

# Historical Natural History: Insects and the Civil War

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*The fact that microbes caused more death than hostile fire is well known to the student of the American Civil War. However, much overlooked is the insect role in the transmission of disease-causing organisms. Maladies such as dysentery and malaria have an important or critical insect component and accounted for tremendous suffering during the war. Surrounded by insects such as flies, lice, and fleas, both Union and Confederate soldiers often found themselves battling more than each other. This account reveals the influence of insects on soldiering during the Civil War.*

## Reveille

Around 4:30 A.M., a signal cannon fired a shot from Ft. Johnson, SC.<sup>1</sup> Moments later, Edmond Ruffin pulled the lanyard on one of the columbiads off Morris Island. His target was a fort in Charleston Harbor—Ft. Sumter. For Ruffin, the Southern firebrand who was adamant about state's rights, firing on the Federal position was the only recourse left. Civil War historians generally credit Ruffin with firing the first shot of the American Civil War (1861–1865) but often neglect his other contributions. Prior to the Civil War, Ruffin was the editor of the *Farmers' Register*. He espoused the then radical idea known as “marling” which was a technique for soil improvement using carbonate lime manure. His writings, however, also included a study of the life history and cultural control of the “Corn or fly-weevil”<sup>2</sup> (the Angoumois grain moth, *Sitotroga cerealella* [Olivier]).

Although the dubious distinction of firing the first shot of the Civil War may have fallen on an entomologist, other folk with entomological interests also were involved in the war. Nearly four years later, one of those entomol-



Soldiers, because of their high literacy rate, could record their insect-related experiences during the war. Illustration from Billings (1887).

ogists witnessed the surrender of General Robert E. Lee's Army of Northern Virginia. Although all hostilities did not end with Lee's surrender, the Confederate army was shattered as a viable fighting force. F. W. Snow, the noted teacher in entomology, recorded the event at Appomattox<sup>3</sup> in his wartime journal (Mallis 1971). Snow was an avowed pacifist who served in the U.S. Christian Commission and aided the wounded (Mallis 1971). The war that

<sup>1</sup>12 April 1861.

<sup>2</sup>Ruffin believed that the common name “weevil” served to confuse the insect. He stated correctly that the insect “in its perfect state is a moth” (Ruffin 1847).

<sup>3</sup>9 April 1865.



Soldiers were quick to record the flyblown condition of fallen comrades and enemies. Here, Union dead lie on the field at Gettysburg (USAMHI; see acknowledgments).

began with a fire-eating entomologist saw its historic end with a pacifistic entomologist.

The Civil War touched the lives of many Americans, including many associated with the classical era of American entomology. The list of those who served in the military or were influenced by the war reads like a Who's Who of early entomology. The war even affected the language of entomologists who did not serve. In Asa Fitch's field observations of the Hessian fly [*Mayetiola destructor* (Say)] on 23 June 1862, he described collecting the adult midges. Using "a slang term which has recently become current in our country," he noted that the adult midge "skedaddles" when it is approached with a vial (Fitch 1865). Fitch's June entries predated the Seven Days<sup>4</sup> near Richmond and the resulting Union withdrawal. The common soldier's term for military retreat—skedaddle—had found its way into the entomological literature.

The wealth of information available to the student of the Civil War, one of the best documented wars in human history, exists for a number reasons. For the first time, the American population had a high degree of literacy. This was significant because more soldiers could record their thoughts and experiences of the war. Some participants were eloquent writers, whereas others barely were literate. Examples of such writings are included verbatim in this article. Information concerning daily life, regimental strengths, and troop movements was described and mailed without restriction, because soldiers' letters were not censored during the Civil War. Soldiers and their families,

sensing the historical importance of the war, preserved many of those personal accounts and reminiscences. In addition, the Civil War was the first war that was photographed extensively. This photographic legacy provides a wonderful glimpse of the activities of soldiers and their lives. Other illustrative sources include the various sketches and drawings made by soldiers and reporters. Some of the insect-related illustrations are included in John Billings' (1887) excellent narrative, *Hardtack and Coffee*.

Whole treatises are devoted to a single day of a particular Civil War campaign; others are devoted to tactics, accouterments, soldier life, medicine, regimental histories, ghosts, and even sex. But none is devoted entirely to the role of insects in the Civil War, despite the effects of insects on nearly every aspect of a war said to define us as Americans. The influence of insects and disease on the Napoleonic Campaigns and military history has been discussed recently by Peterson (1995). Like Peterson's study, the present work represents an investigation into the influence of insects during wartime conditions. My purpose is to illuminate not only the relationships between insects and disease but also to include the many aspects that involved insects and soldiering during the Civil War.

## Flies by the Scores

At the call to arms, communities throughout the North and South began assembling troops. It was evident that insects also were amassing with the soldiers. Flies were advance denizens in the bivouacs. Early in the war, one Confederate described the fly problem in camp.

When we open our eyes in the morning we find the canvas roofs and walls of our tents black with them [flies]. . . . It needs no morning reveille then to rouse the soldier from his slumbers. The tickling sensations about the ears, eyes, mouth, nose, etc., caused by the microscopic feet and inquisitive suckers of an army numerous as the sands of the sea shore will awaken a regiment of men from innocent sleep to wide-awake profanity more promptly than the near beat of the alarming drum (Wiley 1994).

Another Confederate continued, "I get vexed at them and commence killing them, but as I believe forty come to every one's funeral I have given it up as a bad job" (Wiley 1994). Avoiding the enemy proved easier than avoiding flies.

<sup>4</sup>25 June–1 July 1862.

To appreciate the fly problems that confronted the soldiers, it is important to understand soldiering in the Union and Confederate armies. This was an era before the highly mechanized armies of the twentieth century. Excepting river transport, trains, and one's own feet, much of the transportation depended upon animals—horses, mules, and, occasionally, oxen. The number of animals required to support both armies dwarfs anything by today's standards. In 1864, the Army of the Potomac was followed by more than 4,000 six-mule team wagons as it entered the Wilderness Campaign.<sup>5</sup> The total number of horses and mules that began that campaign was 56,499. Armies from the western theater also maintained a large animal entourage. General Sherman's army of 60,000 was accompanied by 2,500 wagons and 600 ambulances (Billings 1887). It is probable that those wagons also were pulled by six-mule teams.

This, too, was an era before modern MREs (Meals Ready to Eat). Meat rations commonly were supplied as fresh beef, although this was often a luxury for many Confederate soldiers. To supply meat for the soldiers, large cattle trains had to be moved with the army. When the Union army crossed the Rapidan before the Wilderness, it was accompanied by an estimated 8–10,000 head of cattle (Billings 1887). This massing of humanity and animals produced equally large quantities of garbage, refuse, and excrement that surrounded the soldiers from all sides. A Virginia private elaborated in his diary: "Dec. 3, 1863 . . . On rolling up my bed this morning I found I had been lying in—I won't say what—something though that didn't smell like milk and peaches" (Wiley 1994).

At the beginning of a new campaign, marching routes usually were strewn with every imaginable article of clothing and personal effect deemed unnecessary or too burdensome by the soldier. But widespread untidiness probably best manifested itself in camp. Brooks' (1966) description of the soldiers' camps was no doubt apt.

Few recruits bothered to use the slit-trench latrines (and those who did usually forgot to shovel dirt over the feces) and most urinated just outside the tent—and after sundown, in the street. Garbage was everywhere, rats abounded, and dead cats and dogs turned up in the strangest places. The emanations of slaughtered cattle and kitchen offal together with the noxious effluvia

from the seething latrines and infested tents produced an olfactory sensation which has yet to be duplicated in the Western Hemisphere. As for water—and seldom was there enough—any source would do in the early camps. Frequently, it was so muddy and fetid the men held their noses when they drank the stuff. In many instances, the heavy rains washed fecal material directly into the supply with disastrous consequences.

