The Spring 2009 semester has been a very exciting one. In February, the Department, in conjunction with the GW Alumni Association, hosted a well-attended alumni reception at the American Academy of Forensic Sciences meeting in Denver. A number of current students and alumni presented papers at that meeting. Stephanie Houlgrave (who graduated in May) probably set a record for a professional conference. She presented three research papers: one in the criminalistics section and two in the documents section.

On May 16th, the Department held its annual reception for its graduates in the State Plaza Hotel on F Street. Before the graduates headed over to Funger Hall for the CCAS Celebration, we held an informal hooding ceremony in which each of the graduates was hooded by his or her faculty adviser. We hope in the future to make a formal hooding ceremony part of the reception.

Commencement was held on Sunday May 17th on the National Mall in front of the U. S. Capitol. White House Chief of Staff Rahm Emanuel gave the commencement address. There is a collection of photos of the departmental reception, the CCAS Celebration and Commencement on the last page of the newsletter.

We expect to move from Sampson Hall to the Mount Vernon Campus before the end of the summer. Dean Peg Barratt of the Columbian College of Arts and Sciences had suggested several new locations, including the University’s Loudoun Campus at Ashburn and the Alexandria Campus near the King Street Metro and Amtrak stations. The Mount Vernon Campus will be ideal for the Department. Its Acheson Science Center has a chemistry teaching laboratory and a biology teaching laboratory on the first floor. We will share these with the chemistry and biological sciences departments.

There is a large dry laboratory on the bottom floor that will become our instrument laboratory. The large computer laboratory on the bottom floor can be converted later into a state-of-the-art computer forensics facility. The laboratory space in the Acheson Science Center is currently underutilized so we would not have to displace any of the laboratory courses that are currently taught there. The basement of Somers Hall has vacant office space that will be converted into DNA teaching and research laboratories, as well as office space for the entire full-time faculty.

The Mount Vernon Campus has an underground parking garage. We expect to move from Samson Hall to the Mount Vernon Campus before the end of the summer. Pelham Hall at Mount Vernon campus

Dr. Walter Rowe, Chair, Forensic Sciences

“We expect to move from Sampson Hall to the Mount Vernon Campus before the end of the summer”

Dr. Rowe
We’re Outta Here, con’t

garage and a surface parking lot. Because the campus has undergraduate dormitories, the University runs frequent shuttles between the Foggy Bottom and Mount Vernon campuses.

The Department is also up for an academic program review. Because the information that must be gathered for an academic program review overlaps with that needed for the self-study required for FEPAC accreditation, the Department has decided (at long last) to complete the FEPAC self-study with the intention of applying for FEPAC accreditation in the spring of 2010.

Alumni can help us with this project. Over the next several months we may contact you about your forensic science employment history. We will also be asking for recommendations about how our degree program could better prepare graduates to work in the forensic science field.

In the last newsletter, the Department announced that it was recruiting a new chair at the associate or full professor level. The faculty search continues and we have interviewed two promising candidates. A final decision will probably be made by the end of June.

We’re Moving!

“The Vern”

In 1999, the university acquired the 23-acre Mount Vernon College for Women campus and renamed it The George Washington University at Mount Vernon College. Nicknamed “The Vern,” students at this campus are the neighbors of the Embassy of Germany in Washington in the Foxhall area. The campus is served by a 24-hour shuttle service known as the “Vern Express.” Students have access to the campus facilities, including the library, computer labs, swimming pool, tennis courts, and top-notch recreational facilities. The campus features wireless Internet access, along with catering services from the on-campus dining facility. Restaurants surround the campus within walking distance.

