

## AFIP to debut legacy book in the spring

Later this year the AFIP will unveil its “legacy” book during an event sometime in late spring. The event is in the early planning stage and details are not currently available.

The book, “Legacy of Excellence, The Armed Forces Institute of Pathology, 1862-2011,” is a narrative and pictorial history of the Institute from its early days to now. The inspiring and educational story of how the AFIP evolved from a vision and a few collected specimens into one of the most highly regarded and respected institutes in the world is documented primarily through photographs, although each chapter also includes some introductory text.

This historical work is broken into six chapters. An abbreviated version of each chapter is included in this, the AFIP’s final newsletter prior to disestablishment later this year.

AFIP Director Dr. Florabel G. Mullick explained the motivation behind producing the book.

“About two years ago we were thinking seriously about what we could do to help those who work at the AFIP remember their times here. We certainly didn’t want to throw a big party as we closed, because obviously we don’t think that’s anything to celebrate,” Dr. Mullick said. “But celebrating all that this institute has accomplished through pictures and

words – that’s a whole different story.”

In 1962 the AFIP published a book about the Institute’s first 100 years, but that book was more scientific in nature, and was not intended to be both informative and reflective.

“This new book is designed in a coffee table-style format, which gives it a very informal, inviting look and feel. The design encourages you to flip through its pages so you can reconnect with the Institute and those who worked here, no matter how many years down the road,” she said. “I believe that those who currently or have worked at the AFIP are truly going to enjoy this product. You’re not going to be able to pick it up without feeling proud about the Institute’s accomplishments and the people who made them possible.”

The book is being published by the Borden Institute, which is part of Office of the Surgeon General. Once published, it is expected to be available for purchase through the Government Printing Office website.

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One of the more famous photos featured in “Legacy of Excellence, The Armed Forces Institute of Pathology, 1862-2011.” Here, four of the institute’s great pathologists discuss cases while gathered around a multihead microscope circa 1988. (Seated from left to right) Dr. Nelson Irey, chair, Department of Environmental and Drug Induced Pathology; Dr. Frank Johnson, chair, Department of Chemical Pathology; and Dr. Nelson Helwig, chair, Department of Gastrointestinal Pathology; (standing) Dr. Henry Norris, chair, Department of Gynecologic and Breast Pathology. (NCP 17013)





## DIRECTOR'S MESSAGE



### A Fond Farewell

It has been a pleasure during the past four years to have this tool to share with you my thoughts about the AFIP and pathology in general. As most of you know I've never been shy about touting the world-class accomplishments of the AFIP's world-class workforce. So I always looked forward to finding some quiet time to gather my thoughts and put down on paper what I wanted to communicate to you. I wish I could say that was true for this newsletter as well, but I cannot. For this is the final AFIP newsletter we will produce.

As I'm sure you all know the AFIP is on track to disestablish and permanently close by mid-September this year. In preparation for that, the Institute ceased all education programs on October 1, 2010. Additionally on Oct. 1, we stopped accepting non-federal civilian consultation cases. This action was followed by cessation of all research on December 15, 2010. And on March 31 what remains of our consultation mission will come to a close when we also cease accepting cases for military members and veterans. All three AFIP missions, and the DoD Tissue Repository mission, will then become the responsibility of DoD's new Joint Pathology Center.

After that we will be focused on closing our laboratories, emptying the building of equipment, and most importantly, helping everyone who wants to continue working gain employment elsewhere – not exactly uplifting activities that we would want filling the pages of the newsletter.

Indeed, as I thought about this final edition of "the AFIP Letter" I struggled momentarily to come up with a focus that would leave you with positive, even fond memories of the AFIP. But earlier this year, as I was doing a final review of our upcoming book – "Legacy of Excellence, The Armed Forces Institute of Pathology, 1862-2011" – my focus for this final newsletter became clear. As is explained on page one of this newsletter, the book is a narrative and pictorial history of how the Army Medical Museum was gradually transformed into the AFIP, and how the AFIP became one of the most respected and revered medical institutions in the world. In some ways the book will resemble a treasured family album, filled with the portraits of the greats in pathology during the past 149 years – all connected by history and all related by their professional DNA.

Thus, on the pages that follow you will find what I like to call a miniature version of that legacy book – a sneak peek at the product to come, even if it is just a glimpse compared to the entire project.

I fully understand that many of you remain disappointed and frustrated by the disestablishment of the AFIP. And as someone who has spent much of my professional career here, I can certainly understand this. All of you – regardless of when you began your interaction with the AFIP – instantly became rich with an inheritance bequeathed to you through decades upon decades of splendid service by others who made the Institute a world leader in pathology consultation, education and research.

It is my sincere hope that by allowing you a sneak peek at the legacy book, it will ease your disappointment and frustration and allow you to forever embrace and remember the people, events and work which shaped this truly great institute. If it does no more than jogging a happy memory you may have of your interaction with us, then I will have met my objective. If it leaves you with a lasting understanding of the countless contributions this institute has made to military medicine and the larger civilian medical community, so much the better.

I would not be honest if I didn't say that having the responsibility of closing the Institute has been one

of the most painful experiences of my life. To watch an institution that literally has been a veritable treasure house of medical knowledge and a vibrant center for consultation, research, and education slowly become a shell of its former self before its doors ultimately close for good, challenges my heart and soul each and every day. How does one, after all, watch missions that have benefitted so many people fade away; say farewell to people who have been treasured colleagues, many for decades; walk out of a building that has been your professional home for some 40 years for the last time? These are aspects I struggle with each and every day.

At the same time, they are aspects that inspired me to move forward with producing a legacy book. I thought that if we could leave something behind that honored the work of all who are still with the Institute today and all who came before us, perhaps it would ease the pain of disestablishment, put a smile on our faces and bring some joy to our hearts – a product that years down the road you can pick up, thumb through it again, and say with pride, "I was a part of something truly unique and a genuinely great institution."

Finally, I want you to know it has been an honor, indeed a privilege, to lead the Armed Forces Institute of Pathology for the last four years. And please know deep in your heart that you will remain forever, deep in my heart.

*Florabel G. Mullick*

Florabel G. Mullick, MD, ScD, FCAP  
Senior Executive Service  
The Director



## The Roots of Excellence: 1862–1882

Starting out as little more than three dried and varnished specimens placed on a shelf above an ink stand on a desk, the roots of the Armed Forces Institute of Pathology date to May 1862, when Army Surgeon General Brigadier General William Hammond issued orders to establish the Army Medical Museum. The museum's mission: to collect and properly catalog all specimens of morbid anatomy that had accumulated in the various U.S. hospitals since the commencement of the Civil War.

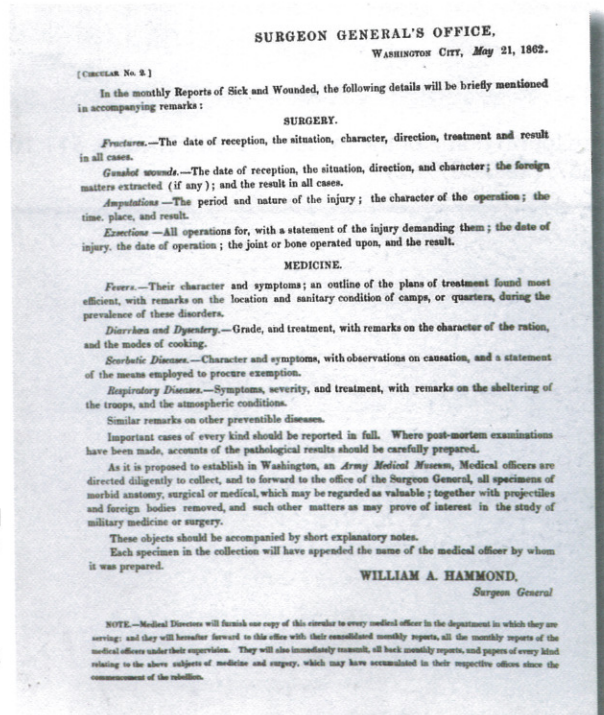
First located in a room in Hammond's office in Washington, D.C., the museum moved three times in its first two years of existence before settling in at Ford's Theatre in 1866. As was common among museums in the 19th century, the Museum functioned primarily as a reference collection.

The material collected was used to produce the *Medical and Surgical History of the War of the Rebellion*. A systematic, statistical compilation of the types of injuries and diseases a military doctor could expect to treat, the multivolume *History* contained 6,000 pages, weighed 56 pounds, and took 26 years to finish; the final part was published in 1888.

Opened to the public on April 16, 1867, the museum drew about 6,000 visitors by the end of the year. And by 1876, the 10th year of the museum's residency in Ford's Theatre, the surgical collection contained 6,539 specimens; the medical section 1,279; the microscopical section 7,275; the human anatomical section 1,254; and the comparative anatomical section 1,522.

► In this circular dated May 21, 1862, Surgeon General Hammond announces his intention to establish the Army Medical Museum. (MIS 62-2214)

The primary emphasis remained on preserving specimens. But slowly and steadily, the museum's curators and researchers had been moving beyond this collection mission, such as pioneering work in microscopy. And as the museum neared its 20th year, General Hammond's original vision of a museum collection that would "embrace all forms of injuries and diseases, so that eventually it would become a general pathological museum, accessible for study to all medical men who are prosecuting original inquiries," was becoming a reality.



