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Entomologists in World War II

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After World War I, the War Department provided for the commissioning of entomologists in the Army Organized Reserve as Sanitary Corps Officers. In 1940, the Army Surgeon General realized that the U.S. could be drawn into a world conflict and began to organize the Medical Department to support this effort. It was recognized that the prevention and control of malaria in posts in the Southern states and in possible overseas areas was one of the principal problems facing the military buildup. In considering the control of malaria in the Southern states, it was recognized that an extensive mosquito control program would have to be implemented. The fourteen entomologists in the Organized Reserves were ordered to Active Duty in 1941 and assigned to military installations in the South, where malaria was a potential hazard to service members. The government decided that more entomologists would be needed to control disease-carrying insects at and around training camps and appointed Dr. George Bradley of the United States Department of Agriculture (USDA) to the task. Dr. Bradley was transferred to the U.S. Public Health Service (USPHS) and commissioned a Colonel. He hired 6 young entomologists, including me and T.E. McNeel, as his assistants. Three of us were eventually commissioned as First Lieutenants in the USPHS. Dr. Stan Freeborn later joined the group and was also commissioned as a Colonel in the USPHS. In November 1941, we were assigned to work at the USDA

laboratory in New Smyrna Beach, Florida, where we intensively studied mosquito taxonomy, biology, and control. On December 8, 1941, Dr. Bradley told us that we would now be working exclusively on malaria. Our group was designated Malaria Control in War Areas (MCWA), and our job was to control mosquitoes within a one mile perimeter of any military establishment. At the same time, great strides were being made by the USDA in the development of pesticides and insect repellents. This combined control program was so successful that malaria was not a serious hazard to Service members in the United States.

By 1943, there were 723 entomologists in the military; the Army commissioned 240 and the Navy 118. Most of the newly commissioned entomologists were eventually assigned to overseas theaters: the South Pacific for malaria control, and the European theater for typhus control. The Army Medical Department organized Malaria Survey Detachments that consisted of an entomologist, a parasitologist and 11 enlisted men, and Malaria Control Detachments that consisted of a sanitary engineer and 11 enlisted men. As of February 1944, there were 35 Malaria Survey Detachments and 65 Malaria Control Detachments.

In 1941, the Naval Medical Department established the Hospital Volunteer Specialist Group [H-V(s)], and two Navy entomologists, LTJG William Lawler and LT Paul Woke, were commissioned. By the end of

WWII, there were over 200 commissioned entomologists in the Navy. Ensign Ken Knight was the first Navy entomologist to work in a combat zone when he and a team were sent to an island in the New Hebrides, where the Marines were being devastated by malaria, and reduced the malaria rate to essentially none. The Pacific Theater provided a cornucopia of arthropod-borne diseases that had a significant impact on fighting forces. The Navy, Army and Allies combined control and prevention efforts to meet the challenge. The Navy Division of Preventive Medicine developed field laboratory teams, designated Navy Epidemiology Units, to fight malaria. In 1944 the Division of Preventive Medicine was responsible for the guidance of 122 of these units. Navy entomologists also served in the South Pacific, Burma, India, North Africa, Caribbean, Central America and Europe. Two Navy entomologists lost their lives in WWII: LT William Gordon was killed by mortar fire during the invasion of Los Negros, in the Admiralties, on March 5, 1944, and LT John Maple died in an airplane crash while directing an aerial spray operation on Okinawa in April 1945.

Following WWII, only a handful of entomologists remained on active duty, with most officers reverting to inactive status. In the Navy, the H-V(s) sections disappeared, with only the Malaria and Mosquito Control Unit at the Naval Air Station (NAS) Banana River, Florida, remaining. It eventually moved to NAS Jacksonville and is now designated as the Navy Entomology Center of Excellence. In the Army, the Sanitary Corps became the Medical Service Corps and the Army Air Corps was established as the Air Force.

During WWII, the military had a total of 771 specially trained personnel combating malaria, typhus, tsutsugamushi fever, and other arthropod-borne diseases. Obviously, malaria was one of the most important diseases that military entomologists had to control. General McArthur said "...for every division I have fighting the enemy, I must count a second division in the hospital with malaria and a third division convalescing from this debilitating disease." In addition to combating malaria and other arthropod-borne diseases, nuisance insects were causing morale problems. The greatest nuisance insect problem was caused by bed bugs at bases in the U.S.

