



The United States Army Special Forces — Walter Reed Army Institute of Research Field Epidemiologic Survey Team (Airborne)

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ABSTRACT

The U.S. Army Special Forces — Walter Reed Army Institute of Research Field Epidemiological Survey Team (Airborne) was formed in late 1965 and later deployed to Vietnam in 1966. Funded by Walter Reed Army Institute of Research and staffed by highly trained Special Forces qualified medical personnel from Fort Bragg, North Carolina, the team was attached to the 5th Special Forces Group (Airborne) while in Vietnam. During its short existence, the team conducted extensive and important field studies on diseases of military medical importance, often under combat conditions.

EARLY MEDICAL RESEARCH PLANNING

The military situation in South Vietnam during the latter half of 1961 foreshadowed increasing United States involvement. Experience in World War II and Korea had shown that the military medical problems encountered in the Pacific and Southeast Asia demanded immediate attention. On January 3, 1962, the Chief, Research and Development, Department of the Army, requested the Surgeon General's proposals for establishment of an appropriate medical research and service program, focusing on military medical problems that United States troops could expect, if called upon to serve in South Vietnam.¹ The Surgeon General's reply, submitted within the next two weeks, called for a comprehensive program. The increase in service requirements was tied to the decisions on future buildup of U.S. forces, and specifically, the Surgeon General called for the establishment of necessary patient care, medical evacuation and preventive medicine units with professional augmentation, plus a medical research laboratory. These elements of the medical research and service program were to be identified as a distinct unit acting in close liaison with South Vietnam's military medical and

civilian medical community. The Surgeon General cited the need for close coordination with existing U.S. assets already in-country and an awareness of the concepts concerning employment of U.S. forces in para-military organizations.² Program supervision was to begin with the Commander in Chief, Pacific (CINCPAC), Military Assistance Advisory Group Vietnam (MAAGV), with operational control to be exercised by the Command Surgeon of the overall medical assets in Vietnam. Approval of the concept plan was to be followed by a more detailed analysis, citing specific resource requirements.³

Interim revisions of the plan called for activation of an Army medical research unit. Pending establishment of the unit, temporary field teams of researchers were to be sent in order to begin studying the ecology and control of disease vectors and isolation of rickettsial and viral agents in Vietnam. The research unit was to be considered a field unit of Walter Reed Army Institute of Research with attachment for logistics and administration to the newly established 8th Field Hospital at Nha Trang.

To support the planned research effort, an increase of 25 additional beds to the existing 100 bed capacity of

the hospital was proposed. Staffing was to consist of research personnel.⁴ This research unit was to serve as a base of operations for additional field teams coming from other highly sophisticated research facilities located offshore.

Established medical evacuation patterns from Vietnam and existing offshore military facilities in the Pacific suggested utilization of Okinawa as the initial backup support site for conducting medical research. Clark Air Force Base in the Philippines was viewed as a possible long range, central offshore support site for field elements in Southeast Asia. It was felt that for certain clinical studies, there were advantages in evacuating selected patients to a sophisticated research support base, instead of "...transporting complex laboratory equipment and refrigeration capability into jungle areas."⁵ Proposed problems for medical investigation focused on preventive medicine, combat surgery and medicine, neuropsychiatry, and field testing of medical equipment.

By 22 May 1962, the Director of Defense Research and Engineering approved the concept plan in principle for planning purposes. He specifically endorsed immediate activation in Vietnam of a medical research unit from Walter Reed Army Institute of Research. Subsequent coordination with CINCPAC through the Joint Chiefs of Staff resulted in support of the plan, eliminating the need for a central research facility in the Philippines, in favor of existing Pacific medical research facilities.⁶

COL (later BG) William D. Tiggert, Medical Corps, headed the fact-finding team which departed for Southeast Asia to conduct a six month study of medical research facilities and resources. In January 1963, the team filed its report. COL Tiggert recommended a realignment of medical research efforts in Southeast Asia, establishment of a medical research unit in Vietnam administered directly by the Walter Reed Army Institute of Research (WRAIR) and reorientation of existing medical research facilities in Kuala Lumpur and Bangkok to support future medical research efforts in Vietnam. Offshore medical research facilities in Japan and Taiwan were recognized as probable support sites.⁷ The fledgling Seventh Medical Laboratory (Detachment #1) in Saigon was viewed as a likely pivot for expanding research.⁸

Further proposals by COL Tiggert, et al., focused on the need for priority research in areas of wounding patterns and the required surgery, drug resistant malaria, and a study of medical advisory effectiveness in limited war. A need for further clinical and laboratory studies in selected infectious and parasitic diseases was also cited.⁹ Requirements for supportive personnel, funding, and administration were emphasized, recognizing that "...a large proportion of the proposed program deals with subjects in which a theater medical laboratory does not have compe-

tence..." and that "...direction of the effort must come from an organization such as WRAIR, capable of operating anywhere in the world."¹⁰

With the subsequent approval by the Director of Defense Research and Engineering in August 1963, the U.S. Army Medical Research Team (Walter Reed Army Institute of Research) Vietnam (hereafter MRT) was activated and established in Saigon by November of that year. Its chain of command was to be through the Director of WRAIR to the Commanding General, Medical Research and Development Command.¹¹

Initially located at facilities provided by the U.S. Army Support Group, MRT moved in July of 1964 to a site directly across from the Institute Pasteur, Vietnam's primary medical research facility. This auspicious proximity to the Institute resulted in excellent collaboration, establishment of a plague research laboratory equipped by MRT and built by the Institute, and publishing of a joint annual progress report.¹²

THE FEST EMERGES

Concurrent with the establishment of the MRT in Saigon, the U.S. Army Center for Special Warfare (CSW) at Fort Bragg initiated modest efforts to identify tropical diseases that Special Forces personnel were exposed to during their brief Pacific area tours. For periods up to six months, Special Forces were routinely assigned to Southeast Asia on temporary duty, either from Okinawa or Fort Bragg.

The genesis for these efforts was found in the continuing need for up-to-date medical data and intelligence. The newly assigned CSW Surgeon, LTC (later COL) Richard L. Coppedge, Medical Corps, was instrumental in formulating a suitable program for production of this vital information. He proposed a plan in September of 1962 which envisioned utilization of the talents of Special Forces aidmen, to act as "sentinels" for collection of medical information from remote overseas areas. This was to be accomplished in accordance with guidelines approved by senior specialists in appropriate fields of medicine and allied sciences.¹³ Incorporated subsequently into this plan was a residency training project developed by a young preventive medicine resident at Womack Army Hospital. MAJ (later COL) Llewellyn J. Legters, Medical Corps, designed a medical screening program for Special Forces personnel returning from Vietnam. In July 1963, he was transferred to the CSW as the Preventive Medicine Officer and gained the opportunity to test his program.¹⁴

With extensive field medical experience in airborne units, a Master's Degree in Public Health from Harvard, and a prodigious capacity for work, MAJ Legters was well suited for this assignment. His screening program pivoted

on identification of personnel to be deployed overseas, followed by a pre-mission physical, with accompanying laboratory examination of blood and stool samples. Upon return from overseas, a post-mission physical was to be performed on these same individuals, with resulting laboratory studies utilized for comparison. Individually drawn sera obtained prior to deployment were compared to post-mission sera. Through extensive antibody titration processes, exposure to diseases encountered overseas was determined. In addition to sera comparisons, extensive laboratory studies were made.¹⁵

Initiation of this program quickly produced positive results, alerting the CSW Surgeon's Office to numerous problems that faced Special Forces personnel in Vietnam. Identification of specific diseases and follow-up studies by the CSW Surgeon's Office led to an increasingly close, but still informal relationship with Walter Reed Army Institute of Research through a few joint studies.¹⁶ Through briefings to the Armed Forces Epidemiological Board by CSW medical personnel, data generated from post-mission medical screenings came to the attention of other military medical researchers.¹⁷

Identification of chloroquine resistant *Plasmodium falciparum* malaria in a Special Forces Soldier hospitalized at Fort Bragg focused on the CSW screening program. Findings created an awareness of the potential for large scale medical problems, if increased numbers of U.S. troops were introduced into Southeast Asia. A need for further study was indicated.¹⁸

As more epidemiological data became available from increasing numbers of returnees, MAJ Legters soon realized that a vital facet of the military medical research cycle was missing. Traditional medical research focused on hospitalized patients, not the circumstances for disease transmission. Environmental and epidemiological data was needed to complete the picture on diseases of military significance and to identify any possibilities for disease prevention and reduction. His worries encompassed not only the short-range acute diseases readily identified, but also those medical problems such as tuberculosis, where a latency period had to be considered. There was no doubt in his mind about the laboratory capability available in the Army's stateside resources. Essential "field" capability was missing.¹⁹

To fill this gap, MAJ Legters envisioned a field collection unit, with a mission of studying diseases of military significance. The unit was to be composed of Special Forces medical personnel, supported by a sophisticated laboratory facility and adequate funding. Neither of the last two resources was available at the CSW. The concept certainly had merit, since the deployment of Special Forces units to Vietnam led to the establishment of numerous A-

camp throughout Vietnam. The opportunity to utilize Special Forces assets now existed.