Brigadier General William Alexander Hammond, surgeon general of the U.S. Army, 1862–1864. (MIS 61-4774)



Posed amputation scene depicting the use of anesthesia, the widespread use of which was documented in the *Medical and Surgical History of the War of the Rebellion*. (CP 1563)





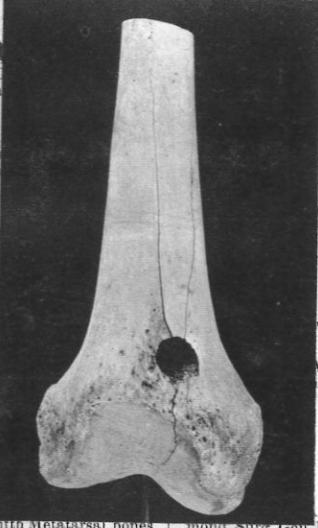
The fourth home of the museum, Ford's Theatre, 511 10th St., N.W., 1866-1887. (Reeve 32782)



Major John Hill Brinton, U.S. Volunteers, first curator of the Army Medical Museum, 1862-1864. (MIS 63-85-2)

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No. OF SPEC'N.	DESCRIPTION.	NAME OF CONTRIBUTOR.
72 *	Gunshot fracture of upper third shaft of Tibia.	Surg. J. H. Brinton, U.S.V.
73 *	Gunshot fracture, comminuted; perforation of Humerus.	A. Asst. Surg. W. W. Keen, U. S. A., Gen'l Hosp. No. 1, Frederick, Md.
74 *	Shell contusion of Tibia; great suppuration.	A. Asst. Surg. D. W. Cheever, U. S. A., Judiciary Hosp., Washington, D.C.
75 *	Gunshot fracture, comminuted, of shaft of Femur.	Dr. Bowles, Waters' Warehouse, Georgetown, D. C.
76	Gunshot fracture of Femur; perforation above condyles.	Surg. C. H. Page, U. S. A.
77	Gunshot fracture of condyles of Femur; deposit of callus.	
78	Gunshot fracture of upper half and neck of Humerus.	
79 *	Gunshot fracture of upper half shaft of Tibia and Fibula.	Asst. Surg. S. A. Storow, U.S.A., Eckington Hosp., Washington, D. C.
80	Gunshot fracture of Tarsus and lower extremity of Tibia and Fibula.	Dr. Warner, Waters' Warehouse, Georgetown, D. C.
81	Gunshot fracture of Tibia and Fibula.	do.
82 *	Gunshot fracture of lower extremity of Radius.	U.S.V.
83 *	Gunshot fracture of Tibia with deposit of callus.	J. S. V., Hosp., do.
84	Gunshot fracture of Tibia.	U.S.V.
85 *	Gunshot fracture of ball perpendicular to shaft of Tibia.	do.
86	Gunshot fracture of carpal bones and distal radius.	U.S.V.
87 *	Gunshot fracture of distal radius.	do.
88 *	Gunshot fracture of distal radius with conoidal ball.	do.
89 *	Gunshot fracture of carpal bones.	do.
90	Gunshot fracture, comminuted, of upper half of Humerus.	do.
91 *	Gunshot fracture of distal radius.	U.S.V.
92 *	Gunshot fracture of distal radius.	do.
93 *	Gunshot fracture; comminuted, of process and head of Tibia.	A. Hamer, U.S.V.
94	Gunshot fracture; comminuted, of shaft of Humerus.	do.
95	Gunshot fracture of Ethmoid, and Upper Jaw.	do.
96	Gunshot fracture of Humerus.	do.
97	Gunshot fracture of Tibia, third, fourth, and fifth Metatarsal bones.	do.
98	Gunshot fracture of Carpus; amputation.	Asst. Surg. Gen. U. S. A. Asst. Surg. J. J. Woodward, U. S. A.
99 *	Gunshot fracture of lower half of Femur.	Surg. J. H. Brinton, U.S.V.



Early "dry" exhibits in comparative anatomy, which included skeletal remains of various mammals, birds and reptiles, as well as "wet" specimens, which were preserved in liquid and enclosed in glass. (Woodward 1856-B)

◀ A collage of two images from the Catalogue of the United States Army Medical Museum (Washington, D.C.: Government Printing Office, 1866-1867), as printed in Henry RS, *The Army Forces Institute of Pathology; Its First Century, 1862-1962* (Washington, D.C.: Office of the Surgeon General, Department of the Army; 1964). The specimen shown is listed as No. 76 in the catalogue. (MIS 62-733-4)



Main exhibit hall, Ford's Theatre building in the early 1870s (Reeve 32786).



◀ This Joseph Zentmayer microscope is one of those issued by the Surgeon General's Office at the time the Army Medical Museum was established. The model was introduced in 1862 for use by U.S. Army hospitals and was produced until 1876. (MIS 60-4713-76)



A photograph of equipment used in the Army Medical Museum's pioneering work in photomicrography, mid-to-late 1860s. (Woodward 1580)





## New Horizons: 1883–1918

As the Army Medical Museum entered its third decade of service to the nation, it housed an ever-expanding anatomical collection and volumes upon volumes of literature calling out for new leadership. Enter Major John Shaw Billings and Major Walter Reed.

Dr. Billings became the fourth curator of the museum in 1883 and successfully lobbied for a new museum building that opened in 1887—a building which would eventually earn the affectionate title “Old Red Brick.” He moved the museum into a more historical direction, with the goal of building a national museum with a broad encyclopedic reach.

Billings’ policies and vision for the museum’s future paved the way for the next curator to explore even wider horizons. In 1893 Major Walter Reed became the fifth Museum curator. Reed is most famous for broadening understanding about typhoid and proving beyond a doubt the method of transmission of yellow fever.



Dr. John Shaw Billings, famed librarian and fourth curator of the Army Medical Museum, 1883–1893. (MIS 60-5419-2)

In 1910, the museum was reorganized into two main sections: the Pathology Department and the Instruction Laboratory. The Pathology Department was a new function, and the size and scope of World War I required that new procedures for collecting, preserving, and cataloging thousands of new specimens be established. Unlike the Spanish-American War, which had yielded little in the way of collections, World War I brought the museum 9,960 accessioned specimens. Writing in 1919, Army contract surgeon Dr. James Ewing said of the museum: “The variety of diseases represented was surprising and the opportunity of illustrating the developmental stages of common and even of rare diseases, with their complications, was far greater than the writer has ever before enjoyed.” Ewing’s assessment, as well as other records of the time, made it clear that by 1919 the stage had been set for the institution’s transformation from a traditional museum to a diagnostic facility concerned with patient care via pathology.



Chemistry laboratory for the Army Medical School, which shared space with the museum until 1910. (AMM 1156)



A photograph of the museum building following completion in 1887. The building became known as the “Old Red Brick.” (AMM 740)





Dr. William Gray was the first person on the Army Medical Museum's staff to use the new X-ray technology in a clinical setting. Here he X-rays a patient on a hospital ship during the Spanish-American War in 1898. (AMM 2186)



Major Walter Reed, fifth curator of the museum, 1893-1902. (MIS 05-6832-1)

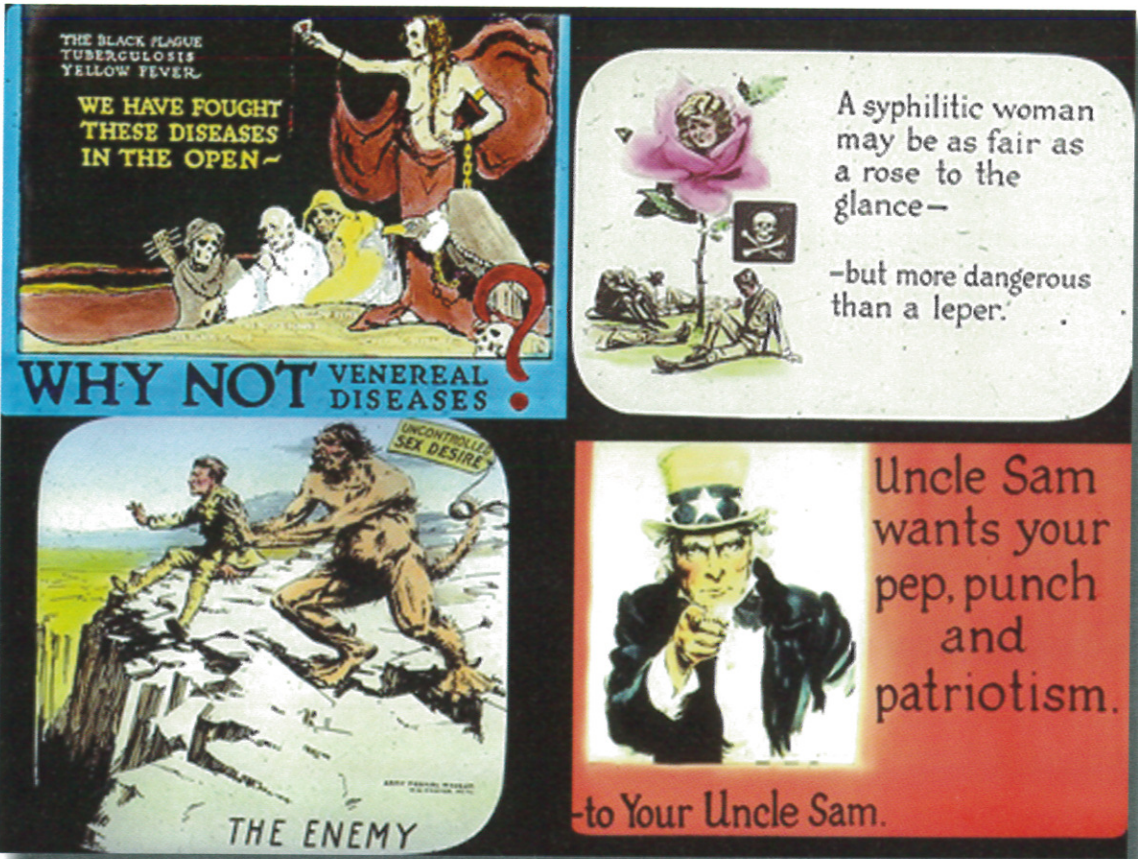


Osteology exhibit on display just prior to World War I. (Woodward 3833)

