FIELD ARTILLERY

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Field Artillery

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Foreword

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The United Suites Army met an unusually complex challenge in Southeast Asia. In conjunction with the other services, the Army fought in support of a national policy of assisting an emerging nation to develop governmental processes of its own choosing, free of outside coercion. In addition to the usual problems of waging armed conflict, the assignment in Southeast Asia required superimposing the immensely sophisticated tasks of a modern army upon an underdeveloped environment and adapting them to demands covering a wide spectrum. These involved helping to fulfill the basic needs of an agrarian population, dealing with the frustrations of antiguerrilla operations, and conducting conventional campaigns against well-trained and determined regular units.

It is still necessary for the Army to continue to prepare for other challenges that may lie ahead. While cognizant that history never repeats itself exactly and that no army ever profited from trying to meet a new challenge in terms of the old one, the Army nevertheless stands to benefit immensely from a study of its experience, its shortcomings no less than its achievements.

Aware that some years must elapse before the official histories will provide a detailed and objective analysis of the experience in Southeast Asia, we have sought a forum whereby some of the more salient aspects of that experience can be made available now. At the request of the Chief of Staff, a representative group of senior officers who served in important posts in Vietnam and who still carry a heavy burden of day-to-day responsibilities have prepared a series of monographs. These studies should be of great value in helping the Army develop future operational

concepts while at the same time contributing to the historical record and providing the American public with an interim report on the performance of men and officers who have responded, as others have through our history, to exacting and trying demands.

The reader should be reminded that most of the writing was accomplished while the war in Vietnam was at its peak, and the monographs frequently refer to events of the past as if they were taking place in the present.

All monographs in the series are based primarily on official records, with additional material from published and unpublished secondary works, from debriefing reports and interviews with key participants, and from the personal experience of the author. To facilitate security clearance, annotation and detailed bibliography have been omitted from the published version; a fully documented account with bibliography is filed with the U.S. Army Center of Military History.

The qualifications of Major General David Ewing Ott to write *Field Artillery, 1954-1973*, are considerable. He served in combat with field artillery units in World War II, Korea, and Vietnam. In World War II he was a forward observer with the 868th Field Artillery battalion of the 65th Infantry Division, and during the Korean War he was executive officer and operations officer of the 64th Field Artillery battalion of the 25th Infantry Division. In Vietnam he served as executive officer of II Field Force Artillery in 1966 and as commander of the 25th Infantry Division Artillery in 1967. Other assignments that make him particularly qualified to write the monograph include instructor of field artillery gunnery at the Field Artillery School from 1948 to 1951; S-3, 82d Airborne Division Artillery, 1957 to 1959; commander of the 2d Howitzer battalion of the 83d Artillery from 1959 to 1960; Chief, Artillery branch, Officer Personnel Directorate, Office

of Personnel Operations, Department of the Army; and Director, Vietnam Task Force, International Security Affairs, Office of the Assistant Secretary of Defense. General Ott is presently the Commanding General, U.S. Army Field Artillery Center, and Commandant, U.S. Army Field Artillery School, at Fort Sill, Oklahoma. He is thus the Army's senior field artilleryman.

Washington, D.C. 15
March 1975

VERNE L. BOWERS
Major General, USA
The Adjutant General

Preface

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This monograph will illuminate some of the more important activities—with attendant problems, shortcomings, and achievements—of the U.S. Army Field Artillery in Vietnam. The wide variations in terrain, supported forces, density of cannon, friendly population, and enemy activity which prevailed throughout South Vietnam tend to make every action and every locale singular.

Though based largely upon documents of an historical nature and organized in a generally chronological manner, this study does not purport to provide the precise detail of history. Its purpose is to present an objective review of the near past in order to assure current awareness, on the part of the Army, of the lessons we should have learned and to foster the positive consideration of those lessons in the formulation of appropriate operational concepts. My hope is that this monograph will give the reader an insight into the immense complexity of our operations in Vietnam. I believe it cannot help but reflect also the unsurpassed professionalism of the junior officers and noncommissioned officers of the Field Artillery and the outstanding morale and esprit de corps of the young citizen-soldiers with whom they served.

I would like to express my appreciation to the following people who assisted in this effort:

Major General Roderick Wetherill, as commandant of the Field Artillery School, authored the monograph from November 1972 until his retirement in May 1973, when authorship was transferred to me. To General Wetherill go my sincere thanks for getting this project off the ground. Under his direction the initial outline was developed, a research team formed, and initial research conducted.

Major General Gordon Sumner, Jr., presently with the Office of the Assistant Secretary of Defense (International Security Affairs), must be credited with conceiving this project and finding support for its accomplishment.

Major General W. D. Crittenberger, Jr., presently Deputy Director, Plans and Policy Directorate, J-5, Joint Chiefs of Staff, sponsored this project and helped to lay the initial groundwork. During the research and writing of the monograph his advice, based on bis experiences as II Field Force Artillery commander in Vietnam, has been invaluable.

Brigadier General Robert j. Koch, assistant commandant of the Field Artillery School, has been my principal assistant in this effort (as he was for General Wetherill before me). He has helped me to steer the activities of all those who participated in producing the monograph. Beyond that, he has provided valuable input to the monograph based on his experiences as the commander of the 23d Artillery Group and the XXIV Corps Artillery in Vietnam.

