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Welcome to issue #39 of the *AMEDD Historian*! From World War II service to cartoon commentary; there are many varied and interesting subjects in this edition. Dr. Paul E. Stepansky provides a good overview of a history of malaria in the military. Mr. Lewis Barger's article "AMEDD Support during the 1954 Texas Flood", documents humanitarian aid and support provided by the Medical Field Service School.

Also featured are articles on rehabilitation, convalescent care, and an Oscar winning short documentary "Toward Independence," which cover care away from the battlefield. There is a book review for [A History of the Army Blood Program](#), medicinal cupping is explored, and featured archival and artifact items.

Please let us know your thoughts. We would like to hear your comments and are always seeking new articles for publication. In addition to this publication, please visit our website <https://achh.army.mil/> and follow us on social media.

Malaria In The Ranks **Paul E. Stepansky, PhD**

Malaria (from Italian "bad air"): Infection transmitted to humans by mosquito bites containing single-celled parasites, most commonly Plasmodium (P.) vivax and P. falciparum. Mosquito vector discovered by Ronald Ross of Indian Medical Service in 1897. Symptoms: Initially recurrent ("intermittent") fever, then constant high fever, violent shakes and shivering, nausea, vomiting. Clinical descriptions as far back as Hippocrates in fifth century B.C. and earlier still in Hindu and Chinese writings. Quinine: Bitter-tasting alkaloid from the bark of cinchona (quina-quina) trees, indigenous to South America and Peru. Used to treat malaria from 1630s through 1920s, when more effective synthetics became available. Isolated from cinchona bark in 1817 by French chemists Pierre Joseph Pelletier and Joseph Caventou. There you have it. Now read on.

It's 1779 and the British, commanded by Henry Clinton, adopt a southern strategy to occupy the malaria-infested Carolinas. The strategy appears successful, as British troops commanded by Lord Charles Cornwallis capture Charleston on March 29, 1780. But appearances can be deceiving. In reality, the Charleston campaign has left the British force debilitated. Things



Mosquito, ready to bite.
Courtesy NLM.

get worse when Cornwallis marches inland in June, where his force is further ravaged by malarial fever carried by *Anopheles* mosquitoes. Lacking quinine, his army simply melts away in the battle to follow. Seeking to preserve what remains of his force, Cornwallis looks to the following winter as a time to recuperate and rebuild. But it is not to be. Clinton sends him to Yorktown, where he occupies a fort between two malarial swamps on the Chesapeake Bay. Washington swoops south and, aided by French troops, besieges the British. The battle is over almost before it has begun. Cornwallis surrenders to Washington, but only after his army has succumbed to malarial bombardment by the vast army of mosquitoes. The Americans have won the Revolutionary War. We owe American independence to Washington's command, aided, unwittingly, by mosquitoes and malaria.

Almost two centuries later, beginning in the late 1960s, malaria again joins America at war. Now the enemy is communism, and the site is Vietnam. The Republic of Korea (ROK), in support of the war effort, sends over 30,000 soldiers and tens of thousands of civilians to Vietnam. The calculation is plain enough: South Korea seeks to consolidate American commitment to its economic growth and military defense. It works, but there is an additional, major benefit: ROK medical care of soldiers and civilians greatly strengthens South Korean capabilities in managing infectious disease and safeguarding public health. Indeed, at war's end in 1975, ROK is an emergent powerhouse in malaria research and the treatment of parasitic disease. Malaria has again played a part in the service of American war aims.

Winners and losers aside, the battle against malaria is a thread that weaves its way through American military history. When the Civil War erupted in 1861, outbreaks of malaria and its far more lethal cousin, yellow fever, did not discriminate between the forces of North and South. Parasites mowed down combatants with utter impartiality. For many, malarial infection was the enemy that precluded engagement of the enemy. But there were key differences. The North had the U.S. Army Laboratory, comprised of laboratories in Philadelphia and Astoria, New York. In close collaboration with Powers and Weightman (one of only two American pharmaceutical firms then producing quinine) the Army Laboratory provided Union forces with ample purified quinine in standardized doses. Astute Union commanders made sure their troops took quinine prophylactically, with troops summoned to their whiskey-laced quinine ration with the command, "fall in for your quinine."

Confederate troops were not so lucky. The South lacked chemists able to synthesize quinine from its alkaloid; nor did a Spanish embargo permit the drug's importation. So the South had to rely on various plants and plant barks, touted by the South Carolina physician and botanist Frances Peyre Porcher as effective quinine substitutes. But Porcher's quinine substitutes were all ineffective, and the South had to make do with the meager supply of quinine it captured or smuggled. It was a formula for defeat, malarial and otherwise.

Exactly 30 years later, in 1891, Paul Ehrlich announced that the application of a chemical stain, methylene blue, killed malarial microorganisms and could be used to treat malaria. But nothing came of Ehrlich's breakthrough seven years later in the short-lived Spanish-American War of 1898. Cuba was a haven for infectious microorganisms of all kinds, and, in a campaign of less than four months, malaria mowed down American troops with the same ease it had in the Civil War. Seven times more Americans died from tropical diseases than from Spanish bullets. And malaria topped the list.

As the new century approached, mosquitoes were, in both senses, in the air. In 1900, Walter Reed returned to Cuba to conduct experiments with paid volunteers; they established once and for all that mosquitoes were the disease vector of yellow fever; one could not contract the disease from "fomites," i.e., the soiled clothing, bedding, and other personal matter of those infected. Two years later, Ronald Ross received his second Nobel Prize in Medicine for his work on the role of mosquitoes in transmission of malaria. But new insight into the mosquito vector of yellow fever and malaria did not mitigate the dismal state of affairs that came with World War I. The American military was no better prepared for the magnitude of malaria outbreaks than during the Civil War. At least 1.5 million doughboys were incapacitated, as malaria spread across Europe



BG David Birney, 1825-1864. Apparently died of malaria. Courtesy Library of Congress.

from southeast England to the shores of Arabia, and from the Arctic to the Mediterranean. Major epidemics broke out in Macedonia, Palestine, Mesopotamia, Italy, and sub-Saharan Africa.