Seeking support from Medical Research and Development representatives for such a project, MAJ Legters was not given much encouragement until he visited WRAIR. As he tells it "...I think I had a fairly good concept in my own mind. I am not sure how well I articulated it, but after several attempts at the headquarters level, without much success, I remember going out to the Walter Reed Army Institute of Research one day. ... Somehow, I can't remember the details; I wound up in COL Tiggert's office explaining the concept. Much to my amazement, COL Tiggert said 'I will support the project.'"²⁰

With the backing of the Director of WRAIR, MAJ Legters received impetus to formalize the organization, funding and training of the unit that was to be known shortly by possibly one of the longest titles within the Army force structure, specifically the United States Army Special Forces — Walter Reed Army Institute of Research Field Epidemiological Survey Team (Airborne) {hereafter referred to as FEST}.

ORGANIZATION AND PERSONNEL

The 3rd, 6th, and 7th Special Forces Groups and Training Group provided most of the volunteers for the initial contingent of FEST in the fall of 1965. A local arrangement at the CSW released these personnel for special duty with the Office of the Surgeon, CSW, pending receipt of the final space authorizations for FEST. Volunteers were recruited against a proposed personnel authorization which coincided with the initial table of distribution (TD) for the FEST, subsequently approved on 15 May 1966. The TD reflected a personnel space authorization of 26 and was functionally divided into three separate sections. All positions called for Special Forces qualifications and training, in addition to the specific medical skills. A headquarters section of eight personnel supported five clinical teams, plus a field survey section.²¹

Each clinical section, composed of a physician and a laboratory technician (MOS 92B4S), was assigned a specific research project. Because of Special Forces-wide shortage of qualified laboratory technicians, only four of the initial five 92B4S positions were filled, mostly from instructor cadre of the Advanced Medical Training Committee of the Special Forces Training Group. For the sake of expediency, a skilled Special Forces aidman without full laboratory training was assigned to the last position. The field survey section, headed by an entomologist, was more fortunate in assignment of a full complement of trained personnel.

The broad mission of FEST in Southeast Asia was to be three-fold: (1) to collect remote area epidemiologic

intelligence, (2) to conduct field studies of significant military medical diseases, and (3) to conduct field trials of appropriate prophylactic measures, both preventive and pharmacological, for those diseases.²² It was organized primarily to provide a highly mobile capability for medical research operations, based on small cellular sections as the primary investigative elements, focusing on specific diseases or vector studies. The headquarters element was to provide necessary administrative and logistic support, while controlling the overall direction of research. This cellular arrangement was designed for flexibility and rapid response capability to in-country targets of opportunity, while concentrating mainly on pre-determined medical problems.

Receipt of the space allocations precipitated a re-assignment of all personnel who were on special duty with the CSW Surgeon's Office. Orders read "...assignment to Walter Reed Army Institute of Research ..." with attachment for administration, rations, and quarters to the 7th Special Forces Group (Airborne) at Fort Bragg. All positions remained as Special Forces positions on parachute status. The Team's duty station also remained Fort Bragg, until deployment to Southeast Asia.²³ Legters anticipated a need for future replacements, well in advance of deployment; however, his team had to prove itself before solid support was to be gained for replacements. This requirement was critical due to the lengthy pre-deployment training period, in addition to the need for completion of airborne and Special Forces training that preceded it. After the departure of the FEST to Vietnam, a liaison officer, CPT (later MAJ) George E. Hoxsey, MSC, ably carried out the task at Fort Bragg of identifying and selecting volunteer replacements, though no formal authorization yet existed for them on WRAIR's TD.

Late in December 1966, necessary formal measures were taken to ensure adequate replacements for the initial contingent of FEST personnel serving the standard 12-month tour in Vietnam. WRAIR made fourteen spaces available from its TD, to be converted to "Special Forces qualified" medical slots, allowing long range control for selection and training of replacements. The augmentation was also significant, adding veterinary and laboratory officers.²⁴

TRAINING OF FEST PERSONNEL

With the selection of FEST personnel, a vigorous fifteen week pre-deployment training program was initiated at Fort Bragg. Through funds provided by WRAIR, the FEST was trained in the laboratory and field epidemiologic skills suitable for studying a wide variety of diseases. The three-phase program, totaling 684 hours, included a variety of specially selected medical subjects,

Vietnamese language training, and mandatory military subjects.

Beginning 29 November 1965, the initial training got under way with the drafting of formal medical research protocols and identification of related supplies and equipment. Budgetary, administrative, operational, and supply requirements were developed.²⁵ Representatives of the G-3 of the Center for Special Warfare taught mandatory military subjects.

A medical lecture series featured a number of noted scientists such as Dr. Philip Manson-Bahr of Tulane University, Dr. Alexander D. Langmuir of the National Communicable Disease Center (CDC), and Drs. Robin D. Powell and Paul E. Carson of the University of Michigan. They brought their wisdom and experience to the Center for Special Warfare. Each speaker covered some topic which related to significant military medical problems that the FEST might be called on to survey in Southeast Asia.²⁶



*Figure 1: FEST members on parachute training exercise during April 1966. (Author's photo)
(From L to R—LTC Legters, MSG Hickman, CPT Colwell, SSG Hajduk, CPT Boone, CPT Dorogi, SP4 Smith)*

The Team underwent further laboratory training at WRAIR, CDC, and Fort Bragg. Practical field exercises were conducted at on and off post sites. It is curious to note that during one such exercise (a plague study conducted at Gallup, New Mexico, at the request of the state health department) such outstanding success was effected that most of the participating FEST members received job offers from the state.²⁷

The final training phase held Fort Bragg was a practical field exercise in which the field survey and laboratory skills of FEST members were utilized. These activities consisted of rodent collections, ectoparasite determinations, and tissue studies of collected animals

for possible natural infections such as leptospirosis, which was known locally in World War II as “Fort Bragg fever.” Special Forces Vietnam returnees were studied for intestinal bacteria and for malabsorption, i.e. tropical sprue.²⁸

Selected members received additional training at the Parachute Maintenance and Aerial Delivery School in Fort Lee, Virginia, and at the School of the Americas in Panama for the Jungle Operations Course. Four FEST clinicians attended the newly organized Tropical Medicine Course at WRAIR, beginning 6 June 1966. Other concurrent activities for the entomologist and the supply officer included design and development of many new and modified field survey equipment items suitable for remote area operations, e.g. man-pack versions of mosquito trapping devices, and provisions for field data collecting devices compatible with mechanical and electronic data processing equipment.²⁹ Further in-country tactical training for FEST members was to be accomplished by the 5th Special Forces Group (Airborne) upon arrival in Vietnam.

PRE-DEPLOYMENT UNCERTAINTIES

Armed with stateside support and guidance from the Director, WRAIR, MAJ Legters departed for Vietnam in August of 1965 to assess the realities and requirements for conducting research in Vietnam. The trip was only partially encouraging. Despite the full support of the 5th Special Forces Group Commander, no equivalent enthusiasm was voiced by LTC Stefano Vivona, MC, Chief, MRT in Saigon. LTC Vivona’s coolness was apparently the result of an honest appraisal that MRT could readily perform the mission of conducting medical research in South Vietnam with existing personnel assets. Observed in the context of a period prior to the massive U.S. buildup in Vietnam, it may well have been a legitimate view. However, considering the opportunities for exploiting the country-wide spread of Special Forces A-Camps for medical researchers, the lack of support by MRT appeared to be more parochial than objective.³⁰

As part of his fact-finding trip, MAJ Legters accompanied the incoming Group Surgeon of the 5th Special Forces Group, CPT (later COL) Craig H. Llewellyn, MC, on a detailed familiarization tour of many Special Forces locations within South Vietnam. This served a dual purpose of gaining first hand knowledge of the wide ranging medical problems and the peculiarities of the isolated Special Forces camps, where he envisioned implementing his research protocols and solidifying the relationship with the 5th Special Forces Group.

Original planning envisioned close operational ties with the 5th Group, rather than integration as part of MRT. However, that soon became subordinated to the demonstrated need for closer ties to MRT. A joint trip report was

drafted with CPT Llewellyn. The report was essentially self-serving in highlighting those problems which could not only be studied, but which would also be of assistance to Special Forces. Legters was due to brief this report to COL Spurgeon Neel, the U.S. Military Assistance Command Vietnam (USMACV) Surgeon. Due to transportation changes necessitating Legters’ immediate departure, CPT Llewellyn was left in the critical position of advocating the need for FEST in Vietnam.³¹ Support by the USMACV Surgeon was important, since WRAIR did not have the authority for sending FEST into the Vietnam Theater. A request for the FEST had to be generated by either U.S. Army Vietnam (USARV) or MACV to get the necessary space increase authorization. Support of the USMACV Surgeon was indeed a critical pivot point. Legters returned to CONUS (continental United States), filed his report, and received the necessary guidance from WRAIR to proceed with organizing the Field Epidemiologic Survey Team.