Colonel Vincent G. Oberg, director of the Army-Wide Training Support Department of the Field Artillery School, with the help of two of his division chiefs, Lieutenant Colonels Ray K. Casteel and Carl W. Sullinger, co-ordinated this effort within the Field Artillery School. He developed a plan of work, sought out source material, and formed the monograph research team.

The monograph research team consisted of officers and clerks assigned to various field artillery activities on post and of officers who had recently completed the field artillery officer advance course and were on casual, or "blackbird," status awaiting further assignment. The monograph team must be credited with accomplishing the leg work-— researching the topic and expanding into more detail the general guidance they received. Members of the team were Lieutenant Colonel Calvin DeWitt III, Major Bob W. Garner, Major Ronald N. Funderburk, Major Craig H. Mandeville, Captain Richard L. Murphy, Captain Fred R. Franzoni, Captain

Richard H. Reed, Captain Nicholas A. Radvanczy, First Lieutenant Melvin M. Yazawa, Mrs Pamela K. Morales, and Private First Class C. Foster Deen.

Last, I extend my sincere thanks to all field artillerymen who contributed much of the source material for the monograph either by relating to us their personal experiences and observations or by lending us their personal files.

Fort Sill, Oklahoma
15 March 1975

DAVID E. OTT
Major General, U.S. Army


ADMINISTRATIVE DIVISIONS
SOUTH VIETNAM
Da Lat AUTONOMOUS MUNICIPALITY
0 25 50 75 100 MILES
0 25 50 75 100 KILOMETERS
QUANG TRI
Hue
THUA THIEN
I CORPS
Da Nang
QUANG NAM
QUANG TIN
QUANG NGAI
KONTUM
BINH DINH
Qui Nhon
PLEIKU
PHU BON
PHU YEN
DARLAC
KHANH HOA
Nha Trang
QUANG DUC
TUYEN DUC
Da Lat
PHUOC LONG
BINH LONG
TAY NINH
LAM DONG
NINH THUAN
Cam Ranh
BINH DUONG
LONG KHANH
BINH TUY
BINH THUAN
II CORPS
HAU NGHIA
BIEN HOA
SAIGON
CHAU DOC
KIEN PHONG
KIEN TUONG
LONG AN
GIA DINH
PHUOC TUY
AN GIANG
DINH TUONG
GO CONG
III CORPS
SA DEC
VINH LONG
My Tho
KIEN HOA
Vung Tau
Rach Gia
KIEN GIANG
Can Tho
PHONG DINH
CAPITAL SPECIAL ZONE
CHUONG THIEN
VINH BINH
BA XUYEN
BAC LIEU
IV CORPS
AN XUYEN

MAP 1

CHAPTER I

The Vietnam Environment

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The environment of Southeast Asia, and more specifically of Vietnam, posed particular problems that plagued all military activities. The U.S, Military Assistance Advisory Group (MAAG), Vietnam, began the publication of a series of “lessons learned” reports in March 1962. *Lessons Learned Number II*, on artillery organization and employment, appeared in September 1963. Observations made in this report were prophetic. Artillery must be organized and employed in counterinsurgency to meet new requirements, for "there are no well defined battle areas," Indeed, the report of the American advisers continued, "The entire republic of Vietnam can be considered an area of operations." (Map I) Moreover, the terrain in Vietnam was such that it became a major concern along with the tactics and techniques of the enemy. The artillery, especially, must adapt to the physical environment because, the report concluded, even "if time to displace were available the road net or terrain would frequently prohibit displacement,"