At the request of the colonel in charge of the Sanitary Corps, I left the USPHS and was commissioned a 2LT and given orders to report to Camp Lee, Virginia. Upon my arrival, the Camp Surgeon told me the bed bug situation was so bad that a Congressional investigation was being organized. He assigned me to clean up the problem and told me to consult with the camp engineer to find out what was currently being done. All the bedding was being placed in a 1941 semi-mobile sterilization unit and the bed springs were dipped in a vat of some insecticide (Figure 1).

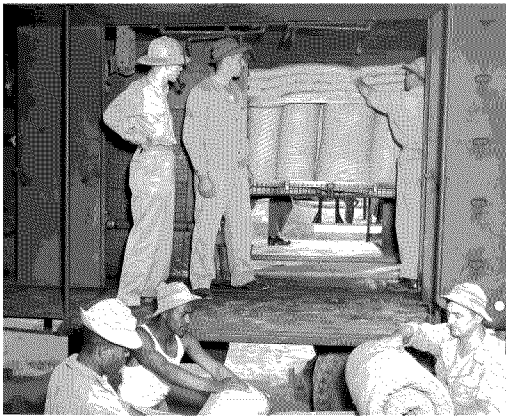


Figure 1: Sterilizing bedding (Top) and dipping bed frames in insecticide (Bottom).

While this was being done, the barracks were inspected, and the web equipment, knapsacks, belts, etc., were examined and found to be heavily infested with bedbugs. Web equipment harbored both eggs and adults, and gas masks were often heavily infested (Figure 2).

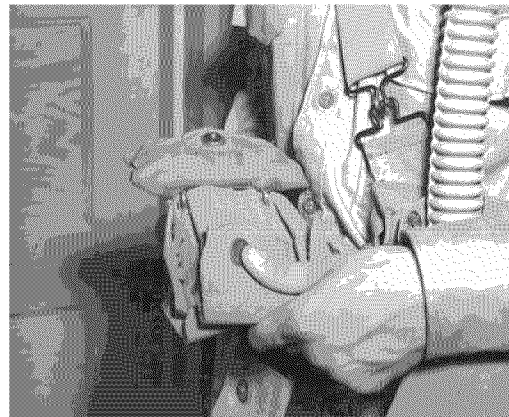


Figure 2: Bed bugs in protective mask carrier and web gear.

This allowed for a quick reinfestation of the beds. Spraying the walls with a hand sprayer using pyrethrum was not very efficient. It was determined that all of these measures were not resolving the bed infestations due to the heavy infestation of the field equipment and other items in the barracks.

We concluded that fumigation would be necessary to penetrate all the cracks and crevices, and treat all the field equipment left in the barracks. Before fumigation was approved, the building was inspected by representatives of the Camp Surgeons Office in order to

determine the abundance of bed bugs and whether local control measures would prove effective (Figure 3).



Figure 3: 2LT Eugene Gerberg conducting barracks inspection for bed bugs and pointing out bed bug excretion on sheets.

Bed sheets were examined for bed bug excretions and blood stains. After a building was approved for fumigation, it was made airtight by wedging the windows shut. The louvers were sealed with Kraft or roofing paper (Figure 4). When all the preparations were completed, guards were placed outside at the doors to ensure that no one entered during the inspection, and an officer inspected the building to make sure that no one was inside (Figure 5).

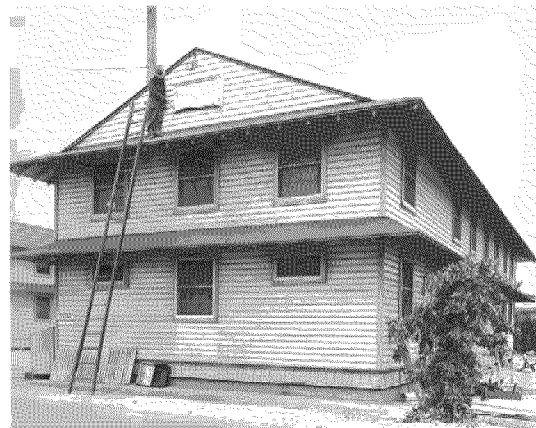


Figure 4: Wedging the windows shut (top) and sealing the louvers (bottom).

Once the building was verified as vacant, the gas fumigant was spread by two men wearing gas masks, supervised by an officer. The fumigant used was Zyklon Discoids, which came in a special container that required a unique tool to open. Each discoid was about the size of a beer coaster and was flipped out of the can onto the floor (Figure 5). One man and the officer went to the top floor and opened the can, discoids were flipped out, and the men moved back toward the exit. When the top floor was done, the process was repeated on the bottom floor.



Figure 5: Final inspection of barracks. Note can of Zyklon Discoids in the middle of floor (top); spreading the Zyklon Discoids (bottom).

