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## **Civil War Crimean Ovens: Origins, Models, and Modifications**

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Starting in 1861, the wintertime Union field tent hospitals of the U.S. Civil War often used subterranean heating systems known as Crimean Ovens. From where did this name originate, and what was the above-ground, exterior firebox's appearance on one end of the tent, as well as the chimney's shape and construction on the opposite exterior? Although there were specific models followed for the construction of such heating features, it is possible that each camp built their heating systems according to their own abilities, available materials, and skilled manpower. The name, as well, would be difficult to link directly to the Crimean War, although there are some theories as to why this name arose.

The system under discussion was basically a firebox, or oven, on the outside of the tent, with a shallow, brick-lined, sheet-metal-covered trough running down the center of the tent's interior, and ending in a chimney on the opposite exterior side of the tent.

The tents were placed on ground with slight inclines, allowing the hot air to naturally rise and escape out the flue. Specifically, Dr. Charles Tripler, Surgeon and Medical Director of the Army of the Potomac, writes in a letter of November 1861 the following description of “a modification of the Crimean Oven”, devised and put into operation by Surgeon McRuer, the surgeon of General Sedgewick’s Eighth Brigade:

“A trench 1 foot wide and 20 inches deep to be dug through the center and length of each tent, to be continued for 3 or 4 feet farther, terminating at one end in a covered oven fire-place and at the other in a chimney. By this arrangement the fire-place and chimney are both on the outside of the tent; the fire-place is made about 2 feet wide and arching; its area gradually lessening until it terminates in a throat at the commencement of the straight trench. This part is covered with brick or stone, laid in mortar or cement; the long trench to be covered with sheet-iron in the same manner. The opposite end to the fire-place terminates in a chimney 6 or 8 feet high; the front of the fire-place to be fitted with a tight movable sheet-iron cover, in which an opening is to be made, with a sliding cover to act as a blower. By this contrivance a perfect draught may be obtained, and use more cold air admitted within the furnace than just sufficient to consume the wood and generate the amount of heat required, which not only radiates from the exposed surface of the iron plates, but is conducted throughout the ground floor of the tent so as to keep it both warm and dry, making a board floor entirely unnecessary, thereby avoiding the dampness and filth, which unavoidably accumulates in such places. All noise, smoke, and dust, attendant upon building the fires within the tent are avoided; there are no currents of cold air, and the heat is so equally diffused, that no difference can be perceived between the temperature of each end or side of the tent.”<sup>1</sup>

From this description we can, already as early as 1861, determine that the Crimean Oven did not have one, singular appearance. This was a “modification” of the plan, although we are not sure exactly what that means, or in what way it may have differed from a bonafide model. Though uniform, s-shaped, subterranean patterns appear in field excavations such as those excavated in Alexandria in 2003 and 2004, other than the oven and the chimney being set off to the side of the front tent opening and

rear of the tent, the above-ground features varied in their written descriptions, from brick or stone construction in the fireplace, to a stove pipe or barrel chimney opposite.

The Report of Surgeon Charles S. Tripler, Medical Director of the Army of the Potomac, to Brigade Surgeon Prince of Graham's Brigade states that Surgeon McRuer had first proposed the idea of warming the tents via Crimean Ovens. Once the plan had found approval from General Heintzelman and other officers, Dr. Tripler directed Dr. McRuer to visit every division of the army, and to construct one of his furnaces for a model, which duty he performed. Therefore, if historians and archaeologists can locate and revisit the camps of Union army divisions from the Fall of 1861, most likely more Crimean Oven models would be able to be found and studied. Unfortunately, all of the excavations to this date have no above-ground remains such as firebox or chimney found in situ`.

Surgeon Tripler reports that the "Crimean pit" models were generally well received, but that others objected to it and found stoves which suited them.<sup>2</sup> Already, Dr. Tripler introduces a variation in the name from Crimean Oven to Crimean Pit.

The autumn of 1861 was a cold one, and reports prior to Dr. Tripler's letter came from Camp Brightwood in nearby Washington, D.C. Dated October 15<sup>th</sup>, 1861, this letter to the New York *Express* describes not quite a Crimean Oven, but more of a California Oven which was a two-foot pit in the center of a tent, walled with stones in soft clay and covered at the top except for where more fuel may be inserted through an aperture. A trench was dug straight down the middle of the tent, one side bringing in cold air to the fire, and the other side carrying off the hot air which warmed the tent's floor.<sup>3</sup>

Not only were camps coming up with their own heating solutions, as late as January 1864, we have a letter sent to Col. James McFerran, Commanding Sixth Sub-district, Warrensburg, Missouri., from E.B. Brown, Brigadier-General of Volunteers, Commanding, Headquarters District of Central Missouri, Jefferson City, Missouri. Brigadier-General Brown tells the colonel in no uncertain terms that his troops may remain in buildings during the present cold weather. However, as soon as the weather improves they would most certainly be moved to camps where they would need to provide themselves with the right tools to build heating systems for themselves: “Furnaces made by a trench through the tent covered with flat stones and earth, with a flat chimney, or when cantonments are on hill-sides, excavations are easily made and fireplaces built in the bank”.<sup>4</sup>

The brigadier-general calls attention to the colonel’s unmilitary sentiment that he would allow dissatisfaction among his men in regards to carrying out such orders. He continues to say that, if there is any mutinous conduct which results, the fault and cause will be placed with the officers in charge. He assures the colonel that his men will easily be made comfortable in two days’ time, by installing this heating method. Obviously, the technology was not entirely well-known at the start of the war, nor at the end of the war.

We read of Poolesville’s camp in 1861 which had a log-constructed hospital, with four more to follow in subsequent years. Quartermaster Folson designed indoor heating with above-ground boilers, and hot water piped via underground trenches.<sup>5</sup> While this was not a Crimean Oven, the subterranean heating system had its similarities.

The poet-to-be, Walt Whitman, volunteered in many a field hospital during the Civil War, and wrote to his mother, Louisa, on February 12, 1864, of the collection of

hospital tents in Culpeper, Virginia. “They heat them there by digging a long trough in the ground under them, covering it over with old railroad iron and earth, and then building a fire at one end and letting it draw through and go out at the other, as both ends are open. This heats the ground through the middle of the hospital quite hot.”<sup>6</sup>

Contacting Culpeper historians, they indicate that none of these heating systems have been located nor excavated to date.