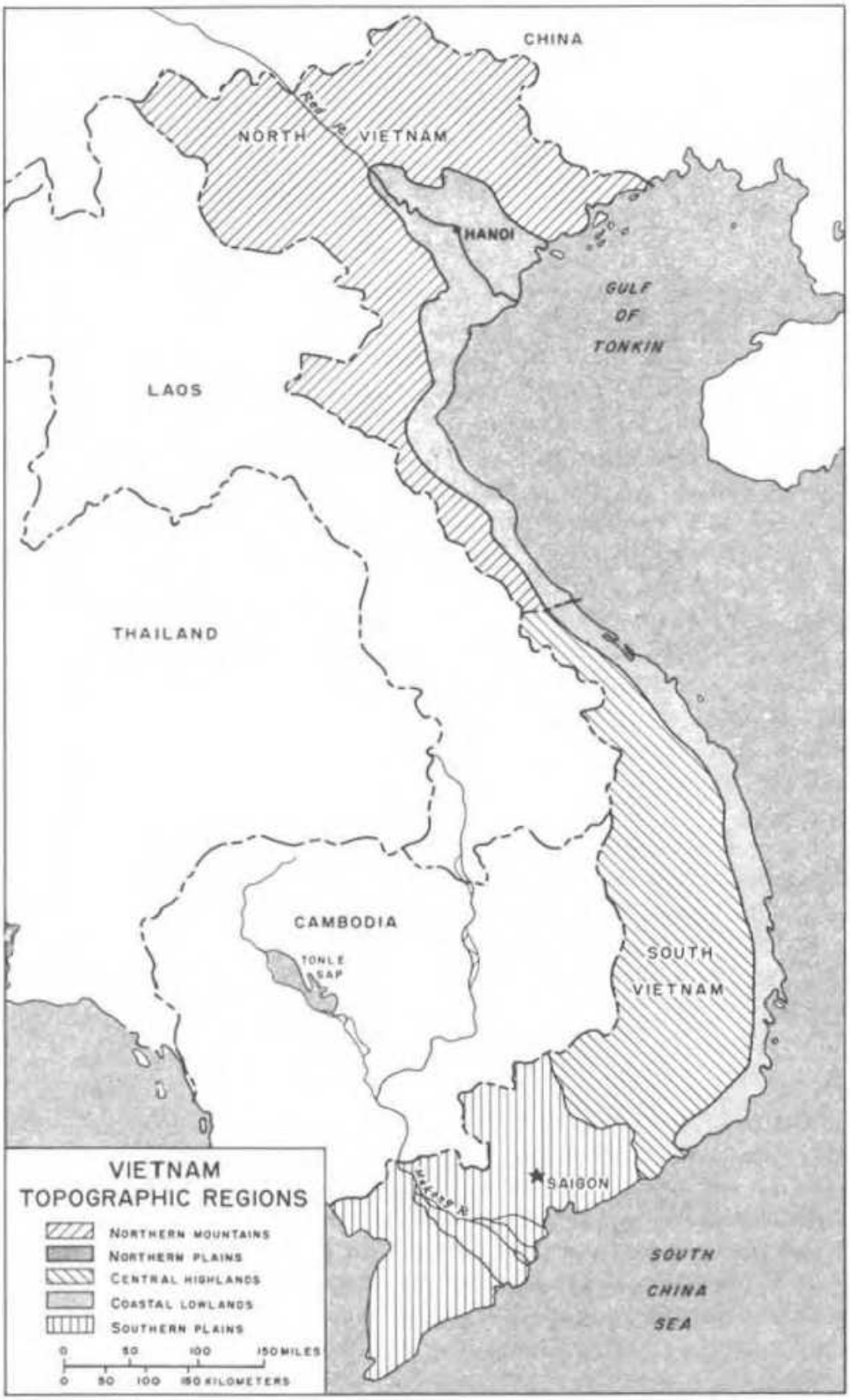
These early observations foreshadowed some of the fundamental problems that American forces would encounter in succeeding years. The Vietnam environment—the human challenge as well as the elemental implications—determined the character of the conflict in terms of geography, the enemy, and the government of Vietnam.

Geography

The coastline of Vietnam, which extends for more than 1,200 miles, forms an S-curve that reaches from the

southern border of China to the tip of the Indochina peninsula. The length of the coastline almost equals that of the Pacific coast of the continental United States. The total land area of Vietnam, some 127,000 square miles, is approximately the same as that of New Mexico. To the north, the country widens irregularly to a maximum of 300 miles; to the south, it reaches a maximum width of 130 miles.

Vietnam may he divided into five distinct geographic regions; (1) the Northern Mountains, (2) the Northern Plains, (3) the Central Highlands, (4) the Coastal Lowlands, and (5) the Southern Plains. (*Map 2*)


CHINA
Red R.
NORTH VIETNAM
HANOI
GULF OF TONKIN
LAOS
THAILAND
CAMBODIA
TONLE SAP
SOUTH VIETNAM
SAIGON
MEKONG R.
SOUTH CHINA SEA
VIETNAM
TOPOGRAPHIC REGIONS
NORTHERN MOUNTAINS
NORTHERN PLAINS
CENTRAL HIGHLANDS
COASTAL LOWLANDS
SOUTHERN PLAINS
0 50 100 150 MILES
0 50 100 150 KILOMETERS

MAP 2

The Northern Mountains region encompasses about 40,000 square miles of rugged terrain in what is part of the Annamite Mountains. The peaks are higher in the north, northwest, and west, where they range from 4,000 feet to about 8,000 feet. The southernmost spur of the Annamite Mountains, over 750 miles long, originates in Laos and stretches southeastward to the Vietnamese-Laotian border and thereafter generally parallels the coast. To the east, the slopes fall off steeply to the narrow coastal plains; to the west, the Annamite spur slopes more gradually to the valley of the Mekong in Laos and Cambodia.

The Northern Plains region includes the Red River Delta and the narrow coastal lowlands of North Vietnam. The area is well cultivated and densely populated. The delta proper, about 5,700 square miles, is indented by the many small mouths of the Red River. Levees, some up to 35 feet high, are built along the major river and stream networks and divide the land into a series of saucer-shaped basins. Most of the land is not over 10 feet above sea level, and much of it is 3 feet or less. Hence, the whole area is subject to frequent flooding.

The Central Highlands region is the 18,600-square-mile region of central South Vietnam. The northernmost portion of the highlands is adjacent to the Northern Mountains region and is largely a continuation of the Annamite Mountains. The ranges are rugged, with elevations near 7,000 feet. Farther south the region is dominated by gently rolling volcanic plateaus with elevations between 2.600 and 5,000 feet.

The Coastal Lowlands region is the narrow belt of plains extending from the Mekong Delta to the Northern Plains region. The region, enclosed on the landward side by the Central Highlands, is never more than 40 miles wide. The entire coastal strip is segmented by mountain spurs that extend to the sea. The region is in varying degrees of cultivation and is interspersed throughout with sand dunes.