The extensive untidiness made excellent breeding habitats for filth flies, especially during the warmer months. The flies' presence represented more than just a nuisance. The habit of crawling on refuse and excrement and then on humans and their food was a serious problem, one not fully realized at the time. Flies are potential vectors of pathogens that cause cholera, diarrhea, dysentery, and typhoid (Greenberg 1973). By the end of the war, diseases would take the lives of more soldiers than would hostile fire (Brooks 1966).

Dysentery and diarrhea were by far the most common ailments in both Union and Confederate armies. Although flies probably were not involved in every enteric disease, there is little doubt they contributed to the prominence of such ailments. Whether soldiers called it the "quickstep" or the "alvine flux," diarrhea and dysentery were the Civil War's greatest cause of misery. Union records list more than 1.7 million cases of dysentery and diarrhea, maladies that took the lives of nearly 60,000 soldiers (Wiley 1992). The suffering from these diseases was especially bad in prisons. More than 4,500 of nearly 20,000 Union prisoners confined between 1 March and 31 August 1864, died of dysentery and diarrhea at Andersonville, GA (Brooks 1966). Confederate

Battlefields were strewn not only with human wreckage. A fearful toll was exacted on military animals. The dead artillery horses near the Trostle barn at Gettysburg also would become quickly flyblown in the July heat (USAMHI).



<sup>5</sup>5–6 May 1864.



prisoners also suffered; of the nearly 41,000 Rebels held at various prisons in the North, dysentery and diarrhea took 6,000 lives (Brooks 1966).

Symptoms of dysentery and diarrhea manifested themselves as more than an occasional case of loose bowels; one soldier noted that his bowels moved 18 times in three hours while he was on as Corporal of the Guard (Wiley 1992). Rank would not exempt one from ravages of the flux. At the battle of Gettysburg,<sup>6</sup> General Robert E. Lee suffered with severe diarrhea (Freeman 1935), prompting some students of the Civil War to wonder if his debilitation played some role in the Confederates' defeat. With such problems, it is amazing that either the Union or Confederate army could carry out its duties, especially when called to battle. One Confederate elaborated on a cure for the bowel problems that plagued him:

I with a number of others were sufferers from camp diarrhea, as it was called, and up to that time we had found no cure—so, entering the battle, I had quite a great fear that something disgraceful might happen and it was somewhat uppermost in my mind; but to my surprise the excitement or something else, had effected a cure. I inquired of some of the others and they reported a cure (Wiley 1994).

Because this "battlefield" cure was not constantly available or especially welcomed, other medicaments were sought. Treatments of opium and belladonna were therapeutic in checking diarrhea. Yet, other commonly prescribed treatments—heavy drafts of whiskey,

<sup>6</sup>1–3 July 1863.

doses of salts, calomel, turpentine, castor oil, chalk, and blue pills of mercury—led to disastrous results by aggravating the condition. Constipation was indeed a luxury for either Yank or Reb!

Fly problems were bad enough during periods of noncombat, but they were even worse after battle and added to the horrors of war. Although modern warfare has provided mechanized equipment to dig mass graves, produced various residual chemical sprays to inhibit fly development, and even supplied large quantities of petroleum fuels for burning the corpses, such technology was not present or used during the Civil War. Bodies often were buried hastily or, in many cases, never buried. The carnage of the battlefield made a prime breeding and feeding ground for flies, but humans were not the only casualties of these battles. Fearful tolls also were exacted on the military animals; at Gettysburg, more than 1,500 artillery horses were killed. Scenes of the fallen repeated themselves throughout the conflict. One Rebel private described the human wreckage after the battle of the Angle<sup>7</sup> at Spottsylvania, VA:

Those who were not very badly mutilated were swollen as long as they could swell. Their faces were nearly black, and their mouths, nose, eyes, hair, and the mutilated parts were full of maggots! This is a horrible picture, but . . . it is not overdrawn. What an awful scent!" (Wheeler 1991).

That much of the active campaigning took place during warmer months provided optimal breeding temperatures for flies, and the dead bodies quickly became maggot infested. One Pennsylvania private at the battle of Antietam<sup>8</sup> recalled after the war,

In the burial of the dead on this particular part of the field, the 130th Regiment, by reason of having incurred the displeasure of its brigade commander, was honored in the appointment as undertaker-in-chief. The weather was phenomenally hot, and the stench from the hundreds of black bloated, decomposed maggoty bodies, exposed to a torrid heat for three days after the battle, was a sight truly horrid and begging all power of verbal expression" (Stotemyer 1992).

As the bodies of the dead quickly became infested, the battle wounds of the living also

The open air and makeshift hospital facilities often were set up near the battlefield. Such a hospital was photographed by a barnyard at Antietam. Removal of wounded could take several days after some battles. Open and hastily bandaged wounds of admitted soldiers were prime breeding sites for flies (USAM-HI).



<sup>7</sup>12–13 May 1864.

<sup>8</sup>17 September 1862.

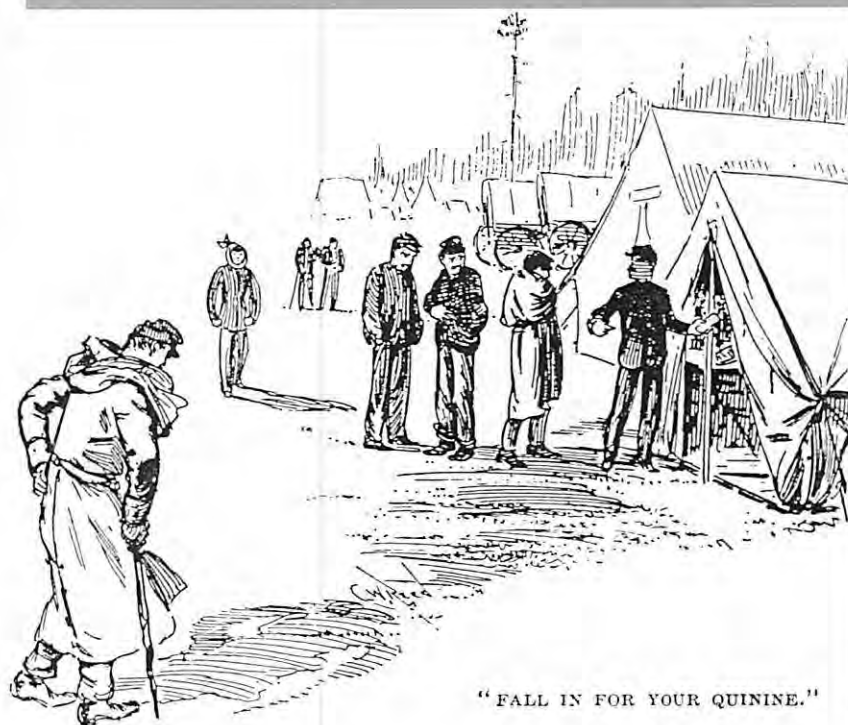
became flyblown. Maimed and wounded soldiers sometimes remained for days on the battlefield before receiving attention or being moved to a hospital. The exposed and open wounds also became prime breeding and feeding sites for carnivorous species of flies. Sallie Broadhead (1864), a civilian who kept a diary during Gettysburg, recorded the following incident just a few days after the battle.

I assisted in feeding some of the severely wounded, when I perceived that they were suffering on account of not having their wounds dressed. I did not know whether I could render any assistance in that way, but I thought I would try. I procured a basin and water, and went to a room where there were seven or eight, some shot in the arms, others in the legs, and one in his back, and another in the shoulder. I asked if any one would like to have his wounds dressed? Some one replied, "There is a man on the floor who cannot help himself, you would better see to him." Stooping over him, I asked for his wound, and he pointed to his leg. Such a horrible sight I had never seen and hope never to see again. His leg was all covered with worms [maggots].

