,726 cases examined. In 1951, Dr. Fennell was



*Figure 19.6 Robert H. Fennell, first pathologist director of the Cytopathology Laboratory (front row, left), and the other officers of the American Society of Cytopathology in 1969: Stanley Patten (back row, left), Warren Lang (back row, right), and Paul Isbell (front row, right). (Photo courtesy of the archives of the American Society of Cytopathology)*

appointed Assistant Professor at the University of Tennessee in Memphis, where he participated in one of the most famous early large trials of cervical cytology (14), and where he helped start a large school for cytotechnologists with the assistance of Ruth Graham, who spent the summer of 1951 there. Fennell described Graham in his 1993 letter as a “wonderful teacher” (12).

Graham returned to the Vincent Laboratory in 1951 and was appointed Director of the Vincent Cytology Laboratory and Clinical Cytologist at MGH. In 1952 the laboratory was the recipient of a “generous gift from the Godfrey M. Hyams Trust” that was used to create an addition to the laboratory space, which allowed increased instruction of cytologists and pathologists in the

cytologic method. Fennell returned from Memphis to MGH Pathology in 1953, recruited by Dr. Benjamin Castleman because of the military service commitments of Drs. Robert Scully and Austin Vickery. During the ensuing years, Dr. Fennell worked closely with Ruth Graham, examining cases of cytologic squamous carcinoma in situ for which no lesion had initially been identified on histologic examination. These studies clearly showed that in cases where an “experienced cytologist diagnosed a certain lesion, multiple sections would eventually show a correlation with the cytology findings” (15, 16). In addition, these studies led to identification and study of a subset of early invasive (microinvasive) squamous cell carcinomas (17). Dr. Fennell observed in his letters that although cytology now played a definitive role in the department, there was always skepticism of the method by the dominant surgical pathology-oriented group, and that the Cytology Unit held a secondary position in terms of resources and prestige (12, 13).

In 1954 the Vincent Cytology Laboratory and HMS were awarded a grant by the American Cancer Society designed as a “group attack on cervical cancer.” This grant was administered by John and Ruth Graham and included not only MGH but also several other hospitals in the Boston area. The project consisted of selection of cancer patients for surgical or radiation therapy and a compilation of the results. That year, for her many efforts in cytology and cervical cancer research, Ruth Graham was awarded an honorary doctor of sciences degree from the Women’s Medical College of Philadelphia.

In 1955 Dr. Fennell moved to the University of Pittsburgh (Magee Hospital), where he was appointed Assistant Professor of Pathology. By this time the cytology specimen volume had steadily grown to nearly 10,000 annually. Dr. Fennell went on to be an active participant in the cytology professional organizations (see below) and an active investigator in gynecologic pathology and cytology during his post-MGH career (18).

### THE TAFT YEARS, 1957–1983

In January 1957 cytology operations moved to the newly opened Warren Building. During that year Dr. Priscilla Dienes Taft (known as “Piri” to close friends) was appointed Director of the Cytology Laboratory and Assistant in Pathology (figure 19.7), after having completed an American Cancer Society fellowship in cytology the year before, learning under Ruth Graham and her colleagues. She replaced Ruth Graham as the director when Graham left for Buffalo, New York, and a position at the Roswell Park Cancer Institute.

Dr. Taft, the daughter of the distinguished MGH microbiologist and immunologist Dr. Louis Dienes (chapter 21), was born in Budapest on May 25, 1917, but the family soon moved to the United States. She graduated from Radcliffe College in 1938 and studied medicine at Yale University, graduating in 1944. She completed



*Figure 19.7 Priscilla Dienes Taft, Director of the Cytology Laboratory, 1957–1983 (MGH archives)*