By 1917, with the United States about to enter World War I, typhoid vaccination scenes such as this were commonplace. (Reeve 36335)





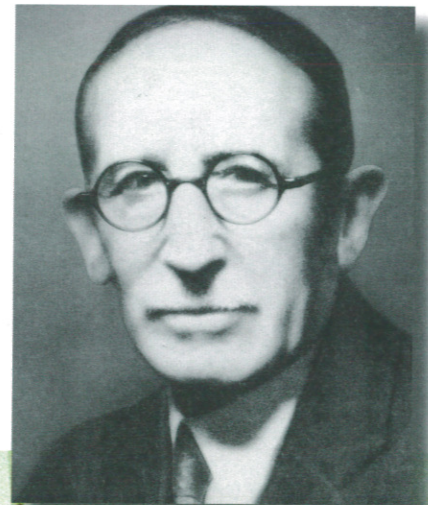


Examples of lantern slides produced by the museum during World War I to warn of the dangers of promiscuous behaviors. (OHA 367 World War I Lantern slide Training Sets)

▼ Dr. James Ewing, who was highly influential in collecting pathology specimens at camps during the war, including specimens from victims of the 1918 influenza epidemic. (NCP 1288)



Eleanor Allen making wax models in France during the war. Allen had studied at the Chicago Art Institute and joined the museum staff in March 1918. (A022256 formerly Reeve 17656)



► Camp Mills in Long Island, New York, one of many camps that had a high rate of influenza cases. (OHA 308: Smith Scrapbook Flu #2)



## Road to an Institute of Pathology: 1919–1945

As World War I came to a close, the Army Medical Museum was poised for a long transition leading to the development of an institute of pathology.

In his 1920 annual report, Surgeon General Merritte W. Ireland encouraged use of the museum's collections by civilian pathologists, believing that only in this way would the Museum "fulfill its larger function as a great instruction center in pathology and epidemiology."

The surgeon general's view was complemented by the convergence of leaders at the museum interested in pursuing pathology. Two curators in particular can largely be credited with taking the museum in new directions: Major George R. Callender, the 12th and 14th curator (1919–1922 and 1924–1929), and Colonel James E. Ash, the 15th and 20th curator (1929–1931 and 1937–1946) and first director of the Army Institute of Pathology (1946–1947).

Major Callendar was the first practicing pathologist to head the Army Medical Museum. As such, he seized the opportunity to create what became the "registry movement." In October 1921 he finalized an agreement between the museum and the Academy of Ophthalmology and Otolaryngology to create what became the Registry of Ophthalmic Pathology, the first of the registries that would make up the American Registry of Pathology (ARP).

This was followed by creation of a registry in lymphatic tumors in 1925, a registry in bladder tumors in 1927, and the formal establishment of the ARP in 1930. The Dental and Oral Pathology Registry was added in 1933. In 1935, the ear, nose, and throat cases in the originally combined ophthalmic and laryngic registry were separated out to

become the Registry of Otolaryngic Pathology. Two more registries were added in 1937, for tumors and dermatology.

During Colonel Ash's second tour of duty at the museum, he became the principal protagonist for expanding the registry movement. Under his leadership, registries for kidney tumors, neuropathology, prostatic tumors, orthopaedic pathology, veterinary pathology, and gerontology were integrated into the ARP, which helped form a vital link between practitioners of the various medical specialties and museum staff.

While the registry movement advanced, the Army Medical Museum continued to struggle with lack of trained staff and lack of space. No amount of reshuffling the exhibits in the building could produce enough space for either a proper display of all the exhibit materials or effective use of every study collection. Several plans for a new building were put forward, only to be scrapped by the economic conditions of the Great Depression and the demands of World War II.

Throughout this period, the Army Medical Museum faced an identity crisis, as various surgeons general and curators debated whether the institution was still in fact a museum, as its name implied, or whether it had become and should remain an institute devoted mainly to medical research and pathology diagnostics. By the early 1930s, because of restricted space and reduced staff, the museum's exhibit function had definitely deteriorated.

But thanks in large part to Brig. Gen. Raymond O. Dart, 18th Curator of the Museum, much ground had been gained in improving exhibits. Many items were put



General Merritte W. Ireland, surgeon general from 1918 to 1931. (NCP 3569)



Major George R. Callender, 12th and 14th curator of the Army Medical Museum, 1919–1922 and 1924–1929. (Reeve 47580)



Dr. Howard T. Karsner, a prominent pathologist, who, along with Major Callender, was influential in forming the American Registry of Pathology in 1930. (MIS 05-6519-2)



into storage to rid the exhibit hall of its overcrowded and confusing look. Old wooden exhibit cases were retired and new cases were built. Collections of microscopes, ophthalmoscopes, hearing aids, and stethoscopes, each collection as comprehensive as any to be found in the world at the time, were exhibited in attractive and meaningful arrangements. Although World War II accessions resulted in even less space for exhibits, during the war years the museum was kept open and updated, drawing visitors at the rate of 200,000 a year.

Although the transition into an institute of pathology was undoubtedly influenced by the experiences of World War I and the subsequent registry movement, the museum's World War II activities solidified the new focus and made General Hammond's 1862 vision a reality. The

amount of materials pouring into the museum exploded to 3,500 to 4,000 pathological specimens per month. To deal with the influx of new cases, museum staff grew to 20 pathologists (from three before the war), about 60 civilians, and 30 enlisted men and members of the Women's Army Corps.

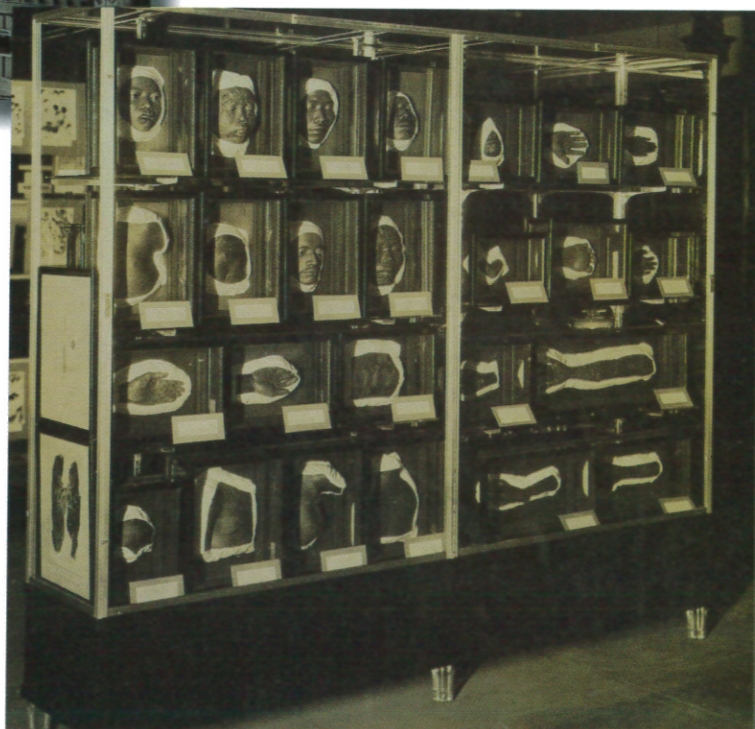
And on January 1, 1944, the Curator's Office issued Order No. 18, in which the "Army Institute of Pathology" appears as a subordinate division of the Army Medical Museum, a relationship that was reversed two years later when the Army Institute of Pathology became officially and formally the general designation of the entire operations.



▶ Colonel James E. Ash, 15th and 20th curator of the Army Medical Museum, 1929–1931 and 1937–1946; and first director of the Army Institute of Pathology, 1946–1947. (MIS 80-4079-1)



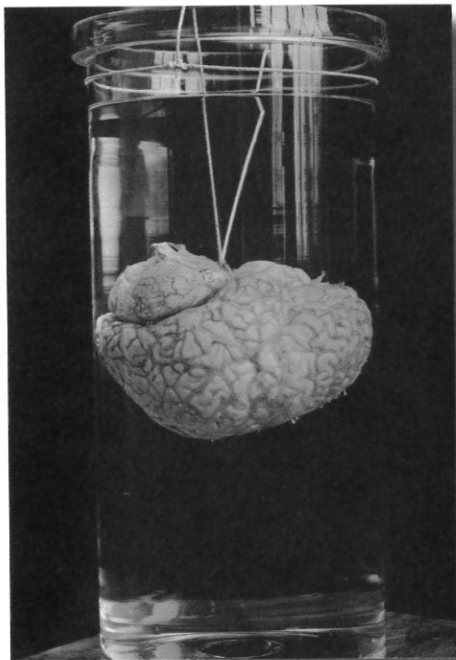
▲ The main exhibit hall of the Museum in the early 1930s. (Reeve 73446-2)



