CHAPTER 6



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 AFIP staff. The first occurred on September 11, 2001, when on a warm, sunny day, 19 Al Qaeda terrorists hijacked four commercial passenger jet airliners. Two of the airliners crashed into the Twin Towers of the World Trade Center in New York City; a third airliner crashed into the Pentagon; and a fourth plane crashed into a field near Shanksville, Pennsylvania, after some of its passengers and flight crew attempted to retake control of the plane.

The AFIP immediately 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 US history. Tasked by federal authorities to identify the victims of both the Pentagon and Shanksville crashes, AFIP's team spent almost 2 months at the Dover Air Force Base port mortuary in Delaware. The team included forensic pathologists, odontotologists, radiologists, a forensic anthropologist, DNA experts, and logistics personnel. Even histotechnicians from the institute's Department of Scientific Laboratories volunteered, serving as autopsy technicians and working hand-in-hand with the forensic pathologists, while logistics personnel created an efficient and timely pipeline for supplies. Given the degraded condition of remains from these particular crashes, most of which were disassociated, 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

A body from the Pentagon attack is passed through the explosive ordnance detector prior to being identified at the Dover Air Force Base port mortuary. (NCP 17387)


9 11 2001

[Opposite] *Thick smoke billows from the Pentagon within a few minutes of the 9/11 attack on the Pentagon. (Department of Defense photo; NCP 17386)*

[Top] *A casualty from the Pentagon attack is radiographed during Dover port mortuary operations in the days immediately following. (NCP 17388)*

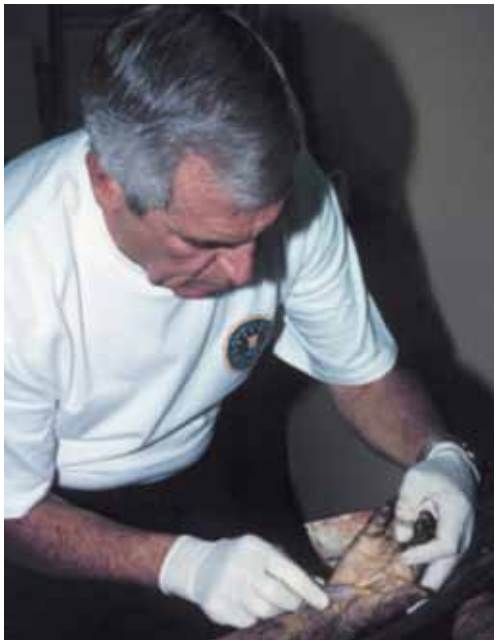
[Bottom Left] *Technicians examine radiographs at the Dover port mortuary to identify injuries and wound patterns of those killed in the Pentagon attack. (NCP 17389)*

[Bottom Right] *AFIP oral pathologist Colonel Steve Williams, Dental Corps, US Army (left), examines dental radiographs during 9/11 operations at the Dover port mortuary. (NCP 17390)*

[Top] *An FBI fingerprint expert meticulously works to help identify a victim of the Pentagon attack during 9/11 operations at the Dover port mortuary. (NCP 17391)*

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

[Opposite] *Deputy Chief Medical Examiner William Rodriguez performs triage on disassociated remains during 9/11 operations at the Dover port mortuary. (NCP 17393)*



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.

One week after 9/11, these horrific events were followed by anthrax attacks that occurred over the course of several weeks. Letters containing anthrax spores were mailed to several media offices and two Democratic senators, killing 5 people and infecting 17 others. Once again the AFIP's expertise was summoned, this time staff of the institute's Department of Environmental and Toxicological Pathology. US Army investigators at Fort Detrick, Maryland, examining anthrax found in a letter sent to Senator Tom Daschle, discovered highly refined spores (making them relatively easy to inhale) but could not determine the substance that made the spores so easily aerosolized. AFIP experts identified the substance as silica, which prevents anthrax from aggregating and makes it easier to aerosolize.

As 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, providing 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

[Left] *Bob Veasey, AFMES chief of operational investigations, was key in managing the continuous flow of supplies and equipment used in the months' long 9/11 investigation and identification efforts. (NCP 17396)*

[Inset] *Air Force Colonel Ted Harcke briefs Air Force Surgeon General Paul Carlton Jr on radiology operations at Dover in the wake of 9/11. (NCP 17394)*

[Opposite] *AFIP's Dave Boyer collects a DNA sample from a victim of the Shanksville, Pennsylvania, crash. (NCP 17395)*