If an exposed wound was not infested on the field, there was a good chance it would become so at the hospital. One Union private described a hospital scene: "Near the hospital was a pile of arms, legs, hands, and feet that had been cut from the wounded. These had not been buried, just thrown in a pile and worms [maggots] had begun to work on them" (Strong 1961). Union surgeons got rid of maggots in wounds with chloroform. Because of shortages in medical supplies, Confederate doctors did not always have access to such supplies. They discovered accidentally that the maggots were actually more efficient at digesting necrotic tissue than a scalpel or nitric acid (Brooks 1966). J. F. Zacharias, a surgeon in the Confederate army wrote:

During my service in the hospital at Danville, Virginia, I first used maggots to remove the decayed tissue in hospital gangrene and with eminent satisfaction. In a single day, they would clean a wound much better than any agents we had at our command. I used them afterwards at various places. I am sure I saved many lives by their use, escaped septicemia, and had rapid recoveries (Greenberg 1973).

Besides their efficiency, the maggots also excrete allantoin, which aids in the digestion of necrotic tissue and, thus, promotes new tissue growth. However, maggot therapy works best



"FALL IN FOR YOUR QUININE."

under sterile conditions—a situation that was a rarity during the Civil War given the lack of understanding of germs. Maggot therapy was not novel to the Civil War and had been rediscovered various times throughout history (Brooks 1966).

Prime breeding sites for flies existed around the camps, battlefields, and hospitals, but conditions also were ripe in the squalor of the prison camps. Probably the most notorious of these camps was the one at Andersonville, GA. Here, of the 33,000 Union prisoners confined on 26 stockaded acres, over 13,000 died; in the summer of 1864, the death rate was well over 100 per day (Byrne 1983). A visiting Confederate physician recorded some of the conditions at the prison. Near one area for cooking was a mound of "corn bread, bones, and filth of all kinds, thirty feet in diameter and several feet in height, swarming with myriads of flies" (Futch 1968). Whereas adult flies filled the air, maggots were found everywhere else. One prisoner recorded,

us Boys got a spade & took off the top of the ground & it was alive with maggots where we Lay & the Boys say the ground is so all around here Hard but cant be helped there isn't a Hog sty in the North aney nastier than this camp (Futch 1968).

Prisoners' rations also were likely to be flyblown. One Union diarist recorded beef rations as "some of the wormiest types I ever did see" (Futch 1968). Others concurred: "We draw this

Quinine was administered to Union soldiers to prevent malaria and a host of other ills. The Union blockade of the Confederacy made accession of the drug difficult in the South. Confederates relied on mixtures of alcohol and tree barks, black market quinine, or perseverance. Illustration from Billings (1887).



"TURNING HIM OVER."

From general to lowly private, lice were a constant companion to all soldiers. Illustration from Billings (1887).

evening spoilt beef and maggotly mush alive with worms" and

Rather Dul fourth I tell you shet up in A hog pen Drew fresh Beef or said to be fresh But I called it rather Oald all Magotts and stunk enough to knock a man over" (Futch 1968).

Maggots even were found in the water supply. The small stream that served for drinking water and a latrine was described as a "semi-liquid mass of filth" that contained "innumerable long-tailed large white maggots [rattailed maggots?]" along with "fermenting excrement, and fragments of bread and meat" (Futch 1968). This is an interesting comment for a couple of reasons. First, because rattailed maggots (Syrphidae) live in highly polluted water, it reflects the contaminated condition of that stream. Second, because rattailed maggots sometimes are responsible for human intestinal pseudomyiasis, one wonders if some of the soldiers may have suffered from this condition. Speculation aside, there is little doubt that flies added to the living hell of Andersonville.

## Gallinippers Galore

Although nonbiting flies abounded, biting flies proliferated as well, and presented their own set of problems. No story about the involvement of insects with the Civil War would be complete without referring to biting flies, especially mosquitoes. Called "gallinippers" by the soldiers, they were considered by some Confederates to be a greater nuisance than Yankee bullets. One imaginative Confederate, commenting on mosquitoes during the Civil War, said they were a "preponderous size—almost able to shoulder a musket" (Wiley 1994). The low-lying wet areas of the Mississippi River provided an excellent breeding habitat for mosquitoes. A Rebel compared the mosquitoes of his native Tennessee to those of his current billet in the Mississippi lowlands. "The Mississippi river fellow is far larger, has a longer and sharper bill, and though he sings the same tune, he sings it with far greater ferocity"; although the Tennessee mosquitoes could only muster squads, the Mississippi mosquitoes moved in regiments (Wiley 1994).

J. H. Browne, a correspondent for the New York Tribune, confirmed the mosquito problem along the Mississippi. He not only elaborated on his disdain for the pests but even accused them of having Confederate sympathies.

The countless mosquitoes in the vicinity of Fort Pillow, during the month of April, 1862, must have had strong Secession sympathies; they certainly were bitter enemies of the Nationalists and phlebotomized them without mercy. They never were so numerous and venomous before at that season of the year, in that latitude, and they bled soldiers and sailors as perseveringly as did ever Dr. Sangrado his system-murdered patients.

Those annoying insects were always vigilant, and had the honor of extracting the earliest sanguinary fluid during the bombardment.

They had no fear of gunboats or mortars, artillery or bayonets. They recognized no distinction in rank, attacking Commodores and Captains, Bohemians and Brigadiers alike.

One hundred did I slay, even while writing half a dozen lines; and yet there were thousands to supply their places. They seemed as anxious to die as the Rebels pretend to be.

The difference between them was, they did die, and the Rebels did not—when they could help it. Mortifying reflection to vain-glorious Man! Mosquitoes are braver than the three hundred Lacedaemonians who fought and fell beneath the shade of Xerxes' arrows.

Sleep was often an impossibility, on the Fleet or in camp; and a number of the Bohemians rose one morning with their optics so nearly closed, from the attack of the mosquitoes, that the poor fellows would have been entirely excusable if they had taken what, in bar-room parlance, is classically called, an eye-opener.

Confound the mosquitoes! I used to exclaim every minute. They were the pests of the South, and of summer, and, like the Thane of Cawdor, did murder sleep!

Every thing was very dull about Pillow the first two or three weeks, with the exception of the constant battles between the Bohemians and the mosquitoes; the latter having declared unrelenting and ceaseless war against the knights of the pen.

The strife went on without intermission, day and night; the mosquitoes relieving each other punctually, and mounting guard every five seconds.

We had no bars [mosquito bars or netting] on the fleet (and none in the Mississippi, for the matter of that), and we were therefore victims to the remorseless cruelty of the venomous insects at all times and in all places.

The Correspondents, as I have said, often arose in the morning with their visuals so swelled, from the bites of the winged pests, that they looked as if they had been taking a few first lessons in the "noble and manly art of self-defense," from the Tipton Slasher or the Benicia Boy.



I pitied the poor fellows, but the fact that my own suffering were even greater than theirs, prevented that complete exercise of commiseration which an intact epidermis would have insured.

The mosquitoes in that vicinity must have been of the true Secession order, being opposed—as the Richmond papers used to be—to reading and writing; believing it conducive to error and disobedience.

We never took up a book or commenced any manuscript but the mosquitos attacked us in force, and showed the most desperate determination to drive us from our labor or our lore.

The reason of this was, I conjecture, that the mosquitoes hated writing because they themselves could not write, and they therefore made their mark—most effectually, too, as my crimson-spotted hands and face fully and convincingly and painfully attested (Browne 1865).

The annoyance of mosquitoes also punctuated the eastern theater. Two days before the battle of Mechanicsville,<sup>9</sup> a Pennsylvanian recorded in his diary simply, “Went on picket at five o’clock in the evening. Got no sleep at all that night on account of the mosquitoes being so bad. No other news” (Tritt 1993). Presumably, the soldier got no sleep after he came off picket duty. A New York Volunteer stationed near Charleston, SC, described the hazards of picket duty in mosquito-infested areas.