Donors
Like every other educational institution in the country, The George Washington University has more demands for resources than it has revenues to meet them. The Department of Forensic Sciences appreciates donations from its graduates. Thanks to Michael Coble, MFS ’97, PhD ’04, Ksenia Nasielski, BA ’03, MFS ’06, Charles Schwab Foundation (Employee Matching Gift Program) for contributing during the Spring Semester. See our website at www.gwu.edu/~forensic to learn how you too can help.
Mount Vernon Campus

Chemistry Lab

The Dry Lab

Computer Lab

Eckles Memorial Library

Alumni News

Tracie E. Smith, BA ‘03, MFS ‘08, CCE, ‘08

After graduation from GW, Tracie was hired as a Computer Forensic Examiner with the DEA. The laboratory processes a wide variety of digital media and provides on-site imaging support to agents all over the country. Tracie says that the environment has been one that allows her to utilize the skills she learned at GW, while furthering her education in her work environment. What she loves about the field of digital forensics is that every case is different, introducing new challenges with each piece of media she processes. She never stop learning. She feels she is one of the few people who can say that they love what they do, and she is grateful to GW for giving her this opportunity. “I would not be here without the skills I learned in the High Technology Crime Investigation program, or the internship at the FBI that I was able to secure through GW”.

Student News

Jessica Nelson –CSI received the J. Edgar Hoover Scientific Scholarship. It carries a $25,000 award to be used for further education.

Randy Schiefer graduated from the Master Forensic Science program in 1983. He is retired from the US Air Force and is now the Academic Dean at ITT Technical Institute in Dayton, Ohio.
Faculty News

Daniele Podini - Prof. Podini had two papers presented at the American Academy of Forensic Sciences annual meeting in Denver:

Daniele S. Podini, Joni Johnson and Ronald Lai, BS, Sabrina N. Walborn and Moses S. Schanfield. “Evaluation of the SNIPlex Genotyping System for Screening Ancestry and Phenotype Informative SNPs.”


Ted Robinson - Professor Robinson co-presented with student Cristin Pohlig a paper entitled “Casting Shoeprints in Sawdust.” at the Spring Chesapeake Bay Division-International Association for Identification Education Conference in Virginia Beach VA, March 29-April 3. A group of GW students also presented a Mock Crime Scene Workshop with Professor Robinson, where they staged the crime scene with evidence, and three teams of four attendees each competed to see who could solve the crime first. Students working on the workshop included Brandon Farley, Alison Shapleigh, Liz Lyons, Ashley Hanchar, Irene Llunoras, Daniel Sweitzer, Jackie Romero, Danielle Schulz and Felicia Truong.

At the end of the 2009 Spring Semester, Professor Robinson was promoted to Associate Professor.

Walter Rowe - Professor Rowe represented the Department at the annual meetings of the American Academy of Forensic Sciences in Denver in February. He had two papers presented at the American Academy of Forensic Sciences meeting in the Questioned Documents session:

George Virgin and Walter F. Rowe. “Looking at How to Differentiate Measurements Used to Test Printing on Documents.”

Walter F. Rowe and Stephanie Moore. “Examination of Blue Gel Inks.”

Professor Rowe also represented the Department at the annual meeting of the Mid-Atlantic Association of Forensic Scientists in Hunt Valley, Maryland.

Moses S. Schanfield - Professor Schanfield had a paper presented at the annual meeting of the American Academy of Forensic Sciences:

Daniele S. Podini, Joni Johnson and Ronald Lai, BS, Sabrina N. Walborn and Moses S. Schanfield. “Evaluation of the SNIPlex Genotyping System for Screening Ancestry and Phenotype Informative SNPs.”


Eva Vincze - Professor Vincze submitted a proposal to the Technical Support Working Group. TSWG operates as a program element under the Combating Terrorism Technical Support Office (CTTSO). Its interagency configuration addresses technical challenges to meet requirements across the four pillars of combating terrorism: antiterrorism, counterterrorism, intelligence support, and consequence management. The $1.1 million dollar proposal would allow us to develop a collaborative, 3D virtual training environment in which participants, collect, evaluate, analyze and exchange information, intelligence and digital data to improve their competency to fight cybercrime and cyber-terrorism.