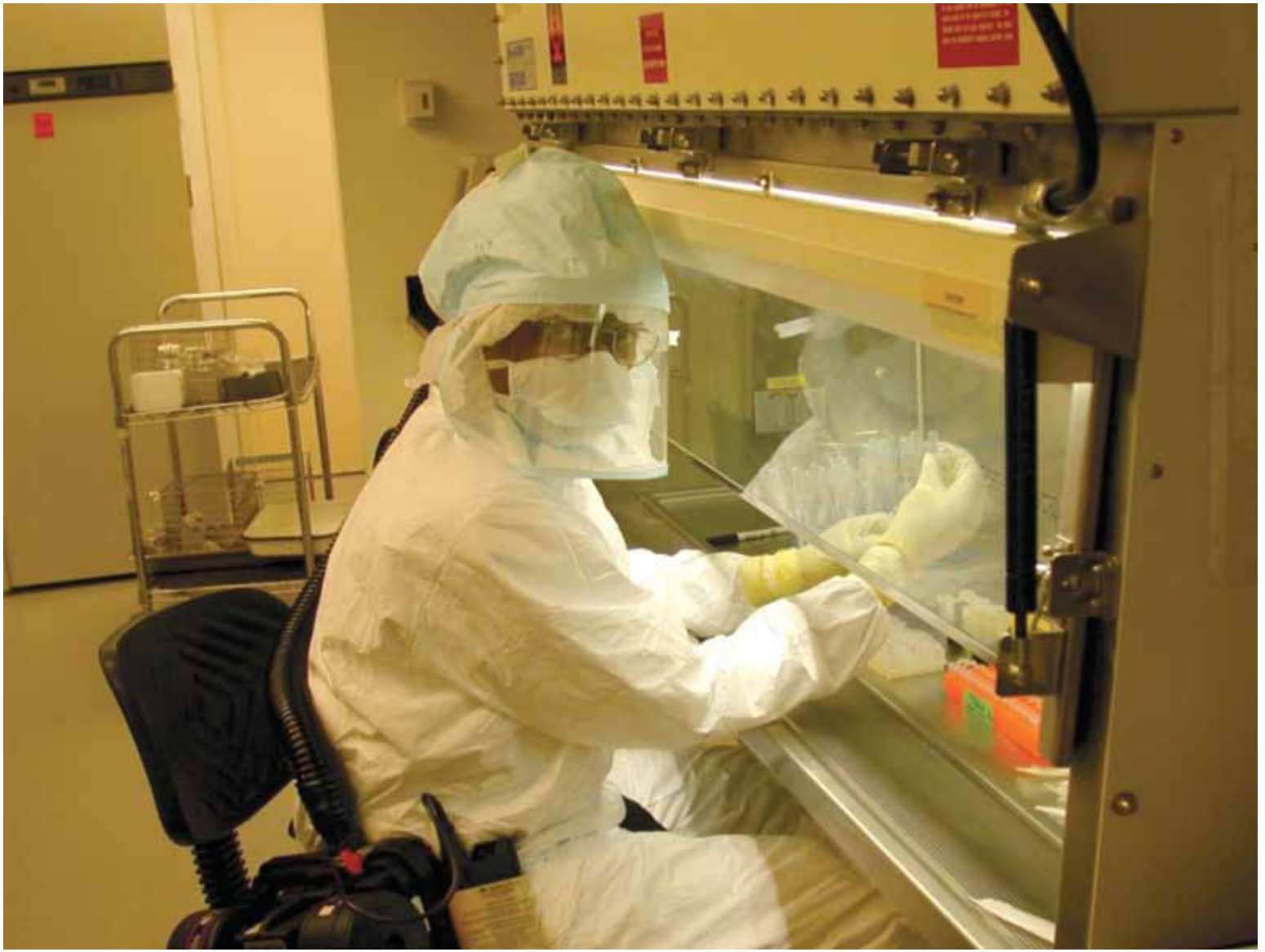
members killed in the wars, which in turn resulted in improvements in protective gear and battlefield medicine. The institute exercised its authority to conduct forensic autopsies on all casualties, both in the United States and in combat, for the first time providing families with a full accounting 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. Also, the Division of Microbiology's biosafety level 3 (BSL-3) laboratories ramped up efforts in support of the Defense Threat Reduction Agency, serving as the primary strain repository for threat reduction initiatives, safely growing and preserving strains of biowarfare agents, and confirming diagnoses of suspected infection with these agents submitted by military hospitals.

These new activities were carried out in addition to the institute's continued core missions of consultation, education, and research, including diagnoses in more than 50,000 difficult (second-opinion) tumor cases each year, and more than 100,000 hours of continuing medical education (CME) credit coursework. At the same time, the AFIP continued to move forward with efforts to improve customer service and advance the field of pathology. In 2003 the Department of Veterinary Pathology developed AFIP Online Web Veterinary Systemic Pathology, a searchable database with full descriptions of more than 675 diseases. Also in 2003, the institute launched its Grand Rounds Videoteleconference program, designed to bring anatomic pathology CME credits to military pathologists and clinicians via Web-based education. The program was complemented by the opening of a state-of-the-art teleconference suite in 2005. In 2004 the Department of Scientific Laboratories began a tissue microarray program, providing an innovative approach to the microscopic examination of tissue samples. Also, efforts


DNA
DNA
STAP

Candy Moroz, finance and logistics support officer for AFIP's Directorate of Advanced Pathology, works with a Dover staff member to assess supply requirements. (NCP 17397)

Environmental Pathology staff in 2001 at the Hitachi S-3500N Scanning Electron Microscope (Hitachi Ltd, Tokyo, Japan) with the ThermoNoran energy dispersive x-ray accessory (Noran Instruments Inc, Fitchburg, WI) used to assist with the anthrax investigatory testing. From left: Marie Jenkins, histochemical technologist; Dr Florabel G Mullick, department chair; Dr Frank Johnson, chief of the Division of Chemical Pathology; and Victor Kalasinsky, PhD, chief of the Division of Environmental Toxicology. (NCP 17398)



[Opposite] *Laboratory technician Wendell Thomas processes anthrax swabs in the BSL-3 laboratory in 2001. (NCP 17399)*

[Top] *DNA technicians Nicol Jimerson and Ryan Vachon transfer microplates from a plate holder to a liquid handling station on automated bloodstain processing equipment at AFIP's AFDIL in 2002. The equipment was purchased to speed up processing of blood samples from relatives of missing service members from previous conflicts, which were used to help identify remains from Southeast Asia, Korea, and World War II. (NCP 17400)*

[Bottom] *Enhanced magnetic resonance image of an embryo at 56 days in the womb. In late 2002 AFIP's National Museum of Health and Medicine opened a new exhibit called "Conception to Birth," based on a book by visualization artist Alexander Tsiaras, which traced the growth and development of human life. Using new medical imaging technology Tsiaras was able to capture images of the developing baby from never-before-seen angles. (NCP 17401)*

to digitize records in the central repository made great strides, with more than 4.5 million paper records, photographic media, and glass slides converted to digital, searchable files by the end of the year. 2005 saw the launch of AskAFIP, an online searchable database, making AFIP's vast diagnostic and teaching resources available to all military physicians, whether halfway around the globe or a few miles away. Other 2005 achievements included successful completion of a decade-long quest to sequence the genetic code to the 1918 Spanish influenza; and the Department of Veterinary Pathology's Wednesday Slide Conference, having completed its 52nd year, became the world's longest running slide conference, in addition to having earned honors as the world's largest and most respected veterinary histopathology conference.

