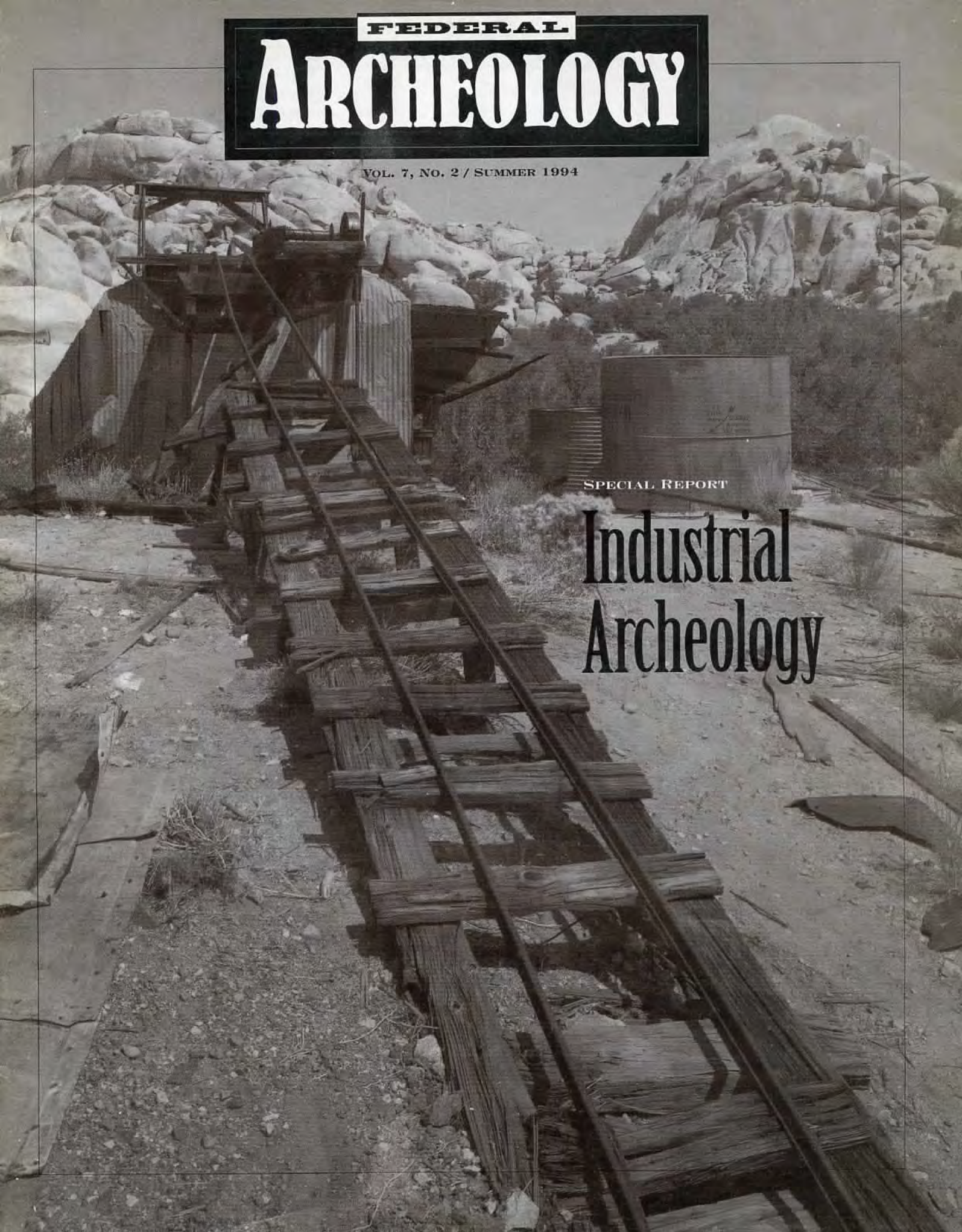
FEDERAL

ARCHEOLOGY

VOL. 7, NO. 2 / SUMMER 1994



SPECIAL REPORT

Industrial Archeology

HIGH-CALIBER DISCOVERY

The Marathon Battery Superfund Site, on the Hudson River across from the West Point Academy, sits squarely inside a National Register property. Archeologists expected some evidence of its historic heritage, but not this.