Dr. Vincze represented the Department at the Armed Forces Communications and Electronics Association (AFCEA) Solutions Series, Inter-agency, Allied and Coalition Information Sharing Seminar.

Dr. Vincze also represented the Department at the Annual American Society for Industrial Security Scholarship Awards dinner. Brendon Hooke ’09 received two scholarships: One for academic excellence and one for his extensive community service.
Forensic Science Solves History’s Mysteries – Part I

Instead of focusing on a single forensic case (as I did in the summer and fall 2008 newsletters), I am going to look at how forensic science has been employed to solve historical problems. These run the gamut from the authenticity of the Hitler diaries to the question of what killed Napoleon and his soldiers in Russia; the problems involve the use of document examinations, firearm examination, forensic toxicology and DNA sequencing.

The Hitler Diaries and Other Forgeries

In the early 1980s the West German newsmagazine Stern paid ten million marks to purchase sixty volumes of what was purported to be Adolf Hitler’s handwritten diary – one that he had supposedly kept during his years as Reichschancellor. Initially, the historical content of the volumes was examined by two historians of the Third Reich (noted British historian Hugh Trevor-Roper and Prof. Gerhard Weinberg). The handwriting in the volumes was also compared to supposedly known samples of Hitler’s handwriting by three different handwriting examiners. These initial assessments were hurried because the publishers of Stern were anxious to protect their scoop. Other than the obvious cheapness of the notebooks in which the diaries were written (certainly inconsistent with the stature of the leader of Nazi Germany) there were no features that indicated that the diaries were hoaxes. And indeed the initial evaluations came down on the side of authenticity. However, once the existence of the diaries became widely known, charges that they were forgeries flew from both ends of the political spectrum. The West German Bundesarchiv eventually conducted a careful analysis of the diaries and branded them modern fakes. The bindings contained polyester fibers, which were not available until long after World War II; the pages of the notebooks contained an optical brightener that was first produced only in 1955. Either one of these anachronistic features would be sufficient to conclude that the diaries were hoaxes. A good general rule for testing the authenticity of a questioned historical document is that an anachronistic feature (be it paper, ink, style of handwriting or content) renders the document inauthentic.

The question remains: How did the historians and the handwriting experts fail to spot the forgery? The two historians initially consulted were also allowed only the most cursory opportunity to examine the diaries and they could only judge authenticity by the accuracy of the statements made in the diaries. There were no glaring historical errors. Indeed, had the diaries proven to be authentic they would have added little to our understanding of World War II; they contained no startling revelations. The Bundesarchiv examination of the content of the diaries identified the specific published sources that the forger had relied upon. The forger had repeated the mistakes of the published sources: he had misdated the passage of a law related to German agriculture and he had misread a congratulatory telegram as being to Hitler rather than from Hitler. The handwriting comparisons were compromised by two facts: the handwriting was in a style of German orthography no longer taught in West German schools (and unfamiliar to the original handwriting examiners) and the forger had been able to insinuate many of his other forged Hitler writings among the supposedly known Hitler writing samples.

During the investigation of the Hitler Diaries and the subsequent trials of the forger, Konrad Kujau, and the journalist, Gerd Heidemann, who acted as the conduit for Stern’s money (a substantial amount of which stuck to his fingers) there were allegations that the diaries were the product of an East German government “forgery mill.” The motives for the forgery were either to get hard currency from West Germany or to manipulate West German public opinion on the issue of the deployment of new NATO missiles. Although Kujau had grown up in East Germany, the notion of an East German government forgery plot was dismissed by most of the media as Cold War paranoia. Then in 2002 Gerd Heidemann’s East German intelligence service file became available: he had been recruited by the Stasi in 1953. He had apparently only become an inactive agent in Stasi’s eyes after his conviction in the Diaries case.