Based on his findings concerning potential military problems in Vietnam and assessment of opportunities to attack long standing research problems, Legters spurred his team to develop research protocols for the study of specific problems. The development of these protocols by team members illuminated needs for specific techniques, equipment, and other requirements, allowing the planning of appropriate training. Yet, at this stage the recruitment and training of personnel proceeded without any permission to enter Vietnam. By January of 1966, deployment to Vietnam appeared imminent, with WRAIR sending a letter through channels, proposing February deployment.³²

The resulting flurry of last minute deployment preparations quickly evaporated into gloom, when it became apparent by February 1966, that no request for the FEST was forthcoming from the U.S. Command in Vietnam. Only Legters’ unwavering optimism and faith in FEST capabilities kept the team intact. Exploratory efforts to send a section of FEST to Thailand, instead of Vietnam, met strong resistance again in the person of COL Vivona, who by now was the Chief of U.S. Army Medical Component SEATO in Bangkok. This time, however, Vivona was on solid ground for opposing the deployment of FEST to Thailand. Any U. S. military increase in Thailand, especially Special Forces personnel, was a potentially explosive issue to the sensitive Thais.³³

The on again-off again nature of deployment was prolonged until July 1966 when Legters returned to Southeast Asia on a final attempt to resurrect the mission. He was quickly able to assess the changing nature of the war effort in Southeast Asia and was able to marshal support from Military Assistance Command, Thailand (MACTHAI) for recognition of FEST capabilities. FEST was to add a new capability to operate in areas that were inaccessible to the

personnel of the U.S. Army Medical Component SEATO. An “Urgent Request for Deployment” was drafted by the J-3, MACTHAI for deployment of FEST personnel. The FEST component was to be satellited on both the U.S. Army Medical Component SEATO in Bangkok and the 46th Special Forces Company in Lopburi.³⁴

Legters sent a letter from Thailand outlining anticipated activities, the possibilities of working with the Thai Special Forces, and the United States Overseas Mission (USOM) Medical Civic Action Program.³⁵ He gave instructions to revise a number of protocols in anticipation of projected changes in focus on the diseases to be studied.³⁶

On the 19th of July, Maj Legters continued on to Vietnam for discussions with the third chief of MRT, LTC (later COL) Robert J.T. Joy, MC, who gave him his wholehearted support for bringing the FEST to Vietnam. Accompanied by the MRT chief, Legters visited both the USARV and the MACV Surgeons. With the concurrence of both, Joy submitted a letter to HQ, USARV for an increase in 19 spaces to MRT.³⁷ The request cited a need to balance the research capabilities of MRT, commensurate with the vast buildup in Vietnam. Joy indicated that augmentation by 15 September 1966 was vital, in order to begin studies of malaria and dengue during their seasonal cycle. He also cited the need to begin a backlog of studies, many of which were to be conducted in militarily hazardous areas, such as isolated Special Forces camps.³⁸ On 3 August 1966 the long awaited message finally arrived from USARV, stating “... Clearance for the increase of spaces has been approved by COMUSMACV and USARV has given in-country clearance.”³⁹

During the week of 10-11 August, COL Tiggertt visited the Center for Special Warfare and the FEST. There, he was presented with a Green Beret by the acting commander of the CSW. It was a fitting tribute to the man who initiated the formation of the U.S. Army Special Forces — Walter Reed Army Institute Field Epidemiological Survey Team (Airborne).⁴⁰

RELATIONSHIP WITH MRT

The advance element, consisting of supply officer CPT (later LTC) Louis T. Dorogi, MSC and SFC Thomas J. McMullen, arrived in Saigon on 5 September 1966 and hitchhiked to the Special Forces B-55 compound, located only a couple of blocks from MRT Headquarters at 149 Cong Ly. MRT did not get the information on arrival dates. By the end of October, the remainder of the FEST arrived. The officers were to be billeted at MRT, while arrangements were made to house the enlisted at various bachelor enlisted quarters around Saigon. MRT was located in the anterior portion of a modern four story Vietnamese maternity hospital on Cong Ly Street, directly

across from the Pasteur Institute. MRT was attached to the 1st Logistical Command in Saigon for administration and logistics.⁴¹ By the time FEST personnel arrived, it was a well coordinated and functioning organization headed by LTC (later COL) Harry G. Dangerfield, MC, its fourth chief. Later the unit was attached to U.S. Army Headquarters Area Command (USAHAC).

MRT had numerous advantages besides enjoying a favorable location halfway between downtown Saigon and Tan San Nhut Airbase. Its capability to draw on in-country supply sources, along with stateside supply support from WRAIR Special Foreign Activity, and if needed, from U.S. Army Medical Component SEATO, was unique. Additionally, it possessed a generous fund to meet emergency situations. It was organized into a number of sections, some of which were physically located in the facilities of the Pasteur Institute.

Within the MRT compound, the 521st Medical Intelligence Detachment and the Central Processing Laboratory of the 20th Preventive Medicine Unit were temporarily housed. TDY teams from CONUS under the guidance of WRAIR were also sent to Vietnam to focus on short range studies, primarily at hospitals. With the exception of a few “field” studies by Captains Anthony T.C. Bourke, MC, and Peter G. Bourne, MC, the majority of the MRTV projects were conducted within a hospital or laboratory setting.⁴² The arrival of Legters’ team signified a shift in emphasis and capability towards “field” studies, whether with Special Forces or conventional units.

There were few major problems with MRT since both LTC Dangerfield and MAJ Legters were pragmatic and mission oriented. MAJ Legters realized early during his second visit to Vietnam that attempts to maintain separateness from MRT would jeopardize effective utilization of his team and for this reason worked towards a harmonious relationship with MRT.⁴³



Figure 2: LTC Legters and LTC Adams, WRAIR, meet with MG Steger. (Author's photo)

In Vietnam, FEST members wore the Green Beret with the 5th Special Forces Group flash and the Special Forces insignia on their left shoulder, while other MRT personnel wore baseball type caps with the 1st Logistical Command shoulder insignia, reflecting separateness not only in form, but substance.⁴⁴ The formal attachment of FEST to the 5th Special Forces Group (Airborne) enabled the FEST to operate in Vietnam virtually without question as members of the 5th Special Forces Group.⁴⁵ This not only enhanced their credibility as researchers, but on a more functional basis allowed them to be welcomed as qualified reinforcements in remote Special Forces camps where FEST was to conduct research. In these camps, only a dozen or so U.S. "Green Berets" advised their Vietnamese counterparts. Without Special Forces identification and qualification, FEST presence would have been burdensome, rather than reinforcing, and would hardly have been accepted. Attachment to the 5th Special Forces Group also had some practical advantages. MRT could provide nothing in terms of field gear, whereas the 5th was able to provide weapons, ammunition, clothing, organizational equipment, and vehicles. Also, the 5th Group's country-wide communications and aerial transportation system were now made available.

MEDICAL RESEARCH IN THE FIELD

The opportunity to demonstrate the capabilities of the FEST came during Operation Paul Revere IV, a U.S. military operation conducted in the central highlands of II Corps tactical zone. Coordination with the Special Forces C Detachment at Pleiku and the 1st Company, Mobile Strike Force (more popularly known as the Mike Force), allowed FEST to study malaria incidence among indigenous and U.S. forces during combat operations.⁴⁶

MALARIA STUDIES

CPT (later COL) Andrew J. Cottingham, Jr., MC, and CPT (later BG) Stephen C. Boone, MC, headed a six-man team conducting the study. Both were well qualified technically and operationally, with Cottingham a graduate of the Jungle Operations Course and Boone the honor graduate of the Recondo Course conducted in Nha Trang by the 5th Special Forces Group.⁴⁷ Their study was to be unique, since it was probably the first instance where medical research was conducted under combat operations. The background to this study could be found in the observations of Special Forces personnel commanding the indigenous irregular Mobile Strike Forces. They noted that the combat effectiveness of indigenous forces was severely curtailed after five to seven days of operations. Various attributed to laziness, dietary deficiencies, deficient stamina, or illnesses, the explanations were inconsistent. Concurrently,

the 5th Special Forces Group had no policy of placing the indigenous troops on prophylaxis against malaria. There was a popular assumption that the natural immunity or resistance of those who lived in hyper-endemic malarial areas would be adequate protection.⁴⁸ Also there was an acute awareness of possible hemolysis resulting from administration of certain antimalarials to those deficient in glucose-6-phosphate dehydrogenase (G6PD). Black Americans with this deficiency were known to be susceptible to hemolysis from dapson (DDS) and primaquine. The severity of Caucasian and Chinese variations of G6PD deficiency was legitimate cause for worry in considering antimalarial prophylaxis for indigenous troops. There were no studies in existence at that time on G6PD deficiency within the ethnic Montagnard tribes of Vietnam, the major source of indigenous mercenaries recruited by Special Forces.⁴⁹ Another primary consideration for study was the general suspicion that infected enemy troops were the primary sources of malarial infection for U.S. troops on combat operations. There was no definite proof since previous data were confused by the presence of considerable numbers of infected civilians in the areas of operations. Operation Paul Revere IV occurred in an area devoid of civilians, and thus afforded the opportunity to study malarial incidence in enemy held areas.⁵⁰ It was also known that there was significant prevalence of parasitemia among asymptomatic indigenous troops in the II Corps area. These troops were seemingly unaffected by the parasites during routine garrison duty, but often came down with clinical malaria when introduced into combat. There was suspicion that physical and mental stress (combat) could contribute to development of clinical malaria.