It was also in 2005 that 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

[Bottom] *Who says scientists don't have a sense of humor? Victor Kalasinsky, chief of the Division of Environmental Toxicology, is disguised as cartoon character Dilbert (United Feature Syndicate Inc, New York, NY) while performing Fourier transform infrared (FT-IR) microscopy in 2002. (NCP 17402)*

[Opposite Left] *Colonel Renata B Greenspan, Medical Corps, US Army, accepts the colors from Major General Kevin C Kiley, commanding general of Walter Reed Army Medical Center, during the May 2003 ceremony appointing her the 16th director of the Armed Forces Institute of Pathology. (NCP 17403)*

[Opposite Right] *In February 2003 NASA once again called upon the AFIP's medical examiners, this time to identify the victims of the space shuttle Columbia, which broke up during re-entry, killing the seven astronauts aboard. AFMES personnel worked with NASA to help recover the astronauts' remains and personal effects in what turned out to be a multistate debris field. (NCP 17404)*

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 Military 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 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. In 2006 AFIP accessioned its 3 millionth case, reflecting its continued role as a world leader in second-opinion consultation. Also in 2006, AskAFIP version 2.0 came online, which improved on the 2005 version by incorporating better search capabilities and providing access to even greater amounts of educational and diagnostic materials; an upgraded telemedicine system was installed in the 10th Command Support Hospital in Baghdad; and a Sexual Assault Response Team Training Program was unveiled, which only a year later was recognized as one of the best training opportunities available in the area of sexual assault and clinical forensics. The year 2007 was a period of reinvigoration for the AFIP. The Division of Molecular Pathology became an integrated service within the institute and received a $1 million laboratory upgrade, giving it the ability to develop new molecular techniques for the surgical pathology departments and collaborate with pathologists and scientists. Additionally, the Clinical Initiatives Program was activated to move the science of pathology forward at a faster rate; initiatives included reaching out to the scientific

community, academia, biotechnology companies, and the pharmaceutical industry to share information and capitalize on emerging trends and research, with the overall goal of developing technologies and techniques to help render faster, higher-quality diagnoses. If there was any question that the institute would continue on a path of excellence and innovation right to the end, it was put to rest when Dr Florabel G Mullick became the first-ever civilian director of the AFIP in June 2007.

In one of her early messages to staff, Dr Mullick addressed the BRAC situation and her vision for the following few years, writing, "in the past there has been a tendency from some agencies facing BRAC actions to gradually assume an air of hopelessness or simply throw up their hands in despair, resulting in organizational paralysis. Let me assure you that will not be the case for the AFIP. We don't shrug our shoulders, we shoulder the burden. We don't hang our heads in frustration; we use our heads to rise above and beyond the challenges before us. Throwing up our hands in despair is not who we are; it is not a part of

our professional DNA. Instead, we will follow the road less traveled under BRAC by renewing and reinvigorating our commitment to innovation, world-class research and diagnoses, and by continuing to help save the lives of our military and civilian customers."[1]

Accordingly, the institute moved forward in 2008, establishing a Registry of Embedded Metal Fragments to track DoD personnel wounded with potentially hazardous metal fragments; completing the upgrade of the Division of Molecular Pathology; beginning renovation of the Department of Radiologic Pathology education facility; taking on the task of providing drug-training aids for the military working dog program; 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 AFIP still attracted celebrated pathologists, including former staff such as Dr Vernon Armbrustmacher, who returned to lead a traumatic brain injury (TBI) project, and Dr Allen Burke, who returned to reestablish AFIP's Division of Cardiovascular Pathology, as well as Dr John Cameron, who joined as head of the Department of Ophthalmic Pathology.

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 pathologists in endocrine, pulmonary, ophthalmic,

[Opposite] *Commander James Caruso, Medical Corps, US Navy, makes notes during an autopsy on a service member killed in Operation Iraqi Freedom in 2003. A multidisciplinary team of more than 40 forensic scientists, specialists, and support personnel from AFIP deployed to the Dover port mortuary in March 2003 to help identify casualties following the start of combat operations in Iraq. (NCP 17405)*

[Top] *Captain Robert Foss, Dental Corps, US Navy, conducts a post mortem dental examination on a deceased service member at the Dover port mortuary, shortly after the start of combat operations in Iraq in 2003. Captain Foss was assigned to AFIP's Department of Oral and Maxillofacial Pathology at the time. He was appointed the department chair in 2004 and associate director, Navy, in 2006. (NCP 17407)*

gynecological and breast, gastrointestinal, and genitourinary pathology; neuropathology; and nephropathology joined the AFIP family.

In addition to maintaining a robust and responsive consultation service, the AFIP responded to the changing educational needs of its customers by offering such courses as "The Effects of Combat Injury on Children and Families," "Suicide Assessment: Identifying and Managing Suicidal Behavior," and "Special Operations Medical Indoctrination." Research efforts in 2009 and 2010 were equally impressive. A Division of Wound Biology and Translational Research was established and began developing molecular therapeutics and diagnostics to help improve outcomes for wounded service members. The division also became a testing site for human swine influenza (H1N1) and quickly built a collection of more than 150 cases. Research into TBI advanced quickly when AFIP's program expanded to include the newly formed Center for Neuroscience and Regenerative Medicine at the Uniformed Services University of Health Sciences, which encouraged development of new technology and techniques to advance TBI treatment. Also, a major renovation project was begun to provide state-of-the-art storage for the institute's stockpile of millions of paraffin blocks and case records.

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 came 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.

Commander Joe Hodge, Medical Corps, US Navy, examines a radiograph of a fallen service member in the spring of 2003 at the Dover port mortuary. (NCP 17406)

▲ Supporting Families and the Force

After the start of combat in Afghanistan and Iraq, the AFIP gave the AFMES permission to exercise its authority to conduct forensic autopsies on all service members killed in the wars—a practice that had never been done before. During a 2009 interview medical examiner Captain Craig Mallak, Medical Corps, US Navy, explained his decision to move forward with the autopsies. "Families want a full accounting. During World War II and the Vietnam War families were simply told that their loved one had died in service of their country. Personally, I felt that families would no longer just accept that."[2] As part of this process all families of deceased service members can receive a copy of their loved one's autopsy report on request, and approximately 85% request them. Additionally, medical examiners are available anytime to discuss the reports with families and answer any questions they may have.

