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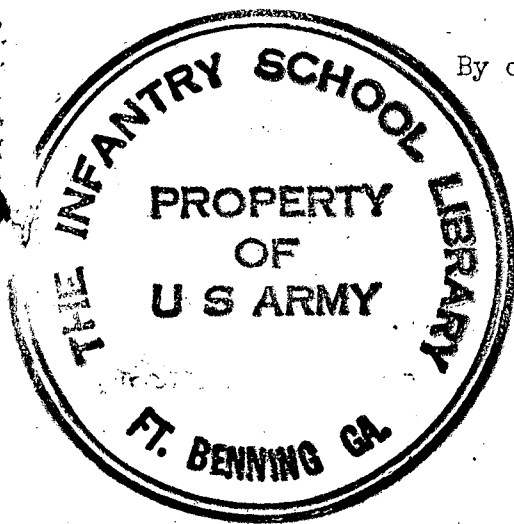
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By command of Lieutenant General DEVERS:



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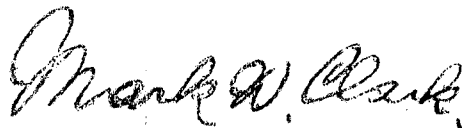
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PREFACE

The Officers and Men of the Fifth Army have met successfully the test of many phases and types of combat. In the face of determined resistance they wrested a strongly defended beachhead from the enemy and fought their way through many types of terrain, over mountains, through valleys, across rivers — anywhere that troops can go. They have endured the hardships of severe weather and climatic conditions, and they have overcome all the obstacles that Nature and a ruthless, clever enemy have imposed in their path. Their experience has covered the length and breadth of much that is to be expected in future fighting in Europe. The lessons and experience they have gained should be of value to those who follow them, in this Theater and elsewhere.



MARK W. CLARK,
Lieutenant General,
Fifth Army

LESSONS FROM THE ITALIAN CAMPAIGN

Period from the Landings of September 9, 1943, through February 1, 1944

SECTION I : INTRODUCTION

1. The material contained in this publication is not to be considered as tactical doctrine. It represents a summary of the major lessons from the Italian Campaign digested from the reports of the Army Ground Forces Board, Allied Force, which contain reports of combat experience, lesson material, and comments from corps, division, brigade, regimental and battalion commanders and their staffs. Additional material has been drawn from other reliable and appropriate sources. It is believed that the lessons and examples given herein, if applied with judgement and due consideration of individual situations, will be of value in the training of units and individuals who have not yet entered combat, or have yet to experience combat under the conditions peculiar to the Italian Campaign.

2. In all reports and testimony of battle experience the soundness of basic principles prescribed in standard training literature ^{has} been confirmed. Detailed study of the operations in Italy reveals but little experience that contributes "new" tactical lessons. Much that is contained in this publication merely reaffirms the previously published lessons of the Sicilian Campaign, and are again restated for the purpose of emphasis. As in the fighting in Sicily, the application and modification of basic doctrine to meet effectively the peculiar characteristics of the Italian Campaign also present a number of interesting and valuable lesson-experiences.

3. The distinctive aspects and peculiarities of the campaign and the terrain over which it has been fought should be fully appreciated in order that the summary of combat experience and battle

lessons herein may be understood in its proper perspective. For this reason the following sections outlining the general nature of the operations and the terrain involved are included.

SECTION II : CHARACTERISTICS OF THE CAMPAIGN

4. GENERAL

In general, the Italian Campaign thus far has consisted of four phases; a large-scale amphibious landing operation in the face of strong and prepared resistance; the development and extension of a beachhead against stubborn resistance and counterattack; a mountain campaign in the hinterland in which the enemy contested every mile of advance and withdrew under pressure to prepared winter defenses; and a phase of static warfare in high, rugged mountains under severe weather and climatic conditions.

5. COMPARISON WITH THE SICILIAN CAMPAIGN

a. Although much of the specific combat experience in Italy has been similar to that in Sicily, the broad aspects of the two campaigns present marked differences.

b. Resistance to the assault landings in Sicily was nominal as compared with the determined opposition encountered at Salerno and adjacent beaches.

c. The campaign in Sicily involved pursuit action throughout, and resolved itself into one prolonged, unbroken attack which drove a withdrawing and delaying enemy from the island. In Italy the enemy has conducted a determined all-out resistance, and has yielded ground slowly and only after being forced out of his positions. In almost every case he has fallen back to prepared defenses from which he has continued his stubborn defensive action, launching strong counterattacks which have frequently forced our troops to defend rather than attack. After being driven to his so-called "Gustav Line," the

enemy stood at bay in his winter positions in a hold-at-all-cost effort not matched by any general resistance encountered by our forces in previous campaigns.

d. Although the seizure of Sicily involved a campaign of mountain fighting, the mountains traversed on the island were not properly comparable in height, slope, or ruggedness to those fought over in Italy.

e. In Sicily the campaign was conducted during the dry season, in the heat of summer, at a time when rivers and streams had become flat, dry watercourses easily crossed during the advance. In Italy the difficulties of mountain fighting have been materially increased by continuous rain which produced prolonged periods of mud scarcely equalled during the worst muddy season in the Tunisian Campaign. Severe cold in contrast to the summer heat in Sicily has prevailed throughout a large part of the Italian Campaign, and the winter rainy season has swelled the numerous streams and rivers into formidable water barriers involving river crossing operations not hitherto experienced in any campaign in this Theater.

f. The effects of these contrasts in the broad aspects of the two campaigns are best revealed in their comparative duration. The island of Sicily was taken in thirty-eight days. The campaign for the Italian peninsula is now in its sixth month.

6. THE LANDING OPERATION

a. In the landing operation, surprise was not achieved, and German forces had occupied defensive positions and were prepared to resist the landings several days before the assault. Although the defense preparations were not complete, the resistance encountered was formidable. Beaches were extensively mined. Strong points centering around numerous machine guns had been organized and wired. Artillery was in position to fire on approaching craft and on the beaches. Fire was actually opened on the convoy while assault units were being loaded into landing craft.

b. The assault units, including artillery, some tank destroyers and antitank guns landed successfully before daylight, and subsequently assisted by air support and naval gunfire, gained beachhead positions in the face of enemy opposition during the first day. Some disorganization of units existed, but the narrow beachhead was seized and maintained against several armored counterattacks which were repulsed by divisional artillery and antitank weapons which had been brought ashore early in the landings.

7. DEVELOPMENT AND EXTENSION OF THE BEACHHEAD

Following the assault landings and establishment of initial positions on D-Day, the Italian Campaign entered its most critical phase, in which the narrow beachhead was developed and extended inland to provide space for maneuver and a resumption of large-scale offensive operations. Necessary reorganization and realignment of units were accomplished, and the initial temporary disorganization occasioned by landings against opposition was rectified. The extension of the beachhead required more than a week of critical fighting, and was carried out against strong resistance and under pressure of counterattacks and tank action. During this period assistance and cooperation of the highest order were rendered by the supporting air and naval forces.

8. MOUNTAIN CAMPAIGN AND STATIC WARFARE

a. After the extension of the beachhead, the offensive was resumed. The enemy was gradually forced back into mountainous country in which the campaign of the U.S. forces has since continued, except for a few limited intervals of open country fighting. The gradual and stubbornly contested advance to the enemy's winter line involved mountain fighting of a type and under conditions not before experienced either in northern Tunisia or in Sicily. The mountain masses have been higher and more rugged than any previously encountered. They have often been fought for and occupied piecemeal or one at a time. In such operations fighting at close quarters and the widespread use of grenades have played a major

role.

b. The advance has included several large-scale stream crossing operations, involving wet bridging on a scale not heretofore required. The numerous blown bridges along the line of advance have also necessitated a continual routine of bridging operations of all types to such an extent that the Chief Engineer, Fifth Army, referred to the fighting in Italy as a "campaign of bridges."

c. In the forward areas as the advance pressed through the high mountains, practically all supplies, including ammunition, subsistence, and other essentials have been transported to the front line elements by hand or by animal transport over mountain tracks and trails. The problems of supply occasioned by a combination of terrain, weather, and climate, have not been equalled in past experience in this Theater.

d. Town and village fighting, and the passage of major demolitions in towns and villages have played a large part in the operations. Extensive use of mines by the enemy has continued and increased, and because of the terrain and the limited roads and trails, has constituted an ever-increasing menace and obstacle. In the high mountain areas, combat has often been resolved into series of operations of small units and strong combat patrols. The use of massed artillery, necessary literally to blow the enemy out of his mountain strong points, has proved increasingly important; and in the high, sharp hill masses providing excessive dead space and defiladed hostile positions inaccessible to artillery fire, mortars of all calibers have become all-essential as support weapons.

e. Climate and weather have also influenced operations to a marked degree. The prolonged periods of rain, with the attending difficulties occasioned by mud in the cultivated and less rocky areas, and the severe cold in the high mountains have had their effects in impeding and slowing up both combat and supply operations.

f. As the advance finally reached the prepared "Gustav Line," the fighting has become more bitter and intense. Under the static

conditions prevailing in this period, it has often been referred to as a "1918 campaign" transferred to the Italian mountains.

SECTION III : CHARACTERISTICS OF THE TERRAIN

9. BEACHHEAD AREA

a. The beachhead area consisted of a small and restricted undulating coastal plain, traversed by small streams and cut by deep, narrow irrigation ditches. The larger streams were generally from fifty to seventy feet wide, in depth varying from four to six feet. The stream banks were steep, often averaging from five to ten feet from the top to the water's edge. The plain was intermittently covered with sparse olive groves, cultivated fields, areas of wild vine growth and scrub, fruit trees, and twin rows of shade trees bordering the main roads. The towns and villages dotting the plain were small, compact, with twisting, narrow streets. Houses were of thick stone and mortar construction.

b. The streams and irrigation ditches restricted the movement of wheeled and tracked vehicles, but did not impede the advance and maneuver of foot troops. The undulations in the plain afforded relatively good fire and minor maneuver positions for infantry, and the groves, vine growth, and tree plantings provided some thin satisfactory cover. Ruffs of trees bordering the larger streams also provided fire positions for both enemy and friendly infantry and artillery. The coastal plain rose abruptly to belts of moderately high mountains situated at varying distances from two to ten miles from the shore line. This high ground overlooking the plain gave advantage to the enemy in affording artillery positions which commanded the plain, and also provided him favorable defense positions into which he withdrew as the beachhead was extended.

10. MOUNTAINOUS HINTERLAND

a. The hinterland through which the advance of the U.S. forces

progressed was generally characteristic of the southern Appenines.

The general terrain consisted of steep, rugged mountains of high elevation, cut by narrow, twisting valleys and gorges. The surfaces of the slopes were rocky, irregular, and covered thinly with scrub evergreen and some stunted oak. The valleys extended to the coastal plain or terminated against interior mountain barriers. They were generally drained by deep gorges forming outlets for the watershed towards the sea. All land in the valley areas except the steeper side slopes had been under intense cultivation and the soil, as a result of centuries of working, became seemingly bottomless mud after periods of continued rain. The more moderate slopes were covered with scattered vineyards, together with fruit and olive groves. In some of the higher areas, fairly large hardwood forests prevailed.

b. Villages and towns were sited both in the valleys and on the slopes of high mountains, some being located on the heights or mountain tops. Buildings and houses were of stone construction, with thick walls invulnerable except to direct hits by artillery, and afforded excellent commanding positions when villages and towns were on dominating terrain.

c. Maneuver through terrain of this sort has been slow and difficult. Frequently it has been restricted to small unit operations along the whole front. The rugged mountains, poor roads, and mud have imposed difficulties of supply not hitherto encountered, and the location and occupation of artillery positions have been accompanied by numerous problems as a result of defilade, dead space, and difficult ground. In some of the areas covered with forest and thick tree growth the newer element of fighting in woods has been added to the general scope of mountain warfare, and exacting standards of rock and mountain climbing have been necessary in the higher areas in addition to the more conventional infantry fighting.

11. ROAD NET AND COMMUNICATIONS ROUTES

a. The road net and system of terrestrial communications through the area of the advance have been limited and restricted. The metalled road system consisted of a few main routes generally widely divergent, laterally connected by poorly constructed secondary roads and tracks. The roads were generally narrow, and in the mountainous country were often cut into the steep slopes. Numerous gorges and valleys, streams and other surface barriers had necessitated extensive bridging of the highway routes, with the result that nearly all roads were punctuated at frequent intervals by single or double span stone bridges and culverts. In the higher regions gradients were steep and dangerous. Through the valleys and cultivated areas, roadways were generally bordered with stone walls, restricting off-roadway movement of vehicles. In the mountains off the few principle roads, all ground communication has been restricted to trails and tracks the majority of which could accommodate only a single file of troops or pack animals.

b. The systematic and extensive demolition operations of the enemy seriously increased the problems produced by the limited and restricted nature of the road net. Practically every bridge in the wake of the hostile withdrawal has been thoroughly demolished. Sections of road on mountain sides have been blown out, and mines have been extensively sown over all routes of movement and supply. Where the main roads have funnelled through towns, road and building demolitions have been carried out by the enemy on a large scale, often leaving barriers requiring extensive engineer operations before wheeled and tracked vehicles could resume the advance.

12. RIVERS AND STREAMS

The rivers and larger streams forming the watershed of the region often presented serious obstacles in the advance of our forces. They averaged from 50 to 100 feet wide, with depths varying from three to six feet. The currents were generally moderate and free-flowing. Fording places were generally accessible to infantry, and in some

instances, supporting tanks were waterproofed and forded the rivers behind the infantry. Blown bridges continually necessitated wet bridging operations on a scale not heretofore required, to provide for crossing of wheeled vehicles, heavy weapons, and supplies. Smaller streams and tributaries restricted the movement of vehicles and heavier weapons, but presented no serious barrier to foot troops.

SECTION IV : LANDING OPERATIONS AND BEACHHEAD EXTENSION

13. GENERAL

The landing operations at Salerno and adjacent beaches were the first in this Theater to involve serious enemy resistance, and for this reason the general tactical lessons are of special interest and importance. The tactics and technique of amphibious operations are highly specialized and technical subjects, and fully detailed treatment is naturally beyond the scope of this publication. Certain broad tactical lessons of value to any ground task force likely to be involved in future amphibious landings are appropriate to this summary, and are therefore included. In the selection of lesson material contained herein attention has been directed to those aspects of the landings which relate to the tactical operations of the ground units involved.

14. TIMING OF LANDINGS

a. The timing of the landings in an amphibious assault is a highly important element in the success of the operation. It is believed essential that the fullest use of the cover of darkness be made, to prevent undue loss before reaching the shore. Conversely, landings during daylight hours, or landings staged too shortly before dawn and not completed before daylight will permit a relatively small enemy force supported by artillery to inflict serious losses on the assault waves and follow-up before and as they reach the

beaches.

b. At SALERNO the H-Hour was 0330 on September 9, which left less than two hours of darkness to cover the follow-up and completion of the unloading. When daylight arrived the beachhead had not been established, and observed enemy fire was directed on the beaches which seriously interfered with beach operations and subjected the unloading craft to direct fire from 88mm guns. A landing operation incompletd before daylight will also permit the enemy to organize and deliver counterattacks and tank attacks while the beachhead is being consolidated. It is therefore essential that the operation be timed to allow the landing of all assault and supporting troops before the end of darkness. In this connection the Commanding General of the 36th Infantry (Assault) Division reported:

. . . The German troops encountered in this area (SALERNO), although relatively small in numbers, were employed with great skill and showed stamina, initiative, and a determination to fight. Landing during the hours of darkness insured little loss before striking the shore. It would have required the survival of only a relatively small portion of hostile 88's and tanks to have inflicted heavy damage on the assault waves before they reached the shore. It is believed sound to conclude that landings on hostile shores should be executed at such a time before dawn as will permit the landing of assault infantry, tanks, artillery, and antiaircraft guns prior to the time that hostile tanks can be used effectively against our infantry. A landing made during daylight hours will without question result in German counterattacks with tanks prior to the arrival on shore of the appropriate means to defeat those counterattacks. . . .

15. INFANTRY ACTION IN THE ASSAULT LANDING

In a landing operation against serious resistance, a certain amount of disorganization, landing of elements on wrong beaches, and disruption of plans must be expected. Unit commanders must anticipate these conditions and must be prepared to correct them swiftly and without loss of control. Officers of all echelons must not lose sight of their primary planned objectives, and regardless of temporary disruption, must act quickly to carry out their missions and reorganize their troops to resume the general plan of attack. Leaders must keep constantly in mind that the success of the operation as a whole depends on

the ability of individual units, however small, to carry out their missions through the maintenance of discipline, control, and initiative regardless of local disruption of plans. A major lesson at SALERNO emphasizes that assault landings against opposition require the highest level of troop leadership and discipline. Comments of the assault Division Commander indicate that there is room for marked improvement in this respect:

. . .The infantry in landing operations, as in other operations, carries the heavy load, suffers the losses, and must have the guts to go forward despite danger and heavy casualties. Without question our training has not yet produced disciplined officers and disciplined men. Throughout the operation there was ample proof that. . . control which is so essential to infantry operations and is so difficult to obtain and maintain was not achieved in an adequate degree. . .There will always be some boat waves which will land on beaches other than those intended and which will land at times other than those prescribed. Commanders of all units must expect these things to happen, and be prepared to take prompt action to rectify such occurrences and reestablish their units in proper place. . .

Likewise the General Officer in charge of the beaches during the assault landings stated in his report:

. . .Leaders up to and including battalion have a tendency to allow their troops to get out of control. This is especially true of night operations. . .Some lagging troops stopped behind dunes. These were urged on toward objectives. . .

16. ARTILLERY IN THE ASSAULT LANDING

a. The outstanding lesson of field artillery in the SALERNO landings was the necessity of getting units ashore early in the assault operation to provide timely and adequate support for the infantry. The early presence of this artillery and its timely support was chiefly instrumental in repulsing strong German tank and counterattacks shortly after daylight on D-Day. The Army Ground Forces observer with the assault division reported that

. . .Close and prompt support by artillery units was a very effective morale booster for the fighting soldier in the line. The close support rendered by the 36th Division Artillery was characterized by its promptness. It was credited with stopping a tank attack of 25 tanks, destroying 11 and immobilizing 3. . .

Without this support, supplemented by other antitank weapons and units, the hostile attacks that developed might well have created an extremely critical situation. In this connection the Commanding General of the 36th Infantry Division stated that "it is certain that the Germans were greatly surprised by the warm reception accorded their tanks shortly after dawn on 9 September 1943," and the Chief of Staff of the same assault division stated in his journal of D-Day that

... Had it not been for the arrival of the 151st Field Artillery Battalion thirty minutes before the first counterattack by German tanks, it is probable that the beachhead would have been destroyed. . . .

b. Of equal importance from the standpoint of amphibious lessons was the use of DUKWs for landing artillery. This means of bringing in artillery was tried at SALERNO for the first time in this Theater. A total of four battalions of 105mm howitzers was landed in this manner, and the DUKW as a means of transport for this purpose proved highly satisfactory. Experience showed that the howitzer, a six-man gun crew, and twenty-one rounds of ammunition can be efficiently taken ashore in one of these vehicles. Additional DUKWs were used to bring in more ammunition, and equipped with A-frames, these were also used to assist in unloading the howitzers. It was further reported that considerable cargo space on the larger ships can be conserved by loading the light artillery onto DUKWs prior to sailing.

c. It is essential for the landings and for the operations immediately following to have artillery forward observers and liaison officers well forward with their supported infantry companies and infantry battalion commanders. Thus disposed they are able to locate targets and bring down fire on them promptly and effectively during the early critical period of the operation. The assault Division Commander pointed to this principle in his report and declared:

... So long as the observers were with their supported units, the artillery rendered close support at all times. Several forward observers became casualties and a few were captured. The radio sets of some observers were damaged by hostile fire. Thus at one critical time, the lack of forward observers materially reduced the value

of artillery support. . .