Pre-mission thick and thin blood smears, collected in Pleiku prior to the deployment of the 1st Company, Mike Force, established a 58% *P. falciparum* malarial infection rate and a 1.6% *P. vivax* infection rate among indigenous troops examined. Parasitemia levels were universally low.⁵¹ Within Special Forces personnel in the same unit, none were found to be infected prior to combat operations.

Interestingly, once the 1st Company, Mike Force was committed to action on 13 November 1966, two separate outbreaks of malaria occurred. Five cases of clinical malaria appeared between 16 and 20 November. These cannot be attributed to infection after the onset of the operation, since the classic incubation period for *P. falciparum* malaria is 10 to 14 days.⁵²

It was followed by a massive outbreak of malaria beginning immediately after the 1st Company, Mike Force was extracted by helicopter from the operational area. Between 24 November and 10 December, 43 indigenous troops came down with clinical *P. falciparum* malaria.



Figure 3: CPT Cottingham conducting sick call near Dak To to get cooperation of villagers to participate in malaria study. (Photo – courtesy of CPT Cottingham)

Pre and post-mission medical studies were correlated with medical data and observation during the combat operation. This material was analyzed in terms of the operational data provided by the 1st Company, Mike Force. The results showed significant applicability to future operations. Prior semi-immunity among indigenous troops was shown to be inadequate protection against acquisition of new infections arising from operations in malaria endemic areas. Malarial rates were compared to U.S. units operating in the same general area during the same period and were found to be significantly higher (25.6 cases per thousand man combat days of exposure) than in U.S. units on antimalarial drugs.⁵³ Peaks in malarial outbreaks in the other U.S. units were also correlated to contact with North Vietnamese Army (NVA) forces. Essentially, it was the same experience that the 1st Company, Mike Force had encountered during November. This reinforced the belief that NVA troops constituted a primary reservoir of malaria.⁵⁴

Chloroquine insensitivity of *P. falciparum* was found to be high among infected troops, both in those who were infected prior to Paul Revere IV (82.4%) and among those who were presumably infected in the operational areas (80%). This factor confused interpretation of the chloroquine insensitivity in the *P. falciparum* strains identified.

Further studies of blood from 59 indigenous Montagnard troops conducted at the Department of Medicine, University of Chicago, revealed an 8.5% rate of Caucasian type of G6PD deficiency. This finding confirmed the possibility for massive hemolysis from administration of antimalarial prophylaxis to indigenous troops.⁵⁵

The same investigators began a broad based study in January 1967 to collect data on malaria preva-

lence and chloroquine insensitivity in western II, III and IV Corps tactical zones. In February, another malaria prevalence survey of the 1st Company, Mike Force, was conducted. A 30.1% prevalence was found, versus a previous 59.7% rate in November. This decrease was significant, since after Operation Paul Revere IV this same unit had been placed on intermittent weekly chloroquine and daily dapsone only during subsequent military operations. Studies in II Corps further found that CIDG troops had consistently one half of the civilian malarial rate for *P. falciparum*, probably due to availability of medical care.⁵⁶ At the Dak To Special Forces camp located in II Corps Tactical Zone, chloroquine sensitivity tests of patients showed only a 19.1% insensitivity, versus an 80% prevalence. It was presumably caused by the presence of North Vietnamese troops in the area.

Within western III Corps, around the periphery of the Special Forces B-Detachment of Song Be, the malarial rates for both villagers and CIDG differed significantly, with a *P. vivax* rate of 23.3% versus only a 2.5% *P. falciparum* rate. A byproduct of this study was a 14.9% prevalence of microfilariae, indicating possible long range problems for U.S. personnel operating in the area. This became the impetus for further studies on filariasis.⁵⁷

Of major importance was the identification of significant chloroquine insensitivity (47.8%) of clinical malaria cases in the “Seven Mountains” area of IV Corps. This sharply circumscribed area was almost a separate ecological entity. The Seven Mountains (between 500 and 700 feet high) are virtually the only elevated areas within the Delta region of Vietnam. It had been a Viet Cong controlled area for a long time. The high rate of insensitivity was surprising, in that previously there were no similar problems. In April and May, a number of Special Forces out of Ba Xoai were infected with *P. falciparum*, despite being on routine chloroquine-primaquine prophylaxis. Investigation of this problem led FEST members to conclude that previously unidentified NVA troops were operating in the Seven Mountains area. A confidential report was prepared to this effect, with a recommendation for immediate administration of daily dapsone to all personnel in Ba Xoai, in addition to the weekly administration of chloroquine-primaquine.⁵⁸ The report on NVA presence was soon confirmed by intelligence sources.⁵⁹

VECTOR STUDIES

Parallel to the malaria study efforts, the field survey section of the FEST conducted studies of malaria vectors in western II and IV Corps tactical zones. CPT (later LTC) Ray E. Parsons, MSC, the section chief, directed the studies. He was the first entomologist to serve in that capacity within Special Forces.

During November and December, FEST conducted mosquito surveys to establish the primary malaria vectors in the area of operations for Paul Revere IV. A base laboratory was initially established at the C-Detachment in Pleiku, but was quickly moved to the Plei Djereng Special Forces camp to facilitate transportation of specimens for processing.⁶⁰



Figure 4: CPT Parsons dipping for mosquito larvae in Song Be. (Author's photo)

The mosquito collections were conducted in conjunction with patrol activities of the 1st Company, Mike Force and at the artillery fire support bases for the 4th Infantry Division. The principal method of mosquito collection was the man-biting technique, where one member of the team bares a part of his body to attract the feeding mosquito. Security permitting, red filtered flashlights were employed to aid in capturing mosquitoes. This was accomplished by placing small plastic vials over the mosquitoes. The vials were sealed by wads of cotton until the mosquitoes were dissected or killed (via chloroform) for further taxonomic study. Another collection tool was the battery powered light trap. Daytime collections were made with aspirators or vials at resting sites of the mosquitoes (walls, bunkers, etc.). Larval collections were made by dipping white enameled dippers into likely mosquito breeding sites, such as stagnant pools, water filled bomb craters, and moisture filled depressions in trees.⁶¹ The larvae were placed in 70% alcohol and shipped to the Institute Pasteur for identification and mounting.⁶²

Parsons had broad objectives, namely the collection of basic ecological, taxonomic, and distribution data on all genera of mosquitoes for possible use in on-going and future studies of malaria and other mosquito related diseases. To this end, he felt that a number of permanent base camps should be established to give an in-depth picture of

the seasonal mosquito population variation and problems associated with mosquito vectors. Dak To, a Special Forces camp in northwestern II Corps, was selected as one site because it was representative of Western Highlands ecology. In addition, it was near the operational areas of Paul Revere IV. Readily accessible by air, the camp location simplified potential communications and logistics problems. Additionally, studies by other FEST members of a recent plague outbreak in the camp were in progress. This location allowed more economical use of personnel. Later an alternate site was established at the Special Forces camp at Dak Pek, north of Dak To. Due to poor accessibility, that site was infrequently used.

The second permanent study site was established at the Ba Xoai Special Forces camp at the base of the Seven Mountains area of IV Corps. Clinical studies established the camp as being located in an area endemic to *P. falciparum* malaria. The prevalence of malaria decreased abruptly with increasing distance from the "mountains". It was suspected that the "mountains" (prominent terrain features in an otherwise flat area) held the key to malaria transmissions.

At the Dak To Special Forces camp, FEST accomplished malaria prevalence studies in March 1967, followed by adult and larval control collections in the camp vicinity. Following area mosquito control measures (i.e. aerial spraying and ground fogging), further studies allowed comparison to previously cited baseline data. Results showed only a temporary decrease in mosquito larval counts within open areas around the Special Forces camp, raising questions about the effectiveness of aerial spraying methods used in the area for malarial control. Breeding and biting habits of anopheline mosquitoes were also correlated to seasonal changes in malarial rates.⁶³

The strategic location of Dak To, astride one of the main infiltration corridors into the Western Highlands of Vietnam, was emphasized by a multi-battalion NVA attack against the camp on 16 June 1967. The attack followed on the heels of an ambush which on 15 June 1967 virtually decimated one company of the Mobile Strike Force operating out of Dak To. The predawn attack on the camp pinned down most of the CIDG defenders and their U.S. and Vietnamese Special Forces advisors, with mortar and machinegun fire. The defenders were caught by surprise and most were unable initially to return fire from their crew served weapons, except for one man. SFC (later MSG) Edward W. Davis, preventive medicine specialist for the FEST, was in Dak To conducting live rodent trapping in the vicinity of the camp the day before the attack. Davis single-handedly operated and fired the camp's only 4.2 inch mortar, a procedure normally requiring a multiple man crew. When the volume of incoming fire be-

came too heavy around his above-ground position, he ran to and operated an 81mm mortar by himself, bringing fire on the enemy entrenched on the ridge line, overlooking the camp. Davis was wounded during one of his attempts to man the camp's mortars, but still managed to treat other wounded personnel.