Our worst picket duty is on the borders of the swamp. The myriads of stout ringtailed mosquitoes rush upon the detail the moment it arrives and jab their bills in chuck up to the head. Even overcoats are no protection from the torturing rascals, who pierce through everything. Sleep is of course impossible with such a ravenous hoard of bloodsuckers singing and biting and buzzing . . . getting up your sleeves and trouser legs, crawling slyly down your neck or dashing into your ears and throat, wearing a fellow’s life out with coughing, slapping, pinching and scratching (Whightman 1863).

Enduring the mosquitoes was bad enough, but it was the ensuing malaria that could prove worse for many soldiers. Folk of the 1860s did not connect the disease with mosquitoes. One Union soldier reflected that “We are more afraid of ague here than the enemy” (Wiley 1992). Malaria was termed “simple intermittent fever” by the medical professionals, but the soldiers referred to the malady as ague or

“the shakes.” Malaria was so prevalent in some camps that a standard greeting was “Have you had the shakes?” (Wiley 1992). There were over 1.3 million cases and 10,000 deaths from malaria in the Union Army (Steiner 1968). Fully one quarter of all illness reported in the Union Army was malarial in character (Wiley 1992). Confederate soldiers also suffered, although fatalities from the disease were comparatively lower. In 1861 and 1862, one seventh of all cases of sickness reported by Rebel armies east of the Mississippi was malarial (Wiley 1994). Malaria greatly affected at least one campaign. The prevalence of the disease among Union troops contributed in thwarting the first Federal attempt to capture Vicksburg, MS, in 1862 (Steiner 1968); the city did not fall until the following year.

Although malaria was common in both the North and South, an effective drug—quinine—was available for prevention and cure of the disease. Union armies used over 19 tons of quinine sulfate during the war (Smith 1976). However, the Northern blockade of the Confederacy made this drug difficult to obtain in the South, which led to quinine smuggling and a black market. Imaginative ways were devised for smuggling quinine. Federal guards detained one woman after it was found that she had sewn the medicine into her skirts. She was later released when it was discovered that she was the niece of the U.S. Postmaster General (Davis 1982). Another individual did manage to smuggle \$10,000 worth of quinine inside a dead mule (Davis 1982). In 1862, an ounce of



Delousing techniques varied among soldiers but a common technique was crushing the vermin and eggs with fingers ([k]nitting). Illustration from Billings (1887).

<sup>9</sup>26 June 1862.

Other soldiers sought quicker delousing techniques such as boiling garments. The company's cook kettle often doubled as the receptacle for boiling clothes. Illustration from Billings (1887).



BOILING THEM.

quinine cost \$5.00 in New York while the same quantity sold for \$60 in South Carolina. Toward the end of the war, an ounce of quinine was selling for \$400 to \$600 an ounce in the Confederacy (Garrison 1995). When one considers that a Confederate private made only \$16 a month by the war's end, buying the drug would have been prohibitively expensive but selling the drug could be quite lucrative. Because of the scarcity of quinine in the Confederacy, the Confederate Surgeon General had to improvise an antimalarial potion that contained a mixture of willow, poplar, dogwood bark, and whiskey (Wiley 1994). This may seem like an ineffective folk remedy, but inclusion of salicaceous plants such as willow and poplar (from which aspirin was originally derived) may have provided some fever relief.

Other biting flies also earned the respect (and damnation) of the soldiers. Because part of the life cycle of some these insects are spent in an aquatic habitat, soldiers who were stationed near those habitats soon became aware of the insects' presence. No-see-ums were one of the biting flies contributing to the discomfort of some soldiers.

Almost too small to be seen they inflict a bite which appeared larger than themselves—a positive wound, more torturing than that of the mosquito. These tormentors elevated dress parade to the dignity of a military engagement. I had to stand motionless while tears rolled down my face . . . Had I stirred a finger the whole battalion would have been slapping its cheeks (Higginson 1865).

J. H. Browne (1865) had his share of biting fly problems. While maying near the banks of the Mississippi, he soon felt the full wrath of the Arkansas sand flies and gnats.

Not a minute had we reclined our fatigued forms before the sand-flies and gnats assailed us in force; and before we could effect our escape, we looked as if we had just recovered from an attack of the small-pox.

One of my optics was closed, and my companion's lips had assumed the proportions of a full-blooded African's.

The winged pests covered us in swarms, and for five minutes our motions resembled the wild movements of dancing Dervises. Indeed, I doubt if the Dervises ever danced as we did.

With our swinging limbs and ceaseless gyrations, we must have seemed like human windmills, turning to every point of the compass at the same time.

We leaped ourselves out of our boots and hats and coats; and, in the midst of his bewilderment, I found my associate endeavoring to put on a cotton-wood tree, and myself trying to draw a large swamp over my burning feet, and cover my head with a mud-bank.

After a while, we began to grow used to it; but, at the same time, seriously arrived at the conclusion, that, however interesting such excursions might be to the natives, they were not altogether fascinating to civilized beings.

So we went off precipitately through marshes and morasses, breathing gnats and sand-flies as if they had all our lives composed our natural atmosphere; trying to wipe off the blood that had started from our faces with our boots, and to cover our pedal extremities with our handkerchiefs.

While we were struggling along like men under the pressure of forty cocktails, we heard a sharp rattle, and looking before us with what eyes the gnats had left us, we saw two huge snakes coiled, and ready to spring.

Rattlesnakes had no terrors for us then. We were desperate.

At that moment I believe I would have walked in the roaring mouths of a battery, or even up to the matrimonial altar, without shrinking.

We regarded rattlesnakes as symbols of Secession, and we knew the sandflies and gnats were of the Rebel tribe. So we attacked the venomous serpents with our boots; beating to the right and left, quite indifferent whether we struck them, or they struck us.

We had leather pyrotechnics, boot Catherine wheels, for a short time, when the hateful rattling ceased, and we saw the snakes were dead.



We thought we had killed them; but I know now the flies and gnats had swarmed down their throats and strangled them.

Little inclination had we to investigate the matter, but rushed on through the swamps, and at last reached a skiff—whether ours or not was a question of indifference—and, leaping into it, rowed over the river again.

When we had reached the Tennessee shore, we fell in the back water, and ultimately got on board the Flotilla, with one boot between us, no hats, physiognomies that would have set Lavater mad to contemplate, and bearing a close resemblance to the horribly tattooed faces so greatly in favor with the New Zealanders.

I looked into the glass—a thing I rarely do, for I hate repulsive spectacles—and, as far as my defective eyesight could determine, I thought I discovered a striking resemblance between myself and the Egyptian Sphinx, and that I appear as if I might be a brother of the grotesque figure with four heads, by which the Brahmins sometime represent their chief deity . . . To be afflicted with boils is bad enough; but to be besieged by Arkansas gnats is absolutely beyond endurance.

Mules and horses of both Union and Confederate armies also suffered greatly in the Mississippi Valley (Webster 1904). During the spring of 1862, General Furgerson (probably Ferguson) noted that gnats were exceedingly troublesome to horses and mules of a Confederate artillery battery in Greenville, MS (Osborn 1896). Artillery and cavalry officers reported that many horses and mules were destroyed in the vicinity of Pointe Coupee, LA from 1862 to 1864 (Webster 1889). With the outbreak of the war, levees were neglected and, in many cases, had washed away or caved into the river (Webster 1904). The influx of water from the Mississippi river into the adjacent alluvial streams provided optimal breeding habitats for the gnats. Insects were adding to the ravages of war.

## That Lousy War

The relationship between lice and soldiers was undoubtedly one of the closest entomological associations that occurred during the war. Head lice (*Pediculus humanus capitis* DeGeer) and body lice (*Pediculus humanus humanus* L.) are most prevalent in crowded conditions where personal hygiene and sanitation are lacking, but lice can be found even on the most fastidious person. The use of layered wool clothing worn continuously provides the prop-

er temperature and humidity for body lice (Ebeling 1978), and the continual wearing of uniforms typified soldiering during the Civil War. Crab lice (*Phthirus pubis* [L.]) also are acquired through close contact but more readily through sexual contact. The Civil War soldier may have suffered from any or all of the lice known to attack man, but most references mention body lice. Victorian morality may have precluded many soldiers from referring too often to crab lice.