17. PROVISION FOR REPELLING ARMORED COUNTERATTACK

The most serious threat during the period immediately after daylight following an amphibious landing is from hostile armored counterattack. Every provision should be made for adequate antitank support of the assaulting infantry, to repulse such enemy tank action early on D-Day. The landing plan should include the taking ashore before daylight adequate artillery (Cf. Paragraph 16, preceding), antitank weapons, tanks, and tank destroyers. The infantry should also be supplied with antitank grenades, frangible incendiary grenades, antitank rockets, and other weapons for close combat against enemy armor. The first tanks ashore at SALERNO were landed with the sixth assault wave, and the remainder of the tank battalion came in later on D-Day. Two destroyer battalions of self-propelled guns came ashore late on D-Day. The effectiveness of both tanks and destroyers in providing support and defense of the beachhead has been unquestioned. They were largely employed in perimeter defense in hull-down positions, and successfully repulsed and destroyed enemy armor on a number of occasions during the establishment of the beachhead. Concerning the problem of defense against hostile armored counterattack shortly after landings, the Commanding General of the 36th Infantry Division has reported:

. . . The division plan included the landing of artillery and antitank guns in DUKW's and the landing of tanks in LCM's and LCT's prior to daylight. Although some of these elements failed to land prior to daylight, a very considerable number of weapons suitable for antitank use were ashore in time to repel tank attacks made in the vicinity of RED and GREEN beaches. Because of accurate enemy fire on YELLOW and BLUE beaches, DUKWs carrying artillery and antitank guns were unable to land in that vicinity. This made it possible for the enemy with tanks and machine guns, to pin down the right flank assault regiment during most of the day on 9 September 1943. . . It is concluded that special steps must be taken and a special effort made, particularly with the navy, to insure that artillery, tanks, and antitank weapons are ashore by daylight for the purpose of repelling possible armored attacks. . .

Similarly the General Officer in charge of the beaches observed in his report that

. . . Tanks should be landed early in the assault to counter enemy armored action, and troops should be provided with all possible hand weapons to counter early and close-up enemy tank action. "Molotov Cocktails" should make an excellent weapon in the hands of troops for action of this sort. . .

The numbers of enemy tanks and the nature of their employment against the beachhead were summarized as follows in the report of the assault Division Commander:

. . . The enemy employed tanks in groups of from five to twelve. In some cases, but not all, infantry accompanied the tanks. In other cases infantry resisting the advance of the landing troops was supported by tanks. The enemy tanks moved slowly under concealment searching for our infantry. The nature of the ground was such that freedom of action of tanks was restricted by ditches. The tanks were not difficult to observe and our antitank guns including our artillery were forewarned. The fact that the enemy tanks moved slowly and in groups of from five to twelve made it possible to discover and fire on them from concealment. A conservative estimate is that about fifty-eight German tanks were destroyed during the advance to our objective. . .

18. NAVAL GUNFIRE SUPPORT

a. The landings at SALERNO were made without prior naval gunfire preparation and without naval fire support for the first few hours. The minefields in the Bay of SALERNO prevented the approach of naval vessels closer than ten miles from the shore in the early period of the operation, and thus close support of the landing force was impracticable. The enemy dispositions, including dispersed and concealed machine guns and artillery likewise made doubtful targets for pre-landing naval bombardment. It is likely that the naval guns could have destroyed or neutralized German artillery pieces within a few hundred yards of the beach, but naval firing before the landing would have alerted the German defense forces and would have permitted them to know the exact time of the landing when the fire lifted. For these reasons the assault Division Commander concluded that naval gunfire prior to landing should not be executed unless definite

targets are known and are located.

b. Shortly after daylight on D-Day the supporting destroyers were able to approach closer to the shore, and supporting naval gunfire was employed frequently with satisfactory effect. This fire was especially effective for destroying German gun positions and assembled combat vehicles. The fire was accurate and was tied in with the maneuver of the ground troops. This coordination was made possible and effective because of previous practice and training of Army and Navy artillery observer-spotter parties.

c. A summary of the naval fire support and its results was given by the Army Ground Forces Observer with the assault division:

. . . Naval gunfire can be of material assistance in amphibious operations to support the attack inland. It replaces long range organic artillery, the landing of which must be delayed until the beachhead has been made secure. On many occasions naval gunfire was employed in the SALERNO operation on such targets as tank concentrations, heavily defended towns (such as ALTAVILLA), and on targets beyond the range of organic artillery. . .

The Chief of Staff of the 36th Division also reported that naval gunfire had effectively silenced German artillery which was shelling the beaches on D-Day, and the General Officer in charge of beaches stated that numerous naval concentrations were effectively placed on the commanding positions about ACRIPOLE and PAESTIUM. The effective coordination of the Navy and ground forces is shown in a report of the Artillery Section, Fifth Army, which stated that a field artillery battery forward observer successfully adjusted the fire of the 14-inch guns of H.M.S. WARSPITE on ALTAVILLA.

19. ANTIAIRCRAFT DEFENSE

Enemy air reaction to an amphibious landing cannot be accurately predicted. It is therefore essential to include in the plan of operations the early landing of strong antiaircraft units for the defense of the beaches and beachhead area. Although at SALERNO the supporting air cover effectively countered and neutralized the enemy air effort to a large extent, hostile aircraft

succeeded in breaking through and delivered a number of strong bombing attacks during the operation. A reinforced battalion of antiaircraft guns and two battalions of antiaircraft automatic weapons were landed early on D-Day. Some of these units were called on immediately after landing to assist in repelling hostile armor, and fulfilled this mission creditably, one battalion destroying two tanks soon after landing. Employed in their normal role, these units provided timely and effective protection, and were credited with the destruction of twenty enemy aircraft during the first ten days of the operation.

20. PASSAGE OF MINED BEACHES

a. In all amphibious landing operations, mined beaches are to be expected and plans for their passage must be included in the general plan of operation. Such passage involves two phases. First the infantry assault waves must press their attack inland to their objectives regardless of mines and take their losses. The second phase consists of clearing lanes for the passage of vehicles, tanks, and guns as they come ashore, and the routing of these through the lanes to prevent losses through mine action.

b. In the SALERNO landings, the second phase above indicated was not fully and adequately carried out, in that vehicles frequently came ashore at points which were considerable distance from the cleared lanes and were damaged or destroyed by mines in moving to the lanes. The problem thus created was summarized in the report of the assault Division Commander:

... Some craft carrying vehicles landed on the beach at points other than at a prepared roadway. Many of the vehicles thus landed struck mines after getting ashore and were destroyed or severely damaged. It would have been much better if the craft carrying vehicles had remained out from the beach until roadways were available. The main reason for landing at points other than roadways was to unload as quickly as possible and return to the ships in order to avoid being subjected to shellfire at or near the beach. . . .

c. The beaches over which the landings were made were extensively mined. In some areas it was reported that no general pattern

existed and that mines had been thickly sown at random. In others the mines were laid in irregular fields of three to five rows, each row from ten to fifteen feet apart. Laterally the rows contained roughly one mine per yard. The mines encountered were generally the 1942 tellermine, partial-pressure antitank type. Some of these were found mounting a plastic, pellet-filled container screwed into the mine, which gave antipersonnel effect. These containers were approximately eight inches in diameter and contained some fifteen to twenty pellets. Other than these, no antipersonnel mines or booby traps on the beaches proper were reported.

21. COMMUNICATIONS

a. Communications between the assault elements and lower echelons and division and higher headquarters were unsatisfactory during the early stages of the landing operation. This condition was probably caused by a combination of circumstances including effects of strong enemy resistance, wetting and damage of signal equipment while being brought ashore, and disruption of signal plans.

The General Officer in charge of the beaches reported that

. . . Carelessness was noted in the landing of communications equipment. Most communication failure is believed to be the result of careless handling of equipment by personnel. . .

and the assault Division Commander reported in greater detail:

. . . Signal communication between the Division Headquarters and the various subordinate units was practically impossible prior to 1000 on 9 September, 1943. However, it was possible to maintain communication by messengers in jeeps, and this method in most cases was much more rapid than radio in code. The radio set which accompanied the Division Headquarters ashore for communication to VI Corps and Fifth Army could not be used because of mechanical failure. Some information was transmitted to the convoy afloat through the Beachmaster. However the most reliable means of getting information back to the Corps and Army Commanders was by use of messengers in boats. The early landing of jeeps for communication purposes is necessary. . .

b. Failure to include communications equipment with the air liaison officer with the assault division also delayed the

support bombing missions when they were needed in the early period. This situation was noted by the Army Ground Forces observer with the division as follows:

. . . Early air bombing support was lacking due to communication equipment of the air liaison officer with the 36th Division not being present with him. Early requests were transmitted through the Navy but several hours elapsed before the missions were accomplished. Upon securing the communication equipment the missions were very promptly accomplished. . . .

22. MISCELLANEOUS POINTS

The following miscellaneous points have been selected from the comments, observations, and experience contained in reports of the assault Division Commander, the General Officer in charge of the beaches, the Army Ground Forces observers, and from journals and reports of the units involved:

a. Battalion and regimental commanders should land early, so as to influence the action. Troops inexperienced in assault landings tend to bog down and therefore leaders must be exceedingly active and aggressive.

b. Thorough provision for reserves must be made, and transport to make them readily available to any threatened point is equally important. This applies to floating reserves as well as mobile reserves ashore.

c. Some small unit commanders after landing selected positions apparently with cover and concealment as the primary objective rather than positions from which effective fire could be delivered on the enemy.

d. After advancing inland some units failed to dispose themselves for all around defense while halted on an objective, or occupying positions for defense.

e. The self-propelled weapons of the infantry cannon companies were used to good advantage. They were attached to front line battalions and were employed in the forward areas to fire on

tanks, vehicles, and gun positions. They were kept in concealed positions of readiness until just prior to opening fire. As soon as their fire missions were completed, these guns were returned to their concealed positions.

f. Small units such as companies should not be split among several boats. Units going ashore early in the landing should be as near intact as possible.

g. A "beachguard" unit should be designated to land soon after the assault waves in order to clear the beaches and adjacent area of isolated pockets of the enemy left in the wake of the advance inland.

h. Troops must be thoroughly impressed with the dangerous consequences of bunching on beaches or in the dunes. They must be made to keep scattered and move forward under available cover.

i. Care should be taken during the later stages of an amphibious operation to provide for adequate ammunition supply.

j. The use of DUKWs permits maintenance of large forces over beaches. The performance of this vehicle in the SALERNO operation was reliable and effective. DUKWs also proved to be excellent sand prime-movers. They frequently were employed efficiently to tow guns and stuck vehicles across sand when the organic prime-movers had failed.

SECTION V : INFANTRY UNITS

23. GENERAL

In general, few "new" lessons developed from the infantry fighting in Italy. River crossing operations in the face of resistance; and combat in forested areas comprised the newer types of battle experience. In the main, infantry action in the campaign was characterized by adaption and some modification of standard

basic principles to meet the situation that difficult mountain terrain, severely unfavorable climatic and weather conditions, and determined enemy resistance created. A large part of the combat experience to be passed on to units in training relates to the different phases and problems of mountain warfare and to the methods employed in this type of fighting in Italy. The characteristics of the terrain together with the nature of the enemy defenses was productive of wide experience in the attack of emplacements, bunkers, and similar positions; in village and town fighting; and in the varied operations of small units. Scouting and patrolling, as in past campaigns, assumed even greater importance in the fighting in Italy, and night operations of all types, especially night attacks directed at limited objectives, have comprised an ever-increasing part of the infantry action. The supply of front line elements, because of the terrain and other conditions prevailing, has necessitated the exercise of initiative, ingenuity, and responsibility on a level not heretofore required, even in the mountains of Sicily. Among all ranks physical hardening and conditioning to meet excessive strain of the mountain campaign have been paramount to the success of operations. Continual cooperation and coordination of the associated supporting arms, especially in the employment of artillery of all calibers, tanks in small groups, and the attached chemical mortar units have been deciding factors in the advance of our forces. Above all else the Campaign has shown more emphatically than any other in this Theater that there can be no substitute for troop leadership.

24. MOUNTAIN WARFARE

a. Physical Conditioning and Hardening

The necessity for physical conditioning and hardening of the individual infantryman of all ranks cannot be exaggerated. The strain imposed by continual fighting in the mountains is obvious, and it has been materially increased by mud, rain, cold, and unhealthy climatic conditions. Only the highest level of hardening and stamina

can resist the physical strain of combat operations under these conditions. The high percentage of non-battle casualties as a result of exhaustion and physical breakdown as well as by sickness has demonstrated this fact only too clearly in Italy. Concerning the requirements of infantry in the present campaign, the Commander of the 3rd Infantry Division declared:

. . . Another factor which must be recognized is that to be an infantry soldier requires high standards. You have got to select. To be a doughboy now in this type of warfare requires a higher physical standard than to be a paratrooper, or certainly a member of the Service Forces or of the Air Force. . . Not long ago one of my regiments marched fifty-four miles in thirty-six hours. . .

An example of the strain that must be withstood in the fighting that has prevailed, and its effects on the endurance of the infantryman appears in the report of the Commander of the 1st Ranger Battalion, a unit noted for the stamina and physical conditioning of its men:

. . . The Battalion relieved an RCT in a sector north of VENAFRO and after splitting the Battalion due to the terrain, attacked and took the heights in their sector. The terrain was extremely rugged and heavily mined, and the weather was cold and wet. The enemy constantly shelled and counterattacked the positions. Under such circumstances there were many cases of physical and mental exhaustion, especially among replacements. The action was such that even the older (battle hardened) men were affected. . .

Similarly the G-2 of the 34th Infantry Division pointed to the excessive physical labor of infantry communications personnel, and reported that the work of the "regimental and battalion wire crews in this terrain is so fatiguing as to be almost beyond human endurance." The Commander of the 1st Battalion, 179th Infantry likewise asserted that the linemen of his unit have been "worked to the point of exhaustion." The necessity for training in the development of physical stamina, in self-care, and in sickness prevention was stressed by participating commanders of all ranks. The Commanding General, VI Corps recommended that troops in training be made to maneuver "over the toughest and hardest hills available, as we have done in Sicily and in Italy," and the Assistant Division Commander

of the 36th Infantry Division has emphasized that in training, "physical conditioning is all-important."

b. Infantry Tactics in the Italian Mountains

A major lesson from mountain fighting in northern Tunisia and Sicily, that dominating heights must be seized, valleys and natural approaches must be avoided, and units must work along the high ridges and down to force the enemy from his positions, was again emphatically demonstrated in Italy. Some modifications of this principle have been necessary because of the unusually rugged mountains. In some instances the tops of mountains could not be approached or occupied, and the infantry action was thus confined to the slopes. The nature of the mountain ranges and the organization and construction of enemy positions has frequently made necessary the seizure of selected terrain features one at a time. In such cases provision had to be made that the enemy did not occupy and organize adjacent terrain features which would render the first feature untenable. Regarding this, a company commander of the 504th Parachute Infantry stated that

. . . The present system of pushing the Germans off one hill, only to find them on a higher one in rear (or in the flank), is discouraging to say the least. We are, however, grateful for the splendid artillery support we receive. . .

These principles were also summarized in a report of the Commanding General, 45th Infantry Division as follows:

. . . You have an abnormal situation in mountains like these. You can't scale the peaks and you can't use the valleys which are mined. This means you must work the slopes. You must concentrate on taking one terrain feature. When you get that you must decide the next one to tackle. You can only learn these special tactics by going in and applying them. . . From the defensive standpoint it is a case of defending mutually supporting areas. Often the distances make it very hard to find mutually controlling areas. . .

The Commander of the 179th Infantry likewise reported on the principle of avoiding approaches and working the slopes and ridges:

. . . In front of organized German positions we have found mines only in the natural avenues of approach. These avenues are also always covered with machine gun and mortar fire. The attacking units must work along the sides of ridges, instead of using draws or gullies. . .

On the ridges and less jagged mountains the enemy often

disposed his strength on the reverse slopes in order to bring heavy fire on our forces as they crossed over the crests. In this connection a Division Commander has declared:

. . . These Krauts are rear slope boys. We neglect reverse slope defense. The German puts more men on the reverse slope than on the forward. The tendency of our infantry has been to use the forward slope and be easily observed and get the hell shelled out of them. . .

Much of the infantry fighting in the mountainous terrain of Italy has been resolved into individual operations of smaller units and combat patrol action. In these operations the familiar principles of thorough and careful reconnaissance, covering of approach, control, concealment and cover, and support have all been essential to success. In the mountains these basic elements of infantry action, with some modification in technique to meet the peculiarities of the terrain, have been as applicable as elsewhere. Likewise, the combination of fire and maneuver has still proved to be the first principle of infantry combat.

c. Importance and Use of Mortars in Mountain Terrain

Mortars of all calibers have proved to be increasingly important in the mountain fighting in Italy. They have been particularly useful in reaching enemy defiladed positions that could not be covered with artillery fire because of dead space. Frequently they have been the only means of dealing with enemy mortar positions dug in behind ridges inaccessible to other weapons. It has been found that they are also excellent for attacking enemy positions on forward slopes, and a Battalion Commander of the 180th Infantry advised,

. . . Take care of the forward slopes with your mortars. Your own mortars can hit the enemy's defended positions on forward slopes as well, perhaps better, than the artillery. . .

Observation of mortar fire has been an important factor. Because of difficulty in maintaining the supply of ammunition, unobserved fire has often been wasteful. The Commander of the 45th Infantry Division reported that the "81mm mortar we

have now is an adequate battalion weapon. It must be fired with observed fire, otherwise they just throw ammunition around." The numerous heavily protected stone bunkers which characterized the enemy positions, however, generally proved to be invulnerable to even the heavy mortar fire. One of the Ground Forces observers who interviewed a large number of participating unit commanders and mortar crews reported that "all agreed that a direct hit with 81mm heavy mortar shell would not destroy a bunker and that almost always each bunker had to be put out of action by the rifle units themselves." In this connection the Commander of the 179th Infantry reported:

. . . Direct hits were made on several bunkers with 81mm heavy shells. These shells did not penetrate, but merely scattered the top cover. . .