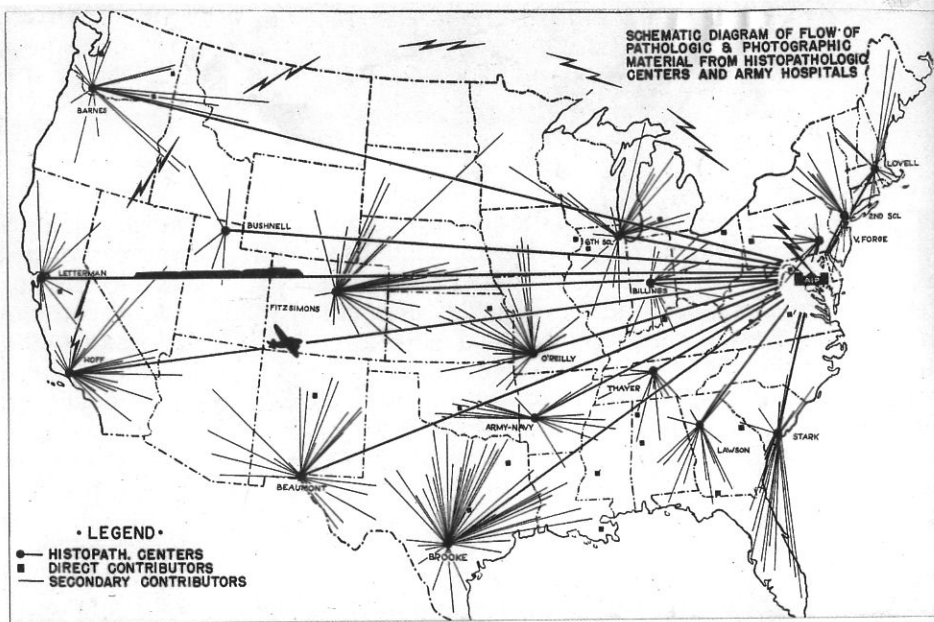
1930 photograph of an exhibit case with models produced by the museum's model-making staff. (Reeve 48762)

Brigadier General Raymond O. Dart, 18th curator of the Army Medical Museum, 1935–1936; second director, Army Institute of Pathology, 1946–1949; and first director of the Armed Forces Institute of Pathology, 1949–1950. (MIS 05-6214-1)

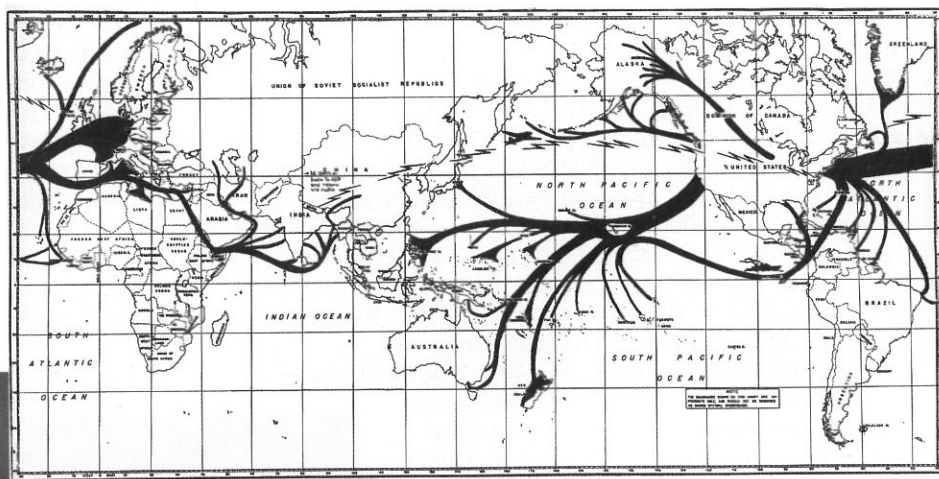




Gross specimen of a brain on exhibit in the museum, undated. Organs were often displayed to help educate visitors about the human body. (Reeve 68094)



Schematic diagram detailing the flow of pathological materials from histopathologic centers and Army hospitals to the Army Medical Museum during World War II. (Reeve 91539-2)



Schematic representation of the worldwide flow of pathological material to and from the museum during World War II. (Reeve 91539)



Histology laboratory personnel at work, circa 1942. (Reeve 69429)



## Growth and Maturity: 1946–1975

For nearly 30 years following the end of World War II, the institute was characterized by tremendous growth and maturity: growth in terms of personnel, missions, departments, specialties, and subspecialties, and maturity in terms of how staff members interacted with each other, the military and civilian medical communities.

But before that growth and maturity could be realized, what had officially become the Army Institute of Pathology by mid-1946 would need a new home and mandate. The mandate came in 1949 when it was determined that the institute should be the central laboratory of pathology for all of the Armed Forces, as well as the Veteran's Administration, with the appropriate change of name to the Armed Forces Institute of Pathology. This was followed by construction of a new home beginning in 1951. And on May 26, 1955, the AFIP was officially dedicated, featuring an address by President Dwight D. Eisenhower.

Occupancy of the new building made it possible, for the first time, to carry out a comprehensive program of pathology. The expansion of professional services was consistently focused on the institute's Department of Pathology—the core of its operation, containing nearly two-thirds of the entire staff. Closely related to the Department of Pathology in the AFIP structure was the American Registry of Pathology (ARP). Several registrars of the individual registries that made up the ARP were senior pathologists who headed specific branches.

The number of cases coming into the AFIP between the mid-1950s and 1975 averaged between 50,000 and 70,000 per year. But caseload figures only scratch the surface of the development of AFIP's consultative services.

The institute's ability to handle a high volume of cases was enhanced by acquisition of new technologies such as the electron microscope and the ultracentrifuge, as well as new techniques using X-ray technology. At the same time, continuous development of new stains by AFIP histologists meant that pathologists had an ever-growing arsenal to help them diagnose cases.

While remaining primarily focused on traditional pathology pursuits, the institute also broadened its breadth and scope during this period. Additions included a laboratory animals

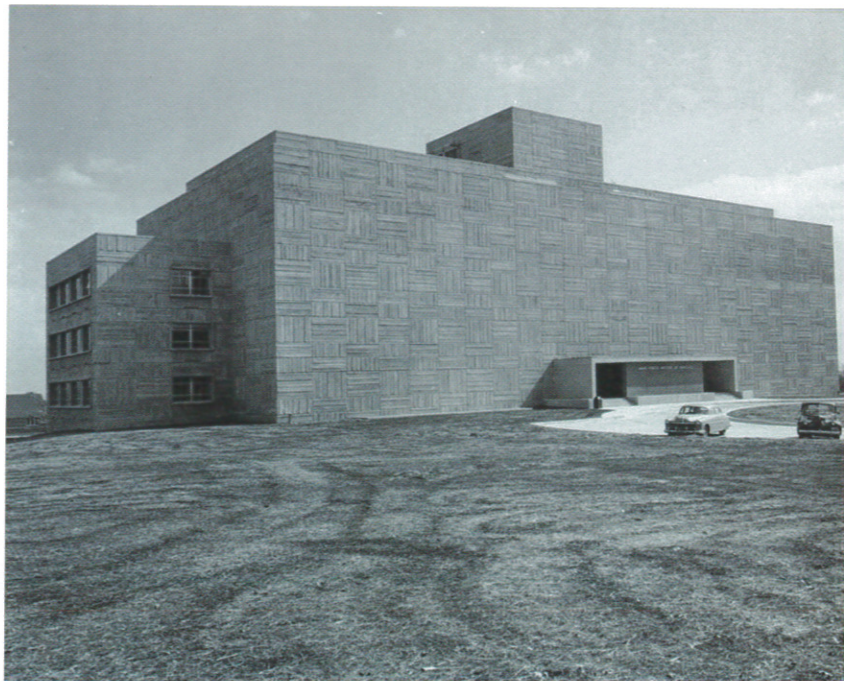
branch, a joint committee on aviation pathology, an aerospace pathology branch, a geographic pathology division, and a forensic pathology branch

As its pathology efforts expanded and matured, so too did the AFIP's education function. Early programs included postgraduate short courses, individual training on a residency or fellowship basis, lectures to and by staff members, and seminars on pathology topics. By 1970 the AFIP was conducting 19 postgraduate courses per year, and by 1975 that number grew to 32.

The AFIP's research function exploded during this time. More than 200 investigations were carried out in the first five years in the new building. And throughout the 1950s, 1960s, and into the '70s, investigative studies included leprosy, malaria, tuberculosis, infectious hepatitis, underwater deaths involving scuba gear, tissue reactions to drugs, battered child syndrome, rabies encephalitis among service members, and injury patterns in military aircraft accidents.

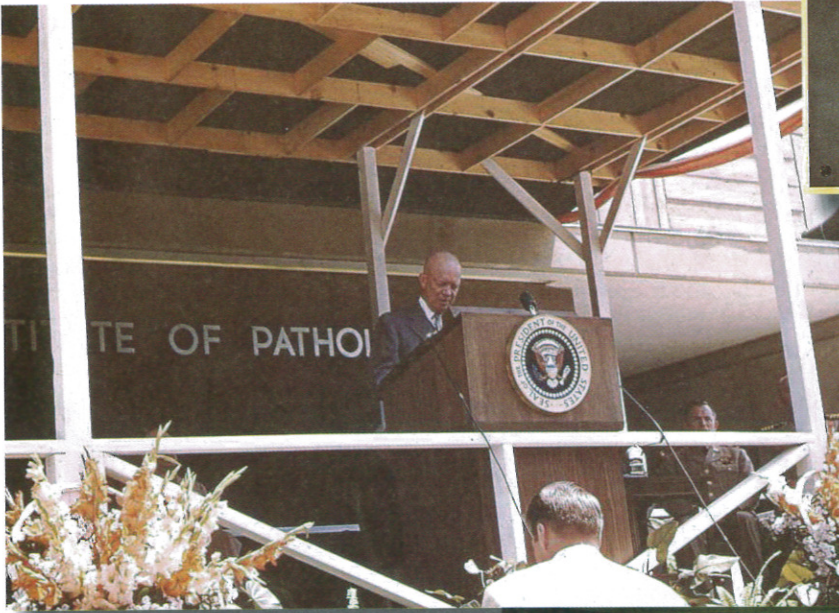
Within the institute, collegiality flourished during these years. With an influx of talent from around the world, pathologists were eager to learn from each other and seek other opinions on tough diagnoses. The design of the building's interior and sharing of laboratory space were conducive to regular interaction and cross-fertilization between the various pathology divisions. Although this atmosphere of collegiality ebbed and flowed many times during the institute's long history, from the 1940s through the mid-1970s it nurtured the AFIP through growing pains as the institute and the field of pathology matured.