In the Great War, malaria treatment fell back on quinine, but limited knowledge of malarial parasites compromised its effectiveness. Physicians of the time could not differentiate between *P. vivax* and *P. falciparum*. As a result, they could not optimize treatment doses according to these somewhat different types of infection. Troops, especially those with falciparum, paid the price. Except for the French, whose vast malaria control plan spared its infantry from infection and led to victory over Bulgarian forces in September 1918, malaria's contribution to the Great War was what it had always been in war – it was the unexpected adversary of all.

In 1924, the problem that had limited the effectiveness of quinine during the Great War was addressed when the German pharmacologist Wilhelm Roehl, working with Bayer chemist Fritz Schönhöfer, distilled the quinine derivative Plasmoquin, which was far more effective against malaria than quinine. By the time World War II erupted, another antimalarial, Atabrine (quinacrine, mepacrine), synthesized in Germany in 1930, was available. It would be the linchpin of the U.S. military's malaria suppression campaign, as announced by the Surgeon General in Circular Letter No. 56 of December 9, 1941. But the directive had little impact in the early stages of the war. U.S. forces in the South Pacific were devastated by malaria, with as many as 600 malaria cases for every 1,000 GIs. Among American GIs and British Tommies alike, the daily tablets were handed out erratically. Lackluster command emphasis and side effects were part of the problem: the drug turned skin yellow and occasionally caused nausea and vomiting. From there, the yellowing skin in particular, GIs leapt to the conclusion that Atabrine would leave them sterile and impotent after the war. How they leapt to this conclusion is anyone's guess, but there was no medical information available to contradict it.

The anxiety bolstered the shared desire of some GIs to evade military service. A number of them tried to contract malaria in the hope of discharge or transfer – no one was eager to go to Guadalcanal. Those who ended up hospitalized often prolonged their respite by spitting out their Atabrine pills. When it came to taking Atabrine, whether prophylactically or as treatment, members of the Greatest Generation could be, well, less than great.

Malarial parasites are remarkably resilient, with chemically resistant strains emerging time and again. New strains have enabled malaria to find ways of staying ahead of the curve, chemically speaking. During the Korean War (1950-1953), both South Korean and American forces fell to the vivax strain. American cases decreased with the use of chloroquine, but the improvement was offset by a rash of cases back in the U.S., where hypnozoites (dormant malarial parasites) came to life with a vengeance and caused relapses. The use of yet another antimalarial, primaquine, during the latter part of the war brought malaria under better control. But even then, in the final year of the war 3,000 U.S. and 9,000 ROK soldiers fell victim. In Vietnam, malaria reduced the combat strength of some American units by half and felled more troops than bullets. Between 1965 and 1970, the U.S. Army alone reported over 40,000 cases. Malaria control measures were strengthened, yes, but so were the parasites, with the spread of drug-resistant falciparum and the emergence of a new chloroquine-resistant strain.

Malaria's combatant role in American wars hardly ends with Vietnam. It was a destructive force in 1992, when American troops joined the UN Mission "Operation Restore Hope" in Somalia. Once more, Americans resisted directives to take a daily dose of preventive medicine, now Mefloquine, a vivax antimalarial developed by the Army in 1985. As with Atabrine a half century earlier, false rumors of debilitating side effects led soldiers to stop taking it. And as with Atabrine, malaria relapses knocked out soldiers following their return home, resulting in the largest outbreak of malaria stateside since Vietnam.

In Somalia, as in Vietnam, failure of commanders to educate troops about the importance of "chemoprophylaxis" and to institute "a proper antimalarial regimen" were the primary culprits. As a result, "Use of prophylaxis, including terminal prophylaxis, was not supervised after arrival in the United States, and



Sign at an unknown Pacific island, WWII.
Courtesy National Museum of Health and Medicine.

compliance was reportedly low.” It was another failure of malaria control for the U.S. military. A decade later, American combat troops went to Afghanistan, another country with endemic malaria. And there, yet again, “suboptimal compliance with preventive measures” – preventive medication, use of insect repellents, chemically treated tent netting, and so forth – was responsible for “delayed presentations” of malaria after a regiment of U.S. Army Rangers returned home. The more things change, the more they stay the same.

Surveying American history, it seems that the only thing more certain than malarial parasites during war is the certainty of war itself. Why is this still the case? As to the first question, understanding the importance of chemoprophylaxis in the service of personal and public health (including troop strength in the field) has never been a strong suit of Americans. Nor has the importance of preventive measures, whether applying insecticides and tent netting (or wearing face masks) been congenial, historically, to libertarian Americans who prefer freedom in a Hobbesian state of nature to responsible civic behavior. Broad-based public-school education on the public health response to epidemics and pandemics throughout history, culminating in the critical role of preventive measures in containing coronavirus, might help matters. In the military domain, Major Peter Weima sounded this theme in calling attention to the repeated failure of education in the spread of malaria among American troops in World War II and Somalia. He stressed “the critical contribution of education to the success of clinical preventive efforts. Both in WWII and in Somalia, the failure to address education on multiple levels contributed to ineffective or only partially effective malaria control.” As to why war, in all its malarial ingloriousness, must accompany the human experience, there is no easy answer.

This is adapted with permission from Dr. Stepansky’s blog, www.adoseofhistory.com

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Right: Sign at the 363d Station Hospital, WWII.
Courtesy National Museum of Health and Medicine.

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AMEDD Support During the 1954 Texas Flood

Lewis Barger, ACHH

Hurricane Alice made landfall south of the U.S.-Mexico border on June 25, 1954, and tracked north-west along the Rio Grande valley. Alice was a relatively weak hurricane and little damage was caused by storm winds, but by the 27th of June the storm was over the Rio Grande and Pecos River valleys where it dropped over 30 inches of rain. Water rushed down tributaries, growing in volume as it went. On the Pecos, water crested at 96 feet washing away the highway bridge on U.S. 90 between Langtry and Del Rio. The Southern Pacific Railway's Pecos River High Bridge survived the flood, but other, lower railroad bridges were damaged leaving 266 people stranded on the 13 car *Sunset Limited* in Langtry, Texas. Dozens of motorists were also cut off, and the town of Langtry, small by any standard, temporarily increased from a population of about 100 to over 400 people. Further down the Rio Grande at Del Rio where the river was broader the river crested at 38 feet on the 28th. Because of the area's geography Del Rio was largely spared, but across the river the town of Acuña, Mexico was significantly damaged and the international bridge connecting the two cities was washed out. Residents of Acuña had received advance warning and evacuated before the flood hit, but buildings were destroyed, and water supplies compromised.