In many instances massed mortar fire proved to be exceptionally valuable for neutralizing enemy dug in positions before an attack. The following account of such action is taken from the report of a Company Commander whose unit successfully captured a strongly defended hill position:

. . . I pushed on with the leading platoon and weapons platoon to a small hill just south of HILL 760 (the objective), but we met with heavy fire as soon as we tried to move forward toward HILL 760. First, I called for a mortar concentration on HILL 760. There was quite a pause after that. Then I called for another concentration on the same area, but this time I arranged for the 81's to start firing about two minutes after this concentration lifted. The 81's caught the Germans just coming out of their shelters, and we could tell by the screams that we got a lot of them.

My object was to work on the Germans until I could count on their staying in their shelters for at least five minutes after a concentration. So I kept mixing up the fire. Sometimes I would throw in my 60's to hit an area where I figured they were taking cover from the heavier stuff. Several times this drove the Germans out into the open where we could shoot them down with rifles and BAR's.

Finally I had worked them over long enough to be pretty sure that they wouldn't poke their heads out of their shelters for five or ten minutes after a concentration had lifted. I gave orders for the leading platoon to move forward as far as possible under the next concentration and to charge HILL 760 as soon as the concentration stopped. Then I called for another concentration on HILL 760. The concentration came down and the leading platoon moved forward. When the

concentration lifted they charged and caught the Germans just coming out of their shelters and took them prisoner in about thirty seconds. We captured our objective with almost no casualties. . . .

Transport of mortars and ammunition in the Italian mountains proved to be especially difficult. The problem has been fairly well solved by the use of packboards and animal transport, though it has been found seldom practical to carry forward more than two or four 81mm's in an attack. "Four 81's are all that a company can carry in these mountains, and still keep supplied with ammunition," reported a Battalion Executive of the 30th Infantry, and a heavy weapons company Commander of the 7th Infantry declared at a conference on the lessons of the Campaign:

. . . In this type of terrain use only two 81mm mortars. We can fire all the ammunition we can get up with the two mortars. It is much better to have two mortars firing when you need them than to have six mortars without ammunition. . . .

Likewise a Company Commander of the 504th Parachute Infantry which had been employed in the line in ordinary infantry action, reported on the operations of his mortar platoon, with comment on animal transport:

. . . Our T/E is four 81mm mortars, but in these mountains we can carry only two and have any ammunition. My platoon is down to 2 officers and 19 men. We use five or six mules with each mortar. One mule carries the 81. The remaining mules each carry 18 rounds. Even as slow as riflemen move in this country, the mules can't keep up. In a movement of two or three miles, the mules will get a half-hour behind. . . .

In river crossings the transport of the heavy infantry mortar was especially difficult. Experience in this type of operation was reported by an 81mm platoon sergeant with reference to the crossing of the VOLTURNO:

. . . We had to hand carry our mortars across the river. We did not set up until we reached our objective. We put them in position on the objective and fired on targets of opportunity. I am quite sure we knocked out some machine guns. We had trouble in hand carrying the mortars across the river because of the steep banks and it was also hard to keep up by hand carry. We took only two of our six mortars across with us, and sixty rounds of ammunition, as we did not know when we could get more ammunition. . . .

Experience and lessons from the action of the 4:2

chemical mortar units employed in the campaign are given in a separate section under Paragraph 30, infra.

d. Supply of Forward Units in Mountain Terrain

The supply of the forward elements in the high, rugged mountains became one of the chief problems of the Campaign. Limited roads nets, extensive demolitions by the enemy, and bad weather accompanied by periods of scarcely passable mud seriously impeded the movement of supply transport in the rear areas, but such movement was possible. In the forward combat areas, as the advance pressed into the high mountain ranges, supply had to be accomplished almost entirely by animal and hand transport, and in some instances where units were at impracticable distances from sources of supply, by air. No vehicles of any sort could be used in these areas, and the units often engaged in heavy fighting in the rugged slopes and ridges, depended on pack mule trains and hand supply methods for ammunition, water, and rations. The use of packboards for dismounted transport became increasingly essential, and in some regions it became impossible to employ animals. At times the trails over which the supply columns were forced to move were scarcely defined at all, and men carrying supplies were required to climb slopes, rock formations, and numerous severe obstacles. A typical comment on the supply problem appeared in a report of the Commanding Officer, 7th Infantry:

. . . The difficulties of supply were tremendous, the only method being hand-carrying parties, and then in only small amounts, since the men needed both hands free to climb. . .

Entries in the unit journal of the same regiment reveal tersely and in bold relief the problems confronting forward elements in the matter of supply. The following are quoted from the journal of 9-10 November, 1943:

. . . 1030 - Telephone message to Division, suggesting dropping supplies by air to 1st and 2nd Battalions which are on mountains where supply is difficult. . .

1043 - Telephone message from 1st Battalion: Having fire fight. Water, ammunition, and supplies are low. Can't go any farther until they are obtained. . .

1350 - S-3 told Chief of Staff of the supply difficulties. It took six hours to evacuate a litter case to the bottom of the mountain. . .

1535 - 2nd Battalion still not moving. Had rations enough to feed only one meal to one company. Most of the battalion is up there. . .

The supply of isolated units by air was an innovation adopted in Italy because of necessity. Initially the dropping of supplies was undertaken by the use of A-36 combat planes. Difficulties attending the use of these craft resulted in substituting the artillery air OP cub planes, which have been reported satisfactory for the work. Details of the methods employed were given in a report by the Division Quartermaster and Assistant G-4, 3rd Infantry Division:

. . . We have developed a method of dropping supplies, ammunition, and water to isolated units by cub plane because the method of dropping by combat planes is too complex and the results are not satisfactory. . . One cub plane can carry and drop about 100 pounds. Our cubs have been equipped with Air Force bomb releases for this work. So far we have six so equipped (January 7, 1944) and expect to have the other four equipped very soon. On these missions the cub does not carry an observer, in order to stay within the allowable load limit. One plane can carry two 5-gallon water cans wired to a board, ammunition up to a weight of 100 pounds packed in boxes, or two bundles of rations containing 72 C rations per package. Whatever is slung under the plane must not be over 15 inches thick or over about 3 feet long, otherwise it is too dangerous for the plane to take off.

We keep food, water, and ammunition sufficient for one battalion packed at the Quartermaster Company. If a call comes in from a regimental commander to G-4, these supplies can be dropped in $1\frac{1}{2}$ hours provided weather conditions, etc., are O.K. The unit receiving the supplies displays a panel in the shape of a crescent at the point where they want the supplies dropped. The dropping is done from a height of about 400 feet and our pilots can usually put them within about 20 feet of the spot indicated. . .

Details covering the methods and experience with pack animal and hand transport are contained in a separate section under Paragraph 40, infra.

e. Training for Mountain Operations

Combat experience in Italy has again emphasized the

necessity of sound training for operations in mountainous country. As indicated above, physical conditioning is among the foremost of all training subjects. Of equal importance are such subjects as adaption of basic infantry principles to the peculiar terrain conditions, training in supply functions, and control of units operating in rugged, difficult mountains. Commanders have all agreed that such training must be conducted in actual mountains, the more rugged and rough the better. Such training should be realistic, with all phases of maneuvers and operations actually carried out. Simulation and theoretical operations should be reduced to an absolute minimum. A number of unit commanders were outspoken in their approval of the training conducted at the West Virginia primitive area, but stressed the necessity of introducing a greater degree of realism in the maneuvers there, especially in the matter of supply. A General Officer of the 45th Infantry Division reported that "the West Virginia training was valuable. This country was more nearly like what we are operating in here than any other piece of terrain we have seen." Similar opinion was expressed by a battalion Executive Officer of the 179th Infantry, who also stressed the necessity of realism in supply functions:

. . . We profited by the training we received in the West Virginia primitive area. However I think it would be improved by playing supply actually instead of theoretically. Make the units actually supply their men by means of pack trains and packboards. Make the men actually carry, on packboards, the full weight of rations, water, and ammunition. The course should include complete training in the use of pack animals for at least forty men per battalion. Every possible man in the battalion should be taught how to load and unload a mule. . . .

A Battalion Commander of the same regiment commented on this subject in almost identical terms, and added:

. . . In playing this actual supply, the large amounts of ammunition which are expended should be kept in mind. An expenditure of thirty to fifty rounds per mortar per day is fairly common over here. One company has fired as much as 250 rounds of 60mm mortar ammunition in one day. Remember that all this has to be carried up a mountain by hand. . . .

General mountain training for divisions likely to be employed in country similar to that experienced in Italy was recommended by a

number of higher organization commanders, and the Chief of the Training Section, Fifth Army, advised that

. . . All divisions coming over here would benefit from a course of training in the West Virginia primitive area. We have a Mountain Warfare Training School set up in the MATESE Mountains and it is doing a fine job. This training, however, would not duplicate the training which units would receive in West Virginia. It would supplement it. . . .

f. Other Subjects Related to Mountain Warfare

Other subjects related to mountain warfare as well as common to all infantry employment are treated under separate headings in succeeding paragraphs.

25. TROOP LEADERSHIP

In Italy, sound troop leadership proved to be the outstanding requirement in infantry combat. The severity of the fighting and enemy resistance, difficult terrain, and excessive hardship resulting from weather and climate all imposed a necessity for a higher standard of responsibility and command ability than ever before. Shortly after the landing operations the Commander of the 36th Infantry Division stated in a summary of combat lessons that the necessity has never been greater for

. . . Officers and non-commissioned officers who have confidence in their own ability to lead and command others and in whom the enlisted men will have confidence.

. . . Without question we need much greater basic training in order to discipline the soldier and give the leader a chance to acquire confidence and ability to command. Officers as well as men should start their careers in the Army by being held to a higher standard of care, thoroughness, and responsibility. . . .

The fighting in Italy has also greatly emphasized the importance of leadership in small unit operations and led the Division Commander of the 34th Infantry Division to urge:

. . . Stress leadership training in small units.
Develop in lieutenants and non-commissioned officers a willingness for responsibility. . . .

In more specific detail a regimental commander expressed similar views as a result of combat experience from Salerno to the Gustav Line:

. . . Small unit operations (are) dependent on the ability and leadership of the small unit and squad leader. In patrol work the small unit leader is on his own and is responsible for the fate of his men and the success of his mission. In a coordinated attack, the degree of coordination is dependent on the small unit leader's knowledge of the plan, his ability to carry it out, and the measures he employs. In all night operations, the ability of the small unit leader to control his unit, rendered increasingly difficult by darkness, will determine the success or failure of the mission. . . .

All commanders emphasized the necessity of developing resourceful and competent junior officers ready and capable of taking over command in the event of the senior commander's loss. The high rate of casualties among unit commanders up to battalions has forcibly driven home the increasing importance of this requirement. The Commanding General, 45th Infantry Division bluntly declared:

. . . The battalion commander problem is serious. The way to train battalion commanders is to take one out and send him visiting other battalions where he can learn and teach. Meanwhile the executive gets command and gets trained. Organizations are frequently too much a one-man job -- he gets killed and the organization lacks leadership. The same situation is true of company commanders. Every lieutenant should know he is going to be a company commander. They should be trained much the same way. . . .

Likewise the Assistant Division Commander of the 36th Infantry Division stressed the necessity of "developing the responsibility of company lieutenants and non-commissioned officers, so that they can take over when the next higher commander is killed," and the Commanding General, VI Corps recommended that

. . . We must develop the responsibility of junior officers and non-commissioned officers in maneuvers by placing the second-in-command suddenly and unexpectedly in charge by making the commander a "casualty". . . .

26. DISTRIBUTION OF SMALL ARMS FIRE

As in the campaign experience in Sicily, the Italian Campaign has shown that infantrymen still fail to make full use of the fire power of their rifles and other small arms. There still remains a tendency to hold fire until targets are clearly defined and observed rather than to cover with fire an area known to contain enemy troops. The principle of full small arms fire power and its proper distribution

has not been mastered. The Commander of the VI Corps reported that

. . . In battle our men still do not use small arms fire enough or distribute it properly. For example, fire is coming from a nearby small hill, but you can't see the enemy. You should cover that hill with small arms fire. Reports still indicate that our men do not do this. . .

Experience with this deficiency on the regimental level was described by the Commander of the 7th Infantry:

. . . We have had a hard time getting riflemen to use their rifles. They depend on the artillery and other supporting weapons too much. In most cases it would be better if they fired even if there is no visible target. A group of riflemen may be stopped by a German machine gun which they can't locate, but if they will open fire in the general direction of the machine gun, the Germans will usually pull out. I believe there has been too much emphasis in the States on fire orders and control of fire by unit leaders. Men must be taught to open fire at once in the general direction of any target that is holding them up, without waiting for any squad leader or other individual to tell them to open fire. . .

A battalion commander of the same regiment reported in similar terms and advised, "Teach your riflemen to use their rifles whenever they are stopped, without waiting for someone in authority to tell them what to shoot at," and the Commanding General of the 45th Infantry Division emphatically declared:

. . . The infantry is not using its fire power. This has got to be drilled into them, just drilled into them. . .

27. EMPLOYMENT OF INFANTRY SUPPORT WEAPONS

As in the Sicilian Campaign, the fighting in Italy has again demonstrated the necessity of full and coordinated employment of all infantry support weapons. In the present campaign the terrain has imposed even greater obstacles and difficulties in weapon and ammunition transport than were encountered in Sicily, but again the lesson has been learned that proper use of all support weapons is essential to infantry success. In some instances the requirements of this principle have not been fully accomplished, and comments on this deficiency have appeared in the reports of several commanders. In a conference of battalion commanders and other officers of a regiment of the 3rd Infantry Division on the

lessons of the Campaign, one battalion commander observed that

. . . Company commanders are calling for fire support from the battalion commander before they have employed all the means at their own disposal. They must learn to make full use of their organic supporting weapons. . .

The Commander of the heavy weapons company of the same regiment also reported in this conference:

. . . Rifle companies are not using their weapons platoons to the maximum advantage, and my men notice this frequently. We cannot give all the support from the heavy weapons company, and for this reason maximum use should be made of the weapons platoons. Teach your riflemen that the Jerry machine gun is not very accurate - his first or second burst may be near, but the rest are nearly always high. . .

Another Battalion Commander likewise commented on the failure of some company commanders to employ properly and fully the supporting machine guns available to them, and stated that

. . . There is some question as to the company commanders knowing how to use attached machine guns. You just cannot throw them around everywhere. They must be tied in with the general action of the company, and they must have the protection of the riflemen. . .

In the 45th Infantry Division, similar experience has been noted. With reference to the proper use of the supporting machine guns of the weapons platoons and companies, the Division Commander declared:

. . . The weapons platoons and companies must be used to operate in close conjunction with the rifle companies supported. People must be trained to keep these guns in position all the time. They must not be out of position except when changing positions, either in the offense or defense. Whenever they are halted they must be dug in. We have been losing guns and men because they were not dug in. . .

In some instances it has been noted that infantry commanders have relied too much on supporting artillery when full use of their own heavy weapons would have sufficed, and undue expenditure of artillery ammunition could have been prevented. The Commanding General, VI Corps, drew attention to this subject in the following terms:

. . . A good many battalion commanders do not understand the fire power at their disposal. They call for artillery fire when they could handle the situation with their own mortars. We have wasted too much artillery ammunition on small targets - ammunition that had to be brought up over long distances over bad roads. . .

The problems of keeping up the heavy automatic weapons in

support of the rifle elements varied with the difficulties of the terrain. When the ground made possible the carrying of the heavy machine guns, these were generally preferred. Experience in this was thus described by a heavy weapons company Commander:

. . .The heavy guns can generally keep up in the attack and they have a very stable mount. We do not care for the light machine gun in the attack, but we always have the lights available if needed. In soft ground the light tripod sinks too fast, but the more the heavy tripod sinks the better stability you have. Over flatter terrain we usually carry the one platoon of heavies and one platoon of lights. We often help out the rifle companies by giving them a light if one of theirs gets knocked out of action. . .

In the rugged mountainous areas, it became often impossible to keep up the full complement of heavy weapons as well as ammunition to keep them in action. In one regiment a light machine gun was attached to each heavy section and could be taken up into areas where the heavy guns could not be transported. Maintenance of support in this fashion was thus described by the Commander of the 7th Infantry:

. . .Our heavy weapons companies have carried just about half of their weapons in Italy. In that way they could keep up both the guns and the mortars and enough ammunition to make them useful. Every machine gun squad in the heavy weapons company has a light machine gun as well as a heavy. They carry the light machine gun up these mountains and later substitute the heavy gun if it is practicable to bring the heavy gun up. . .

28. EMPLOYMENT OF ANTITANK ROCKETS AND GRENADES

Combat experience in Italy with the antitank rocket launcher and antitank grenades was generally similar to that in the Sicilian Campaign. In Italy these weapons assumed greater importance and have been more extensively used because of the nature of the enemy defensive positions. They have been especially useful against emplacements, dug-in and covered positions, and the stone bunkers that were continually encountered. Both have continued to be effective against armored vehicles at close range, and in general, commanders have expressed satisfaction with the results obtained. In the early stages of the Campaign the Commander of the 143rd Infantry, which had not experienced previous combat, reported as a result of

this first battle experience that

. . . All our men are sold on the AT grenade and the bazooka, and I believe both are very good for the purpose designed. We have modified all our bazookas to use flashlight batteries. . . My rocket launcher teams consisted of three men with four rockets each, or a total of twelve for each launcher. To carry the rockets we improvised packs from condemned shelter halves and this made it much easier on the men. . .

Later in the Campaign the Chief of Staff of the 36th Infantry Division recorded the following incident which illustrates the excellence of the rocket launcher in the hands of well trained and determined troops:

. . . I saw one of our men with a bazooka walk out toward a tank which was being engaged by artillery. He aimed his bazooka and let go at about seventy-five yards. He hit the tank just below the turret which sailed forty feet through the air. Most of our bazookas have been used against machine gun nests and concrete pillboxes. The bazooka is fine against them. The Germans call it the "shoulder 75". . .

Non-commissioned officers of the 143rd Infantry also testified from personal experience as to the effectiveness of these weapons. One platoon sergeant stated that "the bazooka is a wonderful weapon," and a corporal acting as rifle grenadier reported that "the bazooka and rifle grenades are good against machine gun and mortar nests. I used my rifle grenade against a machine gun nest and knocked it out, and then we turned a bazooka on another and knocked that out, too." In the action at LAGONE a unit had attacked a strong stone bunker, and the following example of effective employment of the rocket launcher was furnished by one of the participants:

. . . After an hour or more the leader of the platoon returned and reported that his platoon had been driven back from the vicinity of the bunker by heavy small arms fire. After we had talked over what to do, he borrowed a bazooka and several rockets from my company and returned to his platoon. Later he told me that he fired two rockets at the bunker from a range of about twenty-five yards. The fire from the bunker immediately stopped and when the platoon closed with it a few minutes later they found the bunker abandoned. . .

The antitank grenade also proved effective against these strongly built bunkers which were numerous throughout the German positions. Although both grenades and rockets are reported as incapable of penetrating the bunker walls, they were effective when exploded

close to the slits and in most cases both grenades and rockets when well directed, stunned the occupants. One sergeant who had considerable experience with both weapons stated that after using them on a bunker, "if you close in fast you'll find 'em (the defenders) either knocked cold or goofy." A staff sergeant of the same unit observed with respect to grenades against these bunkers:

. . . Since the slits are close to the ground level, a grenade exploding within three feet or so of the slit will get the Germans if they are looking out. I have a lot of faith in hand grenades, . . .