Home sweet home. After decades of hope and promises followed by disappointment, in 1955 the AFIP finally had a new, and this time permanent, home. The institute is pictured here just prior to dedication ceremonies formally opening the building. (NCP 17327)





► Plaque with a quote from President Eisenhower’s dedication remarks. The plaque is on display on the outside wall at the AFIP entrance. (MIS 09-10367-1)



◀ President Eisenhower delivers his dedication speech during the May 26, 1955 ceremony formally opening the AFIP. (MIS 55-10841-6)

The Army Medical Museum’s main exhibit area in Chase Hall in 1948 after separation from the Institute. (NCP 2598)



► Air Force Staff Sergeant Frank Avallone just prior to his assignment to AFIP in 1954, when it was still located in Old Red Brick. (NCP 17337)



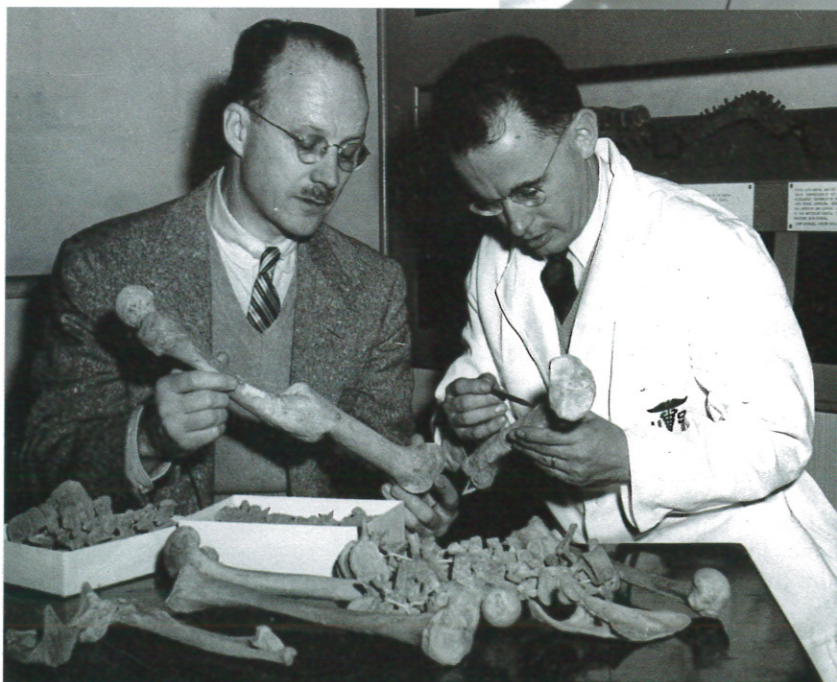
◀ Now a research biologist, Frank Avallone examines a grossed whole prostate in April 2010. Avallone is the only remaining AFIP staff member who has worked for the institute since the building opened in 1955. (NCP 17329)





Ham, the first chimpanzee in space, is greeted by the recovery ship commander following his 1961 flight on NASA's Mercury Redstone rocket. By this time, AFIP veterinary pathologists had already established a strong relationship with NASA and its early experiments with various animals in the space program. (Ham Retrieval GPN-2000-001004)

▼ The expanded space of the AFIP's new home meant increased opportunities for lectures to and by members of the institute staff, such as this one involving several departments. (MIS 58-2917-5)



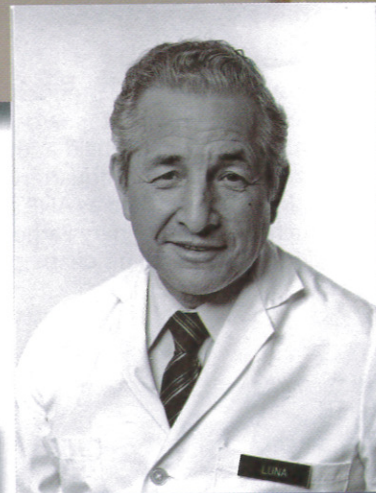
Dr. Lent Johnson (left) and Smithsonian anthropologist T. Dale Stewart examine various bone sets during a visit to the AFIP by Stewart in 1954. Dr. Johnson served as chair of the Department of Orthopedic Pathology from 1946 to 1980, and then as chairman emeritus from 1980 to 1998. (MIS 54-2848-K.)



► During the 1950s and 1960s the AFIP became a world leader in histologic staining methods. Indeed, the 1968 edition of the *Manual of Histologic Staining Methods of the Armed Forces Institute of Pathology* (pictured) by Lee Luna was the most widely used staining reference source in the world. (NCP 17328)

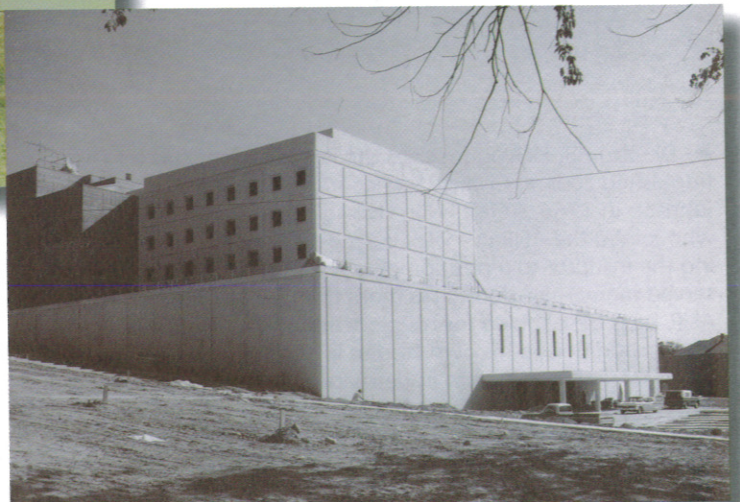


► Lee Luna, who served as chair of the Department of Histopathology for 33 years, was frequently referred to as the “father of histology” by his peers. In 1965 he held the first AFIP Symposium in Histotechnology, which later grew into the National Society for Histotechnology. (MIS 08-1321-298-625)

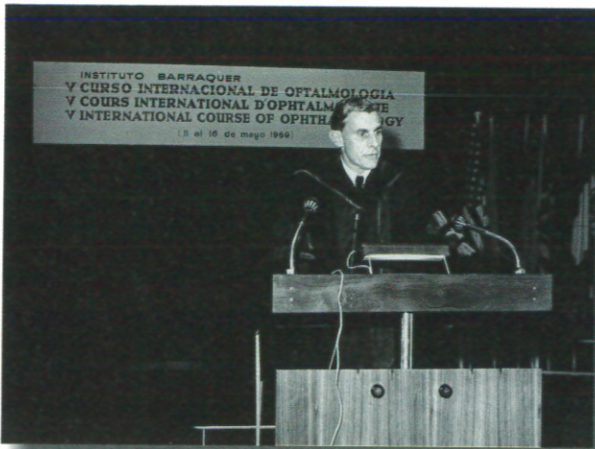


◀ Captain Bruce Smith, AFIP Director, 1967–1971, turns the sod at the March 22, 1968 ground-breaking ceremony for the new wing of the AFIP to house the museum and additional office space. (MIS 68-2777-37)

► Construction of the museum space nears completion in this September 2, 1970, photograph. Although different in style from the original, mostly windowless AFIP construction of the 1950s, the cube-like design on top was intended to help give the addition an integrated look. (NCP 2582)







Dr. Lorenz Zimmerman addresses the International Course of Ophthalmology in May 1969 in Barcelona, Spain. Now recognized as the founder of modern ophthalmic pathology, Zimmerman joined the AFIP in 1952. Only two years later he became chair of the Department of Ophthalmic Pathology, where he remained for nearly 50 years. (NCP 17333)

► Dr. Fathollah K. Mostofi (white shirt) presides over a 1973 international meeting for standardizing the classification of testis tumors, held at the World Health Organization (WHO) headquarters in Geneva, Switzerland. Mostofi was hired as AFIP's chair for the Department of Genitourinary Pathology in 1948, a position he held until his death in 2003. (NCP 17432)



◀ Dr. Florabel G. Mullick reviews case files with her colleague and mentor, Dr. Nelson Irey, chair of the Department of Environmental and Toxicologic Pathology, in 1972. Dr. Irey was not only considered a pioneer in environmental pathology, but by 1972 he was also recognized as the foremost environmental pathologist in the world. (NCP 17341)

► Dr. Elson B. Helwig receives the President's Award for Distinguished Federal Civilian Service from President Lyndon B. Johnson in 1966. At left is Dr. Helwig's wife, Mildred. Dr. Helwig, who joined the AFIP in 1946, played an important role in elevating the institute to a position of world prominence. Although he served many roles during his more than 50 years of service to the AFIP, he is best known for his pioneering work in dermatopathology. In addition to his own studies in the field, Helwig offered a popular training program in dermapathology, shared his expertise through weekly slide conferences, and consulted on difficult cases. He was also one of the most influential members of the World Health Organization panel that produced the first *Histological Classification of Skin Tumors* published in 1974. (NCP 17330)





## Talent, Technology, Transformation: 1976–2000

By the mid-1970s, having achieved an enviable level of growth and maturity, the AFIP was poised for a period marked by a continued infusion of talent and the incorporation of rapidly evolving technological advances, both of which ultimately transformed the institute.

AFIP's reputation as a world leader in pathology meant that leading pathologists and scientists continued to flock to the institute. Additionally, incentive to join the AFIP staff was strengthened in 1976 when Congress chartered the American Registry of Pathology. This legislation gave ARP the ability to expand the scope of AFIP's activities by acting as a principal liaison to the civilian medical community. Included in the charter was a mechanism that allowed ARP to receive fees for education courses and consultations, as well as grant funding. With confidence that this new partnership would ensure recruitment and retention of the best and brightest in pathology, the AFIP turned its attention to identifying and incorporating emerging technologies, and developing techniques to advance pathology and research efforts.