Not only Culpeper, but Winchester also utilized the Crimean Oven method of heating hospital tents. General Sheridan created a 500-tent field hospital for the fall of 1863 and winter of 1864, each with the radiant floor heating systems.<sup>7</sup> The trenches from these heating systems may be seen to this day in impressions in the earth, now overgrown but discernible, in Winchester’s fields and woods of the Shawnee Springs area.

In corresponding with almost two dozen National Parks, Civil War battlefields, professors of history specializing in the era, museums, cultural resource groups and preservationists, very few knew much about Crimean Ovens. Less than a half dozen had any knowledge of the heating feature, and some of those had information which was very rudimentary. All confirmed that nothing in their areas along these lines had ever been excavated. As far as may be determined, Alexandria is the only city which has archaeologically explored two Crimean Ovens. These features do exist in Winchester, but have not yet been surveyed.

Part of this writer’s research included searching thousands of photographs, sketches, and prints of the time. Wading through online collections, as well as in the Library of Congress, and the National Archives I in Washington, DC, and the National Archives II in College Park, MD, it was hoped to come across building plans for a

Crimean Oven, or a depiction of one in use, whether or not that was the actual topic of the picture. Many were the hospital surgeons posing outside of hospital tents, or wounded, enlisted men recovering in such field hospitals, or barrel-and-mud chimneys at every turn in Civil War camps. Topics investigated included Civil War Photographs, Medicine, Pictorial Works, Prints, Sanitary Commissions, Camps, Field Hospitals, and Ovens. Works searched by artists and photographers of the time encompassed William Henry Jackson, Matthew Brady, Herbert E. Valentine , and A. Gardner, to name a few.

In the National Archives online, there was a sketch of “Winter Quarters 1862/1863 at Bull Run at Wolf Run Shoals” by William Henry Jackson that contained what looked to be a Crimean Oven.<sup>8</sup> The name online later changed between retrieval in Fall 2011 and this final report in Spring 2012 to “Improvised Tent Stove, 1863, catalog number SCBL\_260”. Another sketch, “Tent Interior and Exterior” in the same William Henry Jackson Collection shows the oven and it appears there may be a trench, as well.

Though it was inside the hut/tent, not outside, all of the components were there. Consulting with local experts on the subject, they assured me that this indeed could not be a Crimean Oven due to its location inside the winter quarters.

As an aside, it may be worthwhile to note that the curved top of the oven itself is sideways to what the proposed Alexandria Archaeology model depicts. Yet, since the museum’s excellent model is conjecture based upon the very best written descriptions, and since the historic sketch cannot be termed a bonafide Crimean Oven, this detail may not be significant at all.

Many chimneys were found in sketches and in photographs over the course of this research. They ranged from stovepipe chimneys, to barrel-and-mud chimneys, to brick

chimneys. None could be definitively linked to a Crimean Oven. Barrels appeared to be the most widely used, due to the fact that provisions would arrive in these containers, and then they would handily be reused as stools, or stacked and sealed as chimneys.

Correspondence with the Director of Research at the National Museum of Civil War Medicine informed that it was the Quartermaster Department that was responsible for tent hospitals and their heating systems, instead of the Medical Department.<sup>9</sup>

Searching the National Archives did not yield any substantive results, however, when trying to view the consolidated correspondence of the Quartermaster Department. When looking for “Ovens” for instance, Civil War cooking ovens, along with recipes from the era, were found for the most part. This writer had hoped to find a sketch or plan for building a Crimean Oven.

Not only the construction’s design, but the name itself of the Crimean Oven, is open to speculation. In the Manual of Military Hygiene for the Military Services of the United States, it is noted, “Another economical improvisation applicable to tents and huts is the Chinese method in which the fire is built in a pit in front (inside or outside), and the flue runs, under the floor, into an improvised chimney in rear.”<sup>10</sup> This was written in 1917 and many historians and archaeologists have since made the distinction between those heating ovens inside the tent and those found outside, the latter being termed as the bonafide Crimean Ovens. Yet, the terms may still be found to be interchangeable in numerous books and reports, official and otherwise.

The U.S. Government Printing Office publication of 1883, The Medical and Surgical History of the War of the Rebellion, refers to Civil War heating systems, calling the Crimean Oven “the California Plan”.

“The plan which ... gave the utmost satisfaction, was that known as the California plan. A pit was dug about two-and-a-half feet deep outside the door of the hospital tent; from this a trench passed longitudinally through the tent, terminating outside its farther or closed extremity. At this point a chimney was formed by barrels placed one upon the other, or by some other simple plan. The joints and crevices of this chimney were cemented with clay. The trench in the interior of the tent was roofed over with plates of sheet-iron issued for that purpose by the Quartermasters Department. A fire was built in the pit, and the resulting heat, radiating from the sheet-iron plates, kept the interior of the tent warm and comfortable even in the coldest weather.”<sup>11</sup>

This report dated from less than twenty years after the Civil War. While later changes maybe be assumed to be erroneous data due to alteration or improperly naming the feature over time, the earlier accounts should indicate that the name “California Plan” was definitely in use for the very same heating method called the “Crimean Oven”.

Some researchers have noticed the similarities between the California Plan and heating systems used in ancient Asia. There has been speculation that the influence could have easily traveled from Asia via west coast Chinese immigrants to California during the 1840s and 1850s’ Gold Rush. No doubt there were some Civil War soldiers who had been in California and might have brought the “California Plan” technology with them.<sup>12</sup>

There were also individuals such as Mary Seacole, a Jamaican restaurateur and hotel owner who was not only present in California during the Gold Rush, but additionally traveled to the Crimean War in an effort to work with Florence Nightingale as one of her nurses.<sup>13</sup> It is possible that this technology spread by word of mouth from those who had been in various locations where the heating method is found.