As against tanks, both grenades and rockets were reported satisfactory, there being some difference between units as to preference. An Executive of a battalion in the 180th Infantry enthusiastically declared that

. . . We have got the tanks whipped. Men actually fight for a chance to get close to a tank with a bazooka or an AT grenade. Both are swell - don't make any changes in them. . . .

In town fighting both the grenade and the rocket launcher have been especially valuable for clearing out strong points, buildings, and providing for protection against armored vehicles. A lieutenant who participated in the clearing and occupation of MUGNANO reported from his experience in the taking of this town:

. . . I believe the bazooka within the platoon should be up with the point when passing through a town in order to furnish early protection to the point against armored vehicles. In one case (MUGNANO) I had my bazooka firer following me about fifty yards just in front of the advance party. Due to fire from German armored vehicles I was unable to bring him straight up and he had to work his way around through the buildings. When he arrived the armored vehicles were moving out, . . .

Sound training has been essential to success with the rocket launcher. A number of commanders recommended more training with live ammunition to render the teams proficient before going into combat. The Executive Officer, 143rd Infantry, though his unit did well with the rocket, stated that

. . . We did not have sufficient training ammunition for our bazooka teams before going into action. We were so anxious for practice that we actually used

some ammunition that had been classified as defective. Yes, we blew up some bazookas, but no one was hurt. . .

Experience throughout the campaign has shown that thorough care of the launcher and protection from damage, and additional men assigned to carry and operate the weapon are highly important in its successful use. It has been found that proper care is often difficult to maintain, since the launcher must be carried by ordinary riflemen in addition to their rifles and other equipment. The Commander of the 45th Infantry Division pointed out that in several instances because of failure of proper care,

. . .the bazooka has not proved satisfactory. It gets wet and goes out of commission. It has to be kept very dry because of the electrical contacts. It is delicate, cumbersome, and easily damaged. . .

The problems of successful operation of this weapon were clearly outlined in a report of a battalion Commander of the 179th Infantry:

. . .The main trouble with the bazooka is that it is an extra weapon and one that is easily dented. When the going gets especially tough the men carrying bazookas sometimes discard them and just keep their own rifles. Then when you want a bazooka to knock out a bunker, you find there aren't any around. Or the man carrying the launcher bangs it around in trying to carry it as well as his own rifle, and it is unserviceable when you want it. . .

The need for additional men in the rifle companies to obviate the problems above quoted has been mentioned by a number of commanders. Opinion is that a team of at least two men per launcher should be available to carry and operate the launcher, unencumbered with other weapons or duties. In discussing the problem and the question of where the bazooka teams should be assigned within the company, a Battalion Executive of the 189th Infantry stated that it does not matter where the team is assigned, but that "the main thing is to have two men with each bazooka with no other weapons to handle." Likewise the Battalion Commander of the 179th above quoted added that "it would be a different story if there were teams of two men with each launcher with no other weapons except pistols." The same opinion was expressed by the Commander of the 168th Infantry:

. . .It doesn't matter where you put the bazooka team in the rifle company. Just add some men anywhere in the T/O to handle it, so we don't have to take other men for it. . .

One serious deficiency with regard to the use of grenades has been the lack of suitable pouches or bags in which to carry them. The need of such equipment was felt in the Tunisian and Sicilian Campaigns. In Italy it has been needed more urgently because of the increased employment of these weapons. A battalion Executive of the 30th Infantry reported that such pouches are "badly needed," and that grenades "stuffed in pockets and hung in belts, as they are now, interfere with men taking cover properly." In the 179th Infantry more serious consequences as a result of this equipment deficiency were reported by a Company Commander:

. . .Our men need a bag or pouch for carrying grenades. It should be made with internal pockets tight enough so that the lever of the hand grenade cannot fly off, even if the pin works out. I know of one officer and several men who have been killed by grenades exploding in their pockets, apparently because the pins worked out as they were crawling along. . .

29. EMPLOYMENT OF 37mm AND 57mm ANTITANK GUNS

In the Italian Campaign, the employment of 37mm and 57mm antitank guns comprised two general purposes. In areas suited to the employment of hostile armor, they were used in their normal antitank role. In the close, mountainous country where no threat of enemy tanks was present, they were also used whenever possible in general support of infantry operations. In the difficult mountainous terrain, employment for the latter purpose presented serious problems of transport, location of positions, and ammunition supply. In both roles throughout the several divisions that participated, opinion has differed as to the relative effectiveness of these two weapons. Some commanders definitely recommended that the 37mm be replaced by the 57mm because of the added fire power of the latter. The Commander of the 45th Infantry Division has stated that he prefers the 57mm, and the Division Commander of the 36th shared the same views. A number

of other commanders of all grades conversely expressed satisfaction with the 37mm gun as a battalion weapon and recommended that the 57mm be reserved as a regimental gun for general support. Much of the combat experience reported in both open country and mountains indicated that the 37mm proved to be an excellent weapon for the attack of pillboxes, emplaced machine guns, and strong points. The Commander of the 34th Infantry Division stated that "We want to keep the 37mm with the battalions because it is an excellent pillbox weapon," and with reference to the normal antitank role of this gun a Battalion Executive of the 180th Infantry reported:

. . . The 37mm gun should be the battalion antitank weapon. It will stop a MK VI tank if you put smoke on the tank when it is 200 to 300 yards from your position and then hit it in the side when it comes out of the smoke. You can get side shots at tanks if you have your guns placed properly. The 37mm is quick, fast-shooting, and easy to get into position. The 57mm is good as a regimental weapon to back up the 37's but it is too slow going into action for a battalion weapon. . .

In another Division, the Regimental Commander of the 168th Infantry expressed a similar opinion, though he discounted the capability of the gun to stop a Mark VI tank:

. . . I think that the 37mm should be the battalion anti-tank weapon. The 37 is a good triple-threat weapon. It will not stop a MK VI, but that is not the battalion's job anyway. Somebody behind has got to do that. The 37mm will stop a MK IV if it is well placed and holds its fire long enough. . .

In the 3rd Infantry Division, the Commander of the Reconnaissance Troop commented on the general utility of the 37mm gun as a support weapon, and in connection with its employment in his troop, observed:

. . . We must have the 37mm if we bump into armored cars, machine gun nests, and antitank positions. We have used it against antitank positions and machine gun nests with good effect. The 50 caliber is not enough. . .

In the mountainous terrain unsuited to tank action, both 57mm and 37mm were effective for attacking bunkers, emplacements, and strong points whenever it was possible to get them into position. The chief difficulty has been transport and location of positions into which they

could be taken. The Assistant Division Commander, 36th Infantry Division stated that "we can't get the 37's up much better in these mountains than we can the 57's," and the Commander of the 180th Infantry declared that "our 57mm guns are practically useless in this country because we can't find positions into which we can get them."

The solution of this problem, according to a number of officers, would have been the use of the old M1916 37mm gun, which would have been ideal for the terrain. "In this mountain fighting," reported the Regimental Commander of the 179th Infantry,

. . . some of the old M1916 37mm guns would be a Godsend. We could make direct hits on those stone bunkers if we had them, and they are light enough to be manhandled in- to almost any position. A few in the Army Ordnance Depot that we could get when the need arose would be a fine idea. . .

Similar opinion was voiced by the Commander of the Reconnaissance Troop, 36th Infantry Division:

. . . I would like two of the old M1916 37mm guns in each platoon. They could be transported in $\frac{1}{4}$ -ton trucks and then be carried by hand to places from which they could be used to knock out machine gun nests, etc. The antitank 37 is OK and should be retained for antitank work. But frequently we can't get it into firing positions from which it can be used to knock out these machine gun nests. . .

30. EMPLOYMENT OF THE 4.2 CHEMICAL MORTAR

Experience in Italy has continued to demonstrate the effectiveness of chemical mortar units in support of infantry operations. As in Sicily, the present campaign has shown the 4.2 mortar to be a most accurate weapon capable of delivering a large volume of precise and destructive fire on a variety of targets. Chemical battalions have been attached to infantry divisions, for sub-attachment to regimental combat teams. The principle of mass fire has been followed except in unusual situations, and the campaign has shown definitely that the chemical mortar should not be considered as a substitute for support artillery, or as a weapon to supplant the organic 81mm and 60mm mortars of the infantry. Its outstanding tactical value has been the large volume of accurate

fire which it can deliver at the critical time and in the place as desired by the supported infantry commander.

As in the case of the infantry mortars and other heavy weapons, severe difficulties in transport of both the weapon and ammunition have been imposed by the mountainous terrain. Transport by $\frac{1}{4}$ -ton truck has been used whenever the ground has permitted. The qualities of high angle fire and relatively long range for its type of weapon have to some extent lessened the problem of keeping the mortars forward, but in the high rugged mountains some units have been virtually immobilized. Despite the difficulties occasioned by terrain, the 4.2 has been successfully used throughout the Campaign, and the following general principles based on combat experience are quoted from a memorandum of Fifth Army:

- a. The heavy mortars should be ranged in on all likely avenues of enemy approach as soon as a position is occupied.
- b. Whenever the infantry takes an objective by assault, the mortars should be sited so that enemy counterattacks may be broken up by intense mortar fire when directed by the infantry commander.
- c. Preceding an attack, the mortars and large stocks of ammunition should be pushed forward as far as possible. During the attack they should be used freely to prevent enemy movement by covered routes, to blast field works, and to provide smoke when needed.
- d. Mortars should be located in defilade from enemy artillery fire and should have good observation of enemy positions. They should be located as near as possible to roads and trails in order to facilitate ammunition supply.
- e. Mortars should be used to attack with precision fire targets that cannot be reached with artillery. Mortar and artillery forward observers should work together, each taking under fire the targets appropriate to his weapon.
- f. In a stabilized situation the mortars should be freely used to harass the enemy and wear him down. The ground and enemy

movements should be studied and mortar fire should be employed to interfere with hostile movements as much as possible.

The chemical mortar has been effective with high explosive, white phosphorus, and with combinations of both. Against machine gun emplacements and buildings infested with snipers and groups of riflemen, and for general infantry support, it has proved most valuable. It has been especially important as a means of attacking large bodies of enemy in defiladed or sheltered assembly areas prior to their attack. The following example of this type of action is quoted from a memorandum of the G-3, Fifth Army:

... A force of approximately one German infantry battalion was observed forming in a sheltered valley for an attack on the Rangers who were holding a mountain pass. The mortars had ranged in on this area as a likely avenue of approach. At the critical moment the Ranger Commander called for mortar fire and 550 rounds of HE fired at the most rapid possible rate by one chemical company broke up the formation and left the ground covered with dead and wounded. In another attack under similar circumstances against another unit, 400 rounds of HE and 250 rounds of WP broke up the attack completely and nearly 200 dead were left in the valley. In a larger attack near VENAFRO, massed fire of a chemical battalion was placed on the attacking force, which was repulsed. . .

Whenever the situation has demanded, the chemical mortar has been most effective in laying smoke screens. One report of such an operation shows that

... A smoke screen about 500 feet high and 3 miles long was placed on the north side of the VOLTURNO to cover bridge building operations. This screen was maintained for eleven hours during the first day. In the succeeding night it was maintained by smoke pots, and in the morning it was renewed by mortar fire and kept up for six hours. A total of 3,800 white phosphorus shells were fired at the rate of one shell every fifteen seconds after the screen had been initially established. . . .

An unusual and highly successful type of mortar employment was the illumination of attacking forces by silhouetting them against the glare of phosphorus shell fired into an area behind the attacking troops. A report of this incident illustrates the possibilities of this novel employment:

... In a German night attack at SAN PIETRO, white

phosphorus shells were fired beyond the main body of the attackers. The light of the burning phosphorus threw the enemy soldiers into bold relief, and our machine gunners were enabled to execute deadly fire and break up the attack. Approximately 400 rounds were used in this operation. . .

The extensive employment of the chemical units is apparent from the fact that approximately 40,000 rounds of 4.2 mortar shell were fired in the sector of two divisions in the period of one month. One battalion served in the line for 120 consecutive days without relief. Frequently when a division has been relieved from the line, the incoming division has requested the mortar battalion in the area to remain attached to it. The Chief of Staff, 36th Infantry Division referred to the work of the mortars as follows:

. . .The attached chemical units have done a fine job. We have used the 4.2 to good advantage in many places where we could not get our self-propelled cannon company weapons, or our 57mm guns into position. . .

31. NIGHT ATTACK AND NIGHT OPERATIONS

Night operations of all types have assumed increasing importance throughout the fighting in Italy. The necessity for movements under darkness in mountainous country affording the enemy dominant observation is readily apparent. Limited objective night attacks have played a larger role than ever in the infantry operations. They have been of special importance in the taking of towns and villages against which daylight assault invariably proved costly in casualties. In all operations at night, and particularly in attacks, the elements of thorough planning, reconnaissance, and briefing of all ranks as to their objectives and duties have been essential. Likewise, proficient use of maps and compasses, maintenance of control and direction, initiative and small unit leadership have been paramount to success. Plans and technique have naturally varied with the nature of the terrain, the objective, and the unit making the attack. The following general observations are quoted from a Battalion Executive of the 180th Infantry, whose unit has had wide experience in Italy and has conducted a number of successful night attacks:

. . . For a night attack, you must have thorough daylight reconnaissance by all leaders. Put out enough night patrols to screen your forward movement and to keep track of what the enemy does. These patrols should push up to within 200 yards of the enemy positions, to within 100 yards if possible. Give each leading company a definite terrain objective, and do the same for each platoon, if possible.

Make your movement to the line of patrols in platoon column, well closed up, with platoon columns within visual contact of each other. Allow 15 to 20 minutes at the patrol line for the platoon leaders and their men to get oriented, to get all information from the patrols, and to get deployed. Then move forward quietly and slowly until you are discovered -- then charge. Your attack must be made along the sides of the slopes of ridges if the ridges run in the direction of your attack. You can't move along the tops of ridges or in the bottoms of the draws, because the Germans always have these areas covered with machine pistols or light machine guns.

After you capture the objective, don't stay on it. The Germans will shell hell out of it. You must move forward, or to the flank, to ground from which you can control the objective and where you will be out of the German concentrations. Temporarily, at least, they keep you off the objective and you keep them off it.

Follow the attack closely with wire, and take a radio along. You will usually have to get your own artillery lifted so that you can move off the objective. Use a pyrotechnic signal for this if the radio and wire are both out, but otherwise don't use it. It gives the Germans too much information. . . .

Combat in Italy has shown more than ever the necessity of emphasized training in night operations for units before going into action. The Assistant Division Commander, 36th Infantry Division, who had directed the night training at the Fifth Army Leadership and Battle Training Center, commented after several months' experience in Italy:

.... Now, as to night training. It should be stressed after basic training is completed. First, you must teach the soldier how to live at night. The squad should sleep as a squad, so that the squad leader can get hold of his men quickly. Also platoon chiefs must be able to get hold of squad leaders, and so on. One Company Commander of the 34th Division who saw our Battle Training course said that if they had had it he might have been able to save more of his company in a certain situation when they were jumped at night. As it was it took nearly two hours to assemble his company. Similarly, the soldier must be taught all the small things -- cooking at night, following direction, use of the compass, how to organize a defensive position in the dark so as to be able to receive a counterattack at daylight, and such a simple thing as how to dig a foxhole properly at night. . . .

With regard to night training of units, the Chief of Staff of the 34th Infantry Division recommended:

. . .As to night training, stress control and maintenance of direction. I am sure the Division Commander would say that any attack at night should not be for over a kilometer and a half. On the nights of November 3 and 4 we advanced three kilometers under darkness against opposition and occupied the heights north of the VOLTURNO. Our casualties were 60 killed, 329 wounded, and no missing. Your training for night advance should include passage of obstacles of all kinds. . . .

Similar recommendations were made by the Commander of the 36th Infantry Division, whose troops fought their first campaign from SALERNO to CASSINO:

. . .In addition to night movements and driving and the use of maps at night, units to include battalions must be taught how to maintain direction at night so that they can proceed from one terrain feature to another at night and be sure to be on the right terrain feature in the morning, prepared to resist counterattack. Frequently they will have to fight to get this terrain feature. Therefore training should include the night attack, which however, must be on a fixed direction and with a limited objective. Organization of the position in the dark after it is reached must be included in this training. . . .

Likewise the VI Corps Commander declared that "men must be trained to take care of themselves at night and not get lost," and a Battalion Commander of the 179th Infantry stated as a result of extensive experience in Italy:

. . .Emphasize training in night attacks by small units, platoons or less, to knock out machine gun nests and bunkers. In this work make them keep off roads, trails, and narrow patches of open ground, as these are always mined or covered by direct fire of automatic weapons. However, teach them to move parallel to roads or trails, or they will get lost at night in such terrain as this. . . .

Small unit technique in the occupation and organization of ground at night in mountainous country was thus described by a platoon sergeant of the 179th Infantry:

. . .When we move into a position at night we always dig everybody in on the forward slope first. We dig four deep slit trenches each big enough to hold two or three men. We dig them two in the front and one to each flank. The rest of the men dig individual foxholes. We put two to three men in each of the four slit trenches as a day outpost. The rest of the platoon moves to the reverse slope and digs in again. If the Germans attack, the men on the reverse slope move forward and occupy their holes on the forward slope. The idea of putting two or three

men in each of the "outpost holes" on the forward slope is to have reliefs of sentinels without daylight movement. Each night the outpost group is relieved by other men from the platoon and moves back on the reverse slope. . . .

In the 45th Infantry Division, the Commander emphatically stated that

. . . I am an exponent of night operations. The Army Ground Forces policy of having one-third of all training at night is correct. It must be borne in mind that mines will stop us at night, but the German can't mine the whole country. . . . Our marching, even the hardening exercises, should be done at night. Officers and non-commissioned officers must learn to follow routes. NO lights should be permitted. Men must learn to march, bivouac; move transport at night. Units have to be relieved at night, and this must be practiced. Teach them to move quietly -- no singing, no noise. Give them lots of marching on trails under assumed situations.

In late November, 1943, special inquiry was made by the G-3, Fifth Army, into the lessons of night operations that had developed from the Campaign. The opinions and recommendations of a number of experienced commanders as a result of this inquiry were identical with those above quoted. Comment on the enemy reaction to this type of combat were of special interest:

. . . The German soldier does not like to fight at night and does not fight at night as well as during the day. In several instances German security at night has been found to be lacking. Some instances have also indicated that the German soldier when surprised at night has become confused and has been an easy victim of the well-trained night fighter. . . .

32. SCOUTING AND PATROLLING

No elements of infantry combat have been more important in Italy than scouting and patrolling. As the mountain fighting has become more and more static, frequently the entire activity on wide fronts has become patrol operations of one type or another. In January the Regimental Commander of the 179th Infantry stated that "the fighting now is almost all a matter of scouting and patrolling," a judgment then justified by the existing situation.