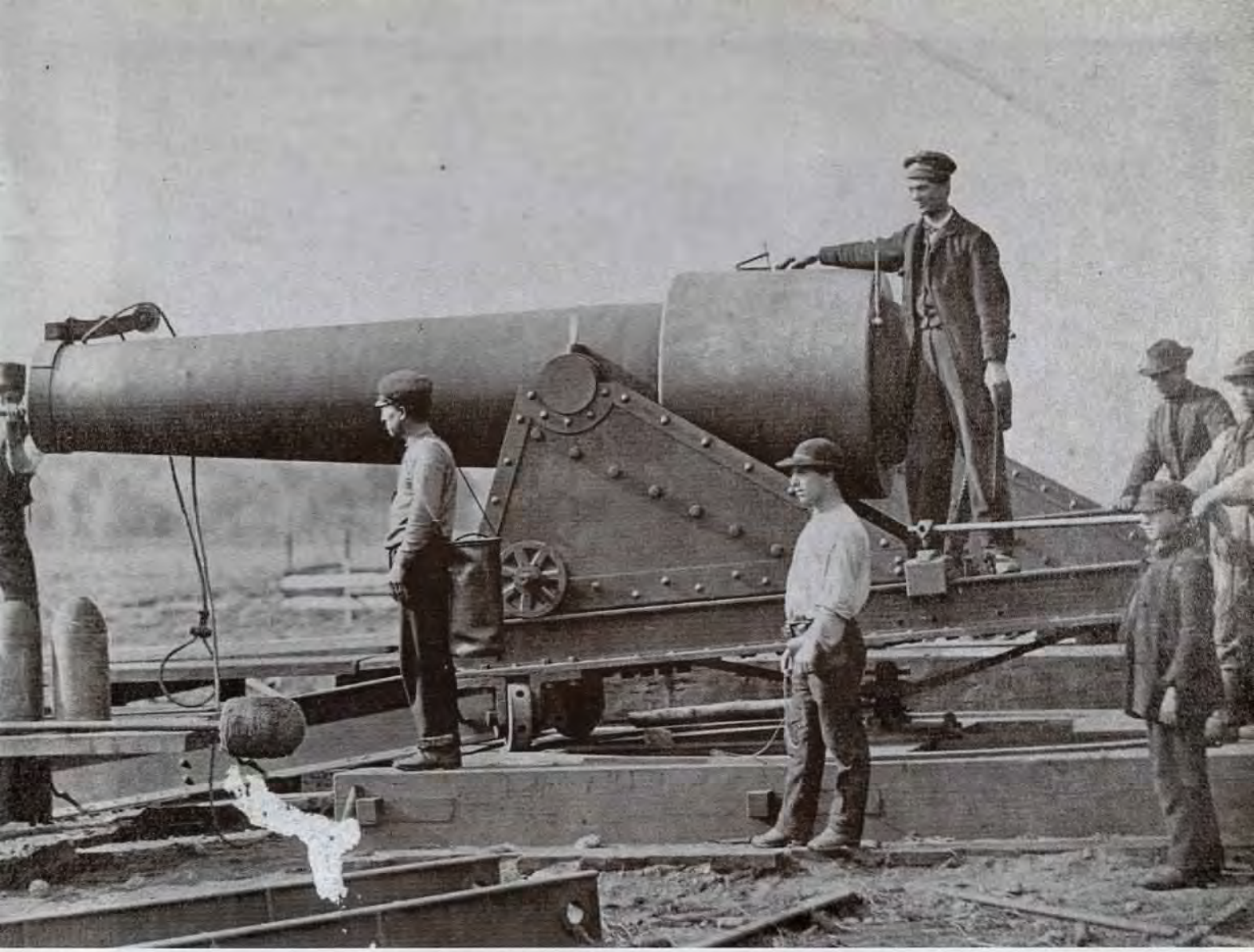
BY JOEL W. GROSSMAN

MY FIRST IMPRESSIONS were not good. What would emerge three years later as a major Civil War-era discovery began as a somewhat somber visit to a heavily overgrown, debris-covered shoreline of the Hudson River. Standing in the cold, numbing rain, I was surrounded by a sea of brick rubble from collapsed 19th century buildings and by the more modern junk of rusting car bodies. It was a challenging place to do archeology. The site was both foreboding as a focus of study and contaminated with cadmium.