Meanwhile, SFC Leslie G. St. Lawrence, the other FEST preventive medicine specialist at Dak To, exposed himself to enemy fire numerous times, aiding other wounded, while he himself received fragment wounds. An officer, who had one leg virtually severed at thigh level and the other leg severely injured due to a nearby blast from an 82mm mortar round, collapsed near St. Lawrence. Wounded and blown off his feet at least twice in the process of trying to stem the bleeding, the NCO succeeded in getting help to get the wounded man into a bunker for treatment. Both NCOs were later awarded the Silver Star and the Purple Heart for their actions.⁶⁴



Figure 5: LTG Leonarg G. Heaton, the Surgeon General, presenting SSG Leslie St. Lawrence with the Silver Star. (Author's collection)

Later that same day, elements of the 173rd Airborne Infantry Brigade arrived to relieve the garrison and begin operations in the vicinity of the Special Forces camp. These developments provided the opportunity to evaluate mosquito control measures such as ground fogging and aerial spraying and the ecological impact of large-scale operations in an area for which baseline malaria and mosquito data were available.⁶⁵

PLAGUE STUDIES

Dak To was also the focus for a very important plague survey conducted earlier that year between 21 February and 2 April 1967. Bacteriological confirmation of bubonic plague was obtained in ten personnel, while serologic confirmation resulted in two out of 20 suspected



Figure 6: LTC Legters taking throat cultures during plague outbreak at Dak To. (Photo courtesy of CPT Cottingham)

cases. Diagnosis in the other eight cases was presumptive. The bimodal epidemic peaked three weeks apart.⁶⁶

There were four deaths attributable to *P. pestis* (later renamed as *Yersinia* or *Y.pestis*). Further, a much higher attack rate was observed among CIDG dependents than among the troops, indicating a probability of plague transmission occurring within the underground CIDG dependent housing area. These were the first bacteriologically confirmed plague cases in Kontum Province, though four months earlier suspect cases were noted in Kontum City. Interestingly, at the same time as the Dak To outbreak, similar outbreaks occurred in Nha Trang, where the Special Forces Logistical Support Center (LSC) was located. The possibility of plague introduced via routine delivery of supplies had to be acknowledged.⁶⁷



Figure 7: SGT Stern and CIDG troops setting rodent traps. (Author's collection)

Studies on the ecology of the outbreak were initiated in April. Trapping of rodents within the camp and adjacent areas, including neighboring Montagnard villages extended over a four month period. Sentinel mice were used as another collection method.⁶⁸

Most importantly, subclinical plague was demonstrated and was thought to be the reason for the relatively low casualty rate. This was observed in the decreasing severity of cases as the outbreak progressed. Apparently, those with a subclinical infection developed protective antibodies. They came down with only a mild ambulatory form of plague, called *pestis minor*, when exposed to a large infective dose of *P. pestis*.⁶⁹ The adequacy and effectiveness of streptomycin in two to three gram daily doses was demonstrated when LTC Legters himself was treated for plague (*P. pestis*), during the course of the study.⁷⁰ In April, the FEST observed a possible pneumonic plague outbreak in IV Corps in its first non “field” oriented study. Evidence of *P. pestis*, found in throat cultures of five pediatric patients at Kien Giang Hospital, precipitated the study. Results from the brief study proved inconclusive as to the specific etiologic agent responsible for the fatal respiratory epidemic.⁷¹



Figure 8: (SFC Melton and SSG Moore) SFC Melton and SSG Moore processing rodent for plague study. (Author’s collection)

SCRUB TYPHUS

During Operation Paul Revere IV, initial evidence was found to classify scrub typhus as a significant military medical problem. Sixteen personnel out of 110 in the 3rd Company, Mike Force, showed clinical evidence of scrub typhus, in addition to one case among its U.S. Special Forces cadre. The 1st Company suffered somewhat fewer cases of scrub typhus. Isolates of the causative agent *Rickettsia tsutsugamushi* (later renamed *Oriental tsutsugamushi*) were obtained from two indigenous members of the 3rd Company, while use of an immunofluorescent (IF) technique provided supportive evidence.⁷²

The second major outbreak of scrub typhus occurred during 18-21 December 1966 among members of a 34-man reconnaissance platoon from the Binh Thanh Thon Special Forces camp. The unit was on a training exercise

near Dong Ba Thin in the southeastern II Corps area and operated in areas heavily covered by low scrub type of vegetation. Review of scrub typhus diagnoses at the 8th Field Hospital in Nha Trang and at the 93rd Evacuation Hospital at Bien Hoa indicated the occurrence of scrub typhus in widely scattered locations within II and III Corps.⁷³

In an attempt to define the ecology of scrub typhus and establish possible chigger mite vectors, CPT Parsons and members of his field survey section initiated two surveys at Dak To and Dong Ba Thin, respectively. At Dak To, the presence of a multi-battalion NVA force curtailed operations after two months. Marked differences were found in the species of mites or animals trapped in the two locations. Blackplating in scrub areas was quite successful in mite collections. One hitherto unknown species of chiggers not previously recorded in Vietnam was found.⁷⁴



Figure 9: SFC Chavers and CIDG troops going on patrol at Dong Ba Thin. (Author’s collection)

The study had to be terminated prematurely since two companies of NVA troops were observed to be moving into the area. These were more than a match for the small CIDG security force accompanying the FEST. Verification of scrub typhus presence in the Dong Ba Thin area came about when one of the FEST research personnel exhibited classical clinical symptoms of scrub typhus at the closing stages of the study.⁷⁵

SPLENOMEGALY

In other studies, CPT (later LTC) Edward J. Colwell, MC studied the “big spleen” syndrome in I and II Corps, finding that splenomegaly in the indigenous population was probably attributable to chronic *P. vivax* and *P. falciparum* infections in the Mekong River Delta area, while *P. malariae* was found in 10% of tribesmen examined at the Gia Vuc Special Forces camp. Splenic enlargement was attributable to specific hepatic disorders.⁷⁶ In other studies

on precise histopathologic definition of hepatic disorders, Colwell and his collaborators found it necessary to perform closed liver biopsy or aspiration for specific diagnosis, because of the similarity of previous clinical and laboratory diagnoses among the various acute and chronic hepatic disorders. They made the observation that physicians working in underdeveloped areas could compensate somewhat for limited diagnostic capabilities and overburdened surgical services by mastering closed liver biopsy and aspiration techniques for hepatic diagnosis.⁷⁷

LEPTOSPIROSIS

Leptospirosis studies by CPT Howard L. Lipton, MC, did not find statistically large numbers of infected troops, but demonstrated that the possibility for infection was wide ranging. Studies of Marines at the then Special Forces camp at Khe Sanh, in I Corps and later with the 199th Infantry Brigade during Operation Fairfax (27 April–6 May 1967) north of Saigon, suggested the occurrence of subclinical or asymptomatic infections on the basis of serotiter elevation, but found no clinical illness.⁷⁸

SCHISTOSOMIASIS

The confirmed presence of schistosome foci along the upper reaches of the Mekong River in Laos and Thailand suggested that foci for the disease might also exist further south. Therefore, prospective studies for locating possible human schistosomal endemic areas within the Mekong River Delta were urgently needed in view of the serious problems with the disease encountered by American Forces elsewhere in World War II. Extensive tests were conducted by CPT Stephen C. Boone, MC, and his assistants, using three different kinds of skin tests, serum collections for fluorescent antibody testing, stool examinations, and rectal mucosa biopsies.⁷⁹ Though a significant number of positive reactions occurred in the skin tests, infections could not be demonstrated in skin test positive individuals by rectal biopsies or multiple stool examinations. Findings pointed to possible zoophilic schistosomes as the source of antibodies.⁸⁰

FURTHER STUDIES

By August 1967 individual replacements for FEST began to arrive, bringing two new skills — those of the veterinary and clinical laboratory officers. LTC (later COL) Charles R. Webb, Jr., MC, replaced LTC Legters as Deputy Chief, MRT and Chief, FEST. MRT added a new trauma study section. The methods of operation remained basically the same, with continuance of previously initiated studies and some new targets of opportunity, but with a new veterinary dimension added.