As in Tunisia and Sicily, the Italian Campaign has shown that infantry units are generally below the required standard of proficiency in these subjects at the commencement of a campaign,

and gradually improve through hard combat experience. Early in the Campaign the Commander of the 45th Infantry Division declared that "our patrolling is very poor, but we still capture prisoners." Confirmation of these views was shortly forthcoming from a corporal of the 67th Panzer Grenadiers captured at PESCOLAMMAZZA by elements of the 45th Division on 5 October, who stated in effect that

. . . American scouting and patrolling activities have been carried out on much too small a scale. This was especially true of night patrols. If the Americans had realized that the German squads were 400-500 yards apart in the recent disengagement phase they could have risked more and would always have been able to get through the German lines. . . .

The same Division Commander shortly afterward again drew attention to the need of better patrol action:

. . . The army as a whole is weak on patrolling. They go to maneuvers and don't patrol enough. Units make contact without their patrols ever hitting. . . .

After an extended period of mountain fighting in which much of the action had been reduced to the action of combat patrols, the level of proficiency became improved and the Commanding General, VI Corps observed, with special reference to the work of the Parachute Infantry:

. . . The scouting and patrolling are now much better, but they were not good to start with. Patrols now get out, stay for two days, take care of themselves, and do not get lost. The Paratroopers' patrolling from the start was much better. They knew how to patrol in strength, to get out quickly well to the front and flanks, and to find their way at night. I suggest that their system of night patrol training be adopted for other troops. . . .

Similar comment on the improved standards in these operations was made by the G-2, 34th Infantry Division early in January:

. . . The value of deep and aggressive infantry patrolling was again brought out. The information obtained from these patrols from personal knowledge of the ground and by the prisoners they secured was later proven to be extremely accurate and could not have been obtained in any other manner. . . .

The value of large ambush patrols for the purpose of capturing prisoners and generally disrupting the enemy was demonstrated, and one Division Commander recommended increased employment of such groups:

. . . There is the ambush patrol -- we should make more use of it. Ambush patrols can catch enemy patrols and get information. We must use larger patrols -- passing to true

raiding parties. Some patrols may be as big as thirty-six men, big enough to raise hell and keep the Germans in a stew all night. We have captured 700 Germans in this campaign (as of latter November) -- mostly by ambush patrols. . .

One lesson, that large patrols with specific missions should make provision for rapid communications with the main force, was pointed out by a Battalion Executive of the 180th Infantry, who gave the following illustration:

. . . I learned something from an incident that occurred near OLIVETTO. We were advancing up a road along the SELE RIVER. The river ran down through a pass in a ridge, and on the left another and higher ridge ran almost at right angles to the first ridge. It was recommended that a strong patrol accompanied by an artillery liaison officer with his radio, should be sent up the high ridge on the left to hunt for artillery OP's and knock them out. Also to locate hostile battery positions and bring fire down on them. The patrol was to move well ahead of the main body, so as to have the OP's knocked out before our advance up the slope to the pass commenced. The patrol was sent out, but the liaison officer was not sent with it because it would have taken too many men to carry his radio. The patrol wiped out three OP's from which the Germans were directing their artillery fire. They could see twelve enemy batteries besides ten to fifteen tanks in firing position but had no means of communication by which they could direct counterbattery fire on them. Lesson: Any patrol like that should have proper means of communication with it. . .

Patrol experience and German methods of counteracting patrol activity were described in a report of the Commander of the 179th Infantry:

. . . The reduction of these stone bunkers is really a patrol action. Our old men have picked up the fine points of patrolling during the campaign, but the replacements know practically nothing about it.

The Germans have a nasty habit which makes difficult the work of patrols sent out to locate the German defensive positions. The Germans do not fire on these patrols if they can avoid it, but let them go on through. Prisoners have stated that they were ordered not to fire except in case of a major attack. They have also recited instances of seeing our patrols go by their position at a given time on a certain night. Checking back, we have been able to verify that one of our patrols were there at the stated time.

On the other hand, if one of our patrols stumbles into a German position, the Germans try to destroy it to the last man, to prevent the information getting back to us. A night patrol must be good to get in, get information, and get back. . .

Concerning the use of patrols to seize and hold ground until stronger elements can be brought up to occupy it in force, the same Regimental Commander drew attention to an important lesson from the fighting in Italy:

. . . In training in the United States, emphasize that ground once gained cheaply should be held. Time after time a patrol is sent out to determine the enemy strength on some hill and finds that the hill is unoccupied. Almost invariably the entire patrol comes back to report. Then some unit is ordered forward to occupy the hill. It moves forward and finds the hill alive with Germans who smother the unit with fire from machine pistols, light machine guns, and mortars. . .

The G-3, 45th Infantry Division made identical comment on this subject and applied the principle also to the question of bridges:

. . . The same thing holds true at bridges. Several times a patrol has found a bridge not blown and the entire patrol has come back to report. Before some other unit can get up to seize the bridge, the Germans have blown it. This is the most common failing in patrolling among the infantry of the whole Division. . .

Regarding the use of call signals among patrols at night a Battalion Executive of the 180th Infantry warned against promiscuous sound signals that might disclose locations:

. . . At night, don't use bird calls as signals. There are no birds in the battle area -- they all leave. However cats and dogs stick around, so dog barks and cat howls if well done are all right. The Germans use cat howls a lot. If a German uses a cat howl, lie down and answer him the same way. He will then come toward you and you can get him with your bayonet. . .

Without exception all commanders recommended intensified training in scouting and patrolling for all units which are training for combat. "There's no such thing as too much training in patrolling, especially night patrolling," declared one infantry Regimental Commander, and a Company Commander of the 504th Parachute Infantry reported also that

. . . A unit cannot train enough in scouting and patrolling. Our patrols, even now, come back with only partial information. A strong patrol sent out with a radio for a period of two days can accomplish more than three patrols sent to definite localities but remaining out for only five hours or so. . .

A Battalion Commander in the 179th Infantry likewise stated that

. . . More training in night patrolling is needed. It must also include digging in at night, so as to be dug in and camouflaged by daylight. This should be followed by occupation of position for the entire next day with absolutely no daylight movement permitted. . .

And the Commander of the 45th Infantry Division with reference to training declared:

. . . The problems must be made realistic. Set up an enemy force. Stage the thing. There is no use sending out a patrol unless there is to be a capture or other real patrol action. Make the training realistic. Put out a listening post, then give them some sounds to listen to. Require reports of what they have seen and heard. If a patrol doesn't do a good job, have them captured and then fine the leader for negligence in appropriate cases. . .

33. TOWN AND VILLAGE FIGHTING

An outstanding feature of the mountainous country in Italy has been the presence of numerous towns and villages through which our advance has progressed. These towns and villages have been almost invariably located on dominating ground or on ground vital to the security of the advancing line of communications. They have generally consisted of closely packed houses and narrow, twisting streets. As a rule the roads approaching them pass through the center of the towns and become the main street of the community. The houses and buildings are strongly constructed, with thick stone walls generally immune even to artillery fire except for direct hits. These towns and villages have been heavily defended by the enemy, and he has made full use of them as organized strong points and positions of vantage for snipers. Approaches and flanks have usually been covered by machine guns and mortars, the latter often being dug-in in defiladed positions in rear of the town. Where the villages have been less congested, and the houses more scattered, the enemy has frequently allowed advance attacking elements to pass and enter the village, and then has sought to destroy the support following, at the same time endeavoring to cut off the advance elements.

Experience has disclosed several ways of dealing with

these villages and towns. An effective method, when the situation and terrain permits, is to by-pass the village under cover and seize high ground beyond it, thus either forcing the enemy to withdraw or cutting him off. This method has proved highly satisfactory in a number of cases, and experience of a battalion of the 504th Parachute Infantry has thus been given by its Executive Officer:

. . . What is taught at Benning about taking small towns or villages is impracticable out here. That system costs too many men in the sort of towns we run into in these mountains. We have learned by experience not to try it. We just work the whole outfit around the town or village under cover, seize the high ground in rear of it, and firmly establish ourselves on that dominating high ground. If the Germans want to stay in the village, we let them stay there till they rot. Take enough food and ammunition around with you to last 24 hours. The Germans will pull out in that period, and usually we inflict heavy casualties on them during their withdrawal. The road through the town or village is not so important. It is always blown anyway and you can't use it until sometime later after the engineers get up and repair it. . . .

The Commander of another battalion of the same regiment concurred in these comments, and recited similar experience in the capture of a number of towns and villages:

. . . I agree with Captain ---'s remarks about not attacking defended towns and villages. We learned at ALTAVILLA not to do that any more. We have employed the tactics he has described, that is, working around to the rear of the village with the whole force, at CALLO, MACCHIA, FORNELLI, and several other towns. It worked every time. Get yourself within 60mm mortar range of the town, and on dominating terrain in rear of it, and the Germans won't stay in it. . . .

Frequently the terrain and location of villages and towns have made the tactics above suggested impracticable. A report from one Division stated that "if possible avoid the villages altogether and cut off the enemy's line of communication. But frequently this is not possible because of the terrain, and also villages are often centers of communication that are vital to the attacker." In these cases, carefully planned, silent night attack has proved successful. In such attacks, systematic infiltration methods have been used by troops equipped with hand grenades and a high proportion of sub-machine guns. As houses have been gained, they have been converted into strong points

from which the attack progresses. Some units have advocated the use of enemy light machine guns to confuse the defenders, but this, unless carefully done and with every man fully briefed as to exact plans, may likewise confuse the attacking force. The use of cooperating tanks, when the ground has permitted, has also been successful in support of the attack.

An example of a successful night attack on a defended town has been recorded in a report of a Battalion Executive of the 180th Infantry who commanded a company which successfully took SAN SALVATORE:

...In a night attack against a town you have a little different proposition from other night attacks because your plan of attack has to be based mainly on a map study of the layout of the town. A good example of such an attack is one we made with one rifle company on SAN SALVATORE. I was commanding a company then.

SAN SALVATORE is about equivalent in size to a U.S. village of 1000 people. All streets in the town converge through a central square, like the spokes of a wheel. I was able to make a thorough daylight reconnaissance of the approaches to the town, but the platoon leaders could not get up in time and were limited to a map study.

The plan of attack was as follows: Each of the three rifle platoons taking part in the attack was equipped with all the "Tommy guns," bazookas, and offensive grenades we could lay hands on. We borrowed from other outfits. The attack was to be launched at a prescribed time. One platoon would attack frontally, one from the right side of the town, and one from the left side of the town. Since the streets from all three sides converged into the central square, the fire of all units would be directed towards the square. Orders were issued that there was to be no firing until the unit was fired on; then they were to open fire promptly and rush the buildings with grenades and bazookas. Each unit was forbidden to fire to its rear unless it was definitely sure that it was being attacked in rear by the enemy. Each platoon was to halt on arrival at the central square and keep up fire down the streets leading to the fourth side of the town until all platoons had made contact and I ordered the advance to be resumed. Each platoon would then follow a designated street leading to the exit (fourth) side of the town. I would be with the center platoon.

We commenced our forward movement at the prescribed time. As the center platoon which I was accompanying neared the edge of the town it was fired on by a heavy machine gun and a machine pistol, both located off to the right front. One man equipped with a rocket launcher darted out, silenced one of these weapons with

one round at a range of about 50 yards and then silenced the other one with two rounds at about 75 yards. Then we rushed the town. There were trip wires across the streets connected to booby traps, but it was a fairly light night and we were able to step over them. All the men had been cautioned about trip wires, and in addition, the leading man going up each street was equipped with a light stick to feel for trip wires. We worked up the streets as per the Benning teachings on street fighting. We used rockets against every building from which we received resistance. In addition, we threw grenades in every one of them.

When we reached the square and had made contact, one-half of each platoon was faced to the rear and left, in position as a rearguard to protect our rear against any hostile groups we might have by-passed. We halted on arrival at a stream at the far edge of town. Later Italians told us that most of the German garrison, some 70 or 80 men, had escaped by following the stream bed. Checking up after daylight we found we had captured eleven Germans and had killed five or six. This attack was on the night of 16-17 October. Believe me, the noise of Tommy guns, bazookas, and grenades in these narrow Italian streets at night is simply terrifying. Some of the prisoners told us that they were convinced that they were being attacked by at least a battalion. . . .

Detailed experience in the occupation of towns has also been furnished by a Battalion Commander of the 143rd Infantry as a result of fighting in the MAORI-NAPLES area in October, 1943:

. . . Towns in this country consist of all stone buildings with thick walls, heavy doors and shutters, and usually with a courtyard inside. Most of the streets are quite narrow, with a solid wall of two to four storey buildings on both sides making it impossible for troops to find cover from snipers without breaking open the heavy doors, which are frequently secured with heavy iron bars. There is usually one main street through each town, which is relatively wide. Numerous large churches with high domes or steeples provide enemy observers and snipers with excellent observation for several hundred yards down principal and side streets.

It has been found necessary to place stationary observers on buildings as columns move through the streets, since it has been impracticable for patrols to parallel the columns along the rooftops. It is advisable in addition to patrol down side streets to send patrols promptly to investigate church steeples and tall buildings overlooking the routes of advance, as these are frequently found to be occupied by snipers. Enemy observers at such points observe our troops entering the town and call for prearranged fires when the main body of our troops arrived. Such OP's should be destroyed by artillery fire before our troops enter the town, and should be kept under machine gun fire to neutralize snipers until our patrols can complete their investigation.

Hostile armored cars and mortars are invariably posted on the far sides of towns to sweep the main streets. These streets should be avoided altogether except for patrolling,

until the town has been thoroughly mopped up. Since many towns were too large for the "normal" tactics of enveloping and entering from the rear, our system used was for one company to move straight into town to a designated phase line, then immediately break open doors, put look-outs on adjacent roofs, and send patrols along the side streets to the edge of town. The patrols remain there for security while buildings are being mopped up. As soon as the patrols reach the edge of town and report all clear, the next company passes through to the next phase line and starts cleaning out its portion of the town. Tanks follow each company to take care of snipers and armored cars. . . .

The defense of towns after they have been occupied also assumed importance in the fighting in Italy. The following experience in this type of infantry combat is also quoted from a report of a Battalion Commander of the same regiment:

. . . In the case of small towns, perimeter defense could be used effectively, and the narrow, crooked streets allowed little field of fire or observation within the town. Groups on the highest roof in each company or platoon area acted as observers as well as anti-sniper and anti-infiltration security groups.

However, towns assigned to be held were often too large for effective perimeter defense. Therefore the outskirts were outposted. Platoon combat groups were organized at only the principal street intersections, by occupying two or three adjacent buildings. Machine guns were located at each of these intersections to fire down the streets in all directions. In this way a solid band of grazing machine gun fire could cover spaces between combat groups. Also antitank guns and mines were placed in groups blocking principal entrance roads. Reserve units and headquarters groups held interior intersections, prepared to counterattack. . . .

34. FIGHTING IN WOODS AND WOODED TERRAIN

In some regions through which the advance progressed, thickly wooded areas were encountered which involved fighting in woods on a larger scale than experienced in previous campaigns in this Theater. Combat in thickly wooded highland presented problems in locating concealed enemy machine gun positions, snipers, and centers of resistance not readily detected until in very close contact. Fields of fire were restricted by the tree growth, and in many places observation was limited to such distances as fifty or one hundred yards. Advance in such situations was generally slow and was assisted by heavy mortar

and machine gun fire distributed over the entire area of the attack, followed by riflemen employing assault fire. Successful use of these tactics has been described in a report of a Battalion Commander of the 143rd Infantry whose unit was engaged in wooded country for a considerable period:

. . . The entire area was covered with thick trees and fruit orchards, interspersed with farm houses, stone walls, and numerous sunken roads. Fields of fire have been greatly restricted. Enemy delaying groups with machine guns were widely scattered and impossible to locate until arrival within 100 yards or less. It was found necessary to place heavy weapons in the front line or very close up, to avoid hitting our own troops. After encountering hostile fire it was found very effective to spray the entire woods ahead with rapid concentrations of mortar and machine gun fire for about one minute, followed by a rapid advance of rifle platoons using assault fire to cover all trees and house windows where snipers might be hiding. In each such case, the Germans pulled out rapidly, leaving weapons and ammunition behind, although we had been unable to locate them previously. However, the tendency of troops in such situations is to wait for definitely located targets before they will open fire. This results in great delay by very small groups of enemy who shift position frequently and keep up a demoralizing rate of machine gun fire. Continuous rapid fire delivered by our heavy machine guns had a particularly demoralizing effect on the Germans. . .

35. RIVER CROSSINGS

The Italian Campaign introduced for the first time in this theater the problems of river crossing operations into current infantry combat. Unlike the experience in Tunisia and Sicily, the advance in Italy was on several occasions barred by formidable, rain swollen streams that involved major operations in crossing, each time in the face of hostile resistance. Without exception this experience was new to all units which participated, and necessitated technique, improvisation, and tactics which had not previously been tried in combat. The actual assault crossings were accomplished by the use of ropes, improvised rafts, rubber reconnaissance boats, and by wading and swimming. Heavy weapons were generally taken over on rafts and rubber boats. In some cases they were carried over disassembled by wading infantrymen. The crossings were generally preceded by heavy artillery concentrations on enemy defenses beyond the farther banks, prior to

the arrival of the assault battalions. The actual crossings were covered with small arms and heavy weapons fire of units set up to cover the assault from the near bank.

The most outstanding river crossing operation in the Campaign was the passage of the VOLTURNO. The points of crossing were approximately 80 to 100 feet wide, with a moderate current somewhat accelerated by rain which had also swollen and deepened the stream. The banks were steep and difficult to descend and climb, and further increased the problems of getting heavy weapons and ammunition across. The Commander of the 7th Infantry, whose two battalions made the initial assault crossings, has reported:

... Many problems faced us in the crossing of the VOLTURNO RIVER. In the first place we were all inexperienced in river crossings as this was our first attempt. Our biggest problem was one of finding a suitable crossing point for the men to wade the river. The difficulties encountered in the operation were:

Heavy rains and equipment for crossing. We had heavy rains that raised the river from two to four feet, making it impossible to find a place for troops to cross by wading. It then became a problem of devising means of getting the troops and equipment across. We had to take into account the depth of the river and the steepness of the banks on both sides. We had a very limited amount of equipment on hand to improvise the means to cross. Enough $\frac{1}{4}$ -inch rope was secured to provide each battalion with two guide lines across the river. Tarpaulins were removed from all $3\frac{1}{4}$ -ton trucks in the regiment, and with frames made from salvaged lumber, improvised rafts were constructed. These rafts were found to be buoyant enough to carry equipment or ten men riding or holding on, across the deep water. At the last moment four DUKWs were furnished but never reached the stream because of the bad roads. The Engineers were able to furnish us with a number of rubber pontoons and a few seven-man reconnaissance boats. With these various means it was felt that the troops and equipment would get across. There were no means available for crossing vehicles and no hope of getting them for 12 or 18 hours after we crossed.

Communications. This was also a difficult problem. Captured German cable was obtained so that each battalion could string two sets at each crossing. Normal communication wire was used to tie into these cables. This did not solve the problem initially because artillery fire disrupted the lines and enemy machine gunners controlled the banks after daylight, so that linemen were unable to repair the lines. It was late in the afternoon following the night crossing before telephone communication could be established.

Radio communication was satisfactory and was used to contact battalions.