Soldiers in the Civil War gave the body louse numerous names: bluebellies, rebels, tigers, Bragg's body-guard, zouaves, graybacks, and vermin. They were so common that it would have been unusual for a soldier not to harbor vermin. Lice had no allegiance to any flag, nor did they discriminate on the basis of rank. It was recorded that an orderly of a company officer picked 52 graybacks from the shirt of his chief at one sitting (Billings 1887). Although soldiers felt disgraced when they first became infested, this feeling soon diminished as their situation became universal among their comrades. Many soldiers came to "a state of pleasant unconcern," one even declaring he could not sleep soundly unless he "had a few graybacks gnawing on him" (Wiley 1994).

Different techniques were employed for delousing, or "skirmishing," as the soldiers called it. Soldiers often could be found picking through their clothing or doing their "(k)nitting work." Some used faster delousing methods such as boiling clothes in salt water or singeing clothes over fires. The latter technique reminded one Confederate, whose clothes were "well stocked with big fat fellows," of popping corn (Wiley 1992). One individual recalled his best louse fighting reme-

The 132<sup>nd</sup> Pennsylvania had to contend with Confederates and angry bees on the Roulette farm. This photograph, taken shortly after the battle of Antietam, shows a group of white structures that some historians believe were farmer Roulette's bee yard (USAMHI).



dy "during the '60's down in 'Old Virginny'" was rubbing the seams of his clothes with blue ointment until he could find time to boil them (Anonymous 1904). Military terms were applied to the various delousing techniques. Killing lice was called "fighting under the black flag," throwing away infested clothing was "giving the vermin a parole," and wearing clothing inside-out was "executing a flank movement" (Wiley 1992).

Delousing was not without hazards. Some members of the 3<sup>rd</sup> Pennsylvania Reserves (P.R.V.C.) decided they would venture to a different area for the purposes of louse removal.

Early one morning, some of the boys determined to go up the creek so far that no vermin would be found floating on the water. They had carefully kept their clothes up the trees until they got full suits. Afraid to trust the precious bundles in their hands, they swung them over their shoulders on sticks. Up the levee they marched, and finding a nice place, were soon enjoying a glorious splash. Soon the well-known whistle of the bullet was heard, and they discovered the insurgent pickets on the other side. With the creek before them, a swamp behind, a long embankment their only means of retreat, and their clothes out of reach, they found themselves in a pretty predicament. Lying behind the embankment stripped, with the scorching rays of the sun pouring down upon them, soon became uninteresting; and to save themselves from broiling, they rolled in the mud and tried baking. This operation, renewed as soon as the mud commenced cracking on them, formed the principal feature of their amusement until darkness covered their retreat; but it killed the vermin (Woodward 1883).

Hornets and yellowjackets were a problem for some at Second Bull Run. Along Sudley Road, angry hornets were able to unseat a company of U.S. Regulars. Early postwar photograph of Sudley Road (USAMHI).



After the Seven Days campaign, lice were particularly rampant in the Army of the Potomac. Years after the war, some soldiers apparently looked back on that louse-infested time with a certain esprit de corps. The historian of the 3<sup>rd</sup> P.R.V.C., part of the Army of the Potomac, elaborated, "... a soldier of the Army of the Potomac who declares he never had any [lice], did not belong to the [Pennsylvania] Reserves." He explained,

As we had destroyed all our clothing except what we stood in, and as soap was an article that could neither be bought nor 'appropriated,' and as clothing was issued by piece-meal, it [delousing] was a task more easily undertaken than accomplished (Woodward 1883).

Conditions must have improved for the P.R.V.C.

By dint of washing, scrubbing, scouring and constant vigilance, the triumph was achieved; and the boys came out in their new uniforms as clean and bright as new dollars (Woodward 1865, 1883).

It was probably safe to say respite from the graybacks was only short-lived.

Some soldiers fancifully attested to the learning abilities of the ubiquitous louse. "So universal were they [the lice] at that time, that none thought of being ashamed of them, and we have even heard the boys declare that they knew all the bugle calls and had become so expert in drill as to go through the battalion movement quite accurately, and to have their regular guard mountings and dress parades" (Woodward 1865).

Although lice were problematic in Union and Confederate armies, prisoners of war suffered far worse. An Andersonville prisoner recorded a day of "lively skirmishing," noting that he "caught and killed 17 or 20 lice, all fat and in good condition" (Futch 1968). At the Andersonville hospital, an investigating Confederate surgeon stated that the patients seemed indifferent to their squalor and added that their clothing was extremely filthy and "scaly with vermin" (Futch 1968). A quart or more of lice was reportedly removed from the clothing of a dead comrade at the prison. That however, was probably an exaggeration because 400 lice would be an unusually large infestation even under the most squalid conditions (Snetsinger 1982).

Lice were not totally without redeeming value. They actually provided a source of entertainment and income for some soldiers. Wagers were placed on "louse races" where the

arena was often a mess plate. One soldier, flaunting a champion louse, demanded that the lice be raced from individual plates. After the soldier profited substantially from the events, it was discovered that he had heated his plate prior to the different speed trials (Wiley 1994). In addition, lice fights were held in which bets were placed and the lice were pitted against each other. One veteran claimed that it was not unusual to see a dozen groups of men involved in these fights (Wiley 1994). Even the inhumane conditions of Andersonville did not preclude prisoners from participating in the fights (Futch 1968).

Lice were also the source of some great yarns and waggery. Before retiring for bed, one Virginia private recited his version of the common bedtime prayer:

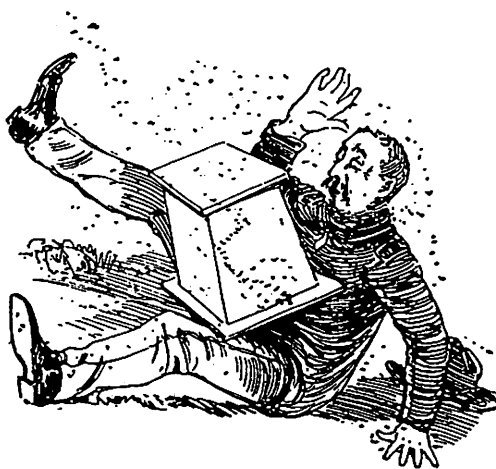
Now I lay me down to sleep,  
While gray-backs oe'r my body creep;  
If I should die before I wake,  
I pray the Lord their jaws to break (Wiley 1994).

Several Confederates claimed they caught lice embellished with the letters C.S. (Confederate States) and I.W. (In for the War) (Wiley 1994). One rebel related, "I pulled off a Shirt last night and threw it down; this morning I saw it moving first one way and then another; I thought at first that there was a rat under it, but upon inspection found it was the lice racing about hunting for a Soldier" (Wiley 1994). Andersonville inmates also commented on the size and strength of lice with admirable good humor; they spoke of "gray-back raising" and boasted of the feats of the lice they pretended to be training for exhibition at the next "vermin fair" (Futch 1968).

## "Fleaing" The War

Overcrowding and poor sanitation during the war provided excellent conditions for rodent populations and their fleas. In addition, camp mascots (e.g., dogs and cats) and humans could harbor their own infestations. Some soldiers were besieged by fleas. In 1862, a Mississippian returning from furlough complained of being preferred for flea attack. "They hav most Eate me up since I came Back her," he related. "I was fresh to them so they pitched in" (Wiley 1994).

The abundance of fleas in some camps resulted in some amazing stories, and one Confederate believed fleas could provide additional entertainment. "I think there are 50 on my person at this time," he wrote to his wife, "but



NO JOKE.