The Southern Plains region takes in the intermediate lowlands and the fertile Mekong Delta. The intermediate lowlands constitute the transitional zone between the Central Highlands and the delta proper. Basically an undulating plain interrupted occasionally by marshland, this transitional zone slopes southward. Elevations range from 300 feet in the northern sector to sea level near the delta. Dense rain forests cover large areas of the region; however, dry field crops such as corn, sweet potatoes, and beans, in addition to the rubber plantations and the less extensive rice fields, are scattered throughout. The Mekong Delta is the most fertile plain in Vietnam and is its largest rice-producing area. Almost the entire delta is covered with rice fields situated within an interlacing network of rivers, streams, and irrigation canals. The plain is low and level; nowhere is it more than 10 feet above sea level. Gradients vary as little as one-fifth foot per mile. The dominant relief features are the rice paddy dikes. The drainage network is irregular and, because of poor runoff conditions, the northern edge of the delta is marshland. Yet the Mekong, unlike the Red River, has a moderating element whenever the river is in flood. The Tonle Sap, a large freshwater take in central Cambodia, serves as a regulating reservoir to stabilize the flow of water through the lower Mekong. During flood stage the silted delta outlets cannot carry off the flood waters. The swollen Mekong then backs up into the Tonle Sap and expands the lake so that it covers as much as four times its low-water area. As the flood subsides, the water reverts to its original flow from the lake to the sea. The regulating reservoir thus significantly reduces the danger of serious floods.

All five major geographical regions contain several basic types of vegetation. Vegetation areas fall into six general categories: (1) rain forest, (2) open forest, (3) swampland, (4) marshland, (5) grassland, and (6) cultivated areas. The rain forest, predominant in the Northern Mountains, Central

Highlands, and intermediate lowlands regions, consists of a continuous, multilevel canopy of numerous species of trees—primarily broadleaf evergreens. Secondary growth rain forests tend to contain small, closely spaced trees and dense undergrowth. The open forests of the plateau region of the Central Highlands and areas of the Northern Mountains and the transitional zone of the Southern Plains include widely spaced trees above a floor of tall, sharp-edged thatch grass. The primarily deciduous trees shed their leaves during the dry season. Swampland is characteristic of the coastal sectors of the Northern Mountains, the Red River Delta, and the Mekong Delta. Primary vegetation in these areas is the mangrove, a variety of evergreen that thrives in brackish water and muddy soil. The tree crowns form a dense canopy and the prop roots constitute an almost impenetrable ground barrier. Marshland fringes the northern edge of the Mekong Delta near the Cambodian border. Reclamation projects have lessened its extent. In the marshland areas, sharp-bladed reeds and rushes grow to heights of seven feet. Grassland is most prevalent in the Northern Mountains, near the Chinese border, but sections of grassland are dispersed throughout Vietnam. Thatch grass is the most common vegetation in these locations. The vegetation and crops of the cultivated areas, particularly in the Northern and Southern Plains and Coastal Lowlands regions, include corn, beans, potatoes, and other dry field crops, as well as coconut, sugar cane, rubber, and rice. The deltas in particular are covered with rice paddies.

As important as topography and vegetation in a geographical survey of Vietnam is a consideration of its climate. Paramount in climatic changes are the seasonal monsoons. During the southwest, or summer, monsoon, the heat of central Asia rises and causes humid air to flow inland from the ocean, usually from mid-May to early October. The humid airflow brings heavy rains to the plateau

area and the western slopes of the mountain regions. Average rainfall during these months ranges from 55 to 110 inches in the north and 40 to 95 inches in the south. However, sections along the eastern slopes and the coastal plains receive relatively little moisture. Except for local variations, high humidity, tropical temperature, and cloudiness prevail during these months. The northeast, or winter, monsoon results from the high pressure in the Asian interior forcing dry, cool air out toward the sea. This flow generally begins in early November and continues until mid-March. The coastal region receives relatively heavy precipitation, whereas across the mountains in Laos the weather is hot and dry. During January, February, and early March, the coastal areas, especially along the Gulf of Tonkin, experience the "crachin"—a period of intermittent drizzle and low cloud overcast. The periods between these monsoons are known as the spring and autumn transitions. The spring transition, from mid-March until mid-May, is a period of very high temperatures and high humidity and a number of cloudy, overcast days. The autumn transition includes the weeks from early October until early November. For the central portion of the coastal plains, the heaviest amount of precipitation and cloud cover occurs during this transitional phase.

The Enemy

The requirements for countering insurgency in South Vietnam were considerably different from those experienced by U.S. artillery in past combat operations. First, the enemy could attack ground forces or the local populace at times and places of his choosing. Second, he was indistinguishable from the populace and even from some of the irregular friendly paramilitary forces. There could be little progress toward identifying and finding this elusive enemy without

first acquiring detailed knowledge of his organizations and methods.

The Indochinese Communist Party (ICP) in 1941 formed the Viet Minh, or League for the Independence of Vietnam. A decade later, the Viet Minh had grown unwieldy and and was reorganized, following the March 1951 Congress of Unification of the Lien-Viet and Viet-Minh Fronts, into the Vietnam Dang Lao Dong, or Vietnam Workers' Party. Ho Chi Minh and the other leaders of the Viet Minh hoped ultimately to reconstruct, within this broad national front, a hard inner core around which a well-disciplined following could be organized. The Central Executive Committee of the new Lao Dong Party was headed by Ho Chi Minh and included the former Viet Minh leadership. The Indochinese Communist Party meanwhile had been dissolved in 1945 after fifteen years of operation and was succeeded by the Marxist Study Club. The Lao Dong Party was, in effect, a less ostentatious recreation of the Indochinese Communist Party. "We may tell the party adherents that the new party is basically the Communist Party under a new form," a confidential executive committee circular pointed out, "but to those that are outside of the party, we will say that it is a newly-created party merely continuing the revolutionary work of the preceding parties."