Although the optical microscope continued to be pathology's workhorse instrument, other instruments and

techniques were added to the arsenal, including multihead microscopes in the late 1970s; gas chromatography technology; scanning electron microscopes; a hypobaric (dive) chamber in the 1970s and a hyperbaric (altitude) chamber in the 1980s, both of which helped advance research on the effects of oxygen on cells at high and low atmospheric pressures; more powerful Fourier transform infrared (FT-IR) microscopes in the mid-1980s; Raman microspectroscopy; Confocal laser scanning microscopy (CLSM), introduced in the late 1980s; and an atomic absorption spectrophotometer obtained in 1991.

Also in 1991, AFIP became a leader in digital image processing with the opening of its own facility. Coupled with microscopy, digital image processing allowed for a 3-dimensional rendering of tissues, resulting in more accurate interpretation of tissue features. A year later this technology, combined with advanced communications systems, was incorporated into what would become a permanent telepathology program reaching around the world.

Throughout the 1980s and 1990s forensic pathology expanded rapidly, and by the mid-1980s, AFIP forensic pathologists were earning a reputation as experts in identifying disassociated remains, having participated in several



In one of AFIP's more iconic photos, four of the institute's great pathologists discuss cases while gathered around a multihead microscope circa 1988. (Seated from left to right) Dr. Nelson Irey, chair, Department of Environmental and Drug Induced Pathology; Dr. Frank Johnson, chair, Department of Chemical Pathology; and Dr. Nelson Helwig, chair, Department of Gastrointestinal Pathology; (standing) Dr. Henry Norris, chair, Department of Gynecologic and Breast Pathology. (NCP 17013)



high-profile investigations.

At the same time, leaders within the DoD had come to recognize the potential of forensic pathology, especially after the 1985 development of the polymerase chain reaction (PCR) process, allowing for the identification of remains using DNA. This powerful tool held the promise of never again leaving a service member unidentified. In 1988, AFIP's Department of Forensic Sciences became the Armed Forces Medical Examiner System (AFMES)—a move intended to create a centralized organization for medico-legal death investigations. And in 1991 the recently formed Armed Forces DNA Identification Laboratory (AFDIL) became part of the medical examiner system, followed by establishment of the Armed Forces Repository of Specimen Samples for the Identification of Remains (AFRS-SIR), which began storing blood-spot cards on all military personnel that could be used to obtain DNA sequencing, if needed. In 1998 a Medical Mortality Surveillance Division was added to analyze active duty deaths for trends.

During the 1970s, '80s, and '90s, all types of scientific research benefited from the development of new technology. Research achievements during this period included

groundbreaking investigations into leprosy, cat-scratch fever, AIDS, Buruli ulcers, and Legionnaire's disease; These efforts complimented established registries used to track the health of service members, including the Registry for Former Prisoners of War; the Agent Orange Registry; and the Persian Gulf/Kuwait Registry.

Education too flourished during this period. In 1976 the AFIP offered approximately 20 courses in the major areas of pathology. By 1980 the program had grown to 37 courses and continued expanding steadily throughout the next 20 years. By 2000, the institute had awarded approximately 1 million credit hours to military and civilian medical professionals.

As the 1990s came to a close and the AFIP entered a new century of service to the nation, the institute had experienced a transformation from a primary focus on Brigadier General Dart's vision of excellence in pathology, into one that also incorporated President Eisenhower's vision of an institute dedicated "to the conquest of disease so that mankind, more safe and secure in body, may more securely advance to the widely shared prosperity and an enduring and just peace."



Captain Robert Karnei, AFIP Director, 1987–1991, performs an autopsy in AFIP's McNabb Autopsy Suite during the mid-1980s.



Dr. Wayne Meyers around 1999 with the shell of one of the hundreds of armadillos he studied at the AFIP throughout the 1970s and '80s. Dr. Meyers played a major role in the development of the concept of leprosy as a zoonosis involving transmission of leprosy from direct or indirect exposure to armadillos, monkeys or chimpanzees. (NCP 17355)



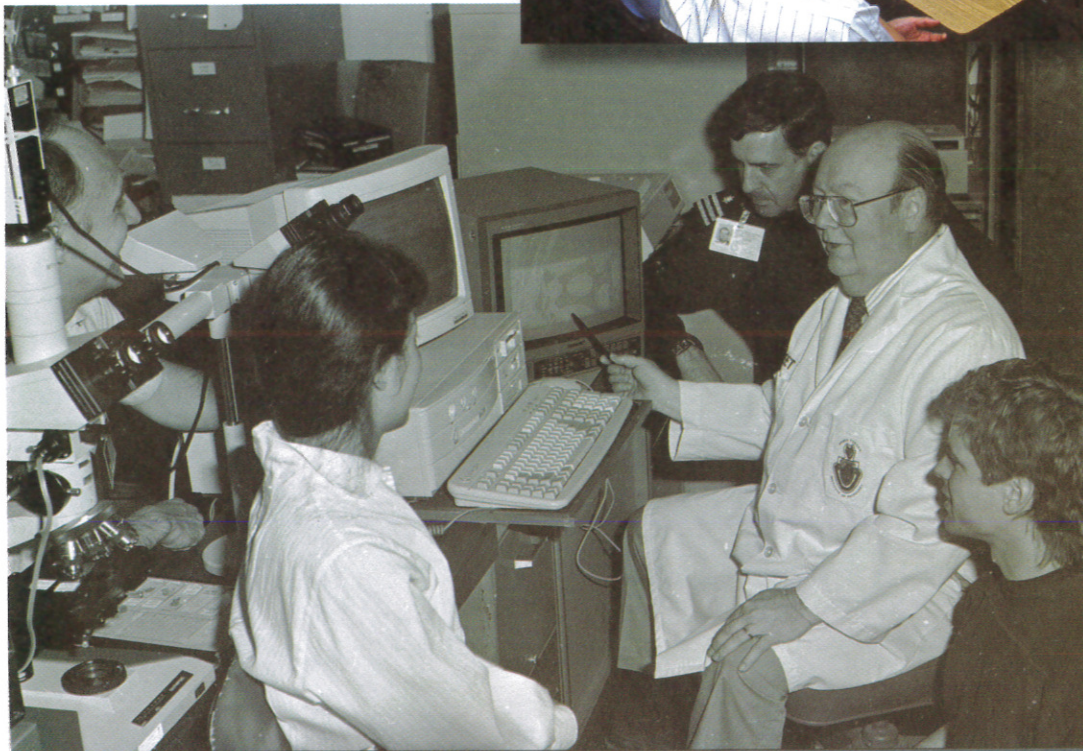
Then Army Major Douglas Wear, Medical Corps, at far end of table, leads a slide conference in the Department of Geographic Pathology in 1985. (NCP 17357)





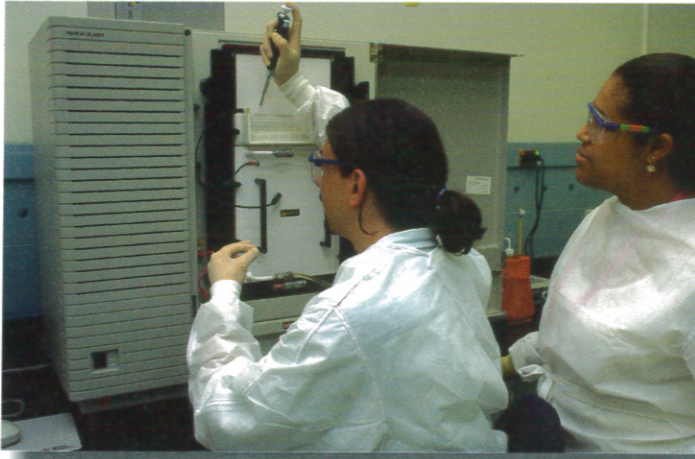
Doctors Charles Davis (left) and Isbell Sesterhenn (right), both of the Department of Genitourinary Pathology, review case slides with Dr. Fathollah Mostofi circa 1997. Dr. Mostofi was the chair of the department at that time. He was succeeded after his death by Dr. Sesterhenn in 2004. Dr. Sesterhenn became a prominent genitourinary pathologist in her own right, and in 2010 she, along with other researchers, developed a highly specific assay for the detection of a protein associated with tumor formations that is present in more than half of all prostate cancers. This reagent has an unprecedented specificity (99.99%) for detecting prostate tumor cells in pathologic specimens. (NCP 17364)

► Dr. Kamal Ishak, chair of Hepatic and Gastrointestinal Pathology (center), leads a weekly conference of liver cases in the early 1990s. A great believer in staff development and sharing of knowledge, Ishak opened these weekly sessions to all AFIP pathologists who wanted to attend, as well as clinicians from outside the institute. (NCP 17366)



Dr. Donald Sweet (right, in lab coat), chair, Department of Orthopedic Pathology, provides instruction on features of a bone biopsy. At left is Dr. Tuyethoa Vinh, assistant chair of the department, and in back is Commander Rob Wolov. (NCP 16737)

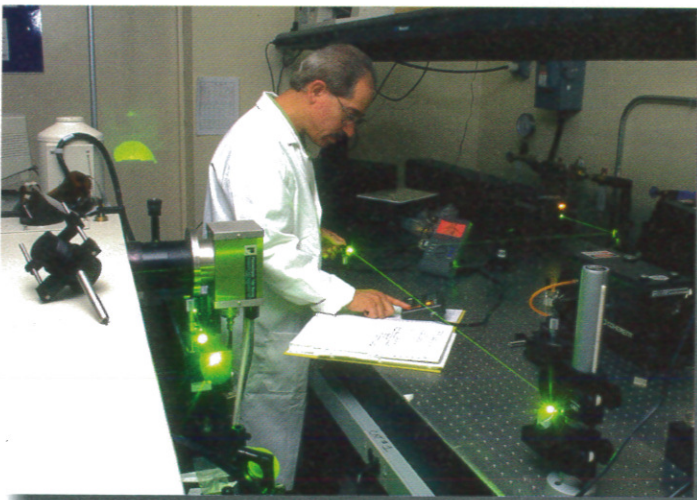




DNA analyst Daniel Katz (left) and Demris Lee, technical leader, Nuclear DNA Section, load DNA samples onto an ABI 377 (Applied Biosystems, Life Technologies Corporation, Carlsbad, CA) analyzer in 1997. (NCP 17373)