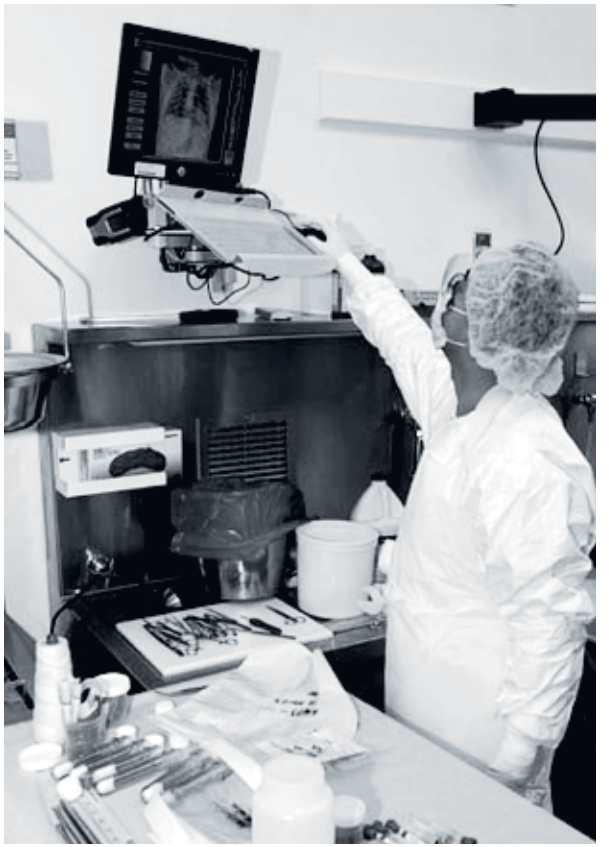
In 2004 the AFMES added CT scans to the autopsy process as part of a project sponsored by the Defense Advanced Research Projects Agency. Incorporating CT scans created a huge new database of information. The scans provided a minutely detailed and permanent 3-dimensional record of combat injuries, giving the medical examiner system the ability to look for injury patterns and identify potential problems with personal protective gear.

REFERENCES

1. *AFIP Letter*. Vol 166, No. 1 (Winter 2008): 2.
2. Grady D. Autopsies of war dead reveal ways to save others. *New York Times*. May 25, 2009: 1A.
3. *AFIP Letter*. Vol 165, No. 2 (Summer 2007): 1.

[Top] *Then Commander Craig Mallak takes a moment to observe his forensic pathology team during a period of high operations tempo at the Dover port mortuary in 2003. Mallak was appointed an armed forces medical examiner in 2002; he subsequently was appointed to a second term in 2006 and a third term in 2010. In addition to being responsible for day-to-day operations, Mallak is guiding the move of the AFMES to its new home at Dover Air Force Base in 2011. (NCP 17408)*

[Opposite] *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)*



[Left] *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 healthcare providers worldwide. (NCP 17410)*

[Top Right] *Lobby of the Charles C Carson Center for Mortuary Affairs, which opened in October 2003 at Dover Air Force Base. The new state-of-the art facility replaced the mortuary's antiquated facilities, which had proved challenging during the 9/11 operations. (NCP 17411)*

[Bottom Left] *An AFMES staff member at work in 2003 at the new Carson Center, which included an autopsy suite with the latest technological advances, such as computer screens that could be used to view radiographs of the deceased. (NCP 17412)*

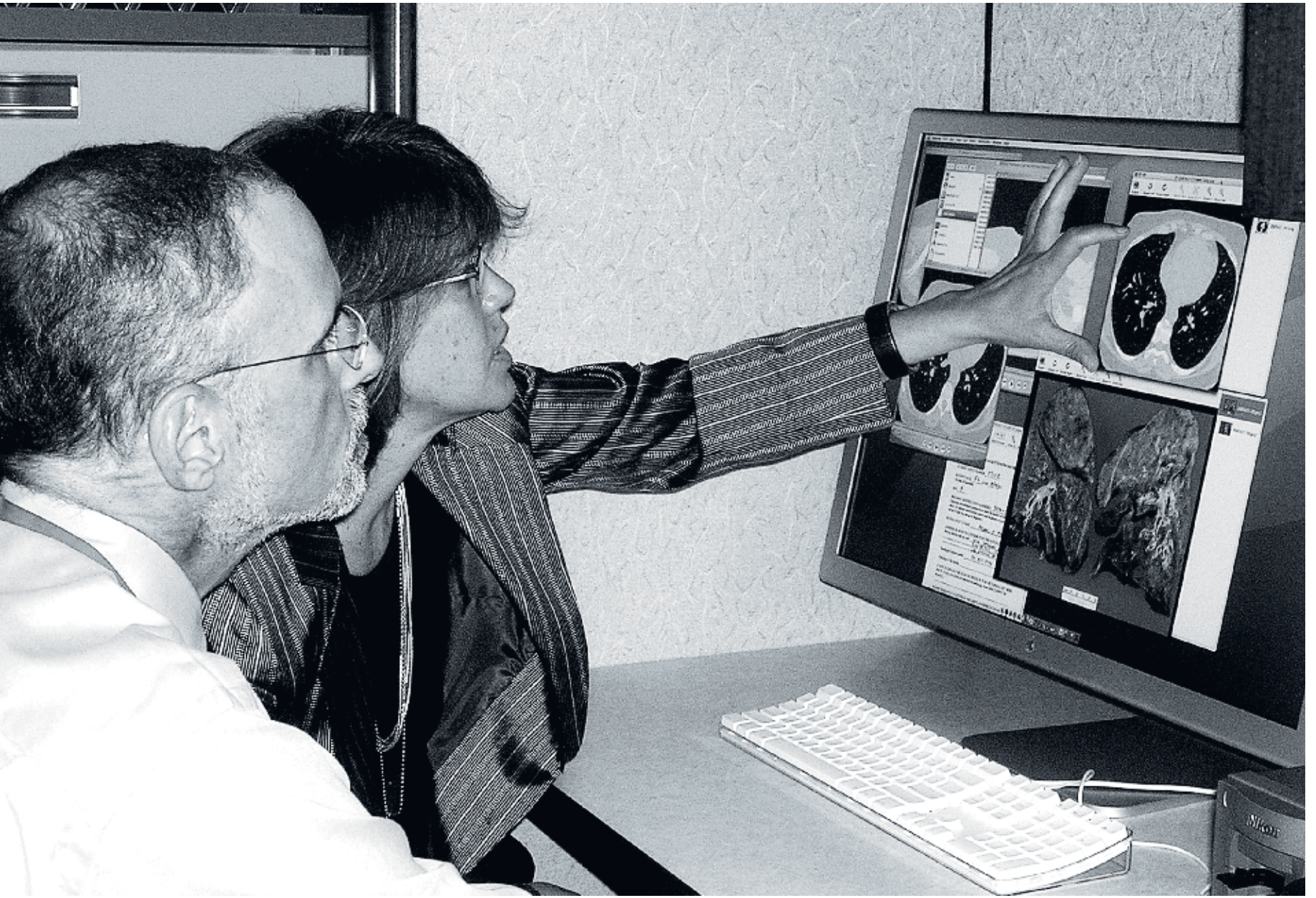
[Left] *Laboratory technician April Shea takes protective gear through its paces while working with a Raman imaging detector to analyze for the presence of biological agents, circa 2002. (NCP 17413)*