postgraduate training in pathology at the Malory Institute of Boston City Hospital and at the University of Kansas. She was married to another long-term faculty member of MGH Pathology, Dr. Edgar Taft. During her quarter century as Director, the Cytology Laboratory specimen volume grew to over 30,000 annually, and the service became a valuable teaching unit in the Pathology department. In his request for Dr. Taft's promotion to Assistant Professor of Pathology, Dr. Castleman described her as having done a "superb job in the organization and running of this department." Early in her career she was involved in the research mission of the department as it related to cytology, working with Drs. Lazlo Vincze (a research fellow in Surgery, assigned to Gynecology at the Vincent Memorial Hospital) and Janet W. McArthur, a gynecologist, on the changes in squamous cells during the menstrual cycle in cytology specimens from vaginal, urinary, and buccal locations (19), and with Dr. John Raker on circulating tumor cells in the peripheral blood (20); she also wrote on optimal preparation and analysis methods for cytologic specimens (21, 22). Later in her career she was involved in research related to therapy effect in cells and urinary cytology in renal transplant patients (23). She also wrote an important review of the cytology of clear cell carcinoma of the genital tract (24) and worked on studies detailing the cytologic effects of exposure to diethylstilbestrol (DES) (25). Jean Buchanan (see below) described Dr. Taft as "constant—she was always there. She was knowledgeable." Dr. Taft served as Director of the Cytology Laboratory until her retirement in 1983. In 1992 the MGH cytopathology fellowship was named in honor of Dr. Taft and her longtime service to the unit and to the hospital.

At the time Dr. Taft was appointed Director, the chief cytotechnologist was Lina Neri, who had studied under Ruth Graham and at Memorial Hospital in New York before returning to join the Vincent Laboratory team. In 1958 Neri resigned to work in the endocrinology research

laboratories at MGH, and she was replaced by Jean Pasakanas (later Buchanan), who remained the Chief Cytotechnologist until her retirement in 1989 (figure 19.8). In 1958 there were six cytotechnologist staff members and one secretary, processing about 10,000 exfoliative cytology specimens, of which 83 percent were gynecologic. In response to a 1972 request for a departmental report on cytology, Dr. Taft wrote that by 1970 the cytology staff had increased to 13 people, still in a space of only 415 square feet. She wrote, "Crowding exacerbates minor problems so at times it is difficult to obtain and keep staff," and "It is hoped that relief will be forthcoming." At this point specimen volume had grown to over 23,000 annually. Under Taft, Neri, and Buchanan a number of American Cancer Society-funded trainees took a three-month course in exfoliative cytology in the laboratory. One of these trainees was Dr. Bernard Naylor, who later became the Director of Cytology at the University of Michigan and who had a very distinguished career in the discipline. As cytology programs developed in Boston, the number of technologists and



*Figure 19.8 Jean Buchanan, Chief Supervisor of the Cytopathology Laboratory, 1959–1989 (left), with Wanda Szyfelbein, Laboratory Director, 1983–1989 (right) (Photo courtesy of Jean Buchanan)*

pathologists interested in this discipline continued to grow.

In 1961 the Massachusetts Society of Cytology was founded by Jean Buchanan and other area cytotechnologists; it held its first annual cytology seminar in 1962 at the Boston Lying-In Hospital, with Drs. Leopold Koss, Arthur Hertig, and Paul Young as the speakers. Subsequent meetings featured luminaries in cytology and pathology, including Drs. William Johnston, Stanley Patten, Myron Melamed, George Weid, Ralph Richart, Alan Ng, and Averill Liebow. The need for a formalized school for cytotechnology was recognized in the next several years, and the Boston School of Cytology, in association with Northeastern University, was born in 1967; Dr. Tilde Kline (of the Free Hospital for Women) was Director and Dr. Priscilla Taft was named Associate Director. Although other schools of cytotechnology had emerged in other areas of the United States before 1967, the Boston school was unique because it represented a collaborative effort of seven area hospitals (Boston City, MGH, Deaconess, Free Hospital for Women, Brigham, Beth Israel, and New England Medical Center). The program's first class was 12 students, of whom two were assigned to MGH. In the same year MGH received a grant from the Cancer Control Branch of the NIH to support cervical cancer detection. As part of the grant, every woman 25 years or older was to receive a cervical cytology evaluation (Pap test) upon admission to MGH. An additional grant from the U.S. Public Health Service Cancer Control Branch in 1968 extended the program to outpatient clinics. The programs ended in 1969, and during that time over 6,000 Pap tests had been enrolled; eight cases of cervical cancer (four in situ, three stage 1, and one stage 2) were identified.

By the early 1970s, the increasing specimen load necessitated the hiring of an additional pathologist dedicated to cytology, and in 1974 Dr. Wanda Szyfelbein joined the cytology staff (figure 19.8). Dr. Szyfelbein was born and educated

in Poland and finished her pathology training at Boston University Hospital and at the MGH in 1974. She was primarily interested in fine needle aspiration biopsy and made several important contributions to that literature, including a 1994 monograph on fine needle aspiration biopsy of the liver (26). She took over as Director of the Cytology Unit upon Dr. Taft's retirement in 1983 and continued in that role until 1989. Dr. Szyfelbein was active in the department until 2003. A highlight of the Taft-Szyfelbein years was their weekly slide sessions with the residents. The attendance and interaction at these sessions was described as "great." Also during this period, from 1979 until moving to St. Elizabeth's Hospital in 1982, Dr. Erika L. Whitmore was a member of the Cytology Unit. She remained a part-time member of the unit until 1990.