Ink dating has come up in the examination of many other historical documents. In the 1920s a young woman named Dorothy Minor made public a collection of documents relating to the early life of Abraham Lincoln. The collection consisted of books with marginal notes supposedly written by Lincoln (a practice not found in books from Lincoln’s library), letters between Lincoln and (cont’ on next page)
Forensic Science Solves History’s Mysteries – Part I (cont’)

Ann Rutledge, the young woman who was supposedly the love of Lincoln’s life, a diary kept by Matilda Cameron, a mutual friend of Lincoln and Rutledge, and notes or memoranda added to the collection by Sally Calhoun, a second mutual friend of Lincoln and Rutledge to whom the collection was supposedly entrusted. The authenticity of the Minor Collection (as it came to be called) was vouched for by no less of a Lincoln authority than Carl Sandburg. The Atlantic Monthly obtained the publication rights to the collection and published a series of articles on it. A young historian named Paul Angle made his reputation as a Lincoln scholar by challenging the authenticity of the Minor Collection in toto. A more in-depth analysis of the Minor Collection revealed that some of the writings were in green ink, a color not available in common writing inks until the production of aniline dyes in the 1870s. The paper on which many of the documents was written resembled the flyleaves in old books – not the common writing papers of the early 1800s. Even if the anomalies of the ink and paper could be explained away, the handwriting and the style and content of the writings raised a lot of red flags. The punctuation of the Lincoln letters did not match authentic Lincoln letters from the same period (or any other period, for that matter). Nor did the syntax and general tone of the letters match Lincoln’s writing style. There was compelling evidence that neither Matilda Cameron nor Sally Calhoun existed. Their names did not appear in family records and the diary and memoranda contain geographical and historical impossibilities (such as a steamboat line operating on the Sangamon River between New Salem and Springfield).

Custer and Fetterman: Two Disasters

Battlefield archaeology is a subcategory of historical archaeology. It uses archaeological artifacts to identify troop positions and to reconstruct troop movements. In the 1980s Dr. Douglas Scott, then an archaeologist with the National Park Service, applied the techniques of forensic firearms examination to fired bullets and cartridges recovered from the Little Bighorn battlefield. The soft lead bullets did not reveal much beyond the caliber of weapon in which they had been fired; they were heavily oxidized and little microscopic detail could be seen. Using fering pin impressions Scott was able to track the movement of a single-shot Springfield .45 caliber carbine over the battlefield. The most significant of Scott’s findings, however, was the large number of repeating rifles (mainly .44 Henry and Winchester repeating rifles) that were used by the Sioux and Cheyenne warriors in the 1876 battle. By comparing firing pin impressions on the fired .44 caliber cartridges Scott could establish the minimum number of repeating rifles represented by the assemblage of expended cartridges. The Sioux and Cheyenne warriors had over a hundred repeating rifles. On a battlefield seam by brush-choked gullies the Indians would have been able to work up close to the positions of Custer’s troopers and subject them to a devastating volume of small arms fire.

Prior to the defeat of Custer and the Seventh Cavalry the greatest defeat inflicted on the US Army by the Plains Indians was the destruction of the command of Captain William J. Fetterman in 1866, in what is now northern Wyoming. Fetterman, two other officers, two civilian employees of the Army and seventy-six enlisted men had been ambushed and killed by a combined force of Sioux, Cheyenne and Arapahoe. The entire fight had lasted under an hour. Unlike the Battle of the Little Bighorn there are no grave markers to indicate possible troop positions: The remains of Fetterman and his men were hastily removed from the battlefield immediately after the action. In 2004 and 2006, a private archaeology consulting firm undertook the mapping and recovery of surface artifacts from the Fetterman battlefield. The search of the field produced expended bullets and cartridges, fired percussion caps and miscellaneous pieces of militaria. One of my graduate students at the Department of Forensic Sciences and I undertook the examination of the fired bullets and cartridge cases. We were able to identify three sets of fired .52 caliber Spencer carbine cartridges that were fired in the same weapons. The .52 caliber Spencer carbine was a repeating firearm with a removable tubular magazine. Capable of a rate of fire of fourteen rounds a minute, the Spencer had been widely issued to Union mounted units during the Civil War, and it would continue to be issued to US troops until it was supplanted by the 1873 Springfield carbine. According to historical sources, Fetterman’s force had fifty Spencer carbines. As in the case of the Battle of the Little Bighorn, the markings on the expended cartridges were used to establish the minimum number of Spencer carbines.
Forensic Science Solves History’s Mysteries – Part I (cont’)