While examining the “California Plan” name for the Crimean Oven, research revealed a Union Camp excavation at Gloucester Point, Virginia, undertaken in 1994 by the William and Mary Center for Archaeological Research and featuring a “California Furnace” or “California Oven”.<sup>14</sup> These latter two terms are not interchangeable in this



instance with the Crimean Oven. The “California Furnace” or “California Oven” features a firepit in the middle of a Sibley bell tent with subterranean trenches leading to exterior chimneys. So while the “California Plan” may be another name for the Crimean Oven or Crimean Pit whose firebox is always found outside the tent, it is not synonymous with the “California Furnace” nor “California Oven” whose firepit is inside the tent.

Two more confirmations of the term “California Plan” being synonymous with the “Crimean Oven” exist, the first in John D. Wright’s, The Language of the Civil War, where he offers the definition,

“California Plan – A heating system for hospital tents in the Union army. A fire pit was dug 2-1/2 feet deep outside one end of the tent and connected to a trench dug through the tent and covered with iron plates. The fire heated the plates to warm the tent, and the smoke escaped along the trench to a chimney (often made of barrels) outside the other end.”<sup>15</sup>

The second time we read of the “California Plan” term being used for the Crimean Oven is in John D. Billings, Hardtack and Coffee:

“The hospital tents in the Army of the Potomac were heated, for the most part, by what was called, for some reason, the California Plan. This consisted of a pit, dug just outside of the hospital door, two and a half feet deep, from which a trench passed through the tent, terminating outside the other end in a chimney, built of barrels, or in such a manner as I have elsewhere described. This trench was covered throughout its entire extent with iron plates, which were issued by the quartermaster's department for that purpose. The radiation of the heat from the plates kept the tent very comfortable.”<sup>16</sup>

Mr. Billings also helps in his description of which tents were assigned to each regiment and how that had changed by the time of the Civil War:

“The hospital tent I have already described at some length. I may add here that those in use for hospital purposes before the war were 24 feet long by 14 feet 6 inches wide, and 11 feet 6 inches high, but, owing to their great bulk and weight, and the difficulty of pitching them in windy weather, the size was reduced, in 1860, to 14 feet by 14 feet 6 inches, and 11 feet high in the centre, with the walls 4 feet 6 inches, and a “fly” 21 feet 6 inches by 14 feet. Each of these was designed

to accommodate eight patients comfortably. Army Regulations assigned three such tents to a regiment, together with one Sibley and one Wedge or A tent.

The Sibley tent I have likewise quite fully described. I will only add here that, not having a “fly,” it was very hot in warm weather. Then, on account of its centre pole and the absence of walls, it was quite contracted and inconvenient. For these reasons it was little used for hospital purposes, and not used at all after the early part of the war.”<sup>17</sup>

We read elsewhere that some of these tents were placed side by side, housing 24 patients in one “hospital ward”.<sup>18</sup> Dr. Parkes writes of the hygiene of field hospitals, both in the American Secession, and in the Franco-Prussian War, also noting that three field tents could be joined end to end. In his estimation, this would accommodate eighteen wounded comfortably. Why it was not estimated to house twenty-four patients (eight in each tent) as listed above is anyone’s guess. Most important of all, he writes of the heating used in the field tents:

“The system of warming was efficient, simple and economical. A trench of about 40 centimetres broad and deep was made in the ground, extending from one end to the other of the tent; a pit of about 1 millimetre 50 centimetres in dimensions excavated at one end. An ordinary stove was built into the latter, the flue of which extended along the trench under the floor, and rose at the farther end in the form of a chimney. Along its course it was carefully built in by brick and mortar, a grated opening being left in the (flooring at short intervals, so as more readily to admit the heat. The pit for the stove was covered over by a peat roof, a few steps leading down to the fireplace. A moveable valve in the flue provided a ready means of regulating the temperature, and even of diverting the heat from one tent to the one adjoining, for which purpose branch flues were arranged from some of them.”<sup>19</sup>

While this ordinary stove with flue, subterranean though it might have been, was not a Crimean Oven, the idea of the underground heating system used underneath adjoining field hospital tents is written of time and time again, as though it were an innovation of the day.

The same, exact type of underground heating method is described by Dr. Johns of Decatur, Illinois, when visiting the hospital at Knoxville, Tennessee, during Sherman's March of 1864:

"Under the direction of Dr. Josiah Curtis, assistant medical director, Department of the Ohio, the Asylum Hospital has been redeemed from a miserably dirty barracks, to one of the most orderly, cleanly, well watered, heated and ventilated hospitals I have visited. The plan of heating hospital tents by flues underneath the centre of the row of sixteen (16) tents, terminating in a tall chimney to insure draft, produces a uniform heat, at much less expense than any other plan of heating tents. The entire repairs have been done by convalescents, and almost without cost to the government. The Holstein Hospital is unfinished, but has accommodations for 600 sick, the tents all heated by underground flues."<sup>20</sup>

Here were 16 hospital tents in Tennessee, all heated by underground flues. Again, not exactly Crimean Ovens, but similar systems, widespread during the American Civil War with written reports testifying to their use. We must ask why no such reports emanated from the Crimean War? The technology is also repeatedly mentioned as an innovation brought from the U.S. Civil War to the Franco-Prussian War of 1870-1871.<sup>21</sup>

Another reference to "The American Ambulance of 1870-71" is described in Paris Sketches from 1875. It is explained that Dr. Swinburne, Chief Surgeon, gained his insights from American Civil War experiences:

"To the astonishment of the French with their native horror of courants d'air, the American Ambulance housed its two hundred wounded in draughty tents, kept warm only by a stove placed in a hole in the ground which dried and heated the earth beneath the tent. The results were miraculous: whereas four out of five died in the purulent confines of the Grand Hôtel, four out of five of Swinburne's cases survived."<sup>21</sup>

Continuing to research the name "Crimean Oven" yields few clues as to the origins of the oven and if it was used at all during the Crimean War. We read from history books that the winters in general there during 1853 - 1856 were extremely cold and harsh<sup>23</sup>, giving rise to such innovations as the "balaclava" and the "cardigan", one

named after the “Battle of Balaklava” and the other after a British officer. Particularly, the winter of 1854 – 1855 was said to be extremely frigid, actually helping the cause of the Russians, and resulting in 5,000 sick in three English hospitals in Constantinople.<sup>24</sup> So they definitely would have used such heating systems if they knew of them, although the hospital buildings themselves were reported to be well-heated by means of stoves.