#### EXPANSION OF CYTOPATHOLOGY AND RECENT YEARS

With Dr. Taft's retirement, Dr. W. Stephen Black-Schaffer (see figure 19.10) joined the faculty after completing his medical education at Indiana University and pathology training at the MGH. He assisted Dr. Szyfelbein as Associate Director of Cytopathology from 1984 to 1989, and then took over as Director in 1989, a position he held until 1991. He continues on the Cytopathology staff to the present. His major clinical interests have been in respiratory and gynecologic cytology, and he has actively participated in decisions related to cytology technology and trainee education. During his tenure as Director, the laboratory made the transition to a modern laboratory information system, implementing the CoPath system in 1990, and the first cytopathology fellowship program was accredited, also in 1990.

Dr. Debra Bell (figure 19.9) followed Dr. Black-Schaffer as Director of Cytopathology. She joined Cytopathology in 1982 after completion of her pathology training at New York University and her cytopathology fellowship at Memorial Sloan-Kettering Cancer Center. She held the

position of Director of Cytopathology from 1992 until 2001. Dr. Bell is noted for her interest and contributions in gynecologic pathology (particularly ovarian) and in gynecologic cytopathology. In 1992 specimen volume had further increased to greater than 35,000 annually, necessitating a much-needed increase in the unit's space. During Dr. Bell's tenure as Director, the laboratory underwent a renovation and expansion following the opening of the Blake Building and the relocation of the Histology Laboratory (which had previously been in the contiguous space on Warren 1) to Blake 3. Until that point, Cytopathology had occupied 992 square feet, and the renovation increased laboratory space to 1,557 square feet, reflecting the continuing expansion of specimen volume and increasing complexity of preparation methods. In 2007 Dr. Bell left the MGH to join the pathology staff at the Mayo Clinic in Rochester, Minnesota.

In 2001 Dr. David C. Wilbur (figure 19.10) was recruited as Director of Cytopathology, a position he still holds. Dr. Wilbur received his medical education at the University of Rochester, where he also completed his pathology training under the mentorship of Drs. Stanley F. Patten Jr. and Thomas A. Bonfiglio, and rose to direct the Cytopathology Unit at that institution. Dr. Wilbur's major interests include gynecologic cytopathology and cytology automation as well as telepathology technology. Before and during his tenure at MGH, he participated in numerous studies of new preparation and automated gynecologic cytology screening technology (27–30). After his arrival, Cytopathology underwent the adoption of full gynecologic cytology automation, a means to a more accurate and productive practice. Dr. Wilbur is also the coeditor, with Dr. Marluce Bibbo, of the third edition of *Comprehensive Cytopathology*, a major textbook in the field, and, with Michael Henry, of the College of American Pathologists, *Practical Guide to Gynecologic Cytopathology* (31, 32).

During the mid-1990s, with the advent of



Figure 19.9 Debra Bell

increasing subspecialization of anatomic pathology, an increase in the size of the Cytopathology faculty became possible. As Dr. Black-Schaffer observed, "Because of subspecialization, pathologists could choose a more narrow surgical pathology practice, which allowed them the opportunity to also focus on cytopathology as a part of their overall practice." This change had the added advantage of allowing the subspecialization process to develop in Cytology, which led to a larger group of practitioners with specific cytologic expertise and resulted in increased academic productivity. At the time of this writing, the Cytopathology staff has grown from the original two or three individuals in the pre-1990 period and now comprises 10 cytopathologists (figure 19.10). In addition to those pathologists already mentioned are the following: Drs. Martha B. Pitman (gastrointestinal and pancreatic pathology, Assistant Director of the Laboratory and Director of the Fine Needle Aspiration Service), Rosemary H. Tambouret (renal and gynecologic pathology [33], Assistant Director of the Laboratory and Cytopathology Fellowship Program Director),

Ronald Balassanian (fine needle aspiration), Elena F. Brachtel (breast pathology), Vikram Deshpande (gastrointestinal and urologic pathology (34–36), John H. Eichhorn (breast and gynecologic pathology), William C. Faquin (head and neck pathology), and Joseph Misdraji (gastrointestinal and liver pathology). Dr. Faquin is also the Chief of the ENT Surgical Pathology Group and has authored two monographs on head and neck and thyroid cytopathology (37, 38). Drs. Misdraji and Balassanian have both been honored with the Pathology department Award for Excellence in Resident Teaching.