[Top Right] *AFIP veterinary pathologists Major Sarah Hale (left), and Major Gloria Marselas and Captain Kim Whitten (in blue-green aprons), perform a necropsy on a 9-year-old female pygmy hippopotamus at the Smithsonian's National Zoo in 2003. (NCP 17414)*

[Bottom Right] *Major Brad Blankenship, Veterinary Corps, US Army, monitors the health of a dolphin during force protection training in San Diego, California, in 2003. Dolphins were trained to locate and mark underwater threats (swimmers, divers, and delivery vehicles) and were later deployed to Kuwait. Major Blankenship served on the AFIP veterinary staff just prior to participating in the dolphin training program. (NCP 17415)*

[Top] *In 2004 the National Museum of Health and Medicine opened one of its most popular exhibits ever, "Battlefield Surgery 101: From the Civil War to Vietnam." Drawn from the museum's historical archives, the exhibit depicts military surgical activities over a 140-year period. In this photograph a military surgeon performs an operation during the Korean War. (NCP 17416)*

[Opposite] *Dr Jeffrey Galvin, then chief of chest imaging, Department of Radiologic Pathology, and Dr Teri Franks, chair of the Department of Pulmonary and Mediastinal Pathology, select pathologic material for inclusion in AskAFIP, which debuted in 2005. A second version, AskAFIP 2.0, went online in 2006. (NCP 17419)*



[Opposite] *Naval Criminal Investigative Service agent Jeanmarie Sentell (right) and an Army interpreter log evidence at a site in Iraq in 2004. Sentell, who was assigned to the AFIP's AFMES at the time, was honored for her work in Iraq, where her often dangerous missions included retrieving the remains of US casualties, processing remains from car bomb explosions, and examining mass graves. (NCP 17418)*

[Top] *Dr Florabel G Mullick, chair of the Department of Environmental and Toxicologic Pathology (center), with colleagues during a group sign-out of cases in 2003. Dr Mullick was the first pathologist to recognize and publish the causal relation between a number of therapeutic drugs and their adverse effect on humans, such as salicylates and Reye's syndrome; hexachlorophene and brain toxicity in infants; and myocarditis associated with methyldopa therapy. (NCP 17417)*

[Bottom] *Armed forces medical examiner Captain Craig Mallak, and David McCallum, who portrays the medical examiner "Ducky" Mallard on the popular television series "NCIS," during the 21st annual James Earle Ash Lecture in 2005. With insight, creativity, and a little humor, they illustrated the differences between forensic science on television and forensic science in the real world. (NCP 17420)*

[Opposite] *Dr Jeffrey Taubenberger, chief of the Department of Molecular Pathology, examines a radiograph of 1918 Spanish influenza DNA with colleague David Evers. In 2005 a team of AFIP scientists lead by Taubenberger successfully completed a decade-long quest to sequence the genetic code to the 1918 flu, furthering understanding of why the lethal virus killed over 50 million people around the globe in less than a year. (NCP 17421)*

[Top Left] *Major Christine Christensen, Department of Veterinary Pathology, with sled dogs at a checkpoint during the 2006 Iditarod Dog Sled Race in Alaska. Christensen, along with Dr Michelle Fleetwood, performed physical examinations of the dogs and provided required treatments at one of the 20 checkpoints along the race. (NCP 17422)*

[Top Right] *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)*

[Bottom Left] *Dr Guanghua Wang, staff pathologist, and LeAnn Hodge, bioscientist, work on a new assay development with an ABI 3130xl Genetic Analyzer (Life Technologies Corporation, Carlsbad, CA) capillary electrophoresis machine in early 2007. (NCP 17424)*

[Right] *Dr 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)*

[Inset] *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."* [3] *(NCP 17426)*

[Left] *Dr Ann Nelson; Master Sergeant Lisa Myers, superintendent of Scientific Laboratories; and Debra McElroy, chief of Scientific Laboratories, review workflow in the microtomy laboratory. (NCP 17429)*

[Right] *Dr Wei-Sing Chu, chief of the Hematopathology Laboratory, extracts RNA/DNA and protein from a single formalin-fixed, paraffin-embedded (FFPE) tissue section for subsequent immunohistochemistry and in situ hybridization in 2008. FFPE tissue sections are valuable samples for examining the histology of biopsies for cancer detection. (NCP 17427)*