In the years after the 1954 Geneva Accords, as it became apparent that the agreement for national elections would not be honored and that the Diem government would soon collapse, Lao Dong Party cadres went south and began organizing the dissidents in South Vietnam. By December I960 the National Liberation Front (NLF) of South Vietnam had been formed. The organization of the Front, according to Douglas Pike, was a "phantom edifice." Lao Dong cadres first conceived the front on paper and then applied it to the grievances of the south. Organizational impetus, in other words, came from the Lao Dong Party, whereas the support, primarily an anti-Diem coalition, was indigenous. Lao Dong

participation in the National Liberation Front, never seriously concealed, became apparent with the formation in January 1962 of the People's Revolutionary Party (PRP), which replaced the southern branch of the Lao Dong Party. Communist domination marked the end of the phase of intensive organization building. Membership in the National Liberation Front had reached approximately 300,000, and the creation of the People’s Revolutionary Party initiated a period of internal NLF solidification which eventually culminated in Northern control of the Front. By 1964, relocated northerners made up about one-half of the Front's 40,000 civilian cadres.

The military arm of the National Liberation Front was the People s Liberation Armed Force (PLAF), which was known before 1960 as the Liberation Army of the Front. Allied forces referred to the Force simply as Viet Cong—a nebulous term for Vietnamese Communists that nevertheless persisted. The army was made up of main force regulars and paramilitary units. The regulars (*Chu-Luc-Quan*), stationed mainly in secret bases and secured areas, were professional, well trained, disciplined, and thoroughly indoctrinated soldiers. They were chosen from battle-experienced regional units or infiltrated from North Vietnam. The organizational plan called for the incorporation of party commissars from the company level up and for a party tell in each platoon that worked with the company commissar.

Until 1956, Communist forces in the south were mostly guerrilla units supplemented by a few regulars. The number of regular forces increased continuously in the succeeding years, so that by 1965 the estimated strength of main force regulars was between 25,000 and 30,000 and by 1965 about 35,000 men. The missions of the PLAF main force regulars resembled those of the armed forces of North Vietnam—the People’s Army of Vietnam (PAVN), more commonly known as the North Vietnamese Army (NVA). Coordination and efficiency were essential. “They have the

capacity," North Vietnam Defense Minister General Vo Nuyen Giap observed, "to annihilate major units or command posts of the enemy."

The paramilitary forces of the People's Liberation Armed Force, made up primarily of indigenous personnel, consisted of regional units and local militia. The regional units were guerrilla bands that operated mainly in their home provinces and districts. Their primary responsibilities were to (I) train and assist the local militia, emphasizing not only military doctrine but also political activities, (2) screen the operations of the main force regulars, and (3) serve as reserves and reinforcements to the regulars. These activities kept the government forces off balance. In 1965, the regional forces contained an estimated 60,000 to 80,000 men. The local militia (*Dan Quan Du Kick*) were largely untrained, poorly equipped, and inadequately indoctrinated. However, as an integral part of the population, they filled an important logistical role for the regional and regular forces. Their social role was perhaps even more critical than their military potential. Proselyting the local populace called for nonmilitary indoctrination. It has been estimated that militia training, conducted by regional units or regular forces, included 70 percent political and only 30 percent military subjects.

After 1959 Communist troop infiltration south was continuous. The majority of the infiltrators were former Viet Minh who had regrouped to the north after the Geneva agreement. Until I960 the North Vietnamese Army assisted the insurgency in the south mainly by providing specialists to the National Liberation Front and the People's Liberation Armed Force. By late 1964, the demand for more NVA units in the south forced changes in the makeup of infiltrators. North Vietnam began recalling former enlisted men in 1964 and officers in 1965. The new need also altered draft requirements. The draft formerly affected those between 18 and 25 years old; it expanded to include persons between

ages 17 and 35. Also, by mid-1966 the semiannual call had become a quarterly call and the term of service, once 3 years, had been extended to the duration of the war.

The enlarged numbers of infiltrators soon exceeded the capabilities of the North Vietnamese training units. The 338th Brigade until 1964 had been responsible for infiltration training, but additional training commands were now needed to cope with the buildup. The 22d Training Group, 250th Training Division, 320th Training Division, and 350th Division joined the training efforts of the 338th. Together these units could train between 78,000 and 96,000 men per year.

The tempo of activity picked up in 1968 and inflated the manpower requirements of the military. Consequently, the People's Liberation Armed Force as well as the North Vietnamese Army underwent further modifications. The PLAF main force and regional units faced the dilemma of enlarged needs and diminished manpower resources. In 1968, approximately 60,500 men were recruited; in 1969, about 57,000. Of these, it has been estimated that 50 percent were recruited through the use or threat of force. Large numbers of these recruits were under 17 years old. The North Vietnamese Army, in turn, was forced not only to aid the PLAF main force but also to send some of its own elements to the regional units. The burden on manpower resources, though heavy, was not critical for the North Vietnamese. An estimate of the number of males of military age (15 to 49 years) in January 1969 showed that of a total of 4,607,000 approximately 2,700,000 were fit for military duty and that another 100,000 men would become eligible each year.