▲ Petty Officer Second Class Thomas Pierce, course director, monitors work of histology school student in the school's microtomy laboratory during the late 1990s. (NCP 17380)



◀ Dr. Jose Centeno, chief, Division of Biophysical Toxicology, use a laser Raman spectroscopy system in the Molecular Microspectroscopy and Chemical Imaging Laboratory to study foreign materials in tissue in 1999. (NCP 17381)

(Back to front) Dr. Bruce Williams, chair, Department of Telemedicine; Dr. Florabel G. Mullick, then chair of the Department of Environmental and Infectious Disease Sciences; and Dr. Kamal Ishak, chair of Hepatic and Gastrointestinal Pathology, analyzing case files in the telemedicine suite in 1997. By then the telemedicine department had installed a BLISS WebSlide (Olympus, Center Valley, PA) workstation and server, giving the staff the ability to read digital slides submitted from contributors using similar systems in the United States and abroad. The system allowed scanning and digitization of entire histologic or cytologic slides—or particular regions of interest chosen by the contributor—for transmission to the AFIP for consultation, which in turn resulted in more definitive diagnoses for electronic consultation. Although the AFIP formally initiated a telepathology program only in 1990, Dr. Mullick had envisioned such a capability as early as the 1980s and helped lead the institute's efforts to establish the program. (MIS 09-10620-1)





## Resolve and Perseverance: 2001–2011

Between 2001 and 2011, two dates in particular put into motion a chain of events that tested the strength and character of the AFIP staff. The first occurred on September 11, 2001, when terrorists crashed two jetliners into the Twin Towers of the World Trade Center in New York City; a third airliner into the Pentagon; and a fourth plane into a field near Shanksville, Pennsylvania, after passengers and crew attempted to retake control.

The AFIP mobilized a multidisciplinary team of more than 50 specialists, scientists, and support personnel to manage what would become one of the most comprehensive forensic investigations in U.S. history. Tasked by federal authorities to identify the victims of both the Pentagon and Shanksville crashes, AFIP's team spent almost two months at the Dover Air Force Base port mortuary in Delaware. The team included forensic pathologists, odontologists, radiologists, a forensic anthropologist, DNA experts, and logistics personnel. Two groups in particular were key: forensic scientists from AFIP's Armed Forces DNA Identification Laboratory (AFDIL), and oral pathologists from the Department of Oral and Maxillofacial Pathology. AFDIL scientists ensured that data systems and records were available to make DNA identifications, while the oral pathology group created a triage area to conduct positive dental identifications.

When attention shifted from the events of 9/11 to the larger global war on terror, including Operation Enduring Freedom and Operation Iraqi Freedom, time and again the AFIP demonstrated its ability to adapt and support these critical missions. Information on the pathogenesis, diagnosis, and treatment options for newly encountered diseases and conditions were posted on the AFIP Web site, provid-

ing healthcare workers worldwide access to high-quality images and information as troops deployed to all parts of the globe. The Mortality Surveillance Division began collecting comprehensive data on all service members killed in the wars, which in turn resulted in improvements in protective gear and battlefield medicine. The institute exercised its authority to conduct forensic autopsies on all casualties, both in the United States and in combat, for the first time providing families with a full accounting of how their loved ones died. The only computer-tomography (CT) assisted autopsy program in the country went online at the AFIP, providing pathologists with detailed images of trauma injuries not previously possible.

In 2005 the second course-changing date for the institution occurred: on November 9, 2005, the 2005 Base Realignment and Closure (BRAC) Act became law. The BRAC law mandated disestablishment of all elements of the AFIP except the National Museum of Health and Medicine and the Tissue Repository; relocation of the Armed Forces Medical Examiner System (AFMES), the DNA Registry, and the Accident Investigation unit to Dover Air Force Base; relocation of the Department of Legal Medicine to Bethesda, Maryland (joining the new Walter Reed National Medical Center); and relocation of the enlisted histology technician training program to Fort Sam Houston, Texas.

The law also stated that any AFIP functions not specifically mentioned in the BRAC Act were to be reviewed for absorption elsewhere in the federal sector. Based on this stipulation, in November 2006 the Department of Defense (DoD) exercised its power to retain certain AFIP functions within the DoD healthcare system, including the



◀ Dr. Florabel G. Mullick (right) is congratulated by Acting Surgeon General Gale S. Pollock following Dr. Mullick's transfer of responsibility ceremony in June 2007. The 17th director of the AFIP, Dr. Mullick was the first civilian director since its founding in 1862. (NCP 17425)



Dr. Mullick addresses the audience during her transfer of responsibility ceremony, saying, "there is no question in my mind, nor in the minds of others, that this is a unique national and international institution of excellence. There is no place like AFIP in the world, or the caliber of the work." (NCP 17426)



Veterinary Pathology Residency Program, the Automated Central Tumor Registry, the Center for Clinical Laboratory Medicine, and the Patient Safety Center.

Faced with eventual cessation of operations, AFIP leaders drew strength and guidance from the institute's long and distinguished history and remained committed to providing world-class consultation, education, and research for as long as possible while planning for BRAC implementation, moving forward with accessioning cases; improving AskAFIP; expanding telemedicine; meeting new educational needs; and transforming the Department of Scientific Laboratories into an institute-wide research and development laboratory focused on exploring new procedures and new prognostic markers for infectious disease.

The years 2009 and 2010 saw increasingly difficult challenges balanced by continued advances in education and research. In late 2009 the loss of a significant number of pathologists threatened to bring consultations in some

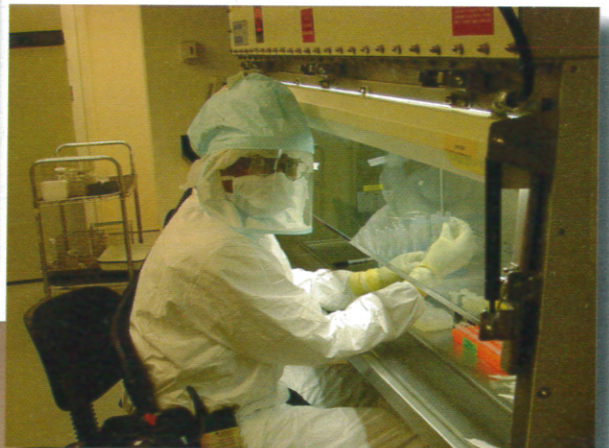
areas to a close. But the institute's reputation as a world leader in pathology consultation and a desire to serve attracted other leading pathologists to fill the void—a trend that continued into 2010.

As spring 2010 turned into summer, and summer into fall, the AFIP began implementing the painful but necessary process of disestablishment, in accordance with BRAC law. The institute's civilian consultation mission was discontinued effective September 30th, and its education function ceased on October 15th with completion of the final Radiologic Pathology Course. All research projects ceased in December 2010, and on April 1, 2011, the institute's consultation mission comes to a close. Almost as quickly as they occupied the building in 1955, scientists, pathologists, and support staff alike will leave the Armed Forces Institute of Pathology for the last time, but they will leave behind a legacy of excellence that will endure for generations to come.



◀ AFIP forensic pathologist Major Andrew Baker, U.S. Air Force (in dark green scrubs), discusses a case in the Dover port mortuary autopsy suite during 9/11 operations. (NCP 17392)

▼ Laboratory technician Wendell Thomas processes anthrax swabs in the BSL-3 laboratory in 2001. (NCP 17399)



◀ Colonel Ted Harcke examines CT scan results as John Getz, project manager for the forensic CT scanner project, monitors the scanner in operation in 2004. In 2005 the first ever CT scanner specifically designed to augment the autopsy process was put into use by the AFMES. (NCP 17409)





As the global war on terror moved forward, the AFIP created a Web-based program known as "Hot Topics." The site was designed to rapidly provide information about emerging diseases troops might encounter, including how to recognize, diagnose, and treat the associated illnesses or conditions, to military health-care providers worldwide. (NCP 17410)

► Dan Butler, system administrator for the Department of Telemedicine, trains staff at the 10th Command Support Hospital in Baghdad on an upgraded telepathology system in 2006, after he installed a digital slide scanner at the hospital. (NCP 17423)

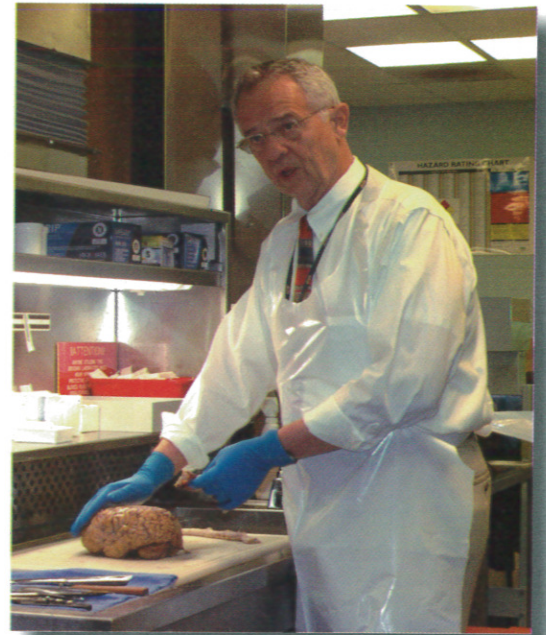


AFIP Medical Education Department team, from left: Ricky Giles, Isaac Miller, Mark Hovland, Carlos Moran (seated), Lisa Holmes, Christina McLean, and Joseph Frederick. In 2008 the AFIP's CME program received a rare 6-year accreditation from the Accreditation Council for Continuing Medical Education (ACCME), which also included four commendations. Only 8% of the hundreds of ACCME providers nationwide receive such an accreditation. (NCP 17431)