I was here to direct archeological fieldwork in advance of a multi-million-dollar Superfund cleanup sponsored by the Environmental Protection Agency (under an agreement with EPA, the Army Corps of Engineers was overseeing the remedial action; Malcolm Pirnie, Inc.—who hired my firm—was providing contractual coordination of the actual work). The Marthon Battery Plant had produced nickel cadmium batteries on the site from the 1950s through the 1970s, as part of the Nike missile program. Here, at a cove just inland from the mouth of a brook, a cleanup facility was to be built to process cadmium-laced sediments. Given the urgency of the cleanup, the issue was could the archeology be done practically, expeditiously, and without undue cost.

EPA believed it could, consistent with the section 106 standards and guidelines of the National Historic Preservation Act. It hammered out the particulars of an agreement to fund and steer the project, the first major attempt to study and protect the prehistoric and historic resources of a Superfund site. The investigation, if successful, would prove the feasibility of meeting the act's mandates on similar sites elsewhere around the country.

The crumbling walls of West Point Foundry, at the foot of a canyon fronting the cove, attest to why the property



Civil War-era photo of gun crew testing R.P. Parrott's 30,000-pound rifled cannon. Children were often employed in the highly dangerous work.
PUTNAM COUNTY HISTORICAL SOCIETY, NEW YORK

is on the National Register of Historic Places. Military weapons were developed here from the early 1800s through the Civil War. Of five production centers set up to counter defense deficiencies observed in the War of 1812, the foundry was the only one under "civilian" control (more on this later).

Where I stood—on Civil War-era furnace fill then thought to be the brook's flood plain—project engineers expected little of archeological significance had survived the many decades of industrial construction and demolition. Besides, military maps from the site's earlier life depicted the area as blank and unoccupied. The vegetation suggested otherwise.

Computer enhancement of commercially available aerial photographs provided the first clue that something was here. Most of the hill and shore appeared as one color, suggesting a homogenous plant cover, perhaps centuries old. Our area was multicolored, suggesting more recent, more diverse plant life. To the trained eye, the enhanced images evidenced multiple episodes of past disturbances and human activity.

AIRBORNE PHOTOGRAPHY was our first adjustment to the demands of the project, phased to comply with the dictates of the National Historic Preservation Act. Each of the phases—identification, evaluation, and documentation of the remains—would require state-of-the-art tools in the hands of a multidisciplinary field crew. A core team came equipped to handle computerized Geographic Information Systems, image analysis, computer transit mapping, concurrent database and data processing, and 3-d photogrammetry, as well as EPA HAZMAT procedures and precautions.

View of excavated gun-testing platform taken with ultra-high-resolution 3-d photogrammetric camera for plotting on computer mapping system.
GROSSMAN AND ASSOCIATES

The project's health and safety plan, tailored to the relatively low level of contamination, required that crew members do little more than wear a "level D" Tyvek suit and follow basic procedures of cleanliness precluding the possibility of undue contact with excavation soil. All of the team members were medically monitored before, during, and after fieldwork.

The main challenge, given the impending construction of the cleanup facility, was to get the job done quickly and efficiently. Under heated domes—moveable steel-frame, air-inflated shelters—the team labored below ground in frozen conditions through the cold of two winters.

Environmental control was essential. Artifacts had to be kept at controlled temperatures, and the waterlogged ground maintained in a thawed and dry state. Two 300,000 BTU heaters operated 24 hours a day. Once the excavation got going, up to 50,000 gallons daily were pumped out to de-water the site.