Ammunition and Other Supplies. Due to the fact that we could not expect to get any vehicles across, ammunition and supplies presented another problem. To overcome this we established ammunition dumps on the near side of the river under cover of darkness, with the expectation of resupplying battalions by means of rubber pontoons and boats. It turned out that ammunition was not a serious problem because the battalions were able to reach their objectives without too much opposition.

Protection against Counterattack after Crossing. Counterattacks could be expected from the high ground on the left, and mechanized attack from the valley in front. From careful study of the ground from air-photos and of the ground itself, it was found that two streams ran generally through the regimental sector which were serious tank obstacles and would prevent tanks from working from the left to the right flank. Crossings were therefore selected for battalion sectors and routes of advance so as to have one stream on the left flank of all battalions. In order to take care of any tank attack from the front, one tank company and one tank destroyer company were waterproofed and attached to the regiment. They were moved under cover of darkness to the near bank of the river with the expectation of crossing soon after daylight. However, it was necessary to get a bulldozer from the engineers to work the bank down so they could get to the stream. About noon the next day tanks and tank destroyers crossed the stream and relieved the worry from mechanized attack. . . .

The experience of the leading assault company of one of the battalions making the crossing is of especial interest and is illustrative of the problems of the operation. The following is quoted from a report of the Company Commander, "C" Company, 7th Infantry, which led the crossing of the VOLTURNO:

. . . .Company "C" was the assault company for the battalion. The mission was to secure as a bridgehead an area about 1000 yards square on the far side of the river. We arrived at the river from our assembly area about 0100 on 13 September. The company was given four ropes to stretch across the river, so I detailed two men on each rope. One man was to swim across and anchor the rope to trees on the far bank while the other man assisted and anchored the rope on the near bank. The ropes were placed about 25 yards apart and each platoon was assigned a rope. The men all had kapok lifebelts to assist their crossing, and by using the ropes they were able to cross in the swift current at this point. The order of crossing was the 3rd, 1st, 2nd, and weapons platoon. Company headquarters was to cross with the 2nd platoon. The weapons platoon had improvised rafts of canvas which proved unsatisfactory, as we lost one raft with one light machine gun, one mortar, one 511 radio, and the ammunition. The current was entirely too swift for the canvas rafts. We lost no men by drowning on the crossing by ropes. . . .

A summary of the tactical lessons of the crossing from the battalion viewpoint was furnished by the Commander of the 1st Battalion, 7th Infantry, and is quoted as follows:

. . .It is quite necessary that a thorough reconnaissance be made of both banks of the river and also of the river itself. Every attempt should be made to have all the equipment necessary for the crossing assembled at least three days in advance, and if possible, use the engineer pontoon boat, as it is by far the most successful. You must have support units up to support the crossing, and must expect opposition at any place. The crossing should be made as early as possible during the night in order to get the entire unit across prior to daylight. We were caught with part of the battalion not over at daylight and suffered most of the casualties from these units. Try to cross the river on as broad a front as possible, yet have your units mutually supporting. We necessarily had to cross on a narrow front, due to the nature of the river bank on the near side. It was about 20 feet deep with only one wash we could use. The first company crossed the river without a shot being fired, but the second company crossed under artillery, machine gun, and mortar fire. The beachhead should be established as early as possible in order to cover the crossing of other troops. Do not use any improvised equipment if you can possibly get around it. We lost entirely too much equipment from our improvised rafts made from the 3/4-ton truck tarpaulins. . .

Comments as to other lesson-experiences from the crossing of the VOLTURNO were obtained from other officers of the 7th Infantry, and are summarized as of interest to all infantry units:

Rifle units should not be expected to carry heavy rafts to cross a river and then make an attack. It is too tiring on the men and consequently slows down their attack too much.

Rafts for infantry units, except for transporting such equipment as machine guns, mortars, radios, and ammunition, are not necessary in such crossings as that of the VOLTURNO. Well fixed ropes are sufficient and satisfactory for the men.

A strong artillery concentration just prior to the crossing is very helpful. At the VOLTURNO, the artillery covered ground well beyond the river, but not actually on the far bank. Fire on the far bank close to the stream would have assisted the units crossing.

The German practice of letting one unit go by and then fire on the following unit was also encountered in the river crossing.

It is never an assurance that a route is clear because another unit has preceded without opposition.

The most satisfactory aid to the infantryman in the passage of a river is the use of ropes to cross on.

In river crossing operations, radio communication must be provided. Wire is too uncertain because of disruption by artillery fire.

36. ATTACK OF STONE BUNKERS AND EMPLACEMENTS

The German defensive positions in the mountains were characterized by numerous well-placed, dug-in and cleverly concealed emplacements, troop shelters, and mortar positions. A new element in the enemy defensive field works was the use of heavy, above-ground stone bunkers of a type not hitherto encountered in previous campaigns in this Theater. These stone bunkers were generally found in rock-strewn areas containing underlying strata and outcroppings of rock which prevented adequate digging-in of positions without the use of demolitions. Numerous stone walls criss-crossed the terrain in such areas, and in most cases the bunkers were sited to blend into the general pattern of the walls and rocky slopes, and were almost indistinguishable until approached at close range.

These bunkers generally consisted of shallow, scooped-out emplacements for light and heavy machine guns, surrounded by strong stone and earth walls, covered with packed and earth-revetted stone to a height of three or four feet. The overhead cover was generally reinforced by heavy timbers or logs. Narrow firing slits were left in the face of the bunkers, close to the ground level. Exits were provided in the rear. The following description of specific examples of these defenses in the vicinity of LAGONE has been given by an observer of the Army Ground Forces Board who studied the enemy positions in this area immediately after they had been taken by our troops:

...The outstanding feature of this position was the simplicity and crudeness of the defensive works and the skillful manner in which they had been blended into the terrain. Because of the rocky nature of the ground, most of the positions observed were constructed entirely above

ground. Machine gun bunkers, mortar emplacements, and personnel shelters were made from local stone with their overhead cover supported by timbers or ties and by doors taken from nearby villages.

While crudely constructed, reports indicate that these bunkers and covered positions effectively withstood direct hits with 81mm heavy mortar shell. Mortar emplacements and shelters for riflemen were usually located behind stone walls. The forward machine gun bunkers, although primarily sited for fields of fire, were nevertheless so placed as to blend perfectly with the surrounding terrain. The bunkers, many of which were partially concealed by undergrowth, became an invisible part of the maze of rock walls which formed their background. . . .

The German defensive tactics employed in holding these positions had to be learned and taken into account in the attacks upon them, and were thus described by the Commander of the 179th Infantry:

. . . The German positions we have run into in these mountains have had very few riflemen in the front line. The forward element of the defense has consisted almost entirely of machine guns in rock bunkers. These bunkers are so cleverly blended into the terrain that they are extremely difficult to locate. In the daytime the Germans seem to hold practically all their riflemen back about a couple of hundred yards. They depend on their machine guns, mortars, and artillery to stop your attack or cause you such losses that a quick counterattack by their riflemen will throw you out. At night they put out listening posts manned by riflemen, but still they hold back the majority. . . .

An effective method of attacking these bunker-studded defensive positions involved systematic silencing and capture of individual bunkers until a section of the line could be penetrated in force. The same regimental commander above quoted has also reported:

. . . To get the Germans out of their defenses, you have got to locate and knock out a few bunkers, then locate and knock out a few more in the same area, until finally you have a hole in their defenses. Then push a unit through the hole, usually at night, and mop up the remaining defenses in the rear. . . .

The actual attack of individual stone bunkers initially required a number of experiments with different methods and weapons. It was found that they were generally impervious to heavy mortar fire, even including direct hits. In some cases, when the guns could be gotten into position, these bunkers have been effectively silenced

and neutralized by direct 57mm and 37mm gunfire. In most instances, however, it has not been possible to get these antitank guns into position for the work. The same has been true of employing tanks. When they could be brought up, they did the job efficiently. A regimental Commander stated in this connection:

. . . At LAGONE, we were able to get two or three tanks into hull defilade positions near FRONZA. From here they knocked out by direct hits several stone bunkers on the north slope of the "PIMPLE" (the high ground just on the north edge of LAGONE). But that was the only place it was practicable to use tanks. . .

Inquiry among a number of officers and non-commissioned officers who had wide experience in dealing with these bunkers resulted in the following recommendations as to the most effective means of reducing them, which comprise a consensus of opinion to which all agreed:

. . . The bunkers must be dealt with by rifle units. It is generally not possible to get tanks or suitable artillery weapons into position to reduce them by direct fire. Mortar fire will not penetrate the heavy cover.

Attacking units should work their way up to within twenty-five to fifty yards of the bunker, under cover of smoke or darkness, if necessary.

After approaching the bunker at close range, hit it, as close to the fire-slit as possible, with a rocket from the antitank launcher, or with several antitank grenades. Then close on the bunker as rapidly as possible and dispose of the occupants with hand grenades or bayonets.

The individuals whose recommendations are quoted above stated that they did not believe that the antitank rockets or grenades actually penetrated the bunkers, but the concussion from such missiles at close range stunned the occupants and made possible their disposal by rapid assault with hand grenades and bayonets. The use of smoke in attacking these bunkers must be carefully executed with due consideration of German defense methods.

On one occasion a bunker was smoked prior to attack and the occupants came out under its cover and took up flanking positions in the edge of the smoke from which they successfully repulsed the attack with machine pistols. The incident was thus described by a Battalion Commander of the 179th Infantry, whose unit was involved:

. . . On HILL 769 one of our companies got up close to the German bunkers. The company could not move in daylight because of the lack of cover, so a night attack was decided upon. It would be moonlight, so it was decided to place smoke on the bunker at the time of the attack. This was done, but as soon as the smoke screen formed, the Germans left their bunkers, moved to their right front and left front to the edge of the smoke and caught our attacking units in the flanks with machine pistol fire. The attack failed.

On a later night attack, we changed our tactics. We put down a smoke screen as before, waited just a few minutes, and then fired a heavy concentration of 81mm light mortar shell right into the smoke screen. Then a final smoke screen was laid down. Our troops advanced as soon as the screen had formed, and caught the Germans in their shelters. . . .

37. ALL-AROUND DEFENSE AND DEFENSE IN DEPTH

The importance of all-around defensive organization, and defense in depth was repeatedly demonstrated during the Campaign. Experience in the previous fighting in Tunisia had emphatically brought out the value of this infantry lesson, and the habitual tendency of the German to launch strong counterattack after yielding ground rendered proper defensive organization a constant necessity in Italy. Despite the dissemination of previous experience in this subject, some units failed to grasp its importance during the present Campaign, as witnessed by a report of the Commanding General, 45th Infantry Division:

. . . More attention must be given to defensive organization. We seem to have taught offense to the practical exclusion of defense. The infantry squad of twelve men is the basic unit in defense, and in general the squad leader does not know how to organize for all around defense - two thirds of a circle at least. We must work the squad defense in with that of the adjacent squads, which is the platoon leader's job. In defense we do not have enough organization in depth, and we tend to dispose troops too much in line. . . .

Similar comment was also made by the Commanding General, VI Corps:

. . . We still have units taking defensive positions and occupying them on a line. They must be taught to organize in depth and in all-around defense, even down to the squad. It has never yet been safe over here to send out only a company on a semi-independent mission. The company is not strong enough to maintain itself beyond supporting distances. . . .

38. INFANTRY-TANK COOPERATION

As in Sicily, the Italian Campaign again brought out the necessity of better training in the combined use of tanks with infantry. The nature of the mountainous terrain, as well as the enclosed terrain in the valleys and more open country, did not admit the employment of armor in mass. The tank action has been confined to the operations of small supporting groups in cooperation with infantry, in both offense and defense. This type of employment has revealed the need of a higher degree of cooperation between the two arms, which has not been achieved because of lack of prior training of the foot troops of the infantry divisions with the attached tanks. This training deficiency was apparent during the fighting in Sicily, and commanders again urged that infantry divisions now preparing for combat include thorough training in this form of combined ground action. The Commander of the 45th Infantry Division frankly observed in connection with this subject:

. . . The infantry is not trained with the Armored Force, or with the armored elements with which it will work. My Division never trained with tanks. Usually they just run the tanks around wild on maneuvers. Tanks have got to work actually with our infantry battalions.

The lack of combined tank and infantry training has caused us to pass up some favorable opportunities. The tank-infantry team should be so trained that combined attack can be set up quickly with the tanks moving under artillery bursts and the combination driving right through. In training an infantry battalion in attack they should always have tanks and tank destroyers with them, following along, supporting either offensively or defensively. I do not think the tanks should be attached to the battalions. They should support the battalion under regimental control. The battalion commander already has enough to handle. . . I have always believed that the tank company should not have been taken away from the infantry divisions. Even if nothing else, they permitted training of the infantry with tanks. . .

The value of the medium tank in combined operations with the infantry division, in both offense and defense was stressed by the same Division Commander, who also pointed out the effect of supporting tanks on the fighting infantryman:

. . . The Infantry soldier has a lot of confidence in the medium tank, not so much for what it has done - actually we have done very little with them in this Division - but for what it can do. It has a great psychological effect.

The infantrymen know its power, and like to see it around. They know it has great defensive power. . . . We have been using these GHQ tank battalions attached to Divisions. During the advance we keep some edging way up front, moving from cover to cover, with the leading infantry elements. German prisoners tell me that the enemy is scared to death of them. . . .

39. INFANTRY-ARTILLERY COOPERATION

In no other campaign in this Theater has the combined action of infantry and artillery been of greater importance or productive of greater results than in the fighting in Italy. The infantry units have learned the full use of the covering artillery fire, and through experience gained in past fighting, have learned to follow closely their covering barrages and concentrations. The importance of thorough understanding on the part of the infantry commanders of the capabilities and limitations of the supporting artillery cannot be too much stressed. In some instances, lack of this understanding has been apparent and should be overcome in all units in training. On this subject, the Artillery Officer, Fifth Army, reported early in the Campaign:

. . . On the front at the present time, (November, 1943), some infantry battalion commanders do not know that they can get the fire of anything more than that of their own direct support battalion. They must learn to ask for more artillery when the target merits it. Some infantry commanders do not know the difference between the liaison officer and the forward observer. They try to get the forward observer to go along as artillery advisers. This is not the forward observer's job. He must stay where he can see. . . .

With reference to the relationship of the artillery and infantry commanders and the employment of the supporting artillery, the same officer also observed:

. . . The infantry commander must tell his support artillery commander what he wants him to do, and not try to tell him how to do it. On one occasion a forward observer had his radio on a reverse slope where it was protected. The infantry commander ordered him to get out on the forward slope. The radio was promptly smashed by fire, and support could not be rendered. On another occasion an artillery battalion some 6000 yards back of the front line was all shot-in and was firing effectively. The infantry commander ordered them forward to within 1500 yards of a mountain mass, where because of the height of the mask, the fire could not

clear. . .

Of special importance has been the training of infantry officers in the adjustment of artillery fire with forward observation methods. As disclosed by experience in Tunisia and Sicily, Artillery forward observers often become casualties at critical periods when artillery support is most needed. Ability of the supported infantry to adjust fire by its own officers in such cases will make the difference between success or failure in attack or defense. In a report to G-3, Fifth Army, on training lessons from the campaign, three regimental commanders advised:

. . .The infantryman should learn to observe and adjust artillery fire at night as well as during the day. Since about 50% of artillery officer casualties are forward observers, it follows that an infantry officer may well be called on to adjust fire and give its maximum benefit to his unit. . .

Similar recommendation, including training in artillery fire adjustment for non-commissioned officers as well, was also made by a Battalion Executive of the 180th Infantry:

. . .All (infantry) officers and NCO's should know how to adjust artillery fire. They often have to do so because sometimes the forward observers get pinned down and can't move, or have become casualties. We have had infantry officers and NCO's adjust fire successfully through seven intermediate communication points before reaching the battery. It is not enough to be able to tell the batteries how far their shells are falling from the target. The infantryman should also know how to close the guns on the target when one of them is hitting close. The infantry officer should also be able to judge what areas the artillery can and cannot hit. . .

40. HAND, PACK, AND ANIMAL TRANSPORT

The general problems of supplying front line elements in the mountainous country have been discussed in Paragraph 24d, supra. These problems, when supply by air was not essential, were for the most part overcome by the use of carrying bags, packboards and improvised equipment for dismounted pack columns, and by animal transport. Experience with packboards was entirely satisfactory. They were used for the transport of all forms of supplies, and it was found that with proper preparations, hot food and water could also be taken to the

front lines by this method.

In the initial landings, only one Division, the 45th, had packboards with them. These had been obtained during the training period in the West Virginia Primitive Area, and were brought overseas with the units. The excellent service rendered through the use of these boards soon led other divisions to obtain a supply of them through local manufacture as the advance was pushed into the difficult mountain country. In this connection the Chief of Staff of the 34th Infantry Division stated in December that his organization had expected to get some quartermaster packboards late in November, but did not receive them. We now have quite a number of the same type made locally, and they have proved entirely satisfactory." At the same time the Assistant G-4, 3rd Infantry

Division reported in some detail:

. . . We borrowed one quartermaster packboard (Stock No. 74 P25) from the 45th Division. At our request, Fifth Army had 250 made locally of the same model, and furnished them to our Division. We are now having 500 more made locally and expect soon to have 300 in each infantry regiment with some spares in the Division Quartermaster Company. The packboards are satisfactory and vital. Our only wonder is why we must make them locally in order to get them. . .

The necessity of these boards is also apparent from a comment of a Battalion Commander of the 179th Infantry with reference to the need of additional men in the ammunition and pioneer

platoons: "All rations, water, and ammunition must be hand-carried to front line units. You can get the stuff up the only part of the way with mules because of the steepness of the slopes and lack of trails. Our ammunition and pioneer platoon is never available for pioneer work because it must be constantly used for carrying parties. At the present strength of our companies, it takes about 20 men to carry up a day's supplies for one company, 10 for rations, 5 for ammunition, and 5 for water. . .

The satisfactory use of packboards for transporting hot food and hot water to front line troops in areas inaccessible except by hand carrying parties was thus described by an Assistant Division G-4 above quoted:

front line hot enough for the men to make cocoa or coffee. . .

In areas where animals could be used, organized mule trains provided the supply link between the truck head and the points at which hand-carry was begun. Mules were obtained locally and allotted to divisions, which organized provisional pack trains, which were sub-allotted to units. Selected men with previous experience in animal management were detailed to carry on the work of these trains. The system used in the 45th Infantry Division was thus described by the G-4:

. . . Forward supply is now largely by pack train. We have one officer for each regiment in charge of a pack train platoon, which may vary from 20 to 150 mules. The number in each regiment is very flexible. It depends entirely on the terrain in the regimental sector. We have a total of 404 pack mules in the Division with 360 men and 5 officers in charge of them. Two other officers comprise the Division veterinarians. Most of the mules are too small for the Phillips pack saddle, so we use the local Italian saddles which are much smaller and lighter. We get the mules through military government agencies, who secure them by purchase and requisition. To our front line units, delivery of supplies is by $\frac{1}{4}$ -ton to a "jeep-head," by mule train to a "mule-head," and from there on a man's back to the unit. We have 300 packboards per regiment which are used constantly and are very satisfactory. . .