represented by the expended cartridges: Fetterman’s men had over sixty Spencer carbines. The firepower of the Spencer carbines proved insufficient to prevent the Indians from overrunning Fetterman’s men. The impression of some of the US Army officers who reached the field after the warriors withdrew was that Fetterman’s force was only overwhelmed after its ammunition was exhausted.

What Killed Napoleon … and his Grande Armée?

The Fetterman and Custer battles were tiny on the scale of the battles of the so-called Napoleonic wars. These wars began with the French Revolution and only ended with the defeat of Napoleon at Waterloo in 1815. Several million European soldiers and civilians died and most of the continent was ravaged economically. Napoleon Bonaparte, who many regarded as primarily responsible for this devastation, was ultimately exiled to St. Helena, a tiny island in the South Atlantic. He died there on May 5, 1821. Shortly before his death, the British government had come under criticism in Parliament and in the British press for its harsh treatment of him. There were even rumors of plots to rescue Napoleon and transport him to South America, where he could establish a new empire.

In the four months before his death Napoleon’s health had deteriorated with bouts of abdominal pain, constipation and intense thirst. The day after his death, Napoleon’s personal physician Francesco Antommarchi conducted an autopsy while five English physicians watched. The necropsy revealed an ulcerating gastric carcinoma that covered 4/5 of the stomach lining. The official verdict was that Napoleon died of stomach cancer. There matters stood until 1955, when the memoirs of Louis Marchand, Napoleon’s valet, were published. After reading Marchand’s description of Napoleon’s final illness, Sten Forshuvud, a dentist and amateur Napoleon scholar, concluded that Napoleon had been the victim of arsenic poisoning. Arsenic was especially favored in the 18th and 19th Centuries as a poison because it was readily available and because prior to the development of the Marsh Test it was undetectable in human tissues. Forshuvud was able to have a sample of Napoleon’s hair analyzed by neutron activation analysis at the Harwell Nuclear Research Laboratory. In 1961 Forshuvud and the Harwell researchers reported in Nature that Napoleon’s hair contained elevated levels of arsenic (elevated compared to modern hair samples). Forshuvud laid out his thesis of arsenic poisoning at greater length in his 1962 book, Who Killed Napoleon?

In 1995, Forshuvud collaborated with Ben Weider on a book entitled Assassination at St. Helena Revisited, which laid out an more elaborate scenario in which chronic arsenic poisoning was used to weaken Napoleon in preparation for acute poisoning with a combination of calomel (HgCl) and orgeat, an orange-flavored drink that contained oil of bitter almonds. The team of English physicians who oversaw Napoleon’s care prescribed (over Antommarchi’s violent objections) a much larger than normal dose of calomel the day before his death. According to Forshuvud and Weider, the calomel and oil of bitter almonds interacted to produce toxic mercury cyanide. Of course, there is no physical evidence to substantiate this scenario.

A team of toxicologists and forensic pathologists have developed another theory of the cause of Napoleon’s death in which arsenic poisoning (either deliberate or accidental) contributed to the cause of death but was not the immediate cause. It is known that arsenic interferes with some ion channels in heart muscle. According to this theory, arsenic brought on a fatal cardiac arrhythmia. Other medications given to Napoleon could have contributed to the induction of a fatal arrhythmia. Calomel causes diarrhea, which could lead to potassium loss. Napoleon also took tartar emetic (antimony potassium tartrate) and quinine. Both antimony and quinine bind inside potassium ion channels in muscle cells.