[Opposite | Left] *Dr Guanghua Wang (right), chief of the Division of Molecular Pathology, and Dr Ann Nelson, chair of the Department of Scientific Laboratories, discuss electropherograms generated by an ABI 3130xl Genetic Analyzer in upgraded molecular laboratory in 2008. (NCP 17428)*

[Opposite | Right] *Major Laura Regan, Medical Corps, US Air Force, deputy chief forensic anthropologist for the AFMES, examines human remains discovered beneath a road in the center of Cambridge, Maryland, in January 2008 after they were unearthed by a crew working on a gas main repair. The state of Maryland requested AFMES's expertise to help identify the remains, which turned out to be those of an African-American woman who was approximately 75 years old at the time of her death. It was believed that the remains were part of an unmarked public cemetery that had been paved over. (NCP 17430)*

[Left] *Dr Michael Lewin-Smith, chief of the Division of Environmental Pathology, examines slides. In 2008 Lewin-Smith was tapped to help the Centers for Disease Control and Prevention unravel the mystery of a potentially emerging illness known as Morgellons. People with Morgellons reported a range of dermatologic symptoms, such as skin rashes and sores, associated with abnormal skin sensations, such as crawling, biting, and stinging. (NCP 17432)*

[Right] *AFIP Medical Education Department team, from left: Ricky Giles, Isaac Miller, Mark Hovland, Carlos Moran (seated), Lisa Holmes, Chritina 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)*

[Left] *The first forensic CT scanner, which became operational at the Dover port mortuary in 2008, replaced the clinical CT scanner that had been in use since 2005. The scanner allowed for a 3-dimensional reconstruction of wounds and their pathways, resulting in a more efficient autopsy process. (NCP 17433)*

[Right] *Archie Fobbs, neuroanatomical collections manager for the National Museum of Health and Medicine, places a brain model atop a student's head to demonstrate functional aspects of the brain during the museum's 9th annual Brain Awareness Week observance in 2008. The program has been one of the most popular annual activities at the museum since its inception in 2000. (NCP 17435)*

[Opposite] *First year AFIP veterinary resident Captain Todd Bell, Veterinary Corps, US Army, treats sheep in southern Iraq prior to his time at the institute. Many AFIP veterinarians served in Operation Iraqi Freedom, where they helped care for military working dogs, conducted food inspections, and helped local populations with the health of their animals during civil affairs missions. (NCP 17434)*

[Inset] *Dr William Gardner, executive director of the American Registry of Pathology, 2002–2011. (NCP 17436)*


BLACK
TALON

[Top] *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)*

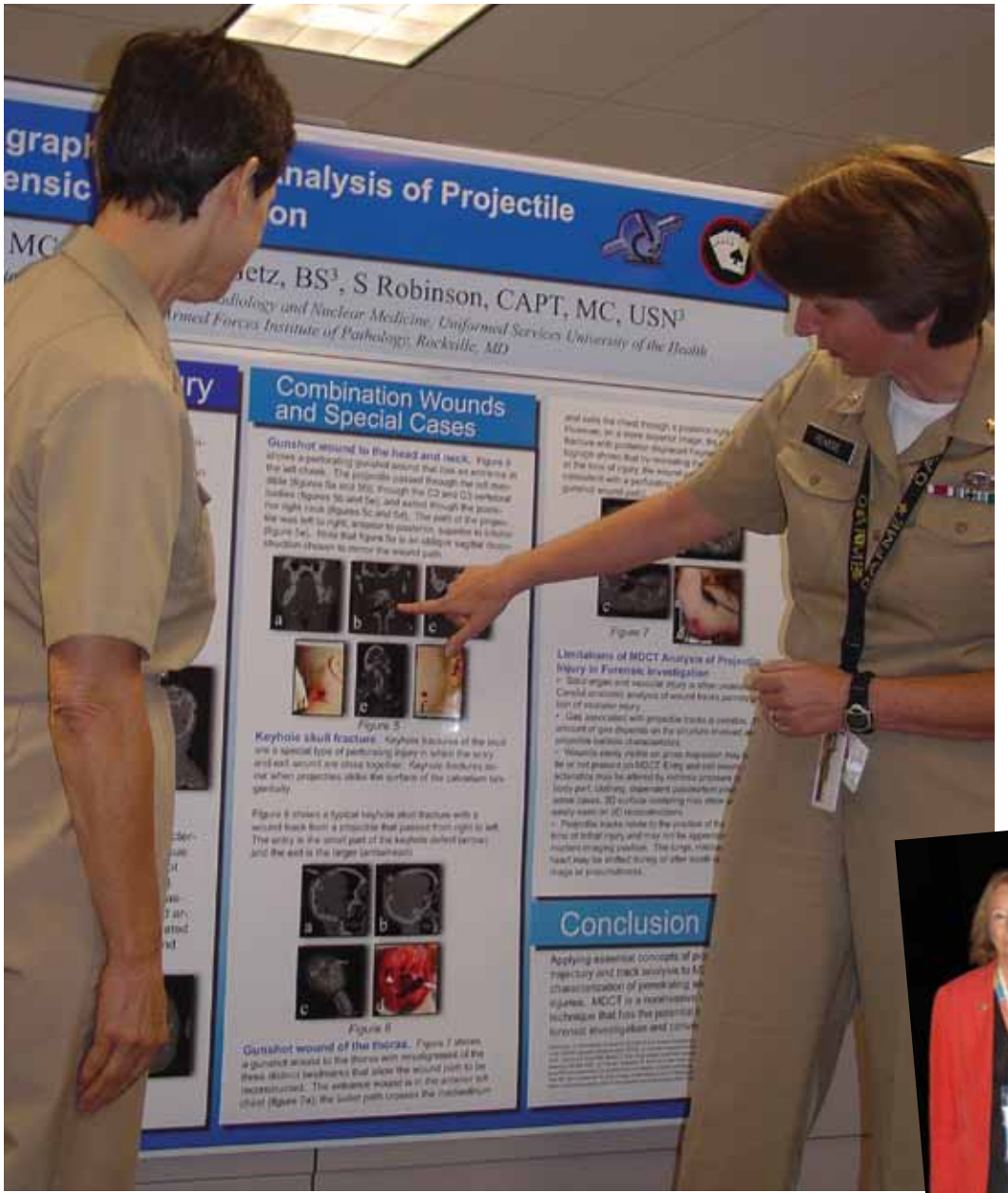
[Inset] *In 2008 AFDIL identified the last two previously unidentified family members of Czar Nicholas II. Over 10 years earlier AFDIL had identified the remains of the czar, his wife, and three daughters. Pictured here is a bone sample used to help identify one of the last two children. (NCP 17439)*