The acting commander of Laughlin Air Force Base in Del Rio, Colonel Richard C. Bender, received requests for military assistance from the state of Texas Defense and Disaster Control Center, the American Red Cross, and the Southern Pacific, with the Red Cross arranging the reimbursement for military support. Bender, in turn, contacted Air Force, Army, and Navy commanders in San Antonio, San Marcos, and Corpus Christi, Texas and coordinated the military support effort. The largest portion of the mission was supported by the Air Force but three helicopters with their aircrew from the Medical Field Service School (MFSS) joined the relief effort.

Beginning in 1952 the AMEDD began to stand up air ambulance units, or medical detachments (helicopter ambulance) as they were officially named, at Fort Sam Houston in San Antonio, Texas, and other locations. By June 1954 when Hurricane Alice struck four units had been activated at Fort Sam Houston. The detachments stood up there to receive their equipment and personnel and train before they were ready to be sent to other locations where they would begin their mission of providing medical evacuation support. One, the 53d Medical Detachment (Helicopter Ambulance), had already been deployed to and stationed in West Germany and the 274th Medical Detachment (Helicopter Ambulance) was preparing to depart for West Germany. Two other detachments, the 63d and 57th, were still stationed at Brooks Air Force Base in San Antonio and attached to the 37th Medical Battalion (Separate), part of the Medical Field Service School. In addition to the detachments the school also had an Aviation Branch which was authorized two Bell H-13 "Sioux" and two Piasecki H-25 "Army Mule" helicopters. The helicopters were used primarily for training students in helicopter operations but also performed other assignments like ferrying VIPs and serving as static displays for public relations and education about the AMEDD.

The MFSS had provided support during humanitarian crises previously. In 1947 the school dispatched elements of the 32d Medical Battalion after ships carrying fertilizer exploded in the port of Texas City leveling large portions the surrounding area (see *The AMEDD Historian*, Autumn 2020). In April 1953 a Piasecki H-25A, newly attached to the MFSS, evacuated an injured soldier from Rock Springs, Texas to Brooke Army



One of the MFSS H-13 "Sioux" as a static display in downtown San Antonio, TX., 1953. U.S. Army Photo, ACHH holdings.

Hospital in San Antonio. When the school got the call requesting support to the Rio Grande flood victims, they were ready to respond.

On the 28th of June, two H-25s and one H-13 joined the Air Force-led relief effort. The MFSS' helicopters carried nearly 4 tons of food, clothing, and other supplies to Acuña and evacuated 45 U.S. nationals to Laughlin Air Force Base. The entire relief effort evacuated over 1,000 people, delivered 81 tons of supplies, and was supported by Air Force, Navy, and Army helicopters flying over 600 missions in five days.

The MFSS' contribution to relief operations was a comparatively small part of the whole but demonstrated again the readiness of the school's personnel to respond in an emergency. It also provided an excellent example of the utility of rotary winged aircraft operating in areas without airfields at a time when helicopters were still a novelty to most people.

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A Medical Field Service School H-25 Army Mule lowering medical supplies by its internal hoist during a training exercise at Camp Bullis, TX.
U.S. Army Photo, ACHH holdings.

AMEDDD Cartoons in Vietnam Grant Harward, PhD

The *USARV Medical Bulletin* (also known as the *USARV Medical Newsletter*) was a bimonthly publication printed by Headquarters U.S. Army Republic of Vietnam between January 1966 and February 1971. Its purpose was to provide useful information for AMEDDD personnel throughout Vietnam. In addition to serious articles on medicine meant to inform, the pages of the *USARV Medical Bulletin* were usually sprinkled with humorous cartoons meant to entertain.

The first and most successful was the “Charley” cartoon by SFC Bobby R. Dowdy under the pen name of De Fox. The cartoon first appeared in the fifth issue of the *USARV Medical Bulletin* and followed the antics of two hapless Viet Cong soldiers named No. 1 and No. 10 who were constantly getting into trouble. Dowdy’s “doodles” (as he referred to them) were such a hit that he was profiled in the *USARV Medical Bulletin*, *The Vietnam Guardian* (a Saigon daily), and the *Army Digest*. “Charley” appeared from September 1966 to June 1967 during Dowdy’s tour of duty with the 36th Medical Detachment (Dental) in Saigon, which operated dental clinics in the city and scattered throughout the Mekong Delta.



SFC Dowdy sketching.

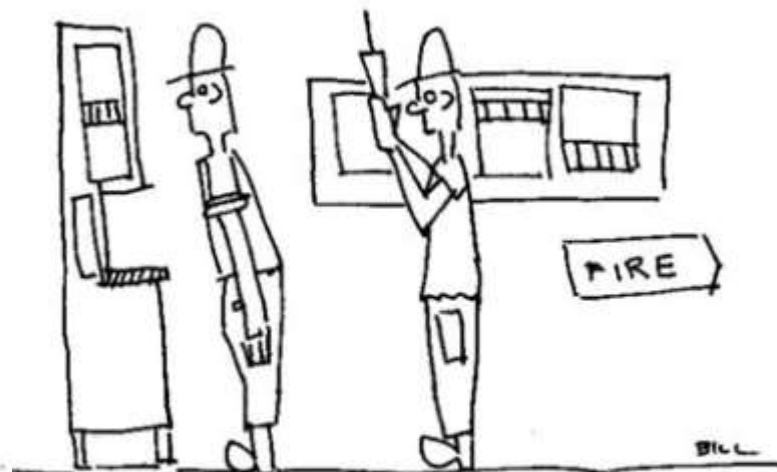
The cartoonists that followed Dowdy enjoyed far less notoriety. A short series of untitled sketches, by a soldier named Bill, about the misadventures of a medic in Vietnam appeared in several issues of the *USARV Medical Bulletin* between August and October 1967. Then a certain A. F. Klemushin started drawing (again untitled) cartoons of a pair of soldiers fighting leeches, mosquitos, and other ills from December 1967 to June 1968. Oftentimes, the cartoonists drew something that related to a subject discussed in that issue. The importance of taking anti-malarial CP (chloroquine-primaquine) pills was an oft-reoccurring message.