Other notable staff members during the “modern” era of the unit include Dr. Teri L. Cooper, who completed a cytopathology fellowship at MGH

in 1992 and joined the staff immediately thereafter. She was a noted teacher, receiving the Award for Excellence in Resident Teaching in 1995, and also served as the Associate Director of the unit until her departure to Berkshire Medical Center in 1997 and also as Director of the Cytopathology Fellowship Program from 1992 to 1995. Dr. Barbara Centeno completed the Cytopathology Fellowship Program at MGH in 1993 and joined the Cytopathology staff in that year. She developed interests in fine needle aspiration biopsy, with particular emphasis on pancreatic cytology, and served as the Cytopathology Fellowship Program Director from 1996 to 1999. Dr. Centeno is currently at the H. Lee Moffitt Cancer Center in Tampa, Florida, where she has continued her



*Figure 19.10* The pathologist and cytotechnologist staff of the Cytopathology Unit, 2010. Seated, left to right: Ron Balassanian, Stephen Black-Schaffer (toward front), Joseph Misdraji, Martha Pitman, David Wilbur, Rosemary Tambouret, Elena Brachtel. Standing: Vikram Deshpande, Jill Ono (fellow), Peter Brown, Nora Popp, Diane Kuebler, Marilyn Nutter, Mary Rego, Ron Arpin, Brenda Sweeney, Rema Rao (fellow); missing from the picture are Heather Smith, William Faquin, John Eichhorn, and Nicole Hartford.

career in cytopathology with notable articles in fine needle aspiration biopsy (39, 40).

The heart of any cytopathology service is the cytotechnologist staff. After the retirement of Jean Buchanan in 1989 as Chief Cytotechnologist, the reins were taken up by David Beech, a graduate of the Boston School of Cytotechnology. Beech held this position until 2008, at which time Brenda Sweeney was recruited from St. Elizabeth's Hospital in Boston to head the cytotechnologist group. Her presence had an immediate effect on the group: the Cytopathology Quality Assurance Program was totally revamped, and Sweeney won the prize for the best paper by a cytotechnologist at the 2009 ASC meeting for her work in new immunocytochemical markers for the detection of high-grade neoplasia in cervical cytology specimens (41). The current cytotechnologist staff consists of Ron Arpin, Peter Brown, Nicole Hartford, Diane Kuebler, Marilyn Nutter, Nora Popp, Heather Smith, and Mary Rego (figure 19.10).

### FINE NEEDLE ASPIRATION

In 1987 the Cytopathology Unit took on a new responsibility: performance of fine needle aspiration (FNA) biopsies. Dr. Ann Thor, who had trained in pathology at Vanderbilt and completed subspecialty cytopathology training at the University of California–San Francisco, was recruited in that year. Her vision and energy began the transition from a unit composed of cytopathologists who only interpreted fine needle aspiration specimens obtained by clinicians to one in which cytopathologists actually performed the procedure. Performance of the aspiration had been shown to improve the overall adequacy and accuracy of the method and provided better clinicopathological correlation, as the pathologist interpreting the specimen had an opportunity to examine the patient and take a direct history. Dr. Thor described Dr. Robert McCluskey, the Chief of Pathology at that time, as “very supportive”; he sent her to the Karolinska Hospital in Stockholm