Miss Florence Nightingale’s name repeatedly surfaces as a leading force in hospital sanitary reforms among the British Army in Crimea. She worked primarily in hospital buildings, and used stoves to heat them. The sanitary inspectors of the British Army suggested wooden huts or barracks for hospitals, along with a permanent tent hospital for the purposes of ventilation and the reduction of disease. They were said to be “heated by means of open fires or stoves”, with no indication of subterranean systems in use.<sup>25</sup>

One British surgeon from Bombay, writing in November 1871 in reference to the Franco-Prussian War of 1870 - 1871 does mention the underground heating method as one that the Americans used in their tent hospitals during the cold winter at the Siege of Paris. Dr. MacDowall notes that, had such a system been used in Crimea, many of the diseases afflicting the military hospitals would have been avoided. This leads one to believe that the system was not necessarily one that was used in the Crimean War at all, although the name might lead us to speculate that. In Dr. MacDowell’s words,

“Let me entreat of you not to allow the notion to prevail that the tent hospital system is not eminently adapted both for winter use and for safe artificial heating if only the proper system be adopted. Long before huts can be put up, and infinitely better than huts when they are put up, tents can be heated in an absolutely safe manner. Most of the fearful ravages made by pyemia, gangrene, and other allied diseases during our Crimean campaign might have been thus avoided, especially in the large military hospitals on the Bosphoros. The only safe plan of heating tents is the American one, adopted in the war of secession, and

which I saw employed at the Ambulance Americaine during the cold months of the siege of Paris. No stove is allowed inside the tent, or above the level of the ground outside. The mud furnace is simplicity itself, and common, thin, light iron chimney-tubing renders the hot-air floor-trench easier of construction, as also the chimney at the other end of the tent. Such tubing is as portable as tents. Wooden huts, as proved at the Ambulance de la Presse huts at Passy, have nothing like the same immunity from contagious disease that tents have, as proved at the Ambulance Ame'ricaine. I have detailed this American tent hospital system at length in a little pamphlet (advertised in The Lancet by Messrs. Churchill) on the medical and surgical aspects of the siege of Paris, entitled 'On a New Method of Treating Wounds (Gruby's system), Tent Hospitals,' etc., etc."<sup>26</sup>

The main differences between this type of heating system used in hospital tents during the Franco-Prussian War are the mud furnace outside (no brick mentioned) and the light iron chimney-tubing inside the floor trench. Again, we note variations according to available supplies and/or manpower. But the fact that the commentator mentions that this heating system would have been beneficial and would have saved lives in the Crimean War seems to indicate that it was not in use at that time, although similar technology, such as the heating of Turkish Baths found in Crimea, might have given rise to the name for use at a later date.

While it is possible that the Americans had greater medical and heating technology than the British experienced in Crimea, the Medical Department of the U.S. Army began studying the English military medical models from the Crimean War following the demise of so many sick and wounded in the beginning of the Civil War. This again could indicate that Americans did not possess sufficient knowledge in Crimea about how to heat tent hospitals by means of a Crimean Oven.<sup>27</sup>

It may be safe to say that wherever the Crimean Oven (or California Plan) system was found in theatres of war, it was mentioned as a welcome, or even controversial idea. But it was worth noting in records. To hear no mention of it from Crimea makes its

origins suspect. Or, perhaps there was a tangential influence from that region which we should consider.

Studies have been made of the Allied Armies' garrison life during the Crimean War. One such study refers to visiting the barracks in Constantinople and their ample bathing accommodations. At least 40 men at one time could have enjoyed washing themselves in the Turkish bath facilities. In this writer's opinion, the Turkish baths, based on the hypocaust (raised floor) Roman heating system whereby exterior ovens would pump and force hot air beneath the floors of the bathhouse, may have led to the Crimean Oven subterranean heating idea.<sup>28</sup>

In other words, it was not that the hospital tent heating system necessarily existed during the Crimean War, but that similar radiant heating methods were first seen in the Crimean War (not to mention the identical "California Plan" during the California Gold Rush) and later adapted for use during the American Civil War. If we examine the timing in history of the Turkish Bath, we understand that the first hypocaust type systems started to be used to heat baths of the Ottoman Empire in 1400 A.D. Even more interesting is the fact that the first Turkish Bath came to America in October 1863 as a therapeutic bathhouse, opened by Dr. Charles H. Shepard of Brooklyn Heights. The hydropathic physician learned more about Turkish Baths after reading of their popularity in 1859 in England and what is now Ireland.<sup>29</sup>

The fact that this model and its technology spread rapidly during the time period preceding the U.S. Civil War is well-known. In Britian, David Urquhart was the main proponent of the day of Turkish Baths, writing of them in 1850 as he details his travels from a couple of years previous throughout Spain and Morocco. He compared the dry,

hot-air baths in the Ottoman Empire with those used during Roman times. After Urquhart and Richard Barter constructed the first modern bath near Blarney, County Cork, Ireland, the idea found ready acceptance. Another bath was built in London in July 1860, and hundreds soon opened across Britain and the British Empire.<sup>30</sup> With such news spreading worldwide, one can only imagine its potential impact on heating systems used during the Civil War.

Towards the war's end, there were official observers sent by Jefferson Davis, the U.S. Secretary of War, to witness several things during the Crimean War. First, they were to examine the English medical service, very noteworthy for our purposes. Secondly, they were to observe English and Russian military tactics.<sup>31</sup> General George McClellan, who would, in just a few short years become commander of the Army of the East (later, the Army of the Potomac) and later still, general in chief of all Union Armies, would be one of these observers. If he saw or experienced anything approximating a Crimean Oven, he never said so.

What are some other hypotheses that we might make, linking the name "Crimean Oven" with the Crimean War? It is difficult to say, but first, we might make the point that the warfare of this era was undertaken from trenches. Therefore, the use of a trench in heating could possibly be linked to Crimea simply because of the trench feature.