Figure 10: CPT Boone and SFC Wellington collecting snails in a canal for schistosomiasis study. (Photo — courtesy of CPT Boone)

Tropical sprue studies initiated by Collwell and his associates were continued and expanded upon by CPT Donald Catino, MC. He and his predecessors studied a volunteer group of 69 Special Forces Soldiers in the Mekong River Delta over a 17-month period (January 1967 — May 1968). They found that in 13 cases “...the incidence of sprue rose with increasing duration of exposure to a peak of 28% at 9 to 14 months in Vietnam...”⁸¹ No evidence was found in the group of an increase in incidence due to dietary deficiencies. Other data noted focal points for sprue at the Special Forces camps in the U Minh Forest and the Plain of Reeds, with a peak incidence during the hot dry season. Catino found that “... sprue patients exhibited a spectrum of diseases from subclinical to the overt sprue syndrome. None became malnourished or anemic... no quantitative nor qualitative abnormalities were noted in jejunal bacteria of patients ...” and “... enteric bacterial pathogens and parasites were present only as coincidental or secondary invaders in patients with sprue ...”⁸²

Continuance of malarial studies on the Mobile Strike Forces and CIDG in II and IV Corps led the principal investigators, CPT Richard N. Roger, MC and LTC Charles R. Webb, Jr., MC to observe a marked reduction of indigenous malarial prevalence rates. This decline was primarily attributable to the introduction, in November 1967, of weekly chloroquine phosphate chemoprophylaxis for some Mike Force troops. Additionally, malarial prevalence at the Ba Xoai Special Forces camp in January 1968 was 2.5% versus 48.7% in May of the preceding year. The seasonal variations of mosquito populations, chemoprophylaxis, as well personnel turnovers among the CIDG, were deemed responsible.⁸³ However, in the III Corps tactical zone a major malaria outbreak among Mobile Strike Forces demonstrated the wide variety of responses to malaria among indigenous populations. The 2000 man Mike Force

was primarily made up of ethnic Khmers from the Delta area in VI Corps, where there was generally low malaria incidence. CPT (later COL) Stephen C. Hembree's exhaustive study of this outbreak showed a classic case of a non-immune unit being rendered combat ineffective by malaria. Over half of the Mike Force was shown to be previously malaria-free during a previous survey. The unit was deployed on Operation Centurion VIII in the Long Khan Forest in III Corps when the outbreak occurred. The hundreds of acutely ill evacuees overwhelmed the 100 bed CIDG hospital in Bien Hoa. A stand down of several weeks was required before the Mike Force unit could be returned to combat operations.⁸⁴

Another valuable study of malaria in the II Corps Mobile Strike Force, during a combined operation with units of the 173rd Airborne Brigade and the 4th Division at Dak To, provided an opportunity for a comparative study of malaria in semi-immune (Mike Force) and non-immune (U.S.) personnel. The study revealed that conventional U.S. units in the same areas of operation had a much greater problem with clinical malaria than Montagnard soldiers, in spite of command programs of malaria discipline. A further investigation at 28 Special Forces camps during February-July 1969 revealed an overall 8.66% prevalence rate for malaria, among 4,827 CIDG.⁸⁵ Other studies, by the second contingent of FEST involved malaria prevalence and chloroquine sensitivity studies among Viet Cong and NVA prisoners of war and studies of malaria vectors in western IV Corps.

Filariasis studies in western II Corps among indigenous and U.S. servicemen revealed a 4 to 8% incidence in Montagnards, but none in Vietnamese. Though only one U.S. Soldier was found to have microfilaremia, the possibility of other infections could not be discounted due to the nature of the disease.⁸⁶ Due to little information being available on the country-wide distribution of filariasis, a series of studies were made at 28 selected Special Forces camps throughout South Vietnam by FEST parasitologist, CPT Hembree, and staff. Demographic data was collected, blood samples from finger punctures were

drawn, glass slides were prepared and examined under higher magnification, and data was analyzed. While the data showed filariasis present in 11 of 28 Special Forces camps, the researchers were able to reach only general conclusions as to geographic distribution from the small sample of the 4,575 CIDG. There were no microfilariae among the CIDG in I Corps and an insignificant number in IV Corps. II Corps and III Corps were identified as the more highly endemic areas with the highest rate, 12.5%, found at the Duc Phong Special Forces camp in Phuoc Long Province.⁸⁷

Prior to "de-establishment of FEST as a distinct entity within MRT, CPT (later COL) Alfred M. Allen, MC, began a major study on skin diseases among U.S. troops in the IV Corps tactical zone. In collaboration with Dr. David Taplin of the University of Miami, Allen and FEST staff studied what was a leading cause of disability, visits to aid stations, and inpatient hospitalization in Vietnam. Their research with the 9th Infantry Division resulted in more effective measures in prevention and treatment of skin diseases. Subsequently, Allen authored a volume on skin diseases in Vietnam for the Center of Military History.⁸⁸

MEDICAL SUPPLY

As elsewhere in Vietnam, one of the most vexing problems for FEST was supply. The Team's advance element, consisting of the medical supply officer and NCO, arrived in country on 5 September 1966 to discover that only a part of the supplies and equipment ordered by them at Fort Bragg had arrived safely. A significant and vital portion had been sunk on a cargo ship hit by Viet Cong fire, as it was nearing Saigon's river port. Though some of the cargo was salvaged from the river bottom, these were almost universally unfit for subsequent use. With only two weeks remaining before the rest of FEST was due to arrive, frantic efforts were made to determine the extent of loss and acquire substitute items from in-country sources, as well as reordering from WRAIR.⁸⁹



Figure 11: CPT Hembree at Bu Dop in 1968.
(Photo – courtesy of CPT Hembree)



Figure 12: CPT Dorogi with district chief and interpreter at Khe Sanh Village during resupply mission.
(Author's Collection)

Due to the non-standard nature of much of the supplies, little help could be obtained from the 32rd Medical Depot in Saigon. Only the invaluable help of the supply officers from the 9th Medical Laboratory and the 3rd Field Hospital in Saigon averted a costly delay. That, coupled with a healthy smattering of “scrounging” from other units, enabled FEST to begin operations as the remainder of the Team arrived.

Illustrative of the supply problems encountered was the method of transporting and refilling liquid nitrogen containers used for research specimens acquired in the field.⁹⁰ Liquid nitrogen was to be readily available once FEST began operating in Vietnam. However, the initial formal request by FEST for forty gallons was disapproved by the Air Force at Tan San Nhut. It remained for the supply section to resolve the problem on an informal basis — trading of C-rations in sufficient quantities enabled ready access to as much liquid nitrogen as was needed.

Another seemingly insurmountable problem was that Pacific Air Force (PACAF) regulations prohibited the transport of noxious gases and chemicals on the same aircraft with troops. This caused a real dilemma for FEST since the extraction of medical specimens, collected many times under hazardous conditions, could not be guaranteed safe and timely delivery on cargo aircraft. Once again an “unorthodox” procedure solved the problem. Liquid nitrogen-identifying labels were conveniently replaced by labels attesting to the contents as dry ice! The potential hazard of spillage was eliminated by use of absorbent filler inside the liquid nitrogen container.

WRAIR’s multiple supply channels and funds were a decided advantage for FEST support. MRT had numerous out-of-country supply sources that could be utilized. Despite these advantages, FEST had numerous in-country supply problems to contend with:

1. Deterioration of consumables due to lack of adequate storage facilities at the operational sites.
2. In-country transportation problems due to long lead times required to manifest and ship supplies, causing continual attempts to circumvent the existing transportation system.
3. Numerous research protocols, drafted in-country to exploit medical problems that arose during FEST’s stay in Vietnam, left little time for acquisition of supplies and equipment.
4. Extreme difficulty with accountability for major line items of equipment, due to the continual mobility/relocation of FEST sections.
5. Necessity for accompanying any and all supply shipments, since there was little guarantee of timely or safe arrival. This required at least one FEST member to accompany all shipments.

6. Poor communications due to country-wide operations.
7. Isolation of Special Forces camps due to weather and aircraft availability.
8. Continual refill and shipment of liquid nitrogen containers.
9. Lack of organic TOE weapons, equipment, and vehicles.

The supply problems of the FEST were characterized by a continual need for unorthodox methods to accomplish the mission. The growing military bureaucracy, administrative “red tape,” and a relatively slow supply system within Vietnam, forced FEST to find unique and sometimes bizarre ways of circumventing the system. “Scrounging” or trading, drawing as needed on the various supply channels of WRAIR, cajoling transportation personnel into assigning a higher priority for shipments than was routinely granted, circumventing existing regulations or bending them somewhat to fit the needs of the occasion, allowed a degree of success that otherwise could not have been attained.

EPILOGUE

In October 1968, FEST was deactivated as a separate section within MRT. The 1968-1969 Annual Progress Report for MRT stated that it was due to “...a realignment of all personnel along purely functional lines into a ‘one lab’ concept...” and “...cross-training and cross-assignment of Special Forces personnel into areas of interest traditionally reserved for ‘non-airborne personnel’ and the latter into projects heretofore being pursued solely by Special Forces personnel...” While some former FEST Special Forces personnel in Vietnam remained in MRT positions identified as requiring Special Forces qualifications, FEST as a distinct entity was ended.⁹¹

This explanation is inadequate, for the “disestablishment” of FEST can be traced to the increasing problems faced by the second contingent of FEST. The departure of LTC Legters, whose dynamic leadership was the keystone of the whole FEST concept, was a critical factor. More significantly, the growing deterioration of interpersonal relationships between FEST and the rest of MRT triggered open dissension within these elements.⁹²

Beginning with the period just before the Tet Offensive in 1968, FEST research activities suffered long delays due to combat conditions. The delays certainly affected continuity or the timeliness of studies where seasonal observations were essential. Also the growing conventionalization of the war deemphasized “field” studies and the importance of Special Forces. The attachment of FEST to the 5th Special Forces Group was terminated with the dis-

bandment of the FEST. Research efforts were refocused on the more traditional work conducted at hospital and laboratory level.