The tactics of the North Vietnamese Army, and especially of the People's Liberation Armed Force, emphasized security, silence, and speed. The carefully detailed plans, the rehearsals whenever feasible, the speedy execution, and the equally quick and cautious withdrawals were forced

upon them because of the preponderant firepower of the U.S. forces. Offensive activities had to be maintained, the positional defense avoided; NVA and PLAF artillery support adapted to these prerequisites.

Until 1907 the North Vietnamese Army and the People's Liberation Armed Force used primarily mortars and recoilless rifles in standoff attacks against allied military installations and outposts. The limited destructive capability of these weapons and the tightened installation security of the allies, which came to include those areas within medium mortar range, forced the enemy to lessen the frequency of his attacks.

In early 1966 enemy use of Soviet cannon artillery became more common. The 85-mm. Soviet divisional gun, the 122-mm. Soviet MI938 howitzer, the 122-mm. Soviet D14 gun, and the 152-mm. Soviet MI939 gun-howitzer, as well as captured U.S. 75-mm. and 105-mm. howitzers, increased the NVA and PLAF long-range destructive capability. However, allied Firepower placed restrictions on their use. A survey conducted by the U.S. Army XXIV Corps Artillery over a seven-month period in 1968 concluded that the hours most preferred by the NVA for firing were from 1000 to 1300, from 1400 to 1500, and from 1600 to 1900. The frequency rose steadily during the morning hours, peaked around 1130, and then dropped off considerably. Artillery fire peaked again around 1430 and 1830 and decreased significantly following each peak period. The preference for daylight hours, according to the survey, was probably determined by a desire to avoid counterbattery fire. Frequent nighttime moves from position to position were mandatory to avoid detection, and firing was limited to a few rounds per gun from several widely scattered positions.

By late 1966 Soviet and Chinese Communist rockets were in the enemy inventory. These rockets were not only more suitable than cannon artillery for attacking larger

targets but also lighter and more adaptable. And because of their low trajectory, rockets often escaped location by the U.S. AN/MPQ-4 (Q-4) countermortar radar. The 140-mm. rocket attack on Da Nang air base on 27 February 1967 commenced a new phase in the war in terms of enemy capabilities by extending the attack range by about 3,500 yards beyond the maximum range of the 120-mm. mortar and more than doubling the warhead payload. Moreover, rockets were more mobile than conventional artillery. A captured enemy training document explained that the "main purposes of the rockets are objectives having a large area, usually 400 x 400 m, such as enemy strongholds, air fields, storage points, or towns." The rockets could also be used "to support the infantry and to attack distant objectives that may affect the combat mission of the infantry."

All the rockets could he employed from improvised launchers. The 140-mm. rockets used in the attack on Da Nang air base were fired from 134 crudely mounted launching positions consisting of single metal tubes mounted on wooden boards, with elementary elevation and deflection devices. The enemy accomplished simultaneous launchings by wiring several weapons to two ignition wires and then to a battery. A modified Soviet 122-mm. rocket was used during the 6 March 1967 attack on Camp Carroll. The launcher was a single tube taken from the Soviet multiple rocket launcher, the 40-round BM—21, shortened by 18 inches from the original 9.6 feet, fitted with a tripod mount, and equipped with a modified optical sight taken from the Soviet 82-mm. recoilless gun. In this form the weapon could be broken down into five manageable loads for jungle mobility. But the enemy was even able to launch the 122-mm. rocket by propping it against sandbag mounts or wooden stakes. Although errors increased, only three manpacks were sufficient to transport the weapon when it was used in this fashion. The 122-mm. rocket soon became

the standard rocket of the North Vietnamese Army and the People’s Liberation Armed Force.

The Chinese Communist 107-mm. rocket, used in February 1968 against the U.S. base camp at Quan Loi plantation, added another dimension to the NVA and PLAF arsenals. The 107-mm. rocket packed a smaller warhead and had a shorter range than the 122-mm, rocket. However, because they were relatively light, three 107-mm. rockets could he transported as easily as one 122-mm. round. And like the 140-mm. and 122-mm. rockets, the 107-mm. could he launched from improvised pads. An enemy training document pointed out that 107-mm. rocket firing pads could be made of dirt, bamboo frames, or crossed stakes. The rocket could be launched from “road embankments, a dike between two rice fields, the brim of a combat trench, an earth mound, a bomb crater, or an ant hill,” In the summer of 1968, reports mentioned the possible enemy use of multiple rocket launchers. U.S. forces had encountered twin-tubed 107-mm. launchers fitted as if they were intended to be attached to other tubes. These rather sophisticated launchers were obvious contrasts to the crudely improvised 140-mm. and 120-mm. assemblies, On 16 September 1968, the Americans captured a Chinese Communist-manufactured 12-round launcher for the 107-mm. rocket. Broken down, the launchers were easily transportable and delivered the 107-mm. rocket against separate targets; assembled, the multiple launcher massed 12 rounds on a single target area.

Enemy units continued to make the most of their weapons by adapting available resources to prevailing requirements. For example, they created the 107-mm., 120-mm., and 140-mm. overcaliber rockets by attaching larger warheads to the original assemblies. Modification lessened accuracy, but the overcaliber rockets provided effective harassing and saturation fires.

Enemy company commanders, like their counterparts in the cannon artillery units, were conscious of U.S. firepower. A captured company commander explained in December 1968 that U.S. air observers could follow the rocket exhaust and pinpoint launch sites for air strikes. Hence it was necessary to employ “hit and run tactics in accordance with the principles of guerrilla warfare.” Fire control and co-ordination was primary. “No more than five rounds are fired from any single tripod-type launcher. This takes about 20 minutes.” No more than two salvos were fired in about ten minutes time from improvised launchers. Displacement involved “the immediate pickup of all equipment and leaving the area with all possible speed, which takes about 5 minutes.”