In the 34th Infantry Division a general system of mule transport was similarly organized and functioned satisfactorily. Units were furnished pack trains as needed, not in excess of 60 mules per regiment. Within the division a Division Remount Supply Section for procurement of mules, animal maintenance equipment, and pack equipment was organized. In addition an animal pool was set up to keep available serviceable animals to replace those which become unserviceable in the pack trains. For the care and rehabilitation of broken down animals from the trains, a Division animal sick line was also set up. The organization also included a mobile animal maintenance unit which operated to make contact with unit pack trains and regularly perform corrective maintenance,

such as shoeing, etc, in the forward areas. The entire organization was directed by the Division Veterinarian through a Division Remount Center responsible for all pack animal operations and maintenance. The care and thoroughness of this organization serves well to indicate the importance of animal transport in the areas where it operated.

41. COMMUNICATIONS

As in the Sicilian Campaign, infantry signal communications in Italy were materially influenced by the terrain. The mountainous country imposed increased difficulty in the laying and maintenance of wire and in the operation of wire communications generally. In the high, rugged areas all wire had to be transported and laid by hand. In one Division the Chief of Staff reported that

. . . We have twenty men per regiment who just carry wire and do practically nothing else. They go forward, locate the companies, and carry wire back to the battalions. It is the only way we can keep up communications. . .

Similar experience has been noted in other Divisions. Some idea of what wire communication entailed in this country is apparent from a report of the Communications Officer, 180th Infantry in January:

. . . In the battalions, they have had to increase their linemen up to 9 or 10 per battalion by using men from the ammunition and pioneer platoon. During this attack the regiment has about 70 miles of telephone wire in operation. One circuit is 15 miles long. The battalions need extra linemen more to maintain their wire than just to lay it. After a few days your T/O linemen are exhausted because they get practically no rest. . .

The same general picture appears in the statements of a Battalion Executive and a Communications Officer in the 179th Infantry:

. . . The main (communications) need is just twice as many linemen as are now allowed in the battalion communications platoon. We have frequently had 20 miles of wire in operation at one time. For seven men to lay that much wire and then maintain it in these mountains is just too much. We have to depend largely on wire because radio is often not dependable, and runners take too long. . .

The restricted road net and limited trails off the main

roads in the mountains made it difficult to keep wire out of the way of traffic, and maintenance thus became a serious problem. Also the constant difficulty in laying and maintaining lines out of the way of traffic at times led to laxity in the proper protection of wire, and on one occasion the Army Commander declared:

. . . One thing to be noticed is the misuse of wire. Look along the roads and you will see the confused mess of wire alongside, often much of it actually in the road. Each commanding officer must insist that his signal troops do their job correctly, and the signal officers should supervise it. . . .

The mountainous terrain also influenced radio communication. The mass interference as a result of high ridges, peaks, and hill masses often necessitated great care in the selection of station sites, the movement of stations, and radio relay. As in the case of wire, the necessity of hand transport of radio equipment because of the terrain created additional problems. Continual hand carrying of sets led to minor damage and disrepair, requiring increased repair and maintenance. Under these conditions the need of a high level of care in handling and operation was disclosed, and carelessness in the handling of signal equipment, already noted in the initial landing operations (Cf. Paragraph 21, supra), had to be guarded against constantly. Also, the need of additional radio technicians and repairmen was again felt, as acutely as in Sicily. The Chief Signal Officer, VI Corps declared:

. . . We always have a real need for additional skilled radio technicians. This is not a criticism of the men we have. They are good. But we need more of them. . . .

With reference to transport of radio and the problems of care and operation, a Battalion Commander of the 179th Infantry stated that

. . . In each company a basic has to be used to carry the SCR 511 radio. It will be the same when we get the new SCR 300. This is a dangerous job because the Germans keep a sharp lookout for radio antennas and shell every one they see. Also the radio has to be handled carefully; or it goes out of commission. . . .

The new SCR 300, recently introduced into field operations in this Theater has been reported to be satisfactory and exceptionally dependable. In the landing operations at NETTUNO and ANZIO the Commander

of the Special Signal Company used this set for the first time in an amphibious operation, and declared it was the most satisfactory type thus far used. In the 3rd Infantry Division, experience with this set was thus described by the Division Signal Officer:

...The Division has been equipped with the SCR 300 since about December 1st. It has been given a thorough tryout in training exercises and has been used by one regiment in combat. I have checked closely and have so far heard no complaints against this radio. I have asked many radio operators what they thought of it considering its extra weight, and they have all replied that they will gladly carry the extra weight because the radio works, while other types often did not work. . .

We are now making adapters so that the SCR 300 can be used in connection with antennas and 610 power packs installed in vehicles. We are using the SCR 300 for the net from regiment to battalion as well as for battalion to company, because it is frequently impossible to get the SCR 284 up to the battalion location in a vehicle, and the latter set is too heavy to carry by hand in this terrain. The SCR 300 is working very satisfactorily in both nets. . .

In another Division, a Battalion Communications Officer of the 179th Infantry recommended the SCR 300 for use in the heavy weapons company for 81mm mortar observers. This set, he reported, was more reliable and dependable than either the SCR 511 and 536 sets previously used.

The necessity for the highest level of signal security was a major lesson of the campaign. This element of signal training and operations was given special emphasis by the Army Commander:

...Let me stress the importance of signal security. The Germans have an exceptionally good intelligence system. They are skillful at radio intercept. The enemy gets much information by inference. They note the peculiarities of individual radio operators, which soon become a dead give-away to locations of units. The codex is fair, but after all it gives only a low order of security. The Germans note stereotyped words and phrases which reoccur, such as battalion numbers. The use of names, particularly nicknames, is one of the best ways the enemy has to break down our code system. . .

42. MISCELLANEOUS

a. Use of Booby-Trapped Grenades for Security at Night

In some units a practical means of night security was devised by stringing trip wires in front of positions and attaching

the wires to hand grenades. The method employed was thus described by a Battalion Commander of the 179th Infantry:

. . .At night our men put trip wires in front of their positions to give warning of any approaching enemy. They take the fuse assembly from a hand grenade and tie it to the trip wire with a slip knot. The knot is put around the lever to hold it down. When a German hits a trip wire, the knot slips off the fuze, the lever flies off, and the detonator explodes. It may waste grenades, but it is a very useful device. Pull igniters would work just as well if they were available in quantity. . .

b. Use of Signals and Flares

Signals and flares used by patrols and other units must be carefully prearranged and thoroughly understood by all concerned beyond any possibility of mistake. A Regimental Commander declared:

. . .The difficulty of maintaining contact and liaison in the dark requires an increased, and above all, an intelligent, use of prearranged signals. They must be known to all concerned. A misinterpreted signal or an unknown signal is worse than none at all. . .

c. Bayonet Tactics

In a battalion of the 180th Infantry the Commander adopted a system of bayonet tactics in training that proved most satisfactory in combat. He has described it as follows:

. . .When I had a rifle company I taught all my bayonet men to work in pairs, one following the other. If they came upon two or more men, the leading man was taught to call "right" or "left", to tell the other man which side he wanted him to protect. The system worked beautifully in the few bayonet fights we have had with the Germans. . .

d. German Counterattack By Small Groups

The experience of small infantry units in attack has shown that the German will almost invariably launch a counterattack, even against small units, to break up an attack. A Company Commander thus described their tactics:

. . .I learned from previous fights that you can expect a counterattack, usually by 10 to 20 men, in not over five minutes after you get close to the German positions. They are usually strong in light machine guns and machine pistols and counterattack by fire and movement. They keep up a heavy fire while small groups, even individuals, alternately push forward. The attack is almost always against your flank. They seldom close in with the bayonet, but try to drive you out by fire. . .

e. German Ruses

A number of ruses have been employed by the enemy to deceive and confuse our troops. The following have been reported by officers of the 1st Special Service Force:

. . . The enemy employed the "white flag" ruse several times. On the first occasion a captain who went forward to accept a prisoner advancing under a white flag was shot by the enemy. After that the ruse was attempted on several occasions, but failed completely. The method used to defeat it was for one man to order the bearer of the flag to continue forward to our forces rather than to allow any of our men to move to him. During the process the troops in the vicinity would cover the prisoner and probable hiding places with their weapons, at the same time remaining in concealed and covered positions. The general opinion was that the white flag is entirely unreliable, most often being a ruse. . .

The enemy used ruses to locate our positions. At times enemy soldiers would deliberately expose themselves by needless movement with the apparent intent of drawing fire. If our soldiers revealed their position by firing, they were covered with mortar fire. We soon learned not to shoot at these decoys. . .

f. Camouflage Discipline

The standard of camouflage and camouflage discipline has not been maintained at the required level. Because of the friendly air superiority, troops have shown a tendency to become careless. The Commander of the 45th Division declared:

. . . Our camouflage discipline is very poor. . . The way to correct it is to put up a plane - a cub will do very well - and check the camouflage. If the plane can find bivouacs, trains, or CP's, raise hell with the commanders. Put the commander of the faulty unit up in the plane and have him look at his own errors. . .

g. Self-Care and Care of Men

The unusually severe conditions of weather, climate and terrain have made self-care and care of troops more important than ever. Reports indicate that there should be improvement in these subjects. A Division Commander observed:

. . . The average American can't take care of himself in the rain. Many of them just stand under the trees like so many wet turkeys. They must be taught to dig a shelter and use their shelter halves properly. Only the ones on guard need to get wet. Make the men learn to improvise. . . We are getting a lot of cases of trench feet. Many cases are caused by ignorance.

In training and correcting this, use no lectures - make the men do it. We must learn to take care of our men....

h. Development of Patience in Training

The average infantryman when going into combat for the first time is prone to be impatient, to feel that the battle must move quickly, and often fails to understand the elements of time, waiting, and patience that are essential. The S-2, 168th Infantry observed:

...I have seen a report that our maneuvers in the U.S. do not impress men with the necessity for patience, and with the slowness of movement in combat. This is perfectly true, and the subject should be stressed in training in the U.S. You can move only slowly in actual combat. Waiting is part of the curse of war. Anything that can be done in the U.S. training to impress our infantry with these facts so that they will expect these things when they get overseas, should be done....

SECTION VI : FIELD ARTILLERY UNITS

43. GENERAL

a. Role of Field Artillery in the Italian Campaign

In no other previous campaign in this Theater has the Field Artillery played so large and vital a role as it has in Italy. In the first stages of the Campaign the early-landed batteries became one of the deciding factors in securing the beachhead, and in one critical instance have been credited with saving the then unconsolidated beachhead from destruction (Cf. Paragraph 16a, supra). Thereafter through the difficult advance from the SALERNO plain to the prepared winter defenses of the mountainous "Gustav Line," division and reinforcing artillery continued to provide effective and sustained support of the hard-fighting infantry. This support, maintained at all times under varying conditions and situations, had its full share in making possible the advance in the face of serious terrain obstacles and determined enemy resistance.

Unlike the operations in Sicily which involved pursuit action in a rapidly moving situation throughout, artillery combat in

Italy included missions of support in many different types of action. Battalions of various calibers provided preparation fires, rolling barrages, and moving concentrations in support of infantry attack; counterbattery and neutralizing missions; interdiction and harassing fires; protective fires, normal barrages, and other defensive missions as the situation in front varied from time to time. Of special importance was the employment of artillery to break up enemy counterattack. In some instances concentrations of fire on a scale not heretofore employed in any theater were delivered against especially formidable objectives to blast the enemy bodily out of well prepared and dug-in positions. Long range fires involving air adjustment by combat aircraft deep in the enemy territory beyond the range of the organic air OP planes also had a part in the artillery operations. In the main, the role of effective support of its infantry under any and all conditions has been successfully carried out by the Field Artillery in the Italian Campaign.

b. Influence of Mountain Terrain

As in the case of other arms, the rugged mountain terrain, limited road net, and close country in Italy influenced the operations of field artillery to a considerable degree. The close terrain frequently restricted the selection of positions, and often rendered the occupation of position even more difficult than it had been in the mountains of Sicily. The same factors also necessitated the crowding of units in order to get them effectively into action, and consequently resulted in placing batteries in closer proximity than would ever have been done had the ground and road net permitted otherwise. On this point the Commander of the 71st Field Artillery Brigade observed that "we have to get our units in the space available, and that is limited. That is why you see batteries so close together." A similar comment was made by the Commanding General, 13th Field Artillery Brigade, who also stated that "This business of limited areas is sometimes very difficult."

The terrain, coupled with prolonged unfavorable weather, also materially influenced the movement of units and occupation of position. This was particularly true of the heavier 8-inch howitzer and 155mm gun battalions. Poor roads, often deep in mud that reduced traction to a minimum, and soft, muddy position areas delayed movements and increased the labor and problems of displacement and occupation. In rocky areas relatively free from mud, positions were scarcer and were also difficult to organize. Ammunition supply, although presenting no problems comparable to those that the terrain imposed on the infantry, was nevertheless rendered difficult in many areas because of the roads, mud, and steep gradients.

The high ridges and rugged mountains also provided the enemy with defilade that in some cases defied effective coverage with artillery fire. Although the howitzers were generally able to deliver fire wherever critical situations arose, occasions existed when enemy positions, installations, and concentrations could not be reached. In these cases, the infantry relied on the attached 4.2 chemical mortars and organic infantry mortars. Mountain defilade also served to provide a measure of protection to friendly howitzer and gun positions. As is brought out in the later section on occupation of position (Cf. Paragraph 46a, infra), defilade was the first requirement sought by all unit commanders in the selection of position areas.

c. Soundness of Tactical Doctrine and Technique

Experience in Italy has further confirmed the soundness of American artillery doctrine already successfully tested in previous campaigns. As was disclosed in Tunisia and in Sicily, the sound basic principles must be applied with judgment, flexibility, and with proper consideration of individual situations. A typical comment on this subject appeared in a report of the Commanding General, 18th Field Artillery Brigade:

. . . The principles taught at the Field Artillery School and enunciated in our training literature are sound. When applied with judgment and common sense, they have solved all the problems which have confronted this unit to date. . . .

Some variations and minor changes in technique have been adopted because of peculiarities of terrain, situation, and other factors. Also, as units continued in action for long periods of time and gained experience as a result of local situations and conditions, some additions in technique, such as improvements and labor saving devices have been developed. These however, did not constitute change in fundamental principles. They were often merely improved and more effective ways of applying standard procedure. The Commander of the 977th Field Artillery Battalion observed in this connection that

. . . The teachings at Fort Sill are excellent, but it is sometimes necessary to vary. We use a 1:50000 firing chart because of the length of range involved. We are now not simplexing the line to the guns. We run two lines by different routes as we had too many lines shot out and a simplexed line is no better than a straight line when it is shot out. . . On one or two occasions instead of having a common base point, we have two, because of the width of the sector involved and the different center lines. We also have a site chart at the fire direction center which gives the site, including the complementary site, at a glance. . .

d. Effectiveness of Fire

Effectiveness of supporting fire has been a marked feature of artillery action in Italy. Comments of supported infantry commanders, forward observers, and prisoners of war have all indicated that the fire of participating artillery units has played a major role in the advance of our forces. Although it has been believed in some cases that ammunition has been used somewhat over-liberally, the effect of accurate, heavy concentrations of fire from massed batteries has proved its value and has been justified. Strong supporting fire has been delivered whenever it appeared that the front was threatened by counterattack, and in such cases the policy has been to give the support without question. With reference to ammunition expenditure in such missions, the artillery Commander of the 3rd Infantry Division declared:

. . . Possibly there has been some unnecessary firing, but it is hard to say. For example, we get a report of a counterattack. Maybe it is a real one, or it may be a

mistaken alarm, but we go ahead and fire. . .

In addition to the casualty effect, the artillery fire in this Campaign as in Tunisia and Sicily has produced good results in weakening the enemy morale in many instances. Evidence of this is apparent in a report of the G-2, 36th Infantry Division who stated in connection with prisoner interrogation:

. . . German prisoners we have captured recently in our attack here say that our artillery fire has a most demoralizing effect on their troops. We captured about 75 of them on December 3, and they stated that they were just waiting for someone to take them prisoner. . .

Similarly a German sergeant captured by the 3rd Infantry Division gave testimony of the effect of our artillery fire and declared that "it was impossible to stand more than five or six barrages of the strength that have been used in the last few days."

Artillery has been one of the most effective means of breaking up the habitual German counterattack, and in destroying units forming in assembly areas for such attacks. The Commander of the 34th Infantry Division reported that

. . . Time and time again we have seen the enemy form up for counterattack with infantry and armor in the late afternoon, and so far we have been able to stop these attacks with artillery fire. . .

Also the following incident described by a forward observer with the 936th Field Artillery Battalion serves well to indicate the effect of well directed fire on enemy forces forming for counterattack:

. . . The infantry reached the ridge line. We soon saw what looked like about 400 Germans forming for a counterattack. I had previously fired on a bridge, not much over and to the right. This had a concentration number. My data was "Concentration No. — is so much right, so much over." I was able to pass to fire for effect on the third round. The fire fell right in the middle of the Germans. We could hear hollering and saw pieces of clothing and arms and legs in the air. We saw only two Germans after that. . .

Another example of the effect of artillery fire on a German counterattack is recorded in a report of the 27th Armored Field Artillery Battalion on lessons from the Campaign:

. . . In one instance this battalion broke up a counter-attack force consisting of three companies. Two companies were in the assault and one in reserve. Prisoners taken

from the assault companies asserted that the reserve company could not get through the barrage and the assault companies did not dare retire through the fire. Caught between the artillery and infantry close-support weapons they had no choice but surrender. . . .

44. GENERAL TACTICAL LESSONS IN SUMMARY

The major tactical lessons of field artillery in the Italian Campaign cannot be properly called "new". For the most part they follow the general pattern of experience in Tunisia and Sicily, with change and variation because of the distinctive characteristics of the Campaign and the terrain over which it has been fought. In the more recent stages of the Campaign the stabilized situation in rugged mountain country resulted in some experience not heretofore gained in this Theater. The lessons were generally common to all units, varying to some extent with differences in caliber and organization. These lesson-experiences are summarized here for convenience in addition to more detailed specific treatment of individual subjects in succeeding separate paragraphs.

The outstanding lesson of the Campaign was the need and successful achievement of the greatest possible degree of flexibility in all phases of artillery combat. Much of the success of the artillery action has been the result of this flexibility in employment, control, fire direction, communication, and other elements in field operations. Common-sense, flexible operating procedure, designed to meet all the conditions and situations prevailing, has been the rule. Rigid adherence to set procedures has been avoided, and throughout the Campaign artillery technique has been so applied as to provide the maximum support of massed fire whenever and wherever needed by the infantry. Of all principles enunciated as a result of battle experience, this has been the foremost.

The familiar lesson of employment in mass, experienced in a far greater degree than in the actions in Tunisia and Sicily combined, was again one of the deciding factors in the successful artillery operations in Italy. As is brought out in a succeeding paragraph on

tactical employment (Cf. Paragraph 45b, infra), in no campaign in any theater of the present war thus far have our forces assembled in action so much fire power, both in numbers and caliber of guns.