Defining the location and extent of buried remains, the second phase, called for using a range of on-site computer-based processing and mapping systems. A powerful IBM-based system provided immediate hard-copy plots of survey and geophysical data.

First, the crew carefully mapped and removed trees and other plant life, noting their species and size so botanists could recon-

struct the environment after the work was completed. Then, at 10-foot intervals over the 400- x 700-foot area, they surveyed the ground with magnetometers—to produce an underground magnetic map of historic remains beneath the fill. The magnetometers were hard-wired to portable data collectors, which facilitated the immediate transfer of the information to the mapping computers.

With evidence of modern debris filtered out, the mapping computers rendered 2- and 3-d views of the subsurface topography. These underground maps showed the location and relative size of anomalies, each of which would require individual subsurface testing. The coordinates of each anomaly were fed into a computer transit system, which—using a near-infrared beam—pinpointed where crew members should probe. In this case, they used backhoes to cut through the frozen ground.

After methodically examining over 30 anomalies in sequence—with no results to show in the subzero temperatures—we reached anomaly number 35. Slowly, the crew peeled away the four feet of slag and fill that had accumulated over the last 120 years. There, they revealed the remains of a cannon hoisting tower, a rail line running to it from the foundry, and the well-preserved 12-by-12-foot base of a gun testing platform.

Excavating in the deep cold under heated domes.
GROSSMAN AND ASSOCIATES

Throughout the testing and excavation phases, because of government strictures against removing potentially contaminated materials from a Superfund site, conservation and curation facilities were constructed in the field. Here the crew washed, sorted, x-rayed, decontaminated, electrolytically conserved, and computer-inventoried artifacts as they were excavated (at a rate of up to 5,000 per week). This way, the onsite conservation team was able to ascertain the age and origin of some artifacts within hours of discovery. With walkie-talkies, they immediately fed back this information to the field crew, to help direct their efforts.

The artifacts were exotic, inconsistent with the published historic record. The unanticipated find precipitated an intensive investigation at the National Archives and elsewhere. Slowly, the significance of the platform came to light.

FOLLOWING THE ARRIVAL of new director R.P. Parrott in 1837, the foundry both consolidated and expanded its production facilities to enhance its security and self-sufficiency. At its peak, the foundry controlled six mines and 11,000 acres of timberland, employing 700 employees with a capacity to produce 10,000 tons per year of cast iron for the weapons produced there. It was a major research and development center for heavy artillery.

Parrott's public image was one of a lone inventor who created at his own expense, in isolation, with little government support. On the face of it, the foundry appeared to be an example of fledgling capitalism at its best, a private firm rising to meet the needs of the nation's defense. In fact, it was a heavily government-underwritten "proprietary" operation, much like the Flying Tigers in World War II or Air America in Vietnam.

On the eve of the Civil War, the Union was in danger of being outgunned by the superior artillery of the French and British, both potential allies of the South. The "proofing" platform, as it turns out, was being used to test a 30,000-pound rifled cannon capable of bombarding cities from a distance of five miles with almost pinpoint precision. Each shell could carry 300 pounds of a new and deadly chemical dubbed "St. Elmo's Fire." Today we would call it napalm.

The consequences of the testing program were profound. The chemical—being developed in a classified project for the eyes of President Lincoln only, directly under his supervision—was to be used for the saturation-shelling of southern cities. Although later accounts suggest otherwise, the long-range gun—in concert with other batteries of rifled cannon—ultimately burned a third of Charleston to the ground.

Parrott took full credit for the cannon's invention. Archival evidence, however, suggests that key elements were derived from confidential European designs acquired through military espionage.

In 1879, Parrott's successor at the foundry wrote that a Captain Schwartz of the Imperial Russian Navy had appeared in January of 1860 with covertly obtained plans for the production of the secret British Armstrong rifled cannon. By March, a mere two months later, Parrott had produced what he called "the first experimental gun on my own system," words he would later retract during closed-door congressional testimony.