[Left] *Dr Vernon Armbrustmacher, former director, returned to the AFIP staff in 2008, attracted by exciting new research the institute was conducting on traumatic brain injuries. (NCP 17438)*

[Right] *Dr Jose Centeno, chief of Biophysical Toxicology, uses Raman microspectroscopy to characterize foreign material in tissue from cases with embedded metal fragments. In 2008 the AFIP established the Registry of Embedded Metal Fragments to analyze and archive metal fragments removed from service members serving in Iraq and Afghanistan, as well as to identify any potential long-term health concerns the metal fragments might present. (NCP 17440)*

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

[Bottom] *Medical illustrator Aletta Ann Frazier, MD, works on refining some illustrations in 2008. Frazier's complex anatomical artwork has been featured in exhibitions and AFIP's education courses. (NCP 17442)*



[Left] *Commander Lisa Pearse, Medical Corps, US Navy, chief of epidemiology and surveillance, and Captain Joyce Cantrell review content on a poster featuring a CT scan imaging project in 2008. Cantrell replaced Pearse in her position that year. Also that year, Commander Pearse became the first AFIP employee to be awarded the Frank Brown Berry Prize in Federal Healthcare. Pearse was recognized for turning the Medical Mortality Registry into a comprehensive database that multiple government agencies now rely on for invaluable information about active duty service member deaths from all causes, ranging from war to infectious disease. (NCP 17443)*

[Inset] *Dr Mullick enjoys a moment of celebration after becoming the new president of the International Academy of Pathology (IAP) during the academy's international congress in Athens, Greece, in October 2008. At right is Dr Konrad Muller, outgoing IAP president, and at Dr Mullick's left is Dr Kristine Henry, president-elect of the IAP. The IAP is dedicated to the advancement of educational exchanges in pathology worldwide. (NCP 17444)*

AFDIL DNA analyst Jessica Stevens enters information into a database that was used to track chain of custody for evidence and samples collected from the site of the crash of Continental Flight 3407 in February 2009 in Clarence Center, New York, killing all 50 people aboard. Stevens was part of the AFDIL team deployed to the Erie County, New York, Medical Examiner's Office in support of the National Transportation Safety Board's investigation into the crash. (NCP 17445)

Air Force Colonel Mark Mavity and Alan Hawk, historical collections manager for the National Museum of Health and Medicine, view the museum's Balad exhibit in May of 2009. Called "Trauma Bay II, Balad, Iraq," the exhibit features the floor of a trauma bay and equipment from the Balad field hospital during the war. Trauma Bay II was where those with the most serious wounds were taken upon arrival at the hospital. (NCP 17448)

[Inset] *Army Colonel Jo Lynne Raymond, chair of the Department of Veterinary Pathology, examines a slide. In 2008 Raymond became the first female chair of the department. (NCP 17446)*

The Combat Wound Initiative Program leadership team, from left to right: Army Colonel Alexander Stojadinovic, MD, 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)

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)

[Left] *Jennifer Engle, molecular biology research technician, reviews a polymerase chain reaction in swine influenza assays in 2010. (NCP 17450)*

[Inset] *Lieutenant Colonel Lou Finelli, Medical Corps, US 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. (NCP 17452)*

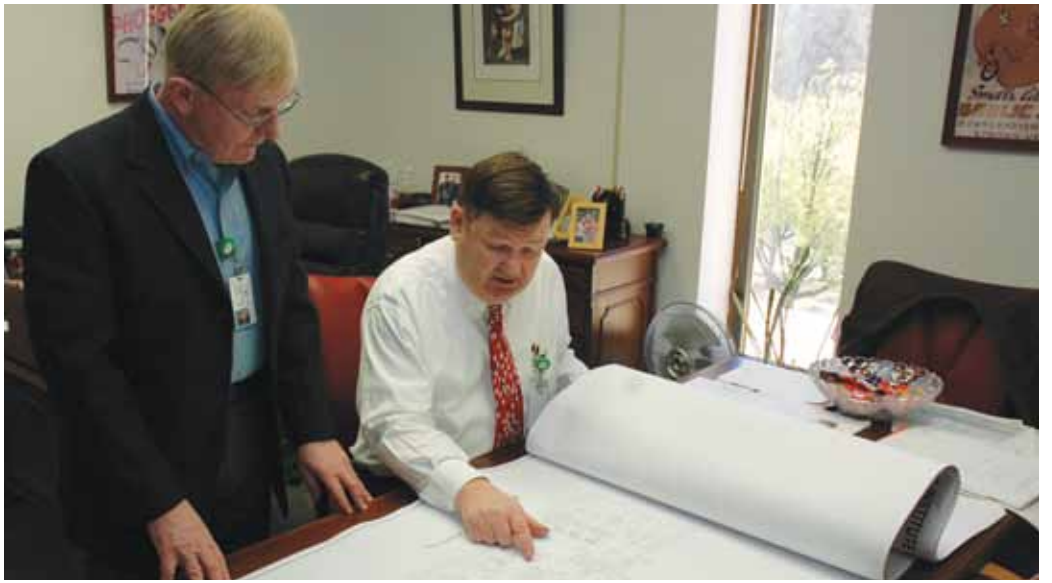
[Opposite] *Adrien Ravizee, research associate, pipefitting cells used to grow influenza virus as virologists Dr Sue Cross (left) and Dr Huiling Hu observe in 2010. (NCP 17451)*