Upon completing both floors, the two enlisted men and the officer left the building, barring the door and posting warning signs (Figure 6). An armed guard was posted and NO ONE was allowed to enter the building. After at least 24 hours, the doors were opened to begin airing out the building. Men in gas masks entered, unsealed the windows and opened them to allow the building to be completely aired out. Before anyone was allowed to return to the building, the area was tested with methyl orange paper to determine

whether hydrogen cyanide gas (HCN) was present in dangerous concentrations (Figure 6).

Thousands of dead bed bugs were found in fumigated buildings. A total of 700 buildings were fumigated and the problem was solved. It was determined that the cracks and crevices of the buildings provided excellent harborage. The use of wooden bedsteads and the practice of hanging web gear and other field equipment on the beds exacerbated the problem.

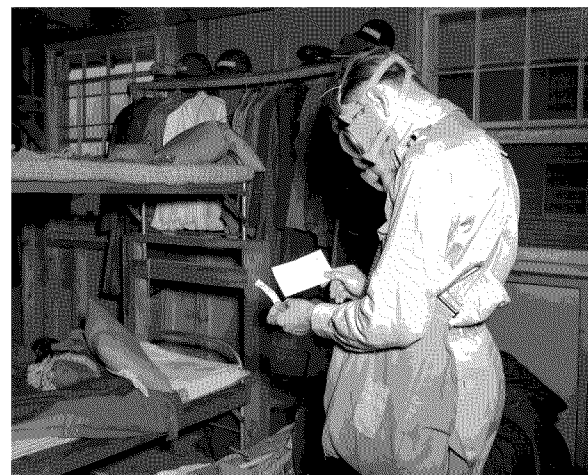


Figure 6: Sealing building and posting warning sign (top)s. Testing for the presence of HCN prior to allowing personnel back into building (bottom).



Figure 7: New metal bed frames with modifications to allow stacking (top), and simple devices for hanging field gear on walls (bottom).

Metal bed frames replaced the wooden frames, and simple hangers were developed to hang field gear, helping to reduce the problem (Figure 7). An educational campaign was also undertaken using posters to point out methods of detection and eradication (Figure 8). This was before the advent of DDT, which later proved to be quite successful in controlling bed bugs.

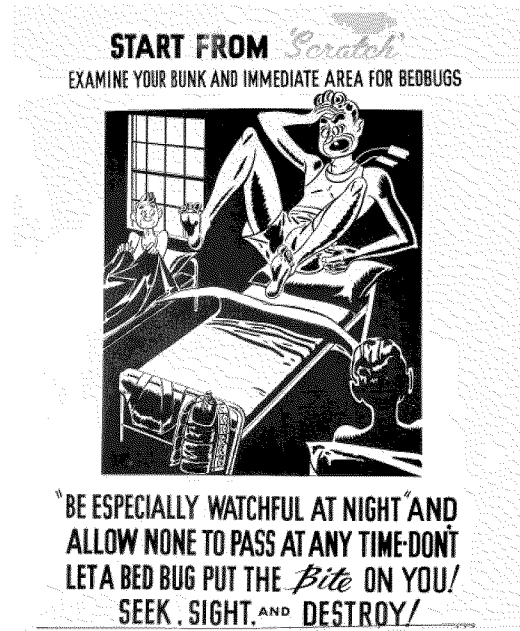
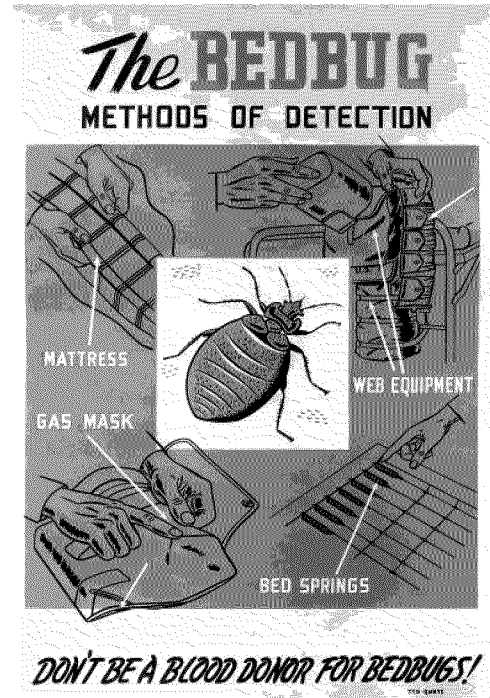


Figure 8: Educational posters on bed bugs.