The actions of Captain Schwartz were entirely consistent with the Russian policy towards the emergence of the United States as a world power. The Czar viewed a unified United States as a counterweight to Russia's recent enemies in the Crimean War—the English and the French.

As the Civil War progressed, the foundry became part of a spy network that stretched from the Black Sea to the White House. The espionage evidenced there saved the Union millions of dollars and years of development time, time the North did not have at the outbreak of hostilities in 1861. Parrott quickly produced a cannon that could stare down a British ironclad, five to twenty percent more deadly and accurate than weapons being wielded by other nations.

What had taken Great Britain over a decade and more than $12 million to develop, the foundry accomplished in a matter of months at a fraction of the cost. While the Union was five years behind Europe in heavy weapons technology at the start of the war, by 1863 it had matched, if not surpassed, its European counterparts.

The platform excavation filled in the details. The crew members used an assortment of tools to expedite excavation and recording as well as limit their exposure to potentially toxic conditions: photo enhancement, computer mapping, computer-

Civil War-era photo of the crane and conning tower, found buried under four feet of rubble next to the test platform. PUTNAM COUNTY HISTORICAL SOCIETY

based correlations with historic maps, among others. Portable x-ray equipment was employed to identify important metal artifacts below the corrosion layer and—in the hands of U.S. Army explosives experts—to examine the cast-iron shells we discovered. One was a standard exploding piece, another an incendiary type much like those used to burn Charleston (as standard operating procedure, gun-testing platforms—which could explode—were always sited far away from production facilities).

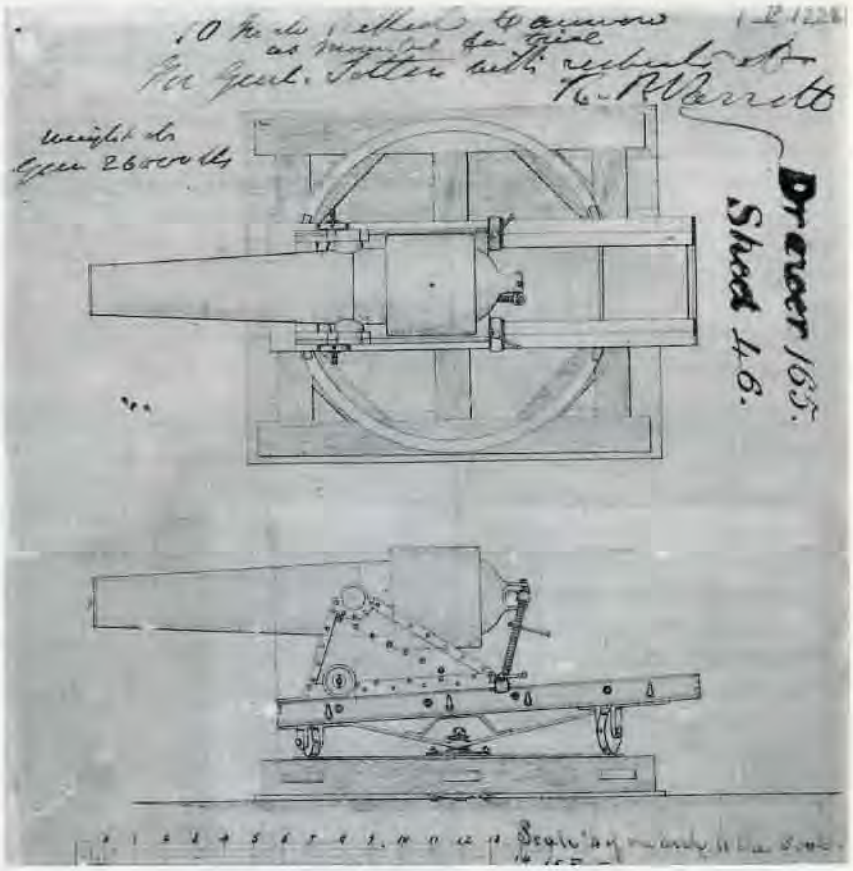
Ultimately, over 5,000 Civil War artifacts were recovered from the platform excavation alone. Through study of what had been the ground surface during the Civil War, the team reconstructed where the gun crews stood, which was correlated with historic photographs of crews "proofing" Parrott's cannon.