A second possibility for the name, even more unlikely, was the fact that the British and French encountered Russian rifle pits inside ravines, caves, and clusters of stone huts. The Russian sharpshooters worked from such areas frequently referred to as "ovens", "The Ovens", or "wasps' nests".<sup>32 33</sup> In a tangential way, perhaps the Civil War

heating term “Crimean Oven” might result from the rifle pits “heating up” during the Crimean War, doubtful though this theory may be.

Previously discussed was the Turkish Bath system of radiant underground heating and its potential for influencing the name of the later Union field hospital heating system. This heated-floor method hailed from the Ottoman Empire, with examples most likely being encountered by the Allies during the Crimean War, whether in Constantinople, or Crimea (modern-day Ukraine), where such baths were in use, along with their method of forced-air heat. This writer’s best supposition for the origin of the name “Crimean Oven” comes from the oven method of heating bathhouse floors which would be well-known among troops stationed there and which technology was spreading rapidly around the world, along with the influence of the California Furnace from the Gold Rush of the 1840s and 1850s, albeit the name is different.

So while this researcher found no clear connection with the Crimean War other than the tangential similarity noted above, it may be enough to lend the name to this heating feature.

The heating oven in William Henry Jackson’s sketch closely resembles the description set forth by Dr. Charles Tripler, even though it is found inside the winter quarters. The unmistakable shape and dimensions appear in keeping with the written description. We know that Dr. McRuer had an exact model which he built in multiple camps, which was a “modification of the Crimean Oven”. From all of the written records, it is evident that this model was not always embraced nor utilized in all of the Union camps. The firebox varied at times from brick, to mud, to stone. The trench varied, sometimes with a stone-lined or brick-lined trench covered with sheet-metal or



earth and stone, occasionally with chimney tubing running down the channel. And finally, the chimney itself varied, from brick, to stove-pipe, to barrel-and-mud.

What may be agreed upon is that this Civil War field hospital heating innovation, known as the Crimean Oven or California Plan, saved many thousands of lives during the war and during those thereafter, such as the Franco-Prussian War. Only future archaeological excavation of sites known to contain the heating feature, such as those at Winchester and assumed at Culpeper, will shed further light on this little known aspect that had such a massive impact on soldiers' health and well-being during the 1860s.

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### **Endnotes**

<sup>1</sup> General R. B. Maret, U. S. A., Chief of Staff Army of the Potomac, The War of the Rebellion: a compilation of the official records of the Union US War Dept. , p. 664, Headquarters Army Of The Potomac, Office Medical Director, Washington, November 25, 1861.

<sup>2</sup> Charles S. Tripler, Medical Director of the Army of the Potomac, The Official Records of the War of the Rebellion , Report of the operations of the medical department of that Army from August 12, 1861, to March 17, 1862., O.R. SERIES I VOLUME 5 S#5, <http://www.civilwarhome.com/tripleror.htm>.

<sup>3</sup> Boston medical and surgical, Volumes 64-65, page 257, <http://books.google.com/books?pg=RA1->

[PA257&dq=tents%20heating&ei=XLKmTozTJMS1tgfJ0LitAg&ct=result&id=mD4BA  
AAAYAAJ&output=text.](http://www.familytales.org/dbDisplay.php?id=ltr_waw7183&year=1864)

<sup>4</sup> E.B. Brown, Brigadier-General of Volunteers, Commanding,  
HEADQUARTERS DISTRICT OF CENTRAL MISSOURI, O.R., SERIES I VOLUME  
XXXIV/2, [S# 62] Union Correspondence, Orders, And Returns Relating To Operations  
In Louisiana And The Trans-Mississippi States And Territories, From January 1, 1864,  
To March 31, 1864 Jefferson City, Mo., January.4, 1864. Written to Col. JAMES  
McFERRAN, Commanding Sixth Sub-district, Warrensburg.

<sup>5</sup> Richard F. Miller, Harvard's Civil War: a history of the Twentieth Massachusetts  
Volunteer Infantry,  
p. 50.

<sup>6</sup> [http://www.familytales.org/dbDisplay.php?id=ltr\\_waw7183&year=1864](http://www.familytales.org/dbDisplay.php?id=ltr_waw7183&year=1864) .

<sup>7</sup> Radiant Mythology, 2004-2010, Robert Bean, R.E.T.,  
www.climateadvanced.com/.../22-Myths-about-radiant-heating.pdf.

8

[http://www.whjcollection.com/show\\_more2.asp?ind=252&sel=1&sto=any&depo=Civil  
War&typo=Pencil\\_Drawing&yro=2&cate=&pgno=1.](http://www.whjcollection.com/show_more2.asp?ind=252&sel=1&sto=any&depo=Civil<br/>War&typo=Pencil_Drawing&yro=2&cate=&pgno=1)

<sup>9</sup> Correspondence from Terry Reimer, Director of Research, National Museum of Civil  
War Medicine, October 2011.

<sup>10</sup> Manual of military hygiene for the military services of the United States, p. 548-549  
January 1917.

<sup>11</sup> The Medical and Surgical History of the War of the Rebellion, P. III., V II., Surgical  
History, pp. 921 W. Wood and company U.S. Government Printing Office. 1883,

[http://www.archive.org/stream/manualofmilitary00havaiala/manualofmilitary00havaiala\\_djvu.txt](http://www.archive.org/stream/manualofmilitary00havaiala/manualofmilitary00havaiala_djvu.txt).

<sup>12</sup> The Chinese in California, U.S. Library of Congress, 2003, 1850 - 1925, <http://memory.loc.gov/ammem/award99/cubhtml/theme7.html>

<sup>13</sup> Encyclopedia of World Biography,  
<http://www.notablebiographies.com/supp/Supplement-Mi-So/Seacole-Mary.html> .

<sup>14</sup> The Civil War at Gloucester Point, Mitigation of Site 44GL358, Technical Report Series No. 19, Submitted to Virginia Department of Transportation by William and Mary Center for Archaeological Research, Department of Anthropology, Thomas F. Higgins III et al, October 12, 1995.

<sup>15</sup> The Language of the Civil War, John D. Wright, Greenwood, August 2001, p. 52.

<sup>16</sup> Hardtack and Coffee: The Unwritten Story of Army Life, John D. Billings, p. 301,  
<http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A2001.05.0006%3Achapter%3D17>.

<sup>17</sup> Ibid., p. 300.