Honey was a favorite target for foraging soldiers. For some, honey bees were even a source for practical joking. Foraging soldiers placed a hive on their captain and made "business quite lively in that neighborhood." Illustration from Billings (1887).

you know they never did trouble me." He then added, "May I have thought of you often while mashing fleas; if you were here you could have your own sport" (Wiley 1994). Another Rebel said, "they [fleas] collect in companies at knight fall for the purpos of carrying us off . . . though like the Yankeys they are repulsed by desperate efforts & great patience" (Wiley 1994).

An even more imaginative comrade contended,

A great alarm was heard in the upper part of the regiment; hastening to the spot I enquired what was the matter. A man was asleep in his tent and a couple of fleas had taken holt on him and carried him half way to the river intending drowning [him] while asleep for he had sworn vengeance against them (Wiley 1994).

One Unionist took even greater pains to describe his involvement with fleas. Although the following story borders on the ridiculous, it does exemplify both the abundance and nuisance of fleas.

Until I began to follow the camp, I had never known, save by auricular evidence, of those unpoetical insects known as fleas; but one night in Syracuse, Mo., "our mess" experienced the cruelty and savageness of the diminutive foes of man, to our bodies' extremist dissatisfaction.

We were all lounging in the tent, reading, undreaming of enemies of any kind, when we all became restless, and the interest of our books began seriously to diminish.

There were various manual applications to various parts of the body, multifarious shiftings of position, accompanied with emphatic expletives that sounded marvelously like oaths.

"What is the matter?" was asked by one of



us of another. "What renders you so uneasy?"

"Heaven knows!" was the answer; "but I itch like Satan."

"My body seems on fire," observed one.

"I wonder," said another, "if I have contracted a loathsome disease!"

"Confound it! what ails me?"

"And me—and me—and me?" was echoed from my companions.

One had become insufficient to allay the irritation of our corporeality. Both hands became requisite to the task, and our volumes were necessarily laid aside.

No one yet appeared aware of the cause of his suffering. If we were not all in Tophet, no one could deny we had gone to the old Scratch. We seemed to be laboring under an uncontrollable nervous complaint. We threw our hands about wildly. We seized our flesh rudely, and rubbed our clothes until they nearly ignited from friction.

One of the quartette could stand it no longer. He threw off his coat and vest spasmodically, and even his under garments, and solemnly exclaimed—"Flee from the wrath to come!"

The mystery was explained—the enigma

**Table 1. Events of the Civil War touched the lives of many Americans including many famous period entomologists**

Entomologist <sup>a</sup>	
J. H. Comstock	Attempted to enlist in Union army at age of 14 but was turned down.
E. T. Cresson	Escaped the Civil War because employer (Thomas Wilson, patron of the Entomological Society of Philadelphia and the Philadelphia Academy of Science) paid for substitute. Seems Wilson had strong Southern sympathies.
C. H. Fernald	Joined the Union navy where he became an ensign. While in navy, took courses required by Bowdoin College and eventually received degree.
S. A. Forbes	Enlisted as private in Co. B. of the 7 <sup>th</sup> Illinois Cavalry. Captured by Confederate forces after Shiloh, was interrogated briefly by Confederate General P.T.G. Beauregard. Contracted scurvy and malaria as prisoner.
W. F. Holland	Left South Carolina in 1863 as boy via the "underground route."
G. H. Horn	Received M.D. in medicine from University of Pennsylvania. Served as surgeon with California Volunteers from 1862–1866.
J. L. LeConte	Served with Union Army Medical Corps as volunteer surgeon and soon became medical inspector with rank of lieutenant-colonel.
O. Luggar	Served as Army Engineer during war.
H. C. McCook	Assisted in raising 41 <sup>st</sup> Illinois Volunteers and served as lieutenant and chaplin for two years.
A. S. Packard, Jr.	Commissioned as assistant surgeon in 1 <sup>st</sup> Maine Veteran Volunteers. Received from General Hyde the commendation that "he was a dare devil and knew no fear."
G. W. Peckham	Joined Union army in 1863. Received field promotion to lieutenant at 19 while in charge of battery.
T. Pergande	Shortly after immigration to United States, enlisted in one of early Union 3-month regiments then re-enlisted for duration of war.
E. Ruffin	Provided early life history account on Angoumois grain moth. Had dubious distinction of firing one of the first shots at Ft. Sumter and last shots at First Bull Run. Committed suicide at end of the war rather than live with "vile" Yankee race.
C. V. Riley	Served for six-month stint in 134 <sup>th</sup> Illinois Volunteers.
F. H. Snow	Service during Civil War was associated with U.S. Christian Commission. Was at Appomattox when Lee surrendered to Grant.
H. Ulke	Known as the "painter of presidents"; was personal friend of Lincoln and Grant. Painted both presidents and operated studio where he photographed hundreds of soldiers during their stay in Washington, DC.

<sup>a</sup>Information on Civil War era entomologists (except for Ruffin) was summarized from Mallis (1971).

solved.

The martyr's person was covered with small black spots, that disappeared and reappeared in the same instant.

To be practically expressive, he was covered with fleas.

The rest of us followed his example, and converted ourselves into model artists.

We were all covered with fleas.

Fleas were everywhere. Tent, straw, books, blankets, valises, saddles, swarmed with them.

The air scintillated with their blackness.

We rushed out of the tent.

They were there in myriads.

The moonlight fell in checkered beams through their innumerable skippings.

They made a terrible charge, as of a forlorn hope, and drove us back.

We reared with anger and with pain, and loud curses made the atmosphere assume a violet hue.

Three of the flea-besieged caught up canteens of whisky and brandy, and poured the contents over their persons and down their throat; scratching meanwhile like a thousand cats of the Thomas persuasion, and leaping about like dancing dervises.

The more the fleas bit, the more the victims drank; and I, having no taste for liquor, began to envy them, as, in their increasing intoxication, they seemed to enjoy themselves after a sardonic fashion.

The fleas redoubled their ferocity on me, and I surrendered at discretion; and at last became resigned to their attacks, until, a few minutes after, a storm that had been gathering burst with fierce lightning, heavy thunder, and torrents of rain.

A happy idea seized me.

I caught up my saddle and bridle, and placed them on my sable steed "Festus," which stood neighing to the tempest, a few feet from the camp.

I mounted the fleet-footed horse, and, nude as the Apollo Belvidere, cried "go" to the restive animal; and off we sped, to the amazement of the sentinels, through the darkness and the storm.

Every few moments the lightning blazed around us with a lurid sheen, as we went like the wind through the tempestuous night.

"Festus" enjoyed it, as did his rider; and six swift-speeding miles were passed ere I drew the rein upon the neck of the panting beast, covered with white flecks of foam.

I paused, and felt that the fleas had been left behind.

The pelting rain and rushing blast had been too much for them; while the exercise had made my attireless body glow into a pleasant warmth.

"Festus" galloped back, and soon I was in

the tent, rolled so closely in a blanket that no new attack of the fleas could reach me.

My companions, overcome with their exertions, sufferings, and potations, had lain down; but the fleas were still upon them, and they rolled and tossed more than a rural tragedian in the tent scene of "Richard the Third."

They were asleep, and yet they moaned pitiously, and scratched with demoniac violence.

In spite of my pity for the poor fellows, I could not refrain from laughing.

With the earliest dawn I awoke, and the tent was vacant.

Horrid thought!

Had the fleas carried them off?

I went out to search for them; and, after a diligent quest, found them still in nature's garb, distributed miscellaneous about the encampment.

In their physical torture they had unconsciously rolled out of the tent.

One lay in an adjacent ditch; a second under an artillery wagon; and the third was convulsively grasping the earth, as if he were endeavoring to dig his own grave; believing, no doubt, that, in the tomb, neither Fortune nor fleas could ever harm him more. The unfortunate two were covered with crimson spots, and looked as if recovering from the small-pox.

I pulled them, still stupid from their spiritual excess, into the tent again, and covered them with blankets, though they swore incoherently as I did so, evidently believing that some giant flea was dragging them to perdition.