Cartoons became less frequent in the *USARV Medical Bulletin* over the next few years. No one cartoonist took up the task, instead various individuals like Ruben F. Fechner, Jr, RGH, Perges, and W sent in one-off drawings from time to time. Many cartoons went unsigned. Not a single cartoon appeared in the *USARV Medical Bulletin* during 1970 or in its last issue at the start of 1971. Apparently, no one found the Vietnam War to be a laughing matter any longer.

All issues of the *USARV Medical Bulletin* are available on the Stimson Library website at [USARV Medical Bulletin - Digital Collections of Stimson Library \(oclc.org\)](https://www.stimson.org/digital-collections-of-stimson-library)

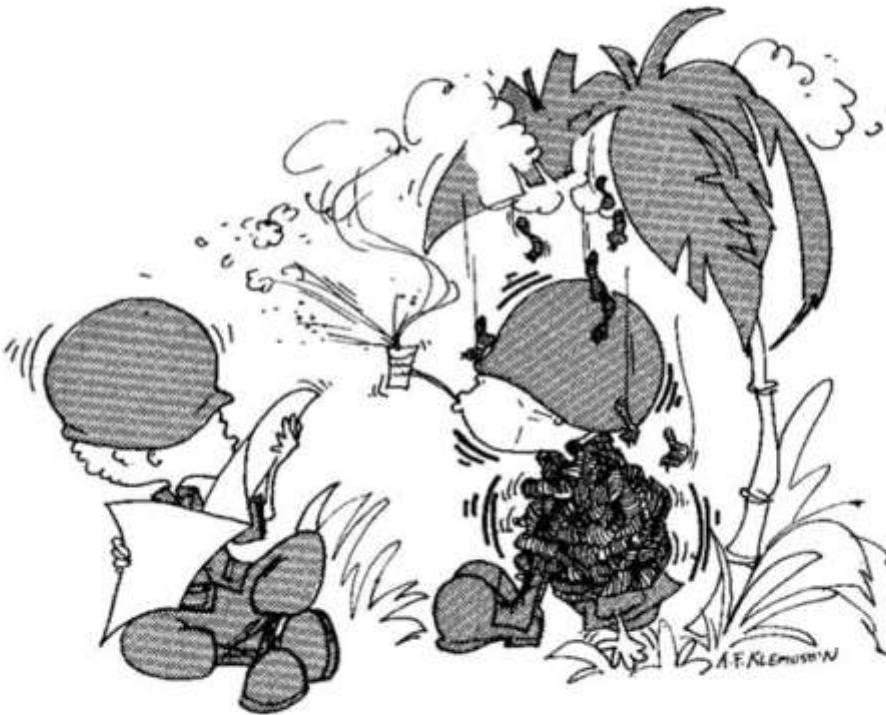
Right: Cartoon by “Bill.”

Below: Cartoon from the “Charley” series by “De Fox.” One VC is telling another “Looks like you got real million piastre chest wound.”



“My buddy tells me you have a new pill for VD.”





"It says CO₂ attracts leeches!"

Another reason not to smoke?
Cartoon by A. F. Klemushin

— 27 July 1775 —

New ACHH Archival Donations:

A selection of Abbott Collection newsletters illustrating AMEDD paintings during World War II.

Frank Leslie's Illustrated Newspaper, August 1, 1863 with an illustration of Surgeon General William Alexander Hammond as the "Modern Hercules."

Panoramic photograph of the 60th General Hospital Unit, William Beaumont Hospital, Fort Bliss, El Paso, February 1944.

Panoramic photograph of the 1955 Neuropsychiatric Procedures Course Class .

Panoramic photograph of the Fort Sam Houston Cantonment Garrison, 1925.

Two unidentified WWI photographs.

New to the Research Library:

Kipp, Larry. Small war: my twenty-seven months as a medic in Vietnam. 2022.

Egan, M. David and Jen Egan. U.S. go home: the military in France, 1945 to 1968. 2022.

Barris, Ted. Rush to danger: medics in the line of fire. 2019.



A Century Celebration Recalls a Family Tradition

Scott C. Woodard, ACHH

Before she was “Mom-mom” Mills to her grandchildren, Gertrude Indoe Mills was born 27 November 1920 in New Jersey. In her 100th birthday in 2020 with friends and family came stories of service to the country. Military service was not foreign to the family. Her grandfather and father served in the Army. She completed her registered nurse training at St. Joseph’s Hospital School of Nursing in Patterson, NJ in 1942. She continued studying obstetrics at Margaret Hague Hospital in Jersey City NJ before volunteering for service as an Army Nurse Corps officer on 15 August 1943 at Fort Meade, MD. Her brother Edward enlisted in the Army the next year.

2LT Indoe arrived with her unit, the 226th General Hospital, on 16 December 1944 in England. The Allied invasion of northern France had begun that summer. As the Allies pushed into Germany, the AMEDD established general hospitals in the Communications Zone and they directly received patients from the Combat Zone evacuation hospitals. In the ‘generals’ patients received definitive care. Doctrinally, the general hospital provided the most difficult and specialized procedures with the most elaborate equipment in the Theater of Operations. Equipped to operate under tentage, most general hospitals utilized available structures for their 1,000 to 2,000 beds.

The 226th was one of six general hospitals established near an airfield outside a former French cavalry post at Reims, France in March 1945. The surrounding area was devastated from German occupation and Allied bombing and had served as the headquarters of the 101st Airborne Division. Hospital staff countered busted pipes, inoperative bathrooms, stripped electric wires, no heat, with Lyster bags for drinking water, outdoor latrines, light sets, and coal stoves. In a newspaper article, Indoe described the trying conditions where water was difficult to acquire and nurses were heavy-laden bearing the water-filled buckets to each ward. In the former French post, she was responsible for one entire building of the 3-5 buildings occupied by the 226th General Hospital. As dictated by doctrine, her patients arrived from evacuation hospitals and were sent back to the United States or England for additional rehabilitation.