<sup>18</sup> History of the Civil War, “Tents”, Robert Niepert,  
<http://www.floridareenactorsonline.com/tents.htm>.

<sup>19</sup> A Dictionary of Hygiène and Public Health, Alexander Wynter Blyth, Ambroise Tardieu, Edinburgh and London: Ballantyne, Hanson and Co., p. 286-287, (306 in pdf),  
[http://books.google.com/books?id=we4TAAAAIAAJ&pg=PA287&dq=heating+systems+for+tents+during+the+crimean+war&hl=en&ei=\\_IGYTsvhK6Hi0QHJ252mBA&sa=X&oi=book\\_result&ct=result&resnum=9&ved=0CF4Q6AEwCDgK#v=onepage&q&f=false](http://books.google.com/books?id=we4TAAAAIAAJ&pg=PA287&dq=heating+systems+for+tents+during+the+crimean+war&hl=en&ei=_IGYTsvhK6Hi0QHJ252mBA&sa=X&oi=book_result&ct=result&resnum=9&ved=0CF4Q6AEwCDgK#v=onepage&q&f=false).

<sup>20</sup> Reports Made to the General Assembly of Illinois, Volume 1, By Illinois General Assembly, page 452,

<http://books.google.com/books?pg=PA452&dq=tents%20heati%20flue&ei=rSmTvTFLIuEtgexw7kG&ct=result&id=kDMbAQAAIAAJ&output=text>.

<sup>21</sup> Medical and surgical reporter, Volume 33, edited by Harold Kynett, Samuel Worcester Butler, D.G. Brinton, page 124,

<http://books.google.com/books?pg=PA124&lpg=PA124&dq=tent%20hospitals%20history%20heating&sig=WcNmS5tOPsOq11AVPcHbQ2tQVJs&ei=NK-sTrnJKoPr0gHc5qjADw&ct=result&id=cUegAAAAMAAJ&ots=M8zgl1btOO&output=text>.

<sup>22</sup> The American Ambulance of 1870-71, Louis Judson Swinburne, "Chapter Four", Paris Sketches, Joel Mursell, Albany NY, 1875. <http://www.ourstory.info/1/AA1.html>,

<sup>23</sup> The Siege of Sevastopol, <http://www.britishbattles.com/crimean-war/sevastopol.htm>.

<sup>24</sup> Russia and Turkey in the XIXth Century, p. 150, (Constantinople),

[http://www.archive.org/stream/russiaturkeyinni00lati/russiaturkeyinni00lati\\_djvu.txt](http://www.archive.org/stream/russiaturkeyinni00lati/russiaturkeyinni00lati_djvu.txt).

<sup>25</sup> Influence of the Crimean War on Hospitals, U.S. Army Medical Department, Office of Medical History, p. 16),

<http://history.amedd.army.mil/booksdocs/wwi/militaryhospitalsintheus/introduction.htm>.

<sup>26</sup> The Lancet, p. 873, Letter to the Editor of The Lancet from Cameron J. F. S.

MacDowall, M.R.C.S.L., Surgeon H.M.'s Bombay Army. November, 1871, Rapport du

Comité consultatif: Report of the Advisory committee By International Financial

Conference, UM-MEDSEARCH Gateway, League of Nations.

<sup>27</sup> Dale Hospital - A Civil War Hospital with Community Support,

<http://www.worcesterma.gov/city-clerk/history/general/dale-hospital>.

<sup>28</sup> Military Europe: a Narrative of Personal Observation and Personal Experience,

Nelson Appleton Miles – p. 19).

<sup>29</sup> Dr Charles H Shepard & the first Turkish baths in the USA,

<http://www.victorianturkishbath.org/2HISTORY/atozhist/NewYork/ColumbiaSF.htm>.

<sup>30</sup> [http://en.wikipedia.org/wiki/Turkish\\_bath](http://en.wikipedia.org/wiki/Turkish_bath)).

<sup>31</sup> April 2009 newsletter,

<http://www.civilwarroundtablepalmbeach.org/newsletters/v22n4.htm>

<sup>32</sup> Claude, Thomas Bouchier, (Lieutenant, afterwards Colonel), 1st Battalion (The Prince Consort's Own) Rifle Brigade, Knight of the Legion of Honour),

[http://www.armynavyairforce.co.uk/victoria\\_cross.htm](http://www.armynavyairforce.co.uk/victoria_cross.htm).

<sup>33</sup> Letters from Head-Quarters: or, The Realities of the War in the Crimea, Somerset

John Gough Calthorpe, p. 435,

<http://books.google.com/books?pg=PA435&1pg=PA436&dq=crimean%20oven%20russian%20rifle%20pits&sig=5f-AY9MLaAr6q5->

[VRSIx7cYAcOE&ei=InbmTqeiC4jj0QGe7PnBBQ&ct=result&id=FdcKAAAIAAJ&ots=aq7-NQH6eR&output=text](http://books.google.com/books?pg=PA435&1pg=PA436&dq=crimean%20oven%20russian%20rifle%20pits&sig=5f-AY9MLaAr6q5-VRSIx7cYAcOE&ei=InbmTqeiC4jj0QGe7PnBBQ&ct=result&id=FdcKAAAIAAJ&ots=aq7-NQH6eR&output=text).