When they were fully aroused, they fell to scratching again most violently, but knew not what had occurred until they had recalled the events of the previous night.

Mess for Union soldiers frequently included a plain flour and water biscuit called hardtack. Crackers often were issued complete with insects. The officer on the right holds one of the hard crackers. Note the cook kettle directly in front of the table. It is similar to the one illustrated on p. 234 for boiling garments (USAMHI).



They then blasphemed afresh, and unanimously consigned the entire race of fleas to the Bottomless Pit.

The fleas still tried to bite, but could find no new places, and my companions had grown accustomed to them.

They felt no uneasiness for the coming night; they were aware that the new fleas would retire from a field so completely occupied, and that the domesticated creatures were in sufficient force to rout all invaders.

So ended that memorable Noche Triste, an exemplification of the Scriptural declaration, "The wicked flee when no man pursueth" (Browne 1865).

As with lice, fleas also became integrated into soldiering activities. The lowly flea even found its way into a stanza of A. Pender's *Goober Peas*:

I think my song has lasted almost long enough,  
The subject's interesting, but the rhymes are mighty rough,  
I wish this war was over, when free from rags and fleas,  
We'd kiss our wives and sweethearts and gobble goober peas!

## Buzz of the Battle

Soldiers often likened the sound of bullets to the buzz of a bee. Lt. Robertson of the 93rd New York Regiment elaborated on the dilem-



Part of the reason for spoilage and contamination of hardtack was due to exposure of the ration to the elements. A Union officer is seated amidst a supply of "Army Bread" or hardtack. Moldy hardtack was replaced at the next drawing of rations; however, soldiers had to accept the insect-infested and hard varieties (USAMHI).

ma that faced him at Spotsylvania,<sup>10</sup>

to advance was impossible, to retreat was death, for in the great struggle that raged there, there were few merely wounded. . .

The bullets sang like swarming bees, and their sting was death (Garrison 1994).

The ferocity of some battlefields was even compared with that of bees. At Shiloh,<sup>11</sup> the savagery and sound of musketry and cannonading in one area of the battlefield resulted in its being dubbed "The Hornets' Nest." Here, the sting of bullets was followed by a Confederate bayonet charge.

Angry bees could complicate matters when coupled with the confusion of battle and one such incident occurred at the battle of Antietam. The 132nd Pennsylvania Volunteers were mustered into service only about a month before they found themselves in the Maryland farm community of Sharpsburg. Because the regiment was previously untested in battle, Antietam would soon become its baptism of fire. As the 132nd was advancing on the Roulette farm, a shot from a Confederate battery slammed into the Roulette bee yard. The result must have verged on the macabre. Some men dropped their muskets and ran into nearby fields, while others slapped their clothes and batted at the angry honey bees, *Apis mellifera* L. In the meantime, more Confederate artillery shells and bullets were finding their marks among the Union troops. "Soldiers were rolling in the grass, running, jumping, and ducking" (Brown 1986). Brigade commanders were quickly concerned that the hysteria that gripped the 132nd could rapidly spread to wholesale panic among the other troops. An order of "double quick" allowed the Pennsylvanians to advance past the Roulette farm and eventually outdistance the bees. As the regiment advanced across open fields toward the Sunken Road, the Confederates opened with a terrific volley of musketry that brought down many of the Union line. With no cover from the fire, the 132nd was ordered to lie down and crawl toward the Rebel lines. Exposed to musketry, artillery fire, and the choking smoke from black powder, some of the 132nd also "suffered from welts left by William Roulettes' bees" (Brown 1986). The 132nd Pennsylvania felt the full fury of two enemies that September day in 1862.

Soldiers were exposed to other hymenopter-

<sup>10</sup>May 8–20 1864

<sup>11</sup>6–7 April 1862.



an headaches. During the late summer campaigns, nests of yellowjackets and hornets were reaching maximum size. One incidence reflected some of the hazards of foraging:

... a plump Pennsylvanian inadvertently knocked a hornet's nest from an overburdened apple tree by jerking an apple from one of its branches. The hornets nearly killed him before he could clear the fence and spring into the road. They stung him over the eye, in the nose, and several times in his scalp before he out ran them (Priest 1992).

Some unfortunate souls did not have the means to extricate themselves from some of these nests. In the evening of the first day of Second Bull Run,<sup>12</sup> both sides tried to remove wounded as best they could under cover of darkness. The following dialogue recorded some of the suffering near the Confederate line.

Captain Blackford of [General J.E.B.] Stuart's staff heard the shrill voice of a young boy, sobbing. He rose to help the suffering youth when the boy's father, apparently the captain of his company, called, "Charley, my boy, is that you?"

"Oh yes," the young soldier replied, trying so hard to act like a man. "Father, my leg is broken, but I don't want you to think that is what I am crying for; I fell in a yellow-jackets' nest and they have been stinging me ever since. That is what makes me cry—please pull me out."

His father did pull him out. He cradled him in his arms, where the warrior-youth soon died (Hennessy 1993).

Stinging insects were problematic on other parts of the Second Bull Run battlefield. Along Sudley Road during the second day of the battle, a company of the 11th U.S. Regulars broke open a hornet's nest.

Confederate bullets had not been able to unseat the Yankees from their position, but a few dozen riled bees did. "In an instant the men were put to flight by the furious insects," one Regular wrote. The panic was contagious; "in a twinkling the position was abandoned and every man was fleeing from an unknown danger." It took several minutes for the officers to restore the line (Hennessy 1993).

Eventually, the pressure of the Confederates (and possibly hornets) caused the Union line to yield in that part of the road.

Although angry bees added to the anguish of battle, honey bees—or rather the honey they produce—were actually sought out by soldiers when not faced with the battlefield. Supplementing rations with honey was a favorite endeavor with Rebs and Yanks. Foraging (often a euphemism for stealing) soldiers were quick to locate bee yards during campaigning and "tramped many a mile by night in quest of these depositories of sweets" (Billings 1887). Some went to great lengths to procure the honey supplement. In one such incident, Union soldiers forged an evening pass, booby-trapped the beekeeper's footbridge, and provided a diversion to secure the "secesh's" beehive (Williams 1862). Beeswax also may have been used. Early in the war, the *Prairie Farmer* suggested that soldiers could make a soothing salve for sore feet by mixing "equal parts of gum camphor, olive oil, and pure beeswax" (Anonymous 1861).

Bees were the source of at least one practical joke.

I recall an incident occurring in the Tenth Vermont Regiment—once brigaded with my company—when some of the foragers, who had been out on a tramp, brought a hive of bees into camp, after the men had wrapped themselves in their blankets, and, by way of a joke, set it down stealthily on the stomach of the captain of one of the companies, making business quite lively in that neighborhood shortly afterwards (Billings 1887).

One could only hope the company captain had a sense of humor and no allergic reactions.

Some soldiers heated hardtack to remove insects, but others preferred crumbling hardtack in coffee and skimming off the insects. The haversack that served to hold the meat and bread ration is drawn to the soldier's right. Illustration from Billings (1887).



FRYING HARDTACK.

<sup>12</sup>29–30 August 1862.

## Infested Fare

The old adage attributed to Napoleon that an army marches on its stomach did not exclude either the Confederate or Union army. Supplying food was imperative for maintaining a viable fighting force. The various food supplies, though, also represented excellent feeding and breeding sites for insects. The daily Union marching ration for fresh beef was 1¼ pounds, although there were occasions when soldiers drew two or more days' rations. A soldier usually kept meat and food rations in the haversack that he slung on his side. If his meat ration was not infested when he received it, it likely was to become so soon. One Yank related, "Fresh-killed beef . . . had to be eaten with the odor and warmth of blood still in under penalty of finding it flyblown before the next meal" (Wiley 1992). Another soldier mused,

Yesterday morning was the first time we had to carry our meal for the maggots always carried it till then. We had to have an extra gard to keep them from packing it clear off (Wiley 1992).

The commissaries and quartermasters were keeping more than soldiers fed.