Gertrude was promoted to First Lieutenant on 1 June 1945 while outside of Reims, France. The year also saw Indoe reunited with her brother, Technical Sergeant Edward Indoe, who travelled from Deggendorf, Germany from his unit. The war came to an end for the 226th General Hospital when it redeployed to the U.S. on 10 September 1945. On 4 January 1946, 1LT Indoe finally was demobilized from the Army at Camp Sibert, AL with 28 months of active duty service. In that time, she served three months in England and six months combat service in France supporting the Allied push into the interior of Germany participating in the Rhineland Campaign. Her decorations include the European, African, and Middle Eastern Theater Campaign Medal with bronze service star, the American Theater Medal, and the World War II Victory Medal. Upon transition to civilian life, Gertrude married Gerard Mills, a Military Police noncommissioned officer stationed at Fort Dix, New Jersey. Together they reared four daughters.

There were more than 59,000 women who served in the Army Nurse Corps in WWII. Like Gertrude, they were all volunteers. Her recent celebration of a 100th birthday recalls the great life-story of one soldier in World War II. However, 1LT Gertrude Indoe’s AMEDD story continues. Continuing the legacy of medical service is her grandson, COL Timothy Switaj, Medical Corps. Always interested in medicine, he recalled receiving her medical textbooks while growing up. Just as Army service began with her grandfather, the family legacy of service continues through the generations in her grandchildren today.



Second Lieutenant Gertrude Indoe, 1943. Photo courtesy of the Mills and Switaj families.



Gertrude and her brother, Technical Sergeant Edward Indoe, reunite in France, 1945. Photo courtesy of the Mills and Switaj

Rehabilitating the Wounded After WWI

During WWI, the Army had to decide how much treatment to give to “crippled” soldiers, those who could not return to duty. Everybody agreed it was a government responsibility, but without a Veterans’ Administration the Army had to care for its own. There were bumps in figuring out what to do and how to do it.

The background was the Civil War experience. While medicine and surgery were primitive then, thousands of amputees survived, and the Federal Government paid for artificial limbs. Federal money created an artificial limb industry, but by 1893 over 40% of the Federal budget was Union veterans’ disability pensions.

In August 1917 the first step was to determine policy: what should the Army do? The first suggestion was everything, including job training – and the Army would treat civilians too. That went too far. The Judge Advocate General ruled against treating civilians, although military retirees could reenlist for treatment. (Job training was ruled not a military responsibility.) It took months to settle Government-wide policy, but in April 1918 hospital commanders were told “no member of the military should be [discharged] until he has attained complete recovery or as complete recovery” as possible. While the Army wanted to do the best for patients, the doctors also thought rehabilitation would save money: they could earn a living, avoiding Federal pensions.

To do this, the Army needed facilities. There was only St. Elizabeths for mental patients and the Soldiers’ Home for a few hundred retirees; the Public Health Service was stretched by its ordinary mission. So dozens of general hospitals were built in the US. Personnel were needed; men were drafted. Occupational and physical therapists were needed, and they were hired. Even though these were female careers, the Army needed the skills and swallowed its concerns about hiring women. (They would be commissioned in 1947.)

Rehabilitation (including fitting of artificial limbs) was supposed to take place in the U.S., with only initial care overseas. Since evacuation was slow, patients might spend months hospitalized in France. Prompt physical and occupational therapy speeded their recovery; early fitting of limbs not only helped patients move around but eased their minds. So the best medical care cut across bureaucratic lines – and the Army responded by sending rehabilitation personnel to France and making temporary limbs there to help patients. The planning mostly ignored behavioral health patients. Since there was virtually no way to help them (reliable drugs would be discovered in the 1950s), they were generally discharged to state mental hospitals; they might get better, but would be safe. With mental healthcare so primitive, the Army was still doing all it could for the men.

When the fighting stopped, patients wanted out of the Army. Doctors wanted to treat them, partly to help the patient, but partly to certify them as cured so they would be ineligible for disability pensions. In November 1919 the Army ordered most patients to be discharged after a year in hospital. Most were already gone, so that roughly matched the capabilities of medicine to rehabilitate patients. If men needed more care the Government would still pay – but they were not an Army responsibility.

Right: Patients receiving gait training with artificial legs.

Below: Occupational therapy for a bed patient.



Convalescent Care in World War II

The U.S. Army had three types of convalescent care facilities during World War II.

First, convalescent camps, also known as rest camps, at Echelon II for walking wounded and mildly ill soldiers who were expected to recover and return to duty within days or a week. These were ad-hoc, created by a medical battalion using personnel taken from a clearing company or a collecting company. Consequently, convalescent camps varied greatly in size from a few dozen to a few hundred beds depending on the intensity of combat and prevalence of disease. The convalescent camp was often attached to the casual company as the two operated in tandem. The convalescent camp provided food, quiet surroundings, and light activity before being transferred to the casual company for some reconditioning before reassignment. Although soldiers requiring more a week or less of convalescence were supposed to remain close to the front, sometimes they were just evacuated after a day because of the rush of incoming casualties. Such soldiers often were returned from a station or evacuation hospital for convalescence, so they would not be lost to their unit. This was especially common with soldiers suffering from an endemic disease like malaria.

Second, convalescent hospitals, also known as holding hospitals, at Echelon III for lightly wounded and moderately ill soldiers who required one to two weeks of healing before return to duty. The convalescent hospital had a T/O&E with 3,000 beds attended by 31 officers and 192 enlisted men. Convalescent hospitals held patients who no longer needed constant medical or surgical care but who were not yet strong enough for the battlefield while they recovered before transferring them to a replacement depot. Under some field armies, neurological cases were held in convalescent hospitals for up to three weeks. This opened up beds in station and evacuation hospitals for more critical patients. Despite the existence of numbered permanent convalescent hospitals in the field, many (perhaps most) were actually unnumbered provisional convalescent hospitals set up by medical battalions, evacuation hospitals, or station hospitals. Consequently, some convalescent hospitals only had a quarter or half the number the beds and personnel as laid down on paper. The large, and often mostly immobile, convalescent hospitals took in patients that otherwise would have been lost from the control of field armies to the Communication Zone and relieved evacuation hospitals of the burden of having to treat venereal disease cases.