By late 1969 the rocket, because of its advantages in terms of payload and mobility, had become the prime weapon of the NVA and PLAF artillery. The rocket units were organized into regiments, battalions, companies, and platoons. The regiment included a headquarters squadron, a signal and reconnaissance company, and three rocket companies. The number of rockets and launchers per company varied with the caliber of the weapons. A 107-mm, rocket company normally consisted of twelve launchers and twenty-four rockets: a 122-mm, company, six launchers and eighteen rockets: and a 140-mm. company, sixteen launchers and sixteen rockets.

The makeup of the cannon artillery units varied according to their location. Medium artillery pieces were prevalent only in the Demilitarized Zone, where regiments usually contained 36 tubes— 24 of 105-mm. and 12 of 130-mm. and 152-mm. In addition, a few 85-mm. and 100-mm. pieces were sometimes incorporated. Elsewhere, conventional NVA and PLAF units normally included weapons not considered artillery pieces in American units. The 60-mm., 81-mm., 82-mm., and 120-mm. mortars and the 57-mm., 75-mm., and 82-mm. recoilless rifles, along

with the 12.7-mm antiaircraft machine gun, were commonly parts of their artillery arsenal. Less common, though still available, were the 70-mm. Japanese and 75-mm. U.S. howitzers. Artillery training, in fact, envisioned the use of captured American artillery pieces. Assembly and disassembly of the 105-mm. howitzer and the use of U.S. aiming devices in laying the 75-mm. and 105-mm. tubes were included in the NVA and PLAF artillery curriculum.

No description of the North Vietnamese Army and the People's Liberation Armed Force and their effect on allied forces would be complete without mention of the ubiquitous sapper. During the first half of 1969, sapper attacks inflicted an average of over $1 million damage per raid. However, the role of the sapper was often misunderstood. Before 1967, the enemy had not grasped the significance of the sapper as an assault soldier. The allies, on the other hand, sometimes erroneously categorized the sapper as a guerrilla simply because some guerrillas employed sapper tactics. The fusion blurred identification. The development of the sapper and his employment before and after the creation of a separate sapper combat arm, equivalent to the infantry and artillery, must be traced before his impact on the war can be appreciated.

The term sapper originated in Europe and traditionally identified a combat engineer. In Vietnam this conventional association remained, but a more particular connotation increasingly qualified the sapper. The sapper signified a raider-ranger unit and gained notoriety as the lead element in an assault on a fixed installation or military field position. Armed primarily with explosives charges, the sapper breached the defensive perimeter and neutralized tactical and strategic positions and thus prepared for the attack of the main body.

Before 1967, however, the sappers were often misused. As late as 1964, the People's Liberation Armed Force envisioned the use of sappers only during the first phase of

guerrilla warfare, before the government of Vietnam could establish strong points and improve defensive positions. Sapper units remained subordinate to the infantry and served as reinforcements in assaults. Deep penetrations were disallowed. Sapper units were constrained in their operations until the artillery had fired. And sappers themselves were occasionally deficient when employed in raids. Inadequate preparation, incomplete reconnaissance, and inexperience of the demolition men used as penetrators all contributed to the poor execution of these missions. Nevertheless, the number of sapper units in South Vietnam increased steadily after 1965, and by 1967 the enemy recognized the misemployment but also the potential of these forces. The North Vietnamese Army upgraded the entire organization and, in late April or early May 1967, created the Sapper Headquarters, Sapper Department, Joint General Staff.

The sapper force, as an independent combat arm equivalent to the infantry or the artillery, operated (1) in the assault without infantry, (2) in the assault with infantry, (3) in special action group activities, and (4) in “water sapper” operations. Sappers in special action groups operated essentially in the cities, proselyting the population and maintaining pressure, while water sappers mined ships, bridges, and other water-associated targets. Special action groups and water sappers were of less immediate importance to the artillery in Vietnam than were sappers employed in the first two modes.

Sapper assaults, with or without the infantry, depended on stealth and secrecy. Their primary method of attack called for making deep thrusts into allied positions from different directions and hitting several targets simultaneously. Organization was determined by the specific mission and the fixation and strength of the allied forces. Characteristically, however, the sapper force included