If fresh beef was not supplied, then soldiers received a meat ration as ham or bacon, salt beef (called salt horse), or salt pork (called sow-belly). Pickling was done to preserve the meat and reduce spoilage and contamination. But, the pickling process almost made the meat inedible anyway. Salt horse "was thoroughly penetrated with saltpetre, was often yellow-green with rust from having lain out of brine, and, when boiled, was four times out of five if not nine times out of ten a stench in the nostrils, which no delicate palate cared to encounter at shorter range" (Billings 1887). The bacon or ham issue "was usually black, rusty and strong, and decidedly unpopular" (Billings 1887). Often the only recourse was soaking the pickled meats in water overnight before any attempt was made to eat them.

Meat was not the only insect-infested ration—other victuals also came with insects. One disgruntled Yank complained,

We live so mean here the hard bread is all worms and the meat stinks like hell . . . and rice to or three times a week & worms as long as your finger. I liked rice once but god damn the stuff now" (Wiley 1992).

An Andersonville prisoner recorded that his beans were "well seasoned with sand and bugs" (Futch 1968). Probably one of the best recorded havens for insects during the Civil

War was a plain flour and water biscuit or cracker. Issued to Union soldiers, this was commonly called "hardtack." Hardtack was distributed in two other forms besides the insect-infested variety. One variety was moldy or wet, a condition that probably resulted from exposure to the weather prior to distribution or from being packaged too soon after baking. A second variety was the hard form, which was aptly named. These crackers, also called "teeth dullers" or "sheet-iron crackers," were so hard that one soldier claimed to have carved a durable violin bridge from one of them (Wiley 1992). Other soldiers, apparently unable to break the crackers with their hands, had to beat the crackers with the butts of their muskets (Wiley 1992). One camp dialogue attested to the hardness of this variety of hardtack.

Sergeant: Boys I was eating a piece of hard tack this morning, and I bit on something soft; what do you think it was?

Private: A worm?

Sergeant: No by G-d, it was a ten penny nail (Wiley 1992).

The third type of hardtack, already mentioned and alluded to, was the insect-infested variety. Yanks referred to this kind as "worm castles" (Wiley 1992) and some went to great lengths in describing its inhabitants. Billings (1887) elaborated on the "maggots and weevils" that he encountered in hardtack.

These weevils were, in my experience, more abundant than the maggots. They were a little, slim brown bug an eighth of an inch in length, and were great bores on a small scale, having the ability to completely riddle the hardtack. I believe they never interfered with the hardest variety (Billings 1887).

Moldy and wet hardtack was usually made good at the next drawing of rations, but soldiers routinely had to accept the infested crackers. This hardtack "had to be pretty thoroughly alive, and well covered with the webs which these creatures left, to insure condemnation" (Billings 1887). Billings' comment is interesting because he is actually describing multiple infestations of the hardtack. The "maggots and weevils" he mentions are probably the immatures and adults of some of the stored product weevils [e.g., granary weevil, *Sitophilus granarius* (L.) or rice weevil, *S. oryzae* [L.]]. However, the "webbing" that he mentions is probably the work of stored product Lepidoptera [e.g., Indianmeal moth, *Plodia interpunctella* (Hübner) or one of the flour moths]. Entomological taxonomy was not the forte of most soldiers.

Some "worm castles" were infested thor-

oughly. One soldier quantified the inhabitants in his hardtack,

We found 32 worms, maggots, &c in one cracker day before yesterday. We do not find much fault, however, but eat them without looking as a good way to prevent troublesome ideas (Wiley 1992).

This is actually a lot of insects when one considers that the dimensions of this cracker were only  $3\frac{1}{8}'' \times 2\frac{7}{8}'' \times \frac{1}{2}''$ . Another Yank took an optimistic view on his hard bread ration, "All the fresh meat we had came in the hard bread . . . and I preferring my game cooked, used to toast my biscuits" (Wiley 1992). John Billings' (1887) reflection on hardtack reveals both the hardtack epicurean and the seasoned veteran.

But hardtack was not so bad an article of food, even when traversed by insects, as may be supposed. Eaten in the dark, no one could tell the difference between it and hardtack that was untenanted. It was no uncommon occurrence for a man to find the surface of his pot of coffee swimming with weevils after breaking up hardtack in it, which had come out of the fragments only to drown; but they were easily skimmed off and left no distinctive flavor behind. If a soldier cared to do so, he could expel the weevils by heating the bread at the fire. The maggots did not budge in that way (Billings 1887).

Insect-infested hardtack was even sung about. Soldiers parodied *John Brown's Body* with:

Worms eat hearty in the commissary stores  
While we go starving on (Wiley 1992).

In the western theater, soldiers parodied the Stephen Foster song, *Hard Times*, to lament the condition of their hardtack. When Union General Nathaniel Lyon overheard the stanzas, he ordered the cooks to serve up corn-meal mush as a substitute for the bad bread. The soldiers responded by again altering the song's chorus:

You were old and very wormy, but we pass  
your failings o'er  
O hard crackers, come again once more!  
(Billings 1887).

Despite the growling and derision, most soldiers were grateful for the sustenance hardtack provided, insects or not. As one historian noted, "Hunger compelled soldiers to eat them and taste was acquired with use" (Wiley 1992).

## Taps

Throughout history, insect-borne diseases have decimated armies and ended campaigns.

The Civil War was no exception. The War claimed the lives of nearly 620,000 soldiers (Brooks 1966). Of the dead, approximately three out of five Union soldiers, and possibly two out of three Confederates, succumbed to disease (Brooks 1966). Many of these disease-related fatalities involved insects. Considering the prevalence of filth, lack of understanding disease etiology, and the state of medicine, it is surprising that more soldiers did not perish. But, these wartime statistics also raise some interesting questions.

There is little doubt that fly problems were important factors in the prevalence of dysentery and diarrhea in both Union and Confederate armies. However, the absence or low incidence of other insect-borne diseases, such as louse-borne and flea-borne typhus, plague, or yellow fever, is interesting. Under epidemic conditions, louse-borne typhus may reach fatality rates of nearly 100%. During severe epidemics in World War I, Russia lost 2–3 million of its people (Harwood and James 1979). However, during the American Civil War, Official Records list only 850 Union deaths to "typhus" (Brooks 1966). Evidently, the pathogen was not present in the American population to reach epidemic proportions, although conditions seemed ideal for the disease. This also may have been true for plague. Rats and fleas occurred at various times throughout the war. This was especially true during the siege of Vicksburg, MS,<sup>13</sup> and in the trenches around Petersburg, VA.<sup>14</sup> However, ranks were not decimated by plague. Perhaps the bacterium *Yersinia pestis* (Lehman & Newmann) van Loghen was not present in the rodent populations. Yellow fever reached serious levels only three times during the Civil War (Wiley 1992). In 1864, the worst outbreak occurred in New Bern, NC, where 763 cases resulted in 303 deaths (Wiley 1992). Was it possible that these diseases were present in greater numbers but were misdiagnosed? Possibly, especially for typhus, where it may have been diagnosed in one of the "continued" or "typho-malarial" fever categories recognized at the time. However, the medical community was well aware of symptoms of plague and yellow fever during this period. Large outbreaks of yellow fever were within recent memory for many at the time of the Civil War. As with plague and typhus, a large yellow fever epidemic never materialized during the war. Had any of these

<sup>13</sup>18 May–4 July 1863.

<sup>14</sup>10 June 1864–2 April 1865.



diseases reached epidemic proportions, history may have recorded a different outcome.

Events of the Civil War, like any war, should not be reduced to battlefield victories or losses. War is far more complicated than that. The role of insects during the Civil War adds a different dimension to our understanding about soldiering and warfare during this period. It is a topic that many historians previously have overlooked. This subject not only underscores the hardships and misery that Americans on both sides had to endure, it stands as a tribute to the human spirit. It also emphasizes man's constant interaction with the insects—wartime or not.

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