## Bibliography

- 1 Maret, General R. B. The War of the Rebellion: a compilation of the official records of the Union US War Dept. November 25, 1861 Headquarters Army Of The Potomac, Office Medical Director, Washington, U. S. A., Chief of Staff Army of the Potomac.– p. 664
- 2 Tripler, Charles S., The Official Records of the War of the Rebellion, Report of Surg. Medical Director of the Army of the Potomac, of the operations of the medical department of that Army from August 12, 1861, to March 17, 1862., O.R.-- SERIES I-- VOLUME 5 [S# 5], <http://www.civilwarhome.com/tripleror.htm>
- 3 Boston medical and surgical <http://books.google.com/books?pg=RA1-PA257&dq=tent%20heating&ei=XLKmTozTJMS1tgfJOLitAg&ct=result&id=mD4BAAAYAAJ&output=text> Volumes 64-65, page 257
- 4 Brown, E.B. Brigadier-General of Volunteers O.R.-- SERIES I--VOLUME XXXIV/2 [S# 62] Union Correspondence, Orders, And Returns Relating To Operations In Louisiana And The Trans-Mississippi States And Territories, From January 1, 1864, To March 31, 1864 HEADQUARTERS DISTRICT OF CENTRAL MISSOURI, Jefferson City, Mo., To Col. JAMES McFERRAN, Commanding Sixth Sub-district, Warrensburg, January 4, 1864.
- 5 Miller, Richard F. Harvard's Civil War: a history of the Twentieth Massachusetts Volunteer Infantry p. 50
- 6 Whitman, Walt Letter to Louisa Whitman, 12 February 1864 [http://www.familytales.org/dbDisplay.php?id=ltr\\_waw7183&year=1864](http://www.familytales.org/dbDisplay.php?id=ltr_waw7183&year=1864)
- 7 Bean, Robert Radiant Mythology, Copyright © 2004-2010 [www.climateadvanced.com/.../22-Myths-about-radiant-heating.pdf](http://www.climateadvanced.com/.../22-Myths-about-radiant-heating.pdf)
- 8 Jackson, William Henry Interior of a military Tent with Semi permanant Brick Stove. Catalogue Num: SCBL\_260 1863 Scotts Bluff National Monument [http://www.whjcollection.com/show\\_more2.asp?ind=252&sel=1&sto=any&depo=CivilWar&typo=Pencil Drawing&yro=2&cate=&pgno=1](http://www.whjcollection.com/show_more2.asp?ind=252&sel=1&sto=any&depo=CivilWar&typo=Pencil Drawing&yro=2&cate=&pgno=1)
- 9 Reimer, Terry, Correspondence from Director of Research, National Museum of Civil War Medicine, October 2011
- 10 Manual of military hygiene for the military services of the United States, W. Wood and company, January 1917, p. 548-549

[http://www.archive.org/stream/manualofmilitary00havaiala/manualofmilitary00havaiala\\_djvu.txt](http://www.archive.org/stream/manualofmilitary00havaiala/manualofmilitary00havaiala_djvu.txt)

11 The Medical and Surgical History of the War of the Rebellion, U.S. Government Printing Office. 1883., P. III., V II., Surgical History, pp. 921

12 The Chinese in California 1850 - 1925, U.S. Library of Congress. 200, <http://memory.loc.gov/ammem/award99/cubhtml/theme7.html>

13 Encyclopedia of World Biography  
<http://www.notablebiographies.com/supp/Supplement-Mi-So/Seacole-Mary.html>

14 Higgins III , Thomas F. The Civil War at Gloucester Point, Mitigation of Site 44GL358, Technical Report Series No. 19, William and Mary Center for Archaeological Research, Department of Anthropology, October 12, 1995

15 Wright, John D. The Language of the Civil War Greenwood, August 2001, p. 52

16 Billings, John D. Hardtack and Coffee: The Unwritten Story of Army Life, p. 30, May 10, 2001  
<http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A2001.05.0006%3Achapter%3D17>

17 Ibid., p. 300

18 Niepert, Robert History of the Civil War,  
<http://www.floridareenactorsonline.com/tents.htm>)

19 Blyth, Alexander Wynter Tardieu, Ambroise A Dictionary of Hygiène and Public Health Hanson and Co., Edinburgh and London: Ballantyne p. 286-287 (306 in pdf)  
[http://books.google.com/books?id=we4TAAAAIAAJ&pg=PA287&dq=heating+systems+for+tents+during+the+crimean+war&hl=en&ei=IGYTsvhK6Hi0QHJ252mBA&sa=X&oi=book\\_result&ct=result&resnum=9&ved=0CF4Q6AEwCDgK#v=onepage&q&f=false](http://books.google.com/books?id=we4TAAAAIAAJ&pg=PA287&dq=heating+systems+for+tents+during+the+crimean+war&hl=en&ei=IGYTsvhK6Hi0QHJ252mBA&sa=X&oi=book_result&ct=result&resnum=9&ved=0CF4Q6AEwCDgK#v=onepage&q&f=false)

20 Reports Made to the General Assembly of Illinois Volume 1 page 452  
<http://books.google.com/books?pg=PA452&dq=tents%20heatin%20flue&ei=rSmTvTFLIuEtgexw7kG&ct=result&id=kDMbAQAIAAJ&output=text>

21 Kynett, Harold Samuel Butler, Worcester Brinton, D G, Medical and surgical reporter, Volume 33 page 124  
<http://books.google.com/books?pg=PA124&lpg=PA124&dq=tent%20hospitals%20history%20heating&sig=WcNmS5tOPsOql1AVPcHbQ2tQVJs&ei=NK-sTrnJKoPr0gHc5qjADw&ct=result&id=cUegAAAAMAAJ&ots=M8zgl1btOO&output=text>