The initial FEST contingent trained together for almost nine months as a separate unit before deploying to Vietnam, while subsequent personnel arrived mostly as individual replacements. Personnel input and training declined thereafter. However, this deficit was partially alleviated by some former FEST personnel returning to Vietnam on TDY for specific short-range projects.

Yet, despite these changes, FEST performed exceptionally well as an elite field research unit. It proved conclusively that medical investigative skills could be readily taken to remote and hostile areas by men who combined medical/research skills with operational qualifications of Special Forces Soldiers and could function effectively in this role. Ability, training, and personal bravery helped the United States Army Special Forces — Walter Reed Army Institute of Research Field Epidemiological Survey Team to successfully carry out valuable experiments in field research in Vietnam.⁹³

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2. The Agency for International Development (AID), the U.S. Army Special Forces and others in the U.S. Country Team.
3. Letter – The Surgeon General of the Army, *Military Medical Research and Service Program in Vietnam*, 16 January 1962.
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6. Dirks, K.R., *The U.S. Army Medical Research and Development Effort in the Southeast Asian Conflict* (Student Research Report No. 9), Industrial College of the Armed Forces, Washington, 15 March 1972.
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9. The diseases recommended for investigation were malaria, arthropod borne viral diseases, dysentery, cholera, plague, melioidosis, tuberculosis, typhoid fever, respiratory infections, leptospirosis, filariasis, dengue, and dengue-like fevers.
10. *Op. cit.*, Tiggert, p.41
11. Disposition Form, Brigadier General Robert E. Blount, Office of the Surgeon General to Chief, Research and Development, *Military Medical Program, SE Asia*, 1 October 1963.
12. *U.S. Army Medical Research Team (WRAIR) Vietnam and Institute Pasteur of Vietnam Annual Progress Report (1 October 1964-31 August 1965)*, 1965.
13. Staff Study, LTC Richard L. Coppedge, MC, Surgeon, U.S. Army Special Warfare Center, Fort Bragg, North Carolina, *Production of Medical Information and Intelligence in Special Warfare Operations*, 4 September 1962.
14. Paragraph 133, Special Order #68, dated 28 March 1963, as amended by AG letter dated 16 April 1963, Headquarters, XVIII Airborne Corps, Fort Bragg, NC.
15. These included skin testing, hemotologic observations, study of urine sediment, plus fecal, blood, and urine cultures. Liver function tests, bone marrow aspirates, or muscle biopsy and other studies were performed if indicated. Also see the staff study by LTC Coppedge.
16. LTC Thomas W. Sheehy, MC, from the Department of Cancer Gastroenterology, was interested in tropical sprue among Special Forces returnees. Evidence of abrupt weight loss and chronic diarrhea exhibited by a number of Special Forces returnees suggested this possibility. In cooperation with the CSW Surgeon's Office, a program to study malabsorption phenomena was initiated. Samples of intestinal mucosa were collected by means of the Crosby capsule, accompanied by studies for serum folate and carotene and d-xylose absorption. See interview with LTC Legters, pp. 4-5. Sheehy, T.W., Cohen, W.C., Wallace, D.K. and Legters, L.J., Tropical Sprue in North Americans, *Journal of the American Medical Association*, Vol. 194, p.1965 and Sheehy, T.W., Legters, L.J. and Wallace, D.K., Tropical Jejunitis in Americans Serving in Vietnam, *The American Journal of Clinical Nutrition*, Vol. 21, September 1968, pp. 1013-22.
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19. *Op.cit.*, Interview, Legters, pp. 7-9
20. *Ibid.*, p.8
21. Letter – COL William S. Gochenour, VC, Deputy Director, *Special Field Team for conduct of medical research in SE Asia*, HQ WRAIR, 27 January 1966.
22. Letter – Headquarters, U.S. Army John F. Kennedy Center for Special Warfare (Airborne), Fort Bragg, North Carolina, *The U.S. Army Special Forces-WRAIR Field Epidemiologic Survey Team (Abn)*, 22 June 1966.
23. Paragraph 201, Special Orders 90, Headquarters, Department of the Army, Washington, DC, 29 April 1966
24. Letter – COL William S. Gochenour, VC, Deputy Director, *WRAIR Augmentation of Special Field Team in conduct of medical research in SEASIA*, HQ WRAIR, 20 December 1966. The letter called for the CSW Surgeon to assist in selection and concur in assignment of individuals to FEST. Deployment of selected individuals was to be in the summer of 1967.
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27. Special Forces Unit in South Vietnam Aids Research Collecting, *Medical Tribune and Medical News*, Vol. 9, No.56, 11 July 1968, pp.1,20.

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29. Section II (Logistics) of ANNEX B (Research Plan) to *Proposal for the conduct of epidemiologic surveys and field trials of prophylactic measures against certain infections in Viet-Nam*, HQ USA SF-WRAIR FEST (Abn), n.d.
30. Op. cit., Interview, Legters, pp. 8-9
31. Interview – LTC Craig H. Llewellyn, with MAJ Louis T. Dorogi, MSC, at Fort Detrick, Maryland, 8 January 1976, pp. 7, 21.
32. Op. cit., COL Gochenour Letter, 27 January 1966. The letter received strong endorsements from the CG, U.S. Army Medical R & D Command, The Surgeon General and CG, CONARC.
33. Op. cit., Legters Interview, p. 9
34. Letter – MAJ Llewellyn J. Legters, MC, from Bangkok, Thailand to CPT David E. Cundiff, MSC, HQ USA SF-WRAIR FEST (Abn), Office of the Surgeon, U.S. Army John F. Kennedy Center for Special Warfare (Airborne), Fort Bragg, NC.
35. The USOM Medical Civic Action Program Teams at that time were in a state of flux, moving their operations to the northwestern area of Thailand. Many of the enlisted personnel on these teams were TDY from the 1st Special Forces Group in Okinawa. The physicians were usually native Thai civilians who worked with the Civic Action Teams for about a month at a time. The method of operation was similar to MEDCAP in Vietnam.
36. Letter – MAJ Llewellyn J. Legters, MC, from Bangkok, Thailand to CPT David E. Cundiff, MSC, HQ USA SF-WRAIR FEST (Abn), Office of the Surgeon, U.S. Army John F. Kennedy Center for Special Warfare, Fort Bragg, North Carolina, 18 July 1966.
37. Letter – MAJ Llewellyn J. Legters, MC from Bangkok, Thailand, to CPT David E. Cundiff, MSC, HQ USA SF-WRAIR FEST (Abn), Office of the Surgeon, U.S. Army John F. Kennedy Center for Special Warfare, Fort Bragg, North Carolina, 26 July 1966.
38. Letter – LTC Robert J.T. Joy, MC, U.S. Army Medical Research Team (WRAIR) Vietnam to CG, U.S. Army Vietnam, ATTN: Surgeon, 25 July 1966. The letter was actually drafted jointly by Legters and Joy, based on the most practical schedule for introducing FEST personnel in-country.
39. Priority Message – 031038Z Aug 66, CG USARV to Director, WRAIR, WRAMC, Washington, DC, *Approval of In-Country TD Increase for USA Medical Research Team (WRAIR) Vietnam*, 3 August 1966.
40. Letter – COL (later MG) Albert E. Milloy, Acting Commander, U.S. Army John F. Kennedy Center for Special Warfare, Fort Bragg, NC to COL William D. Tiggert, MC, Director, WRAIR, WRAMC, Washington, DC, 2 August 1966. The CG of the Center for Special Warfare was originally asked to present the Green Beret to COL Tiggert. However, the CG, CSW disappeared during a return flight over the Pacific.
41. Section I, General Order 1783, HQ, U.S. Army Vietnam, 2 December 1965.
42. U.S. Army Medical Research Team (WRAIR) Vietnam and Institute of Pasteur of Vietnam, *Annual Progress Report (1 September 1965-31 August 1966)*, 1966.
43. Letter – MAJ Llewellyn J. Legters, MC in Saigon to CPT David E. Cundiff, MSC, HQ USA WRAIR-FEST (Abn), Office of the Surgeon, U.S. Army John F. Kennedy Center for Special Warfare, Fort Bragg, North Carolina, 26 July 1966.
44. FEST received from the Institute of Heraldry its own distinct Special Forces flash (black background with a maroon diagonal stripe) for wear on the beret. FEST never wore it in Vietnam and opted to wear the 5th Special Forces Group (Airborne) flash for the sake of expediency and to blend in better with 5th Group personnel. Only a few original FEST flashes were made at this time.
45. Paragraph 2, Section II, General Order 6067, HQ U.S. Army Vietnam, 18 October 1966.
46. Mobile Strike Forces (known as Mike Forces) were irregular indigenous troops recruited, trained, and commanded directly by U.S. Special Forces in Vietnam. As opposed to Civilian Irregular Defense Group (CIDG) forces, Mike Forces were directly under Special Forces control. All were to be parachute qualified.
47. Letter from General William C. Westmoreland, Commander, United States Military Assistance Command, Vietnam, *Letter of Commendation*, to Commanding Officer, U. S. Army Medical Research Team, 17 November 1966. The MACV Recondo Course trained mostly selected combat arms personnel in specialized skills and techniques considered essential for long range reconnaissance operations. It was a physically and mentally demanding course for personnel who would be expected to operate behind enemy lines. The course culminated in actual combat patrols conducted by the students.
48. Interview – LTC (later COL) Demetrios G. Tsoulos, MC, former 5th Special Forces Group (Airborne) Surgeon, by MAJ Louis T. Dorogi, MSC, 25 February 1976.
49. Cottingham, A. J., Jr., Boone, S.C., Legters, L. J., A prospective study of malaria incidence among indigenous and U.S. Forces during combat operation, U.S. Army Medical Research Team, (WRAIR) Vietnam and Institute Pasteur of Vietnam, *Annual Progress Report (1 September 1966-31 August 1967)*, 1967, pp. 2-26.
50. Ibid, p. 7
51. Ibid. P. 6-7
52. Op. cit., Interview, Legters, p.24
53. Op. cit., Cottingham, et al, Study of Malaria..., p. 18
54. Ibid., p.16
55. Letter, Dr. Paul E. Carson, University of Chicago to LTC Llewellyn J. Legters, MC, USAMRT (WRAIR) Vietnam, 24 April 1967.
56. Cottingham, A. J., Jr., Boone, S.C., Legters, L. J., Studies of malaria prevalence and chloroquine insensitivity in western II, III and IV Corps Tactical Zones, U.S. Army Medical Research Team (WRAIR) Vietnam and Institute Pasteur of Vietnam, *Annual Progress Report (1 September 1966-31 August 1967)*, 1967, pp. 27-62.
57. Ibid, pp. 32-33
58. Ibid, p. 34
59. Op. cit, Interview, Legters, p. 25
60. Parsons, R. E., Mc Laurin, B. F. , Do Van Quy; Tran Van Mau , Legters, L. J., A study of vectors of malaria in western II and III Corps Tactical Zone, with notes on other species, U. S. Army Medical Research Team (WRAIR) Vietnam and Institute Pasteur of Vietnam, *Annual Progress Report (1 September 1966-31 August 1967)* , 1967, pp. 63-90.
61. Communications – MAJ Ray E. Parsons, MSC and MAJ Louis T. Dorogi, at Fort Detrick, Maryland, 30 March 1976.
62. Op. cit, Parsons et al, A Study of the Vector, pp. 66-67
63. Parsons, R.E., Cottingham, A.J., Jr., Legters, L. J., Boone, S.C., Roger, R.N., Observations on anopheline and culicine mosquito densities, malaria prevalence, and incidence of malaria and fevers of undetermined origin at Dak To Special Forces camp in western II Corps Tactical Zone, in relation to certain tactical and environmental variables, May-August 1967, U.S. Army Medical Research Team (WRAIR) Vietnam and Institute Pasteur of Vietnam, *Annual Progress Report (1 September 1966-31 August 1967)*, 1967, pp. 91-119.
64. Interview. SFC Edward W. Davis and SFC Leslie G. St. Lawrence and other witnesses conducted by CPT Louis T. Dorogi, MSC at Dak To Special Forces camp on 17 June 1967.