for an additional month of FNA training during her first year on the Pathology staff. The Karolinska was the “center of the world” of fine needle aspiration at the time. In the first year of practice, Dr. Thor performed about 50 aspirations, and by 1994, when she left MGH to take over as Director of Cytopathology and of the School of Cytotechnology at the University of Vermont, the number of pathologist-performed FNAs had risen to about 300 annually. In describing the early days of the service, Dr. Thor stated, “I carried a beeper and was essentially on most of the time.” She remembered that some opposition to the introduction of the service came from Surgical Pathology staff members who did not think that an appropriate level of accuracy could be achieved with this method. Ironically, this attitude closely paralleled that of surgical pathologists in the early years of gynecologic cytology, as mentioned above. Dr. Thor remembers one member of the department calling FNAs “malpractice.” Clinicians, on the other hand, were generally quite accepting of the procedure. Drs. Marcela Fejgl and Helen E. Cajigas were the first fellows who trained in FNA under Dr. Thor. Dr. Martha Bishop Pitman, who trained as a cytopathology fellow in 1990–1991, was “groomed to take over the service” when Dr. Thor left. Dr. Pitman, who was educated at the Medical University of South Carolina and did her pathology training at the MGH, also spent time during her fellowship year at the Karolinska Hospital. After taking over as Director of the Fine Needle Aspiration Service, Dr. Pitman made changes in program administration that improved the efficiency and delivery of services. A dedicated FNA suite opened in the Wang outpatient clinics in 2002, which allowed the pathologists to schedule patients and perform more aspirations: preparation and interpretation facilities were immediately adjacent. During Dr. Pitman's tenure, the pathologists' aspiration service grew in volume to over 1,000 procedures annually at the time of this writing. In 2009 Drs. Pitman and Ronald

Balassanian trained in the use of ultrasound guidance for FNA performance; they planned to train additional unit members and implemented that service in 2010. Dr. Pitman has authored many papers on pancreatic fine needle aspiration biopsy (34, 35) and has coauthored the most recent AFIP fascicle on pancreas (42).

### NATIONAL SIGNIFICANCE

MGH Cytopathology has had considerable national influence on, among other things, national cytology organizations. The American Society of Cytopathology (ASC) was founded in 1951 as the Inter-Society Cytology Council. A group of individuals interested in the cytologic method and its promulgation met at the University Club in New York City; among them were Joe V. Meigs, Maurice Fremont-Smith, Robert Fennell, and Ruth and John Graham, all from MGH, past or present. Others in the group included such luminaries as George Papanicolaou, Frank Vellios, Arthur Hertig, and Arthur Purdy Stout. Joe Meigs and Ruth Graham were elected as the first President and Assistant Secretary of the Council, respectively. Over time, all these individuals would hold executive or board positions, Robert Fennell being elected President in 1969. During the early years of the society, Ruth Graham worked to open the group to a cytotechnologist membership, which was finally accomplished in 1954 with a bylaws change that allowed cytotechnologists to become associate members. Robert Scully was elected a member of the society in 1956. He had taken a significant interest in cytopathology during his year at the Pondville Hospital (chapter 10).

In later years, other members of the Cytopathology Unit at MGH were involved in leadership positions in the ASC. David Wilbur served as President of the Society in 2002–2003, Martha Pitman served as Chair of the Membership (2000–2002) and Ethics (2002–2005) committees and also as Chair of the Progressive Assessment of Competency for Cytology Fellows Task Force

(2007) (a program to develop in-service tests to measure performance nationwide in fellowship programs). For her work on the Task Force, Dr. Pitman received the President's Award of the society in 2007. Rosemary Tambouret served as Chair of the Cytopathology Fellowship Program Director's Committee (2008–2010). Dr. Black-Schaffer was the Chair of the Task Force on Cytopathology Qualifications for Residency Training Programs in 2002–2005. This was a major effort on the part of the ASC aimed at overhauling the curriculum of postgraduate training in cytopathology.

The highest honor bestowed by the ASC is the Papanicolaou Award, and MGH has had three recipients. Drs. Joe V. Meigs and Ruth Graham shared the award in 1963, and Dr. Wilbur received it in 2010.

The Papanicolaou Society was founded in 1992 as an all-pathologists organization dedicated to cytopathology, and again the MGH faculty has been well represented in leadership positions. Dr. Pitman served as President of that group in 2009–2010. Dr. Tambouret was the Chair of the Membership Committee in 2009–2010, Dr. Black-Schaffer was Chair of the Government Relations Task Force in 2009–2010, and Dr. Faquin was Chair of the Budget and Finance Committee in 2009–2010.

### CONCLUSION

MGH Cytopathology is an active and robust division: in 2009 the annual volume stood at over 63,000 specimens; more than 4,000 fine needle aspirations were interpreted and over 1,000 of those were performed by the pathologists. The current success builds on an honorable history that has and continues to make its mark on the field, from its seminal role in helping establish the discipline within the overall field of pathology to continuing academic contributions and leadership roles by currently active staff. An excellent foundation for continued success in cytology practice, research, and teaching has been laid for those who follow.

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