[Top] *(Left to right) Major Hugh Darville, deputy district engineer, Baltimore District, US 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, MD), 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)*

[Opposite] *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)*

[Top] *AFIP chief of staff James Affonco and Frank Roberts, associate chair of Repository and Research Services, review building renovation plans for the new DoD Pathology Repository in 2009. (NCP 17469)*

[Bottom] *Dr Mullick talks with Dr Russell Harley, chair of the Department of Pulmonary and Mediastinal Pathology, while touring the renovated DoD Pathology Repository in 2010. The repository was renovated to store the institute's stockpile of 31 million accessioned paraffin blocks, its paper records, and 4.2 million items received from medical facilities being closed under BRAC in one centralized location. These materials were previously housed in several warehouses. (NCP 17455)*



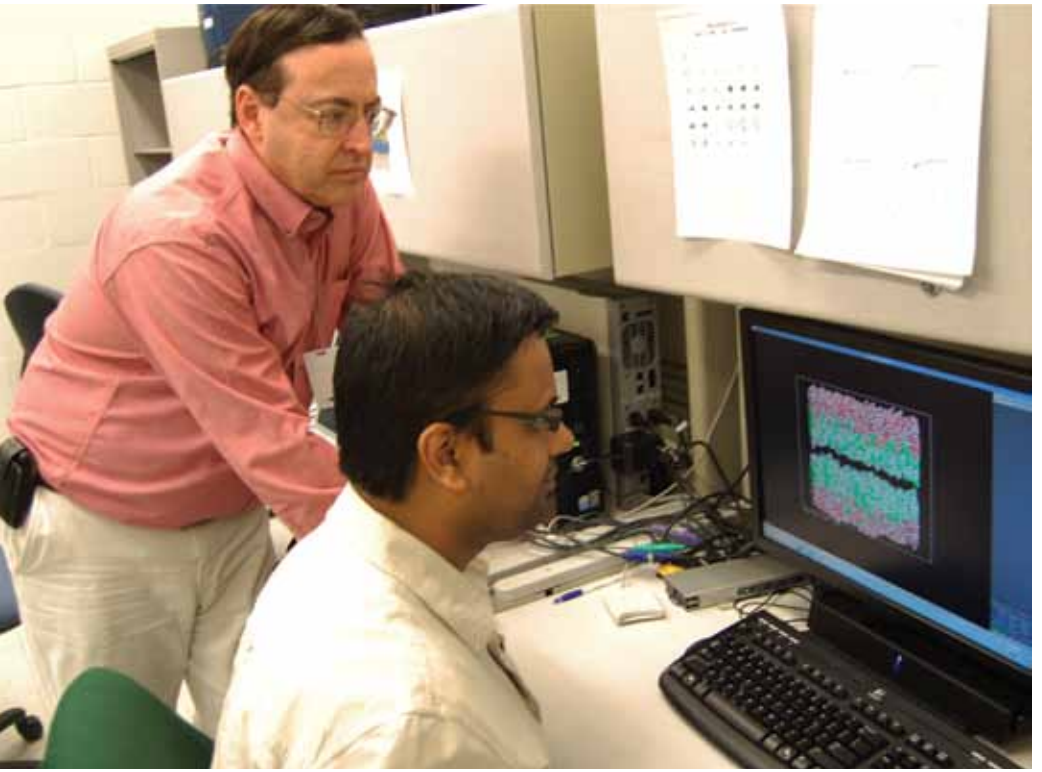
[Top] *Artist's rendering of the new AFMES facility at Dover Air Force Base, which is scheduled for occupancy in the summer of 2011. (NCP 17458)*

[Left] *The US and POW/MIA flags fly stiffly in the breeze atop the frame of the new AFMES facility following a "topping off" ceremony in November 2010. In building construction, topping off is a ceremony held when the last beam is placed at the top of a building. Inclusion of the POW/MIA flag is symbolic of the AFMES's role in helping identify deceased from past conflicts. (NCP 17457)*

[Right] *View of the outside of the DoD Pathology Repository. Although the institute was ordered to disestablish under BRAC, its repository assets were retained for future study. (NCP 17456)*

[Top] *Dr Mina Izadjoo, chief of the Division of Wound Biology and Translational Research, and Dr Mohammad Alavi, research scientist, discuss bacterial genotyping results using a Sequenom (Sequenom Inc, Newton, MA) instrument in 2010. The instrument facilitates accurate identification of different infectious agents and different strains of specific pathogens, such as* Brucella. *(NCP 17459)*

[Opposite] *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)*



[Opposite] *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)*

[Left] *Dr Jeffrey Mason, chief of the Division of Biophysics, and Dr Rahul Bhowmik of the Defense and Veterans Brain Injury Center, observe a molecular simulation of how a blast wave interacts with myelin membranes during research in 2010. In 2009 the biophysics division teamed up with the Defense and Veterans Brain Injury Center in an effort to identify the mechanism responsible for blast-induced mild traumatic brain injury. (NCP 17461)*

[Right] *Dr Antonio Llombart-Bosch, president of the Spanish chapter of the International Academy of Pathology (IAP), presents the academy's gold medal to Dr Mullick, outgoing president of the IAP. Dr Mullick received the medal at the 18th congress of the IAP, held in Sao Paulo, Brazil, in October 2010. This prestigious IAP award is reserved for outstanding members who have devoted many years of service to the organization and who have made significant contributions to the fields of science and academia. (NCP 17463)*

"For decades the AFIP has been the premier pathology institute in the world. . . . This did not occur by accident; rather it is the result of dedication, selfless service, and an unmatched commitment to excellence." —ERIC B SCHOOMAKER, MD, PhD, *The Surgeon General*

BORDEN INSTITUTE | *Fort Detrick, Maryland*

US ARMY MEDICAL DEPARTMENT CENTER AND SCHOOL | *Fort Sam Houston, Texas*