An argument advanced against gastric cancer as a cause of death is Napoleon’s apparent corpulence at the time of his death. (This is also an argument against chronic arsenic poisoning, but somehow for the arsenic poisoning conspiracy theorists it only counts against gastric cancer as a cause of death.) In 2005, Swiss researchers reported their calculation of Napoleon’s body mass index (BMI) from the waist measurements of twelve pairs of his trousers (four from the 1800-1815 period and the rest from 1815 to the time of his death). These data showed that Napoleon had experienced significant weight loss in the seven months prior to his death. Moreover, Napoleon’s estimated BMI at death (cont’ on next page)
Forensic Science Solves History’s Mysteries – Part I (cont’)

fell within the range of BMI determined for forty-seven male victims of gastric cancer.

We now know a lot more about arsenic in hair, about arsenic in Napoleon’s hair and about 18th and 19th Century sources of arsenic exposures. For example, there is no reliable method for distinguishing arsenic incorporated into hair from the bloodstream from external arsenic contamination. External contamination can penetrate the hair and resist attempts to remove it. Arsenic concentrations vary significantly from hair to hair on the same head and along a hair in unpredictable ways. There is only an approximate correlation between arsenic levels in hair and the degree of exposure to arsenic. In the case of Napoleon’s hair, examinations of hair samples taken over an extended period of time (including locks of hair taken when he was a small child and when he was in exile on Elba) have revealed arsenic levels several times greater than those seen in modern European and American populations. In the 18th and 19th Centuries, the potential sources of arsenic exposure were widespread: arsenic was found in rodenticides, insecticides, face powders, hair powders, clothing dyes, tonics and green pigments used in wallpapers. Tests of locks of hairs from lockets and funeral wreaths from Glasgow dating from 1790 to 1849 found some arsenic concentrations more than double the highest found in Napoleon’s hair.

Given that we cannot establish a ‘normal’ arsenic level for 18th and 19th Century populations, rule out external contamination of Napoleon’s hair or exclude accidental exposure to arsenic, the case for the deliberate poisoning of Napoleon must be ruled ‘not proven.’ This episode illustrates the hazard of applying a new technology (in this case neutron activation analysis) to a forensic problem without adequate background research. Since the 1960s, Forshuvud and Weider have leveled serious charges against members of Napoleon’s entourage and against the British government based on the flimsiest of evidence.

Even a cursory reading of Forshuvud’s books and articles reveals that he is a perfervid admirer of Napoleon who views his supposed assassination as an especially heinous act. A discovery in 2001 in Vilnius, the capital of Lithuania, forcefully reminded the world why some governments and private citizens might have considered the killing of Napoleon a moral act. Construction workers uncovered mass graves on the site of a Soviet army barracks. Were these victims of Stalinist terror? The KGB (and its earlier incarnation the NKVD) had deported over a quarter of a million Lithuanians. Were the bodies Jewish victims of the Nazis? The Gestapo and SS had killed over 200,000 Lithuanian Jews during World War II and not all the burial sites are now known. However, artifacts recovered from the grave included early 19th Century French coins as well as fragments of early 19th Century French military uniforms and accouterments.

The first grave excavated contained 717 bodies at a density of seven bodies per square meter. The entire mass grave was estimated to contain 2000 to 3000 bodies. Most of the dead were young (between the ages of fifteen and twenty, as would be expected for military personnel); most were male but there were some females as well (presumably wives or other camp followers). The dental health was good compared to contemporaneous civilian populations. The skeletal remains were examined for evidence of trauma, especially foot fractures. The absence of foot fractures led the physical anthropologist who examined the remains to conclude that most of the dead were new recruits, not the veterans that supposedly comprised Napoleon Grande Armée.