THE SECOND PART of the investigation focused on excavating a housing complex, located on a ridge overlooking the production facilities in the valley below. Here the remedial action required that an existing road be expanded and paved to accommodate 18-wheelers going to and from the cleanup facility. The expansion would obliterate the remains of the complex.

In line with Parrott's legend as the lone inventor, the complex was described in the historical record as home to predominantly poor Irish and English laborers. The archeological evidence painted a more complex picture.

The over 145,000 Civil War artifacts we excavated suggested the presence of skilled workers from England, France, Germany, and Austria, countries then developing heavy weapons. Microscopes, gauges, thermometers, calipers, carbon arcs, and many other scientific implements were found. Domestic items, as well, paint a less-than-compelling picture of poor laborers: elegant ceramic goblets and tableware from France, England, and Hungary; gentlemen's smoking pipes from Paris and Glasgow (notably a Tyrolean pipe from the Austrian Alps); an assortment of musical instruments; a broad range of toys including miniature doll house figurines; many late 18th and early 19th century European coins, including several specimens of Spanish Imperial Reales minted in Mexico; and much, much more.

Finally, consistent with the kinds of R & D activities associated with heavy ordnance, each of the house excavations unearthed fuses, primers, and cannon calibration and cleaning tools as well as unidentifiable electronic instruments including batteries and what seemed to be early capacitors. Hardly the repertoire of poor immigrant laborers.



Drawings of the cannon executed by R.P. Parrott or an assistant. NATIONAL ARCHIVES

The apparent inconsistency between the material remains and the historical record triggered a re-orientation of the archival research away from a strict focus on the foundry grounds to the influence of foreign technology and foreign workers on Parrott's operation. This fruitful line of inquiry tapped a host of resources from the Civil War era: private correspondence, records of the Navy Ordnance Bureau, and congressional testimony from closed hearings on corruption and faulty workmanship in the North's heavy weapons industry.

There is an important postscript to the investigation. Using the same high-tech tool kit employed elsewhere, the team made yet another discovery beneath the housing complex and 20th century road to the foundry from the hills above: a totally preserved series of prehistoric living floors, dating from 2,000 to 5,000 years old. They too were excavated and recorded, by a crew working under heated domes over a 10-day period.

THANKS TO THE INCONSISTENCIES we uncovered between the archeological and the historic record, Parrott's story was set straight and a new chapter, perhaps, written on the history of the Civil War. In the past, Lincoln's espionage operations have earned little credence among historians. However, based on these archeological discoveries, a story has emerged of national and international intelligence operations that flourished under the executive sanction of President Lincoln and his inner circle of military advisors. The historical implications suggest a level of technological and geopolitical sophistication that appears not to have been fully recognized in past treatments of Lincoln's Executive Branch structure and operations.

Even beyond that, within the context of this and similar sites, EPA has demonstrated the feasibility and practicality of doing justice to significant cultural resources under the section 106 compliance procedures of the National Historic Preservation Act. What's more, the project's successful use of applied technology illustrates that the work can be carried out even in the potential presence of contaminants, both safely and without delay. I am pleased to note that the remedial action at the Marathon Battery Company site will be completed by the end of this year, well ahead of the original schedule projected by EPA.

In a fitting twist, the ramifications of the project rippled back across the Atlantic when I was invited to Russia to speak on archeological methods in contaminated environments. As I told the story of how Russia secretly assisted the Union during the Civil War, the audience was enthralled. I sensed that there will be many more collaborations to come.

For more information, contact Dr. Joel W. Grossman, Grossman and Associates, Inc., 201 E. 16th St., New York, NY 10003, (212) 473-2259, fax (212) 473-2595. Questions in regard to federal compliance with the National Historic Preservation Act for this and similar projects can be referred to Mr. Robert Hargrove, Chief, Environmental Impacts Branch, EPA-Region II, Federal Building, New York, NY, (212) 264-1840.