◀ Laboratory technician April Shea takes protective gear through its paces while working with a Raman imaging detector to analyze for the presence of biological agents, circa 2002. (NCP 17413)



▲ Dr. Vernon Armbrustmacher, former AFIP director, 1991–1995, returned to the AFIP staff in 2008, attracted by exciting new research the institute was conducting on traumatic brain injuries. (NCP 17438)



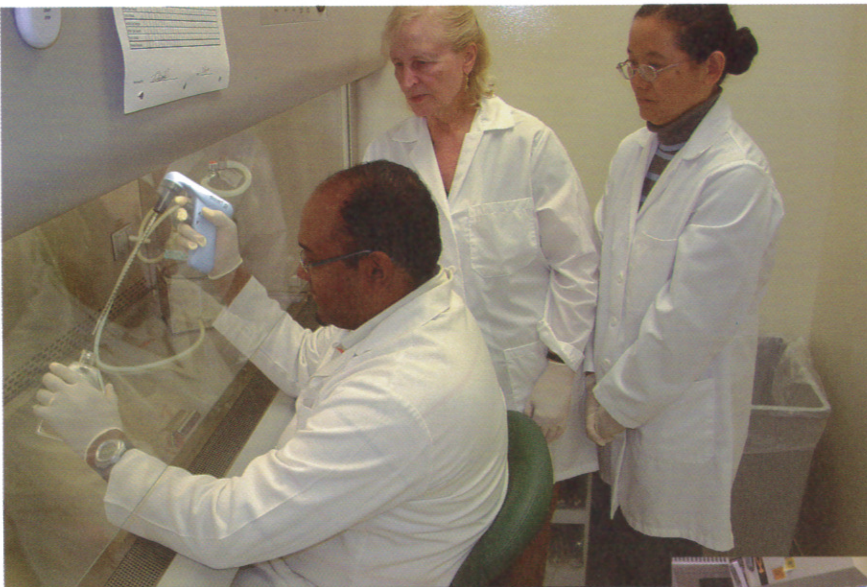
◀ Dr. Brian Summers, a world-renowned veterinary neuropathologist from Cornell University's College of Veterinary Medicine, reviews gross pathology of a canine brain as AFIP veterinary pathology residents look on in 2005. (NCP 17437)



◀ A dynamic new exhibit opened in 2008 at the National Museum of Health and Medicine: "RESOLVED: Advances in Forensic Identification of U.S. War Dead" highlights the underlying forensic sciences that have evolved to fulfill the nation's commitment to the identification of U.S. service members from past and present conflicts. (NCP 17441)

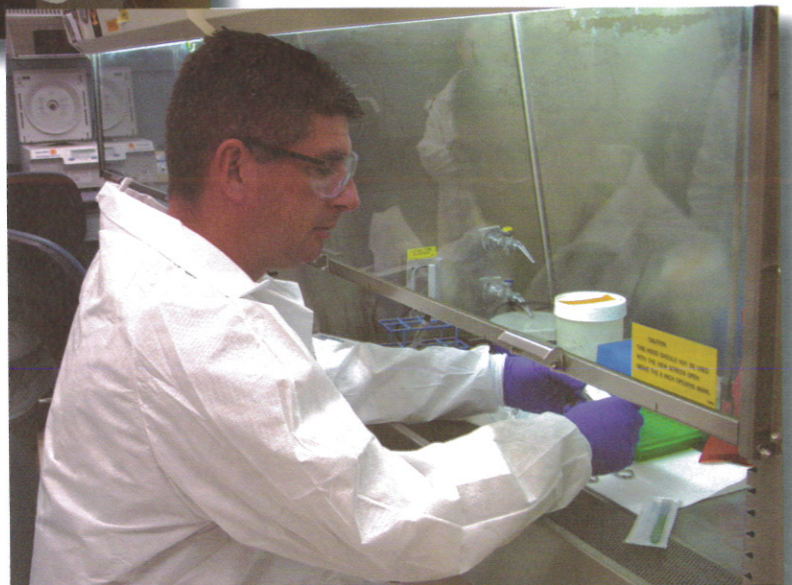


Members of a Navy honor guard carry the remains of Captain Michael Scott Speicher during memorial service ceremonies at Naval Air Station Jacksonville in Jacksonville, Florida, in August 2009. On the first of that month, an AFIP oral pathologist positively identified Speicher by comparing dental records with Speicher's jawbone, which contained several teeth. Speicher had been missing since January 17, 1991, when his plane was shot down during the Persian Gulf War. A team of Marines found his remains after receiving a tip from local Iraqis. (NCP 17449)



Adrien Ravizee, research associate, pipefitting cells used to grow influenza virus as virologists Dr. Sue Cross (left) and Dr. Huiling Hu observe in 2010. (NCP 17451)

► Lieutenant Colonel Lou Finelli, Medical Corps, U.S. Army, director of the DoD DNA Registry, prepares a specimen for nuclear DNA testing during operations in 2010 at the AFDIL. Finelli became director of the registry in 2006.





The Combat Wound Initiative Program leadership team, from left to right: Army Colonel Alexander Stojadinovic, M.D., a surgeon at Walter Reed Army Medical Center; Dr. Jose Centeno, chief of the Division of Biophysical Toxicology; Dr. Florabel G. Mullick, AFIP director; and Dr. Mina Izadjoo, chief of the Division of Wound Biology and Translational Research. In 2009 AFIP's Division of Microbiology was reorganized and renamed the Division of Wound Biology and Translational Research, tasked with conducting research and developing methods for reducing and preventing wound-related complications for troops severely injured in combat, with an ultimate goal of reducing the number of amputations. (NCP 17447)



Left to right: Major Hugh Darville, deputy district engineer, Baltimore District, U.S. Army Corps of Engineers; Colonel Judith Robinson, garrison commander at Fort Detrick, Maryland; Dr. Florabel G. Mullick, AFIP director; Dr. Adrienne Noe, director of the National Museum of Health and Medicine; and David Costello, president of Costello Construction (Columbia, Maryland), prepare to break ground May 21, 2010, on the museum's new facility. Under BRAC, the museum will move to a new facility to be built at Fort Detrick's Forest Glen Annex in Silver Spring, Maryland. (NCP 17453)

► Artist's rendering of the new National Museum of Health and Medicine, which is scheduled to open its doors to the public in September 2011. (NCP 17454)

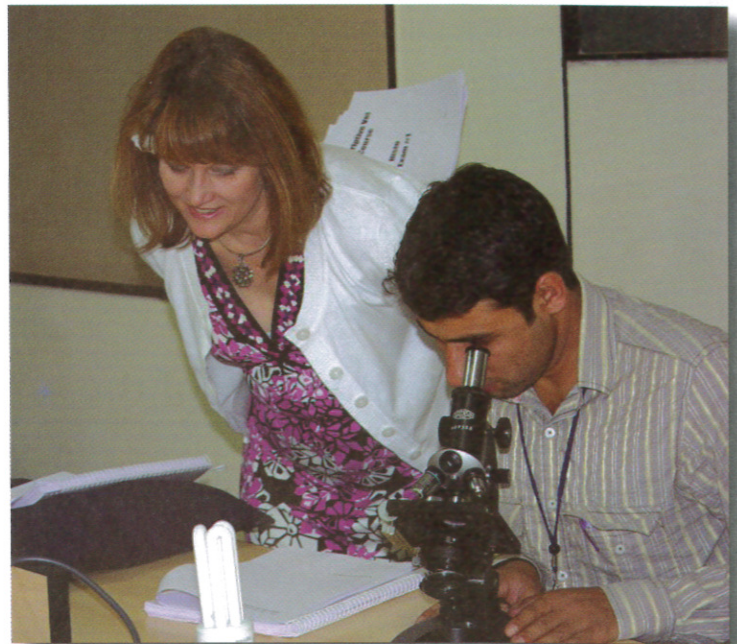




Department of Veterinary Pathology staff and residents are gathered around the largest multihead microscope in the DoD during their daily sign-out of cases in November 2010. Purchased in December 2008, the multihead microscope accommodates up to 18 pathologists at a time, making it ideal for both clinical and teaching purposes. (NCP 17462)



► Colonel Jo Lynne Raymond, chair of the Department of Veterinary Pathology, discusses microscopic lesions with a course participant at Mahboob College in Bangalore, India, in March 2010. AFIP veterinary staff traveled to Bangalore to teach a 5-day course on topics related to descriptive veterinary pathology to 70 residents and practicing pathologists, for the first time extending their outreach program to India. (NCP 17460)





**Armed Forces Institute of Pathology**  
**Washington, DC 20306-6000**  
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The Director

ATTN: AFIP-PA

Armed Forces Institute of Pathology

Washington, DC 20306-6000

Telephone (202) 782-2115 DSN 662-2115

FAX: (202) 356-0763 Email: stonep@afip.osd.mil

**Director**

Florabel G. Mullick, MD, ScD, FCAP

Senior Executive Service

The Director

**Editor**

Paul Stone, Public Affairs Officer

**Graphics**

Frances Card, Publications Officer

6825 16th Street,  
Washington, DC 20306



**Executive Committee of the Armed Forces Institute of Pathology**

Dr. Florabel G. Mullick, MD, ScD, FCAP  
Senior Executive Service  
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