65. For detailed data on malaria and FUO incidence in 173d Airborne Brigade personnel, see U.S. Army Medical Research Team (WRAIR) Vietnam and Institute Pasteur of Vietnam, *Annual Progress Report (1 September 1966-31 August 1967)*, 1967, pp. 101-109, 117-118.
66. Legters, L.J. and Cottingham, A.J., Jr., Clinical and Epidemiological Notes on an Outbreak of Plague at Dak To Special Forces camp, II Corps Tactical Zone, U.S. Army Medical Research Team (WRAIR) Vietnam and Institute Pasteur of Vietnam, *Annual Progress Report (1 September 1966-31 August 1967)*, 1967, pp. 371-432.
67. Parsons, R.E., Mc Laurin, B.F., Legters, L. J. , Preliminary observations on the ecology of plague at Dak To Special Forces camp, II Corps Tactical Zone, U.S. Army Medical Research Team (WRAIR) Vietnam and Institute Pasteur of Vietnam, *Annual Progress Report (1 September 1966-31 August 1967)*, 1967, p. 433-443.
68. Laboratory mice in small cages were placed in numerous sites within the Special Forces camp or fitted with leashes and released into rodent burrows in hope of attracting flea ectoparasites. These mice were then processed and studied.
69. Op. cit., Interview, Legters, p. 30
70. Telephone communications, LTC Andrew J. Cottingham, Jr., MC, Department of Ophthalmology, Fitzsimmons General Hospital, Denver, Colorado, 14 May 1976.
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73. Ibid, pp. 245-246
74. Blackplating is a common entomology technique whereby a large black colored piece of material is placed in an area to attract mites. The mites cling to the plate or material and thus can be collected for further study.
75. Interview – MAJ Ray E. Parsons, MSC by MAJ Louis T. Dorogi, MSC at Fort Detrick, Maryland 30 March 1976.
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85. Specific malarial rates were 277/1000 men/yr for the Mobile Strike Forces; 646.8 and 423.4 respectively for two battalions the 4th infantry; and 320 overall rate for three battalions of the 173rd Airborne Brigade. See Roger, R.N., Fife, E.H., Webb, C.R., Jr., A Prospective Study of Malaria among Indigenous Forces in Vietnam with observations on incidence, chemoprophylaxis, and immunology, U.S. Army Medical Research Team (WRAIR) Vietnam and Institute Pasteur of Vietnam, *Annual Progress Report (1 September 1967-30 June 1968)*, 1968, pp.115-116.
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88. Allen, A.M., Medical Department United States Army, *Internal Medicine in Vietnam, 1965-72*, Office of The Surgeon General and Center of Military History, United States Army, Washington, DC, 1979.
89. Letter – CPT Louis T. Dorogi, FEST, MRT to Special Foreign Activity, (WRAIR), WRAMC, Washington, DC, *Supplies for Special Forces Component*, 13 September 1966.
90. Original planning by FEST depended heavily on the use of two types of liquid nitrogen freezers — an upright cylindrical container roughly the size of a 55 gallon drum and a smaller 30” cylinder of about 9” diameter. The small container could be backpacked through adaptation to the Army rucksack. Original estimate of the holding capacity time of these containers was found to be considerably less than tested stateside. The rapid freezing capability of liquid nitrogen was ideal for the preservation and transport of specimen collection in the field. The weight of the small containers was commensurate with the mobility envisioned for FEST operations in Vietnam. The major problem in Vietnam was that there were only two locations for sources of liquid nitrogen, the U.S. airbases in Saigon and Danang. Liquid nitrogen was used with high performance aircraft at these bases.

91. Foreword to the U.S. Army Medical Research Team (WRAIR) Vietnam and Institute Pasteur, *Annual Progress Report (1 July 1968-30 June 1969)*, 1969.
92. Interviews – LTC James A. Ferguson, VC, on 15 March 1976, COL Llewellyn J. Legters, on 8 April 1976, CPT Wayne T. Hockmeyer, MSC, on 28 April 1976 and telephone communications with MAJ Raymond D. Boyd, MSC, Fort Sam Houston, TX, on 12 March 1976. Also see transcript of tape sent by COL Charles R. Webb, Jr., on 22 March 1976.
93. FEST was a well decorated medical team with four Silver Stars, numerous other awards for valor and meritorious service, and credit for six unit awards, to include the Presidential Unit Citation. All FEST personnel qualified for receipt of the Combat Medical Badge.



Louis Theodore Dorogi, LTC, MSC (USAR Ret) earned his B.A. in history from Bowdoin College and a M.A.P.A. from the University of Oklahoma. His military career started in 1963 with a regular army commission through ROTC; in 1963, 82d Airborne Division, Fort Bragg; 1965 7th Special Forces Group (Abn), Fort Bragg; 1965 U.S. Army Special Forces-WRAIR FEST (Abn), Fort Bragg; 1966 U.S. Army Special Forces-WRAIR FEST (Abn), Vietnam, attached to 5th SFGA; 1968 Walter Reed Army Medical Center, Washington, DC; 1969 627th Hospital Center, Camp Zama, Japan; 1971 U.S. Army Hospital, Camp Zama, Japan; 1972 U.S. Army JFK Center for Military Assistance, Fort Bragg; 1975 XVIII Airborne Corps, Fort Bragg; 1975 Medical History Division, U.S. Army Center for Military History, Fort Detrick, MD; 1978 IRR; 1982 133d U.S. Army Reserve Forces School, Portland, ME; 1990 Retired. His civilian career includes: 1978 Assistant Director Health Program, Passamaquoddy Tribe, Princeton, ME; 1982 Director, Division of Licensing and Certification; 2005 Assistant Director, Division of Licensing and Regulatory Services; 2007 retired. He was an instructor on the Vietnam War, at Southern New Hampshire University from 1992 to 1995. Publications: (1990), Special Forces Medical Training 1952-1971, *Special Warfare*,3(1), 28-36.