22 Swinburne, Louis Judson, The American Ambulance of 1870-71, Chapter Four, Paris

- Sketches, Joel Mursell, Albany NY, 1875, <http://www.ourstory.info/1/AA1.html>
- 23 The Siege of Sevastopol, <http://www.britishbattles.com/crimean-war/sevastopol.htm> )
- 24 Russia and Turkey in the XIXth Century, p. 150, Constantinople  
[http://www.archive.org/stream/russiaturkeyinni00lati/russiaturkeyinni00lati\\_djvu.txt](http://www.archive.org/stream/russiaturkeyinni00lati/russiaturkeyinni00lati_djvu.txt)
- 25 Influence of the Crimean War on Hospitals, U.S. Army Medical Department, Office of Medical History, p. 16  
<http://history.amedd.army.mil/booksdocs/wwi/militaryhospitalsintheus/introduction.htm>
- 26 Letter to the Editor of The Lancet from Cameron J. F. S. MacDowall, M.R.C.S.L., Surgeon H.M.'s Bombay Army. November, 1871 The Lancet p. 873 Rapport du Comité consultatif: Report of the Advisory committee By International Financial Conference, UM-MEDSEARCH Gateway, League of Nations
- 27 Dale Hospital - A Civil War Hospital with Community Support  
<http://www.worcesterma.gov/city-clerk/history/general/dale-hospital>
- 28 Miles, Nelson Appleton [Military Europe: a Narrative of Personal Observation and Personal Experience](#) p. 19
- 29 Dr Charles H Shepard & the first Turkish baths in the USA  
<http://www.victorianturkishbath.org/2HISTORY/atozhist/NewYork/ColumbiaSF.htm>
- 30 [http://en.wikipedia.org/wiki/Turkish\\_bath](http://en.wikipedia.org/wiki/Turkish_bath))
- 31 <http://www.civilwarroundtablepalmbeach.org/newsletters/v22n4.htm>
- 32 Bouchier, Claude Thomas Lieutenant, 1st Battalion (The Prince Consorts Own) Rifle Brigade, Knight of the Legion of Honour  
[http://www.armynavyairforce.co.uk/victoria\\_cross.htm](http://www.armynavyairforce.co.uk/victoria_cross.htm),
- 33 Calthorpe, Somerset John Gough, Letters from head-quarters: The realities of the war in the Crimea, p. 435,  
<http://books.google.com/books?pg=PA435&lpg=PA436&dq=crimean%20oven%20russian%20rifle%20pits&sig=5f-AY9MLaAr6q5-VRSIx7cYAcOE&ei=InbmTqeiC4jj0QGe7PnBBQ&ct=result&id=FdcKAAAIAAJ&ots=aq7-NQH6eR&output=text>
- 34 Geier, Babits, and Scott, The Historical Archaeology of Military Sites: Method and Topic, <http://www.ourstory.info/library/1-roots/Evans/aa01.html>
- 35 Evans, Thomas W., History of the American Ambulance,  
<https://mail.google.com/mail/?ui=2&ik=add56c875b&view=att&th=13314c1613665363&attid=0.0&disp=inline&zw>



36 The Boston Medical and Surgical Journal, Vol. 91, by Mass. Medical Soc., New England Surgical Society, <http://www.civilwardiary.net/diary1863.htm>, Civil War Diary of Sergeant Henry W. Tisdale, Jan. – July 1863

37 Manual of Military Hygiene for the Military Services of the United States, p. 548-549, January 1917, W. Wood and company, <http://civilwarlibrarian.blogspot.com/2008/05/news-archaeology-heating-military.html>  
[http://www.archive.org/stream/manualofmilitary00havaiala  
manualofmilitary00havaiala\\_djvu.txt](http://www.archive.org/stream/manualofmilitary00havaiala/manualofmilitary00havaiala_djvu.txt)

38 Variety of Events to Commemorate the Third Battle of Winchester, <http://www.civilwar.org/aboutus/news/news-releases/2004-news/variety-of-events-to.html>

39 Medical and Surgical Reporter, Volume 33 page 124, <http://books.google.com/books?pg=PA124&lpg=PA124&dq=tent%20hospitals%20history%20heating&sig=WcNmS5tOPsOq11AVPcHbQ2tQVJs&ei=NK-sTrnJKoPr0gHc5qjADw&ct=result&id=cUegAAAAMAAJ&ots=M8zgl1btOO&output=text>

40 Istanbul During the Turkish Period, <http://www.istanbulhotels.net/history/turkishperiod.htm>

41 Cohen, I. Bernard, Florence Nightingale, <http://www.unc.edu/~nielsen/soci708/cdocs/cohen.htm>

42 Dr Charles H Shepard & the first Turkish baths in the USA, <http://www.victorianturkishbath.org/2HISTORY/atozhist/NewYork/ColumbiaSF.html>

43 [http://en.wikipedia.org/wiki/Turkish\\_bath](http://en.wikipedia.org/wiki/Turkish_bath)

44 Civil War Round Table Palm Beach County, April 2009 newsletter, <http://www.civilwarroundtablepalmbeach.org/newsletters/v22n4.htm>

45 Russia and Turkey in the XIXth Century : Constantinople, p. 150, [http://www.archive.org/stream/russiaturkeyinni00lati/russiaturkeyinni00lati\\_djvu.txt](http://www.archive.org/stream/russiaturkeyinni00lati/russiaturkeyinni00lati_djvu.txt)

46 NEWSLETTER - Council for Northeast Historical Archaeology, July 1995, Number 31, [www.cneha.org/newsletters/1995.pdf](http://www.cneha.org/newsletters/1995.pdf)

47 William and Mary Center for Archaeological Research, Lysbeth B. Acuff, The Civil War at Gloucester Point: Mitigation of Site 44GL358, Associated with the Proposed Route 17 Coleman Bridge Project, Gloucester County, Virginia by Thomas F. Higgins III, Charles M. Downing, Kenneth E. Stuck, Gregory J. Brown, and Karl J. Reinhard, 1995 <http://bellsouthpwp.net/g/d/gdmorg/WMCAR/tech.html>

- 48 Bean, Robert, History of Radiant Heating & Cooling Systems, Member ASHRAE; Bjarne W. Olesen, Ph.D., Fellow ASHRAE; Kwang Woo Kim, Arch.D., Member ASHRAE Journal, February 2010. Copyright 2010 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. Posted at [www.ashrae.org](http://www.ashrae.org).
- 49 Florence Nightingale's Letters from Crimea, 1854-1856
- 50 Langdon-Davies, John, The Crimean War: A Collection of Contemporary Documents. National Archives/College Park – 3<sup>rd</sup> Floor – Cartographic & Architectural
- 51 A Guide to Civil War Maps in the National Archives, Record Group 92 (RG 92) – Records of the Office of the Quartermaster General, p. 54
- 52 CLAUDE THOMAS BOURCHIER (Lieutenant, afterwards Colonel) 1st Battalion (The Prince Consort's Own) Rifle Brigade Knight of the Legion of Honour  
[http://www.armynavyairforce.co.uk/victoria\\_cross.htm](http://www.armynavyairforce.co.uk/victoria_cross.htm)
- 53 Crimean Texts LEADING ARTICLES, 2nd leader The Times, 5.5.1855, p. 9, <http://crimeantexts.russianwar.co.uk/sources/times/t550505b.html>
- 54 Rees, John U., Soldiers are ingenious animals, American Civil War Campaign Shelters <http://www.libertyrifles.org/research/campaignshelters.html>

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