Third, convalescent centers at Echelons IV and V for soldiers who had received treatment and needed a month or two to recover. In the Communication Zone, convalescent centers usually began as convalescent annexes to general hospitals. In early 1943, the Surgeon General's Office established a Reconditioning Division to implement an army-wide program for reconditioning convalescent soldiers. By mid-1943, physical therapy was supplemented by light work in and around the hospital, which also helped relieve the burden on the hospital staff. Yet there were discipline problems due to the lack of officers, so a provisional conditioning battalion with four companies of 175 men each, which was later known as a combat conditioning



Troops arrive at the 6706th Conditioning Company, Combat Conditioning Battalion, at Averno Italy, 1945.

camp, was established in the MTO. Patients were used as training cadre in a course that lasted three weeks before graduates were transferred to a replacement depot. After a visit to the MTO, the Surgeon General directed his office to design convalescent centers to be established near parent general hospitals based on British convalescent facilities. In early 1944, reconditioning really became part of the convalescent program at convalescent and reconditioning (C&R) centers that spread from the Mediterranean Theater to the European Theater and Pacific Theater. Patients were transferred from the general hospital to the C&R center 10 days before their discharge (although in most cases they had already been doing occupational therapy, light calisthenics, short walks, and various duties). The C&R centers were overseen by an officer and six noncommissioned officers and were located as far from the general hospital as practicable (up to a mile or two). Patients dressed in uniform and lived much as they would in combat units. The ten-day program included not only physical condi-

tioning through careful graduated exercises and military drill but also psychological readjustment through lectures on war's progress, world events, and lessons learned from past campaigns. Once completed, patients became casualties to be returned to duty. The Army Air Force pushed for its own system of convalescent centers in the Communication Zone. Special convalescent areas and rest camps were established in the Communication Zone of the Pacific for soldiers suffering from malaria to recover without spreading the illness to the local population. Additionally, POW convalescent hospitals were created in the Mediterranean and European theaters. In the U.S., hospital centers (three or more general hospitals, a convalescent camp, Quartermaster and Finance detachments, and other branches) and convalescent hospitals mixed reconditioning of patients capable of returning to duty with rehabilitation of patients incapable of service for return to civilian life. Rehabilitation took on increasing importance after late 1944. Army Service Forces had substantial authority over hospital centers and convalescent hospitals in the U.S. until 1946 when they returned fully to the control of the Surgeon General's Office.

The ad-hoc and provisional nature of convalescent camps, convalescent hospitals, and convalescent centers at Echelons II and III make determining rates of admission and return impossible to determine. Convalescent camps are included in the category "Nonhospital" that embraces aid stations, collecting stations, clearing company, dispensary, and other medical treatment facilities forward of hospital. Nonhospital medical facilities treated 5.6 percent of battle injuries of wound admissions. Convalescent hospitals are included in the category "Other hospitals" consisting of evacuation hospitals, field hospitals, and convalescent hospitals. Other hospitals treated 17.2 percent of battle injuries and wound admissions. At Echelon IV, general hospitals had attached convalescent annexes, later convalescent centers, that seem to have been lumped together in the statistical categorization. General hospitals treated 33.2 percent of all battle injuries and wound admissions. Convalescent facilities accounted for a sizable portion of the location of final treatment at Echelons II, III, and IV before patients were transferred to a replacement facility. Only Echelon V has somewhat solid numbers for convalescent hospitals. Convalescent hospitals in the U.S. treated 12.8 percent of all battle injuries and wound admissions.



Officers exercise at the 123d Station Hospital in England, 31 August 1944. This was a 400-bed facility. There were approximately 12,000 beds for convalescent enlisted men in formal convalescent hospitals in the European Theater.

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The Surgeon General's Oscar™

During WWII there were about 2,000 soldiers who survived a spinal cord injury (SCI) that caused partial paralysis. Those same injuries were death sentences in WWI, largely because bed sores and bladder infections had few effective treatments and the infections spread. By WWII a wide range of small, unrelated improvements were assembled to produce vastly better results. Most patients survived, and fully forty percent of SCI patients would be able to live independently.

In 1948 the Army had George L. George make Professional Medical Film 5055, "Toward Independence." George had only produced one movie, but someone nominated "Toward Independence" for an Oscar™ as a short documentary. In half an hour, the movie mentioned some of the improvements in medicine but told the story of a fictitious George Young who found the will to join in the rehabilitation. Through hard work he learns to take care of himself, especially moving around. By the end he has a car and a job.

Just why it won is hard to say. "The Best Years of Our Lives" won seven Oscars™ in 1946, looking at three WWII veterans, one with psychological trauma and one bi-lateral arm amputee, so perhaps there was a short moment for movies that included seriously wounded veterans. The movie received the Oscar for best short documentary in 1949.

See for yourself:

www.youtube.com/watch?v=nUXnFCwrDVg



The Army Ambulance Service

Before the U.S. entered WWI, Americans volunteered at hospitals and organized several ambulance groups in France, often from humanitarian motives or out of sympathy with the Allies. Once the U.S. declared war the French recognized that these groups were providing vital support, and asked that they be left in place. The American Red Cross took over the hospitals, while the ambulance groups were organized (from 23 June 1917) into the U.S. Army Ambulance Service. The French even asked for more ambulance units, one *groupe* (20 ambulances) per infantry division, and the U.S. pledged to organize 169 groups. Some were recruited from the pre-war volunteers and some were formed by groups (especially colleges) that wanted to get into the war quickly. (Some young men apparently lied about being able to drive in order to get to the war sooner.)

The first units arrived in France on 21 August 1917, four months after the U.S. declaration of war. They mainly supported the French, but some went to Italy, and the American Expeditionary Force had to ask the French and Italians for the loan of USAAS units during a severe shortage of American ambulance units. (One unit, attached to the U.S. 35th Division, evacuated over 8,000 Americans in a sixteen-day period, “overcoming all obstacles in reaching the destination where the wounded are collected.”) Ultimately, not every French division had a USAAS section attached, and priority was given to assault divisions rather than those in quiet sectors. They had narrow, light Ford Model T ambulances with high ground clearance, and went as far forward as battalion aid stations, up steep roads, and around hairpins turns. Transmissions might only last ten or fourteen days under the constant driving. Ambulance driver William Seabrook recalled “Those of us who used to laugh at danger have stopped laughing... We don't come back any longer and tell each other with excited interest how close to our car this or that shell burst-it is sufficient that we came back.”

