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GOING BACK IN TIME THROUGH TECHNOLOGY: MODERN ANALYTICAL TECHNIQUES GIVE GLIMPSE OF CIVIL WAR MILITARY MEDICINE

Cutting-edge chemical analysis techniques and a rare discovery on what is now a South Carolina golf course have given archaeologists a unique opportunity to look back 125 years at how the U.S. Army practiced medicine during the Civil War.

Scientists at the Georgia Institute of Technology used gas chromatography and mass spectrometry to analyze the contents of bottles and "whiteware" jars unearthed from a field surgeon's refuse pit discovered on Hilton Head Island, South Carolina.

One stoppered bottle still contained a clear liquid, while salve material in one jar



David Bostwick and Sarah Shealy operate a mass spectrometer used to analyze samples of Civil War medicines found on a former campsite in South Carolina. (B&W/Color Available)

bore the finger imprints of its last user. Analysis of their contents confirmed some of what was already known about Civil War medicine -- and provided a chilling reminder of how far medical practice has advanced since then.

"They had a fairly interesting group of chemicals from which to choose," said Dr. Kenneth Busch, associate professor of chemistry and biochemistry. "But they did

some nasty things to people in trying to treat them. In many cases, the soldier either healed by himself or he didn't make it."

Analysis by gas chromatography and mass spectrometry showed the stoppered bottle contained arsenic acid, a compound containing arsenic -- best known as rat poison. The acid,

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said Busch, was once used by Army physicians to treat infections resulting from combat wounds, as well as common fungus infections of the skin.

"One way they could disinfect a wound was to pour acid on it," he explained. "That would eat the tissue away and remove the infection. It was not very sophisticated, but it was all they had."

Another sample showed the presence of elemental sulfur, also used as a disinfectant. Busch and Research Technologists David Bostwick and Sarah Shealy identified fatty acids and triglycerides from the contents of the jar, but they could not be further identified as to their origins in plants or animals. Busch believes those materials were part of salves used to treat wounds and skin conditions -- much like modern skin creams.

To his surprise, however, the samples did not contain narcotic drugs. Opium and morphine, Busch noted, were "overprescribed in every possible form" during the Civil War to alleviate pain and to treat a wide range of medical problems including diarrhea -- the leading killer of soldiers.

The narcotics may have disappeared over time. Or because of their value, they may not have been discarded along with the more common drugs.

Other commonly-used Civil War drugs contained mercury and lead, heavy metals that physicians now know are extremely toxic. Surgeons of the time did have ether and chloroform for use in anesthesia; however these volatile compounds would not have survived for 125 years even in well-stoppered containers. The physicians used other acids (hydrochloric and sulfuric) to fight infections, applied turpentine and creosote -- and relied on herbal extracts such as Belladonna and Red Bud bark.

The 125-year-old medicines were found during archaeological excavation of an 1864 encampment on Hilton Head Island, South Carolina. The 32nd U.S. Colored Infantry, composed of black soldiers recruited from the New England states, stayed at the site -- known as Camp Baird -- for five weeks while building a nearby earthen fort.

Atlanta consulting company Brockington and Associates did the survey work for the Greenwood Development Company, which was constructing homes and a golf course on the site.

"It looks like the regiment surgeon

dumped whatever he didn't need before he left," explained Archaeologist Christopher Espenshade. "All are typical forms for medicine during the Civil War."

The surgeon's refuse was found by company archaeologists after they removed topsoil from much of the site. The company also found larger refuse pits, a line of privies, several walk-in wells, and hundreds of post holes that showed where the regiment's platform tents once stood.

"We were able to recognize company streets and the camp layout from the pattern of the post holes," Espenshade said. "They stand out very nicely against the subsoil."

In digging through the pits and privies, the company found bottles, tins, canteens, jars, buttons, beef bones and other garbage left by the soldiers during their five-week stay in the fall of 1864. But what they did NOT find also proved interesting.

The refuse contained few oyster shells, indicating the residents of Camp Baird did not obtain food from the local market. That suggests the soldiers may have remained isolated from the other occupants of busy Hilton Head Island.

"The artifacts suggest that the regiment was pretty well stuck in camp," said Espenshade. "The town of Hilton Head had stores, restaurants and all kinds of supplies, but the artifacts in camp are limited in non-military items."

Whether the isolation was due to racial reasons or simply because of pressure to complete the fort, Espenshade doesn't know. But Union commanders in 1864 were not convinced that black soldiers should be used in battle, so in many cases they were limited to manual labor. About 180,000 African-Americans -- some of them escaped slaves -- served in the Union Army.

Remains of the fortification built by the soldiers, known as Fort Howell, have been preserved as part of the residential community Palmetto Hall.

Information about the mass spectrometry analysis was presented to the American Society for Mass Spectrometry in May 1991.

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