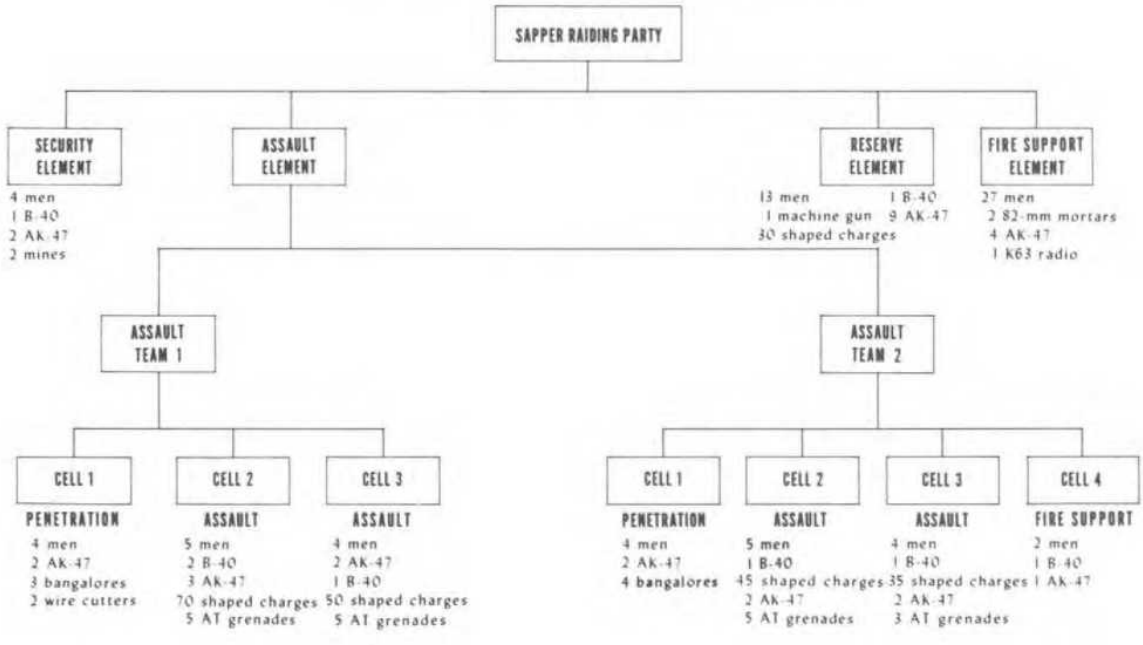
assault, security, fire support. and reserve elements. (*Chart I*)

Assaults without the infantry required fullest use of the fire support or reserve elements, either separately or in combination. The sappers disguised their attacks as attacks by fire through the use of mortars by the fire support elements or as infantry assaults through employment of the reserve elements, which were the equivalent of infantry squads. If the deception worked, the opposing forces would deploy to their bunkers or to the defensive perimeter and leave the center of the installation vulnerable to assault teams.

Sapper attacks with the infantry were either with the sappers in support of the infantry or the infantry in support of the sappers. Sapper units considered supporting the infantry a misuse of their tactical abilities. Attached to a large unit, they tended to lose the advantages of secrecy anti surprise. Nevertheless, sappers continued to he employed as reinforcements to the infantry. The second mode of sapper operation—using the infantry as a reserve, security, or secondary assault element—seemed more effective. The greatest threat to allied positions was an attack spearheaded by sappers with explosive charges, followed by the infantry some 100 to 200 meters behind.

During 1968, after the sapper organization had been made a separate combat arm, attacks by sappers or by units employing sapper tactics occurred on a larger scale and often were accompanied by indirect fire support. By the end of that year, heavy Communist losses resulting from large-scale offensives made the sapper and his techniques empirical necessities. Minimum manpower expenditure was imperative, yet military pressure had to be maintained. The sapper was well suited to these dual demands. A captured enemy document explained that considerable damage could be inflicted by a relatively slight force through the cautious application of sapper tactics: small numbers of men could

“inflict extensive damage on enemy installations.” The sapper should concentrate oil strategic structures “located deep within enemy-controlled areas” rather than concern himself with inflicting casualties. The ability to penetrate, and not the preponderance of firepower or men, was crucial, But, the document warned, sapper attacks should “not normally last over 30 minutes after the enemy is aware of the sapper presence."



From the beginning of 1968 until mid-1969, sappers were essential to the enemy's effort. Although they participated in only 4 percent of all assaults, these made up 12 percent of all significant assaults—those which inflicted serious damage. From January 1968 until May 1969, the frequency of sapper raids remained at about live per month, but their effectiveness greatly improved. The average raid during 1968 resulted in approximately $300,000 damage. In 1969, the average raid inflicted more than $1,000,000 damage and accounted for more allied casualties. The selection of targets testified to the increasing boldness of the sapper units. In 1965 the use of sappers against allied combat positions such as outposts, fire support bases, and landing

zones was still debated, but in 1967 training for this type of attack was rapidly progressing. During 1968 and 1969 these field positions made up 43 percent of the sapper targets; fixed military installations such as storage depots, base camps, and Air Force installations accounted for 32 percent of the sapper raids; and population centers accounted for 18 percent of the total. More than 51 percent of the raids occurred between 0100 and 0300. General Giap showed the increasing confidence in sapper units when he exclaimed. “Regardless of how strongly the US or puppet troops are defended, they can be easily destroyed by our crack and special troops with their special combat tactic.”

The creation of the Sapper Headquarters in 1967, the need for troop conservation, especially after 1968, and the demonstrated effectiveness of the sapper during 1969 contributed to the growing emphasis placed upon these forces. The expansion of the sapper combat arm mirrored this emphasis. In July of 1967 the V-25 Infantry Battalion, a PLAF regional unit in Quang Nam Province, was scheduled to be upgraded to main force status and retained as a sapper force. Here was the first clear indication that large infantry units were being converted into sapper units. By June of 1968, nine main force and regional force battalions and sixteen companies of sappers were in existence. In early 1969, the sapper force had grown to nineteen battalions and thirty-six companies. And by mid-1969, this force had increased to twenty-seven battalions and thirty-nine companies.

Political-Military Considerations

The peculiarities of terrain and enemy operations fundamentally affected the employment of artillery in Vietnam. Gunnery errors in the past seldom had resulted in friendly casualties. Rounds that cleared friendly lines were