Unlike today, there was no en-route care. The Allies tried that early in the war, and found the large number of wounded made it more important to evacuate more patients rather than provide en-route care for some. Also, stopping to provide care blocked roads, interfering with all traffic.

Because the USAAS started and continued as an adjunct of the French, they followed a French organization structure, and even had French soldiers (including a cook) in the units. The U.S. paid, fed, clothed and equipped the men and units, but they served under French orders. Sick, injured, and wounded of the USAAS were typically sent to French hospitals because they were serving with French units. If they needed prolonged care they were transferred to American hospitals.

By the end of the war there were over 5,000 USAAS personnel supporting the French, over 1,000 supporting the Italians, and the rest were supporting the AEF. Almost 13,000 officers and men served in the USAAS, and most of the officers at the end of the war had been promoted from the ranks. 1198 were decorated for bravery, and since they were serving with foreign armies 95% of the medals were foreign. 182 men were killed by enemy action, 40 were captured, and 320 were wounded or gassed; 81 ambulances were lost in action.

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Ancestry.com
Fold3.com



USAAS personnel wore variations on this patch (possibly the Army's first shoulder-sleeve insignia), since the rooster was a widely-used symbol of France.
AMEDD Museum collection.

Don B. Shipman, USAAS

Don Shipman was 24, studying civil engineering at Bucknell College in Lewisburg, PA when the U.S. entered WWI. According to his college yearbook he enjoyed sneaking away to the movies. He quickly signed up for the USAAS, and was mobilized at the end of May, 1917 into Section 524. After only a few weeks of training at Camp Crane (a temporary installation in Allentown, PA) he embarked on the SS Antilles; several ambulance units were deploying on the same ship. On arriving in France they had to assemble their vehicles, which had been shipped knocked-down to economize shipping space. At some point Shipman transferred to Section 30 (later renumbered 642) which was attached to the French *22eme Division d'Infanterie*.

The *22eme DI* saw heavy action in March 1918, and by late May were in a quiet sector. However, on 27 May 1918 a major German offensive hit them and sent the French units tumbling back. The heavy German bombardment had pummeled French forces deployed forward on hills overlooking a river. Section 642 lost four men and eight ambulances captured, but stayed with the remnants of the division, at times being the last element out of a town as they brought wounded back.

Shipman was promoted to Corporal on 16 October 1918, and at some point transferred to the headquarters of the USAAS in Paris. On 1 January 1919 he was promoted to Sergeant, and transferred to Section 537, which had served in Italy. He embarked for the U.S. on 22 June 1919, arrived on 2 July, being discharged from the Army the next day.



Clockwise from top: Shipman; identity disc, AMEDD sergeant's stripes; driving gloves; pliers; bandage and tourniquet; ; French-issue Red Cross brassard; Shipman's diary showing entry for May 28, 1918. He noted "the attack started at 1 AM", how many "cars" the unit lost, and some of his friends being wounded.

Portrait courtesy Internet Archive, other items AMEDD Museum collections.



A Short History of Cupping

Charles Franson, AMEDD Museum

“Cupping” is an ancient healing technique. The cupping process was performed by applying cups to selected skin points and creating a mild vacuum, either by heating the cup or by mechanical suction.

Eber’s papyrus (1550 BC) from Ancient Egypt is one of the oldest medical texts to mention therapeutic cupping. The ancient Greek physician Hippocrates compiled extensive descriptions of cupping, and the practice was found in many cultures, including Chinese, Greek, Middle Eastern, and Western European. Most of the early rationale for the practice was related to restoration of a “balance” in bodily function, such as “qui” in Chinese practice, or regulation of the “humors” in Western practice. There were two forms of cupping: “wet” and “dry.” “Wet cupping” was widely used as a form of bloodletting. The skin was broken, or scarified, and a cup applied to draw off the blood. This was an alternative to using leeches to remove blood. “Dry” cupping referred to the application of cups without breaking the skin. Cups were frequently applied for conditions such as bronchitis, swelling, and “inflammation.”

A cupping set usually consisted of several heavy glass cups, with thick bottoms. The cups were heated over a flame, such as a spirit lamp or candle to evacuate the air, and the open part was placed on the patient’s bare skin over the area to be treated. 5-6 cups were commonly applied. The cups were removed after about 5-10 minutes, and a dressing applied in the case of wet cupping. By the 1860s, various devices had been created to produce the vacuum needed in the cupping glasses. Some used a small air-pump made to fit on the top of each cup, with a valve opening outward. Another approach was a cup fitted with a rubber bulb, which was compressed with the hand when the cup is applied, and then released once the cup is applied, thus producing the needed vacuum.



Vacuum cupping set, probably late 1800s. This set consists of a series of graduated sized cups, each fitted with a valve. The brass pump was attached to the valve, and a vacuum was created. The valve was closed, and the pump removed once sufficient vacuum was achieved.



The 1863 *Hospital Steward’s Manual* noted that the U.S. Army Hospital Steward rarely had “... these more elegant methods of cupping at his command...” The cupping-

apparatus usually furnished by the Army, both in hospital and in the field, consisted of from six to a dozen plain cupping glasses or tins, and a scarificator. The instructions given to the Steward advised that a

vacuum is created in these ordinary cupping glasses or tins by means of the heat generated by the combustion of alcohol. The inner surface of the cup may be moistened with alcohol, which is ignited, and, while still burning, applied to the skin; or a pellet of cotton or strip of paper, moistened with alcohol and ignited, may be dropped into the cup, a which is to be applied while still burning. In either case, the flame is extinguished as soon as the cup is placed upon the skin, by the rapid abstraction of the oxygen of the contained air: so that there is no danger of burning the skin.

Another common method, when using glass cups, was to heat the base of the cup over a flame and ap-

ply it immediately. Cups were removed after 5-10 minutes. Since the object of “dry cups” was drawing blood to the surface, with attendant bruising from blood collecting in subcutaneous tissues due to the rupture of capillaries during the process, it was advised that glass cups were to be preferred (to tin ones), so that the drawing up of the tissues into the cup, as well as the attendant ecchymosis “...can readily be observed during the process.”

The manual continues with a description of the process for “wet” cupping, including the use of a spring-loaded scarificator to incise the skin prior to application of the cups. It’s worth noting that among the indications for wet cupping were abdominal applications for “enteritis and peritonitis,” that were most likely frightfully ineffective.