Napoleon’s army had passed through Vilnius on its march on Moscow. When Napoleon was forced to retreat he hoped that his decimated army could rally at Vilnius, where there was shelter, food and other supplies. Napoleon himself left the army before it reached Vilnius in order to return to Paris. The Grande Armée was not able to hold on the Vilnius. One of Napoleon’s staff officers estimated that in the four days before the army reached Vilnius on December 9, 1812, half of its 80,000 men had died. Instead of succor, the French soldiers encountered mindless red tape: There had been collected there sufficient flour and bread to last for forty days, and butcher’s meat for thirty-six days, for one hundred thousand men. Not a single commander ventured to step forward and give orders for distributing these provisions to all that came for them.

Even basic shelter was denied them: At the barracks and the hospitals they were equally repulsed, but not by the living, for there death held sway supreme. The few who still breathed complained that for a long time they had been without beds, even without straw, and almost deserted. The courts, the passages, and even the apartments were filled with heaps of dead bodies; they were so many charnel houses of infection.

After a brief defense against the approaching Russian army, the remnants of the French army abandoned Vilnius in complete disarray. A vast park of artillery, ammunition wagons and baggage was simply abandoned. A few days later, the survivors struggled across the River Nieman, where Napoleon had begun the invasion of Russia five months before. Survivors reflected on the ruin that had befallen Napoleon and his troops:

Finally, in the room of these innumerable warriors, of their four hundred thousand comrades, who had been so often their partners in victory, and who had dashed forward with such joy and pride into the territory of Russia, they saw issuing from these pale and frozen deserts, only a thousand infantry and horsemen still under arms, nine cannon, and twenty thousand miserable wr Fletcher covered with rags…..

Forensic scientists have applied DNA amplification and sequencing methods to
the identification of pathogens that might be used in biological weapons of mass destruction. A database of DNA sequences of various strains of pathogens such as *Bacillus anthracis* has been established. The French and Lithuanian teams who recovered the remains of the French soldiers from the mass graves in Vilnius wanted to look for evidence of diseases such as typhus. Typhus is spread by human body lice and the DNA of *Rickettsia prowazekii* can be found in human dental pulp. The researchers conducted what can only be called a Homeric research effort. A couple kilograms of soil from the grave were examined for fragments of body lice. The protocol for isolating lice fragments involved first mixing the soil with kerosene and then adding cold water; the lice fragments were recovered from the water: kerosene interface. Fragments of five human body lice were recovered. ‘Suicide PCR’ was applied to the lice fragments and to the dental pulp of seventy-two unerupted teeth from thirty-five skeletons. ‘Suicide PCR’ is so called because the primers used in the DNA amplification are used only once to prevent problems with contamination: The primers had never been used in the laboratory before and would never be used again. DNA from *Bartonella quintana*, the lice-borne agent that causes trench fever, was identified in three of the lice. DNA from *B. quintana* was also found in the dental pulp from seven skeletons; DNA from *R. prowazekii* was found in three other remains. Disease clearly played a role, along with hypothermia and starvation, in the destruction of Napoleon’s army. The immense loss on men and material in Russia made Napoleon’s defeats in 1814 and 1815 almost inevitable.

Part II of this article will focus more narrowly on the application of human DNA profiling to historical problems.

by Walter Rowe

Further Reading:


Lin XL, Alber D, Henkelmann R. Elemental contents in Napoleon’s hair cut before and after his death: did Napoleon die of arsenic poisoning? Analytical and Bioanalytical Chemistry. 2004 May;379(2):218-20.

Lin XL, Henkelmann R. Contents of arsenic, mercury and other trace elements in Napoleon’s hair determined by INAA using the k(0)-method. Journal of Radioanalytical and Nuclear Chemistry. 2003;257 (3):615-20.

Lobell JA. Digging Napoleon’s dead (Mass grave of soldiers from the Grande Armee, Siaures Miestelis section of Vilnius, Lithuania). Archaeology. 2002 Sep-Oct;55(5):40-+


Congratulations to the Class of 2009!

Not even a little rain could dampen the GW spirit!