The directions in later editions of the manual remained essentially the same, with most emphasis on dry cupping. The practice continued into the early 20th Century with diminishing frequency as it was replaced with more effective and better-informed treatments, although a 1909 U.S. Army *Manual for the Hospital Corps* still includes directions for dry cupping.

While cupping is still practiced in Asian and Islamic medical disciplines, Western medicine has mostly discarded the practice, except for alternative and experimental medicine, where it is being studied as a possible physical therapy modality. You may notice circular marks on some athletes, such as swimmer Michael Phelps, that show dry cupping.



Cupping Glass. The “knob” at the base of the cup is heated, then applied to the patient.



Scarificator, roughly 1840s, used to break the skin in “wet cupping.” The spring-loaded device was cocked, and when the lever was pulled, a number of blades swept out through the slots on the face and made a series of shallow incisions to promote bleeding.



A History of the Army Blood Program, by Ronny A. Fryar. San Antonio, TX: Office of the Surgeon General, Borden Institute, U.S. Army Medical Dept. and School, 2020. 238 pp.

Reviewed by G. Alan Knight

Colonel Ronny A. Fryar, a retired U.S. Army Medical Service Corps officer and director of the Army Blood Program from 2009 to 2012, has authored a volume with an intriguing title. What is the Army Blood Program? In a nutshell it is the blood banking program that provides the blood and blood products that are so integral to medical treatment of injured and sick patients. Historically, this program (which continues to function) collected millions of units of blood. Then, and now, the collected blood products are used to support not only Army personnel, but also members of the other armed services, military retirees, and the beneficiaries of military service members.



On the battlefields of World War II, Korea, and Vietnam through more recent conflicts in Iraq and Afghanistan, the availability of blood and plasma has made it possible to perform more complex surgeries and increase the survivability of combat wounds. While Fryar demonstrates that the Army was clearly the leader in originally addressing military blood needs, the Army Blood Program today is an entity that coordinates fully with the blood programs of its sister services. All the services manage their own programs under licensing from the Food and Drug Administration (FDA).

The author identifies the key functions of the program as establishing and operating whole blood collection facilities, transfusion services, and distribution units. Whole blood was recognized as superior to freeze-dried plasma even during World War II. During that war, despite development of effective procedures to collect, ship, and distribute blood “...freeze dried plasma was still the main product used on the battlefield. Its use helped restore the blood pressure of injured soldiers but did nothing to correct hemorrhagic shock. As the war continued, increasing cases of hepatitis led field surgeons to focus more on whole blood.” (p.5) At war’s onset, the U.S. military had no organized whole blood collection strategy or organization and of necessity relied upon the American Red Cross as the key provider. In 1942 Walter Reed General Hospital established the first military blood bank and subsequently a number of other Army hospitals established their own collection programs designed to meet their facility’s blood needs.

The author chronicles the major issues and solutions to blood needs during the war, followed by an exposition of developments during the Korean War. Between the two conflicts, Army hospitals continued collecting whole blood to meet their own requirements. Korean War blood demands stimulated the development of new collection methods, and improvements in distribution. Invention of an improved insulated shipping container was integral to maintaining the necessary temperature for containerized blood and improving the “shelf life” of a unit of blood. Vietnam was the catalyst for increased cooperation among the services in meeting blood needs, and once again, improvements in shipping capabilities based on a newly-invented container designed and manufactured in response to the climatic challenges of a tropical environment. This conflict was the first in which American Red Cross resources were no longer needed for supplemental in-theater support.

In exhaustive detail, the author walks the reader through the countless programmatic and bureaucratic events of the program’s existence from doctrinal development and changes, technology, establishment of blood collection centers at posts, changes in command, and the interface with the FDA. He also addresses the challenges posed to blood collection by diseases such as Acquired Immune Deficiency Syndrome (AIDS) to ensure an AIDS-negative donor base. Other diseases discussed include West Nile Virus, Chagas Disease, and the Zika Virus. The account ends prior to the COVID-19 pandemic.

Fryar’s work clearly demonstrates the importance of blood products in aiding successful surgical intervention in cases of patients with wounds or illnesses. He demonstrates the Army’s success in getting blood as far forward as possible and thus closest to the point of injury. He cites statistics that show the program as a key element in reducing the case fatality rate (CFR) for the U.S. military, a statistic that “represents casualties wounded in action who subsequently died, whether in a foxhole or hospital. The World War II CFR was 19.1%, Vietnam: 15.8%, Iraq and Afghanistan in 2006: 6%.” (p.1)

Given the technical nature of some of the content, active duty, reserve, and retired historically-

inquisitive laboratory officers, and enlisted personnel holding a laboratory specialist MOS are likely to be most interested. This reviewer, a retired MSC and not a laboratory officer, found substantial segments of the book rather arcane. Some material found in Fryar's work may also be of use to future force planners who are tasked to address personnel requirements for blood collecting services at both installation level and in a theater of operations.

The author has provided a valuable service in documenting a critical but largely unrecognized component of Army medicine, especially over the last 40 years. What was originally a program managed by medical officers became a responsibility of MSC officers. As documented by Fryar, many recent advances in military blood banking are largely due to the efforts of Army bloodbankers.

The book includes numerous illustrations (and biographical details) of Army blood program "movers and shakers," transfusion of a combat-wounded patient during an aerial medical evacuation, various distribution-related images, and also exterior shots of facilities. Less edifying are the photos of blood collection facility ribbon-cuttings, and even ground-breaking ceremonies. More problematic are countless illustrations of entire pages of Army regulations, DOD directives, diagrams of special shipping containers (with associated materials, dimensions etc), and other government documents such as an FDA memorandum and a presidential proclamation. This reviewer believes that simply citing the paragraphs of germane documents would have been a more reader-friendly approach.

All in all, *A History of the Army Blood Program* is a well-researched contribution to AMEDD history that has largely escaped the attention of historians since MG Douglas Kendrick's pioneering work, *The Blood Program in World War II*, and in 1973, publication of *Military Blood Banking 1941-1973: Lessons Learned Applicable to Civil Disasters and Other Considerations* by COLs Frank Camp and Nicholas Conte.



Blood being prepared for transport into the Normandy beachhead,
12 June 1944.



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