Forward observation still remains the primary method of directing fire. Coupled with the principle of flexibility of employment, the results of this method of fire direction have been outstanding. The mountainous terrain, affording numerous observation posts in the forward areas, has been a contributing factor. Infantry observers as well as the organic artillery forward observers have continually adjusted the fire of both direct support units and reinforcing battalions with a high degree of efficiency and success. The flexible organization and employment of both organic and reinforcing units have enabled forward observers at any point to utilize the fire power of all battalions within supporting range.

The lessons of flexibility of employment and the maximum use of forward observation further disclosed the need of increased communication facilities and equipment. The marked success of mass employment involving these principles relied largely on the completeness and dependability of signal communications. Almost without exception the standard allowances of signal equipment have been only a bare minimum for operations of the nature and on the scale required by the Campaign, and practically all units have improvised supplementary facilities with captured, salvaged, and additional equipment obtained through field expedients. This condition has been especially true as the stabilized situation in mountain terrain has necessitated more and longer wire lines and relay radio stations to permit control and coordination of the large number of units involved.

Artillery operations in Italy brought out in greater relief a major lesson previously published in the lessons from the Sicilian Campaign, which is restated here for emphasis: "The necessity of the greatest degree of resourcefulness, determination, teamwork, and perseverance in the occupation of positions in terrain presenting extreme

difficulty." Although the requirement of speed occasioned by the pursuit action in Sicily was not present in Italy, the more difficult terrain that prevailed, with the formidable problem of mud and unfavorable weather conditions added, resulted in the same lesson on a far greater scale, especially in the case of the heavier caliber weapons such as the 8-inch howitzer and 155mm gun. Commanders again reiterated that the training of units for combat should emphasize occupation and displacement in the most difficult terrain possible.

The usefulness of air OP aircraft was again successfully demonstrated. Also, the limitations of this method of fire adjustment in high mountains, and the effects of weather and greater opposition from enemy fighter craft than heretofore experienced, were brought out in the Campaign. Air observation adjustment of long range guns by combat aircraft on a scale not before employed, has been conducted with satisfactory results on a number of occasions.

As may be expected in stabilized situations, counterbattery operations assumed increasing importance in Italy. In this connection the employment of observation battalions was greatly expanded, and the value of frequent and complete shell reports to assist the work of corps counterbattery sections was demonstrated throughout.

Two new artillery weapons, the 8-inch howitzer and the 4.5-inch gun, have been employed for the first time during the Campaign. Results with the former have been outstanding, and infantry commanders have been enthusiastic over the fire support it has rendered, especially in repelling counterattack. At the time of preparation of this memorandum, information on the performance of the 4.5 gun is limited, but present indications are that this weapon will prove to be a valuable addition to field artillery armament.

45. TACTICAL EMPLOYMENT

a. General

In general, standard principles of tactical employment were followed throughout the campaign, with some modification to

permit the greatest possible flexibility in fire power and control. Within the organic division artillery, the standard employment of three light battalions in direct support of their combat-team infantry, with the organic medium battalion in general support was adhered to. All reinforcing artillery was employed under corps control, commanded by the corps artillery brigade commanders and coordinated through the corps artillery officer. To facilitate command functions, reconnaissance, and communications within the corps brigades, groups of two and three battalions were organized and employed under group commanders, with the remaining corps battalions operating directly under the artillery brigade commanders.

Whenever the situation required, corps battalions were placed in direct support of divisions, and were subject to the priority missions called for by the divisions they thus directly supported. At the same time, when not occupied with such priority missions, these battalions so employed were also given missions by their parent brigade organizations. Within the corps brigades in Italy it was fairly common practice to place two reinforcing corps battalions in direct support of each infantry division. Experience in this type of employment has shown that the 155 MM howitzer is the best weapon for such direct support missions, and the 8-inch howitzer and 4.5 gun should not be so employed. The latter are better suited for general support of the corps sector.

The greatest degree of cooperation and coordination between the organic division artillery and the reinforcing units has been sought for and, for the most part, achieved. Employment well forward has been stressed, especially in the case of the reinforcing battalions of the corps brigades. The Commanding General, 18th Field Artillery Brigade declared in this connection that his battalions often went into position ahead of the division artillery, and that on one occasion

. . . When we went in the Germans had direct observation from ROTUNDA and other hill masses, and the battalions had to do some pretty fast and deep digging to avoid heavy casualties. Corps artillery to be effective must be aggressively used and must expect losses just like division artillery. . .

On the subject of employment, the Commander of the 71st Field Artillery Brigade also stated:

...Let's forget the term "Corps Artillery." I would rather be regarded as reinforcing artillery. Our missions are the same as those of division artillery. I try to get my battalions up just as far as I can to keep the Jerry artillery back. There is no sense, just because you have a long range gun, in putting it way back. Get it up where you can exploit its range. We have forward observers up with the forward battalions and use them the same as division artillery forward observers. . . .

For coordination of division and corps artillery fires on targets of opportunity, routine and night harassing and interdiction fires, the use of an X-X line delineating area responsibility for such fires has been adopted in order to prevent duplication of fire and waste of ammunition. The use of this line has not been rigid, and in no way has restricted the full use of reinforcing battalions on any mission warranting greater fire power than that available in the division artillery. It has been effective in preventing both division and corps artillery from firing on the same targets when one or the other could properly accomplish the mission.

The need of group headquarters within the corps artillery brigades has been felt throughout the campaign. Although all corps battalions have been employed directly under the brigade headquarters for fire direction and for the coordination of fire missions, the group commanders and their staffs have been invaluable in relieving the brigade commander of details of command, inspection, and other functions not directly connected with fire missions. The group headquarters have also been especially useful in conducting continual reconnaissance for positions, routes, and areas, and in this way have made possible far greater efficiency and flexibility in movement, displacement, and occupation of position. In many instances the group headquarters have also served effectively as an intermediate communications link, providing communications to the group battalions, thus relieving the brigades of additional line establishment and maintenance. When it is considered that the one corps brigade

contained at one time no less than thirteen battalions, and another brigade eleven, the value and need of these intermediate command headquarters becomes readily apparent. In several instances group headquarters were improvised through reorganization of former regimental headquarters and staffs after the break-up of regiments into separate battalions.

In the employment of large masses of reinforcing or corps artillery, experience in Italy has shown that the need still exists for a Corps Artillery Officer in addition to the Commander of the Corps Artillery. The coordinating activities and functions required of the former as a staff officer, and the command functions and responsibilities of the latter cannot be satisfactorily vested in one individual, at least under the conditions prevailing in the present campaign. In this connection the Major General commanding the 13th Field Artillery Brigade observed:

. . . There are many matters of detail and coordination which should be handled by the Corps Artillery Officer at Corps Headquarters, matters with which the Artillery Brigade Commander does not have time to bother. This is particularly important in making the plans for and in coordinating the plans for a complicated operation like the CAMINO-MAGGIORE attack. I believe our experience in the past 14 months shows that we should return to the old system which was used in World War I, which was taught at Sill. for 14 years, that there should be a Chief of Corps Artillery with appropriate rank who can coordinate all field artillery matters within the Corps. . .

b. Employment in Mass

The principle of employment of field artillery in mass has been followed in Italy to an extent never before equalled in any American campaign in the present war. In no theater of operations thus far has so large an array of metal been assembled by American troops and used in coordinated action on a single army front. In addition to the organic division artillery, the U.S. forces in Fifth Army have employed a total of more general support and reinforcing artillery of various types and calibers than was used in both the Tunisian and Sicilian Campaigns combined, exclusive of tank destroyers and tanks

also used in the role of artillery. Among these units were battalions of the 155mm M1 howitzer, 155mm gun units and several battalions of the new 8-inch howitzer. Other types included the 105mm self-propelled howitzer, and the new 4.5-inch gun. Observation battalions were also included in the total. The fire power thus available may be readily appreciated, and when it is considered that tank destroyers and tanks have also been employed as artillery because of the mountainous terrain and close country, the extent of mass employment in Italy is even more significant.

When used in coordinated action through prearranged plans and the flexible fire direction center system, the capabilities of massed fire from the available artillery exceeded all previous experience. The outstanding example of massing of fire occurred in the coordinated attack on the CAMINO-MAGGIORE hill mass. In this operation, which actually required a week's coordinated planning, all the artillery of the three corps of Fifth Army, including the British, were massed on this objective. More than 900 guns were employed in this action, and fired more than 3800 tons of ammunition in support of the attack.

c. Employment of Tank Destroyers in the Artillery Fire Net

The terrain in Italy being generally unsuited for large scale tank action, tank destroyers have been seldom used in their primary role after the advance entered the mountainous and close country inland. The fire power of these weapons in their secondary role as artillery has been fully recognized, and full advantage has been taken of every opportunity to strengthen further the light division artillery. Destroyer battalions have been normally attached to the infantry divisions. The common procedure in their employment as artillery has been to attach one company to each light artillery battalion. The coordination of their fire with the other divisional units has varied. In some cases the destroyers have been used as additional batteries and their fire has been conducted through the

artillery battalion fire direction centers. In other instances, the destroyer companies have organized and operated their own fire direction centers, and have been employed as additional battalions in the general division artillery fire net. The present trend is for the destroyer battalions after receiving training in fire direction methods, to operate their own fire direction centers. Survey of position has generally been conducted for the destroyer units by the survey parties of the division artillery. The destroyers have been used effectively for interdiction and harassing fires.

Experience with these units as artillery has proved their value and suitability for increasing the fire power of the division. In most cases the artillery methods were soon mastered by the destroyer personnel and their units fitted in readily with the fire net of the organic artillery. The Commanding General, 18th Field Artillery Brigade reported:

. . . We had twelve 3-inch (tank destroyer) guns at PACILLI. We put them in under our own fire direction centers. We ran an S-3 school for them and the whole thing worked out very well. The 894th Destroyer Battalion wanted to handle their own fire direction center. At first they didn't know how to work it, but they learned. . .

In the 45th Infantry Division, experience was thus briefly described by the Commander of the Division Artillery:

. . . We tried both methods of fire direction center procedure with the tank destroyers. Now they run their own. We trained them, or rather we put our own men in there to train them, so that they can now handle the job. We have found what we consider a good use for tank destroyers -- night harassing fire. They must register on an observed point from a plane or from an OP before we allow this. We consider this a good use for the tank destroyers because it exploits their long range, and the smaller stuff at night for harassing purposes can be almost as mean as the large calibers. . .

Similarly in the 34th Infantry Division, the Executive of the Division Artillery reported that tank destroyers were regularly used in the fire net. An exception was the 3rd Division, whose Artillery Executive stated that the attached destroyer battalion was habitually held under division control and was used separately on occasion for interdiction fire. (Note: Since the preparation of this

publication, reports indicate that this Division has also employed its attached destroyer battalion in the division artillery fire net.)

Experience and lessons on employment of tank destroyers, from the tank destroyer point of view, are given in Section VIII, infra.

d. Employment of Observation Battalions

Altogether three observation battalions were used throughout the Campaign. The results were generally satisfactory, though experience has again shown, as in Sicily, that the practice of taking flash and sound detachments from the battalions for service with the Divisions is not practicable. On this point the Commander of the 2nd Observation Battalion declared:

... Separate division detachments from sound and flash battalions do not work. Divisions do not know how to work these detachments, often tell them how to do instead of what to do, and the detachments themselves simply do not carry the personnel or equipment to do the job expected of them. . .

The standard system of sound base has been followed. Unit commanders as a result of experience recommend the use of long base for flash ranging. Standard counterbattery methods have been used throughout. Unusual accuracy has been obtained in using sky flashes by taking the center of the glow and accepting the location only when three or more rays give common intersection. General experience of one battalion was thus detailed by its Commander:

... In our present set-up, we have clung to the standard system -- the regular sound base. We still advocate long base flash spotting. . . As to short base flash ranging, the long base gets sky flashes at night which you cannot get with the short base. It is true that the short base may turn up more targets of opportunity, but these short base targets are the same ones that the air OP's will get, whereas the long base will get targets that nothing else will pick up, and will defeat defilade in a way that no other method can. . . We think our sound locations are pretty fair, but we can use sound dependably only about forty percent of the time. We locate targets about half and half, by sound and flash. . .

Unit commanders have remarked on the necessity for all forms of night training, and also training in forward-observer methods. Map reading at night, and other subjects required for efficient operations of small units at night have been shown to be highly

important in the training of flash and sound units. The importance of this was stressed by the Commander of the 2nd Observation Battalion:

. . .In moving into position we have never had occasion to move the battalion as a unit. We always bring it in by small increments. Therefore those who move these small elements at night should get training in map reading, following a route at night, and following a compass at night. Back in the States, we had "keg of beer parties." We would set out a keg of beer at night and give the men a compass azimuth only. Those who got there first got the beer. Men worked in parties of two or three. Map reading cannot be stressed too highly. . .

The same Commander also declared that "instruction in forward observer methods is vital for flash observation," and that "flash observers should be trained in night high burst methods so that they can assist in adjustment."

e. Employment of Pack Artillery

At the time of preparation of this publication, only one battery of pack artillery has been used in the true role of mountain artillery. One improvised battery of pack howitzers has been organized by the 36th Division and has been employed in normal support role under the medium battalion of the division artillery. In the 34th Division, pack howitzers have been used with the infantry similar to cannon companies. The one unit employed as mountain artillery has been the 3rd Provisional Pack Battery of the 3rd Infantry Division. This organization has been part of the 3rd Provisional Mounted Battalion, an improvised unit consisting of the aforementioned battery, a provisional mounted reconnaissance troop of 120 troopers operating much the same as an ordinary cavalry troop, and a provisional pack train of five mule platoons. In the pack battery, a provisional table of organization has been adopted consisting of 6 officers, 126 enlisted men, 4 horses and 80 mules. The unit is organized into four gun sections, a fifth section of 20 ammunition mules, and a two-mule machine gun section.

The pack battery has been employed directly under control of the Division Chief of Staff, or at times under the G-3. The officers have directed which elements of the division were to be supported by the pack unit, and generally the battery commander has reported to the

designated organization commander for instructions. The results in the mountain terrain have been highly satisfactory. Operational experience has been summed up as follows by the Battery Commander:

... We operate a battery fire direction center with an observed fire chart. Practically all our fires are observed. On very rare occasions we have done some night firing, at the request of the infantry, on targets adjusted on during the day. We have never had metro data. We have new graphical firing tables. We have fired some smoke and some time fire. We have had no ammunition trouble. We carry our ammunition as far as we can by truck, and then pack the rest of the way with our 20-mule fifth section. The average ammunition pack haul has been four miles. Our normal load is 180 rounds -- 20 mules with 9 rounds each, 4 to a side and one as top load, in a pinch, 3 on top. We use two aiming circles, and have no BC telescopes, as there is no use for them. We have four SCR 610 radios and one SCR 284 in the division command net. . .

The same officer also furnished additional details of operation and employment of interest to pack units not yet in action:

... We first went in near ROCCA ROMANA in a place inaccessible to the division artillery. We were supporting the reconnaissance troop which went in ahead of the rest of the division. Its mission was to determine the enemy strength in the town. I went with the troop as forward observer and strung W-130 wire right along behind as I went forward. When opposition was met the battery went into position at once about 4000 yards to the rear. I used telephone communication throughout. We figure on wire as the normal means of communication to forward observers. We use the radio only until the wire is in. We have had very poor luck with the SCR 610, which apparently cannot stand pack transportation. . .

We were in our last position seven days, and fired only three days because of the lack of visibility the other four. On those three days we fired about 1200 rounds, at about range 7000, most of it with Charge IV. Believe it or not, we have fired at what the map range showed to be 12000. Of course, we were high up on a mountain, firing out into the flat. . .

Forage has been a problem. We now get oats, and the mules are in good shape. We need a Phillips packmaster tool set and a complete saddler's kit. Also some small U.S. mule shoes, and horseshoe nails. These pack units that are coming over should certainly bring along some good American shoes and nails. . .

f. Employment of Roving Guns

Because of the limited position areas available and the stabilized situation that developed in Italy, roving guns have not been used to any extent by the division artillery. Among the larger

calibers of the reinforcing units, some roving guns have been employed on special occasions with satisfactory results.

g. Employment of the 8-inch Howitzer

Experience with the 8-inch howitzer, employed in combat for the first time in Italy, has been highly satisfactory. Thus far the battalions have been employed intact, under control of group headquarters. Both observed and unobserved fires have been used. Forward observers have been attached at all times to the advance infantry battalions, and wire has been the primary communication medium in the conduct of their missions. The use of wire for the long forward lines has necessitated continual maintenance, but it has been preferred to radio, which has been considered less satisfactory for the purpose in the difficult mountain terrain.

Occupation of position and displacement have presented great difficulties in many instances because of the terrain, poor roads, and mud. The average displacement of seven miles has generally required two full nights for a battalion, and in some cases three. The problems of mobility and traction in the terrain prevailing were thus discussed by the Commander of the 194th Field Artillery Group:

... We need the 7.5-ton Mack truck, with one trailer per battery carrying a TD-18 tractor plus a limber. If they could put a hoist on the rear of the TD-18 with some chain blocks, 5-ton weight - not 3-ton, that would be the answer. The M-4 tractor will not handle the 8-inch howitzer. In one of our mud fights, the M-4 with grousers could not budge it. We put in a TD-18 without grousers, and it pulled the howitzer right out. . . .

You should have seen us getting into the last position. It was one piece at a time, an M-4 and a TD-18 pulling in tandem and a Mack behind. Two cables pulling in front and one snubbing from behind to keep the piece from sliding down the slope. We've put rocks, sandbags, railroad ties, and everything else in the position to keep the piece from sinking out of sight in this mud. The way to get out is to dig around the trails and get the spades out. Then put a prime mover in front and pull the piece forward to where you can close the trail. . . .

Where the ground has permitted, battery fronts of 300 yards with about 100 yards in depth have been preferred.

The accuracy of this howitzer has been very satisfactory. It has been an excellent reinforcing and counterbattery weapon, and

because of its fire power and accuracy, infantry commanders have requested its close support, especially for breaking up enemy counter-attacks. The Commander of the 194th Field Artillery Group observed in this connection that

. . . We are very much satisfied with the accuracy of the weapon. The infantry has fallen in love with it and are even calling for close support fires in greater number than we are able to satisfy. . .

Likewise the Commanding General, 71st Field Artillery Brigade declared:

. . . We are sold on the 8-inch howitzer, and we have sold the infantry on the idea of close support from them because of their accuracy and fire power. The infantry now want to use them for close support and to repel counterattack. Of course, the 8-inch is not a close support weapon, and when they call for these fires we give them only a few rounds. . .

We can use plenty of white phosphorus for the 8-inch. We have also used time fire. It is hard to adjust, but it is quite accurate. We do not like to use it at long ranges because we get so many duds. The M67 fuze should have the percussion element in it. . .

In the 36th Infantry Division, the Artillery Commander also stated that "our doughboys are crazy about the 8-inch howitzer, and ask for it. I would really like to have some of them in my division artillery."

h. Employment of the 4.5-inch Gun

Although information from which conclusions can be drawn regarding the employment and performance of the new 4.5-inch gun is limited, available data indicate that this weapon will be satisfactory and valuable addition to artillery armament. Good results have been obtained at the average range of 14000 yards. These gun battalions have been pushed well forward in order to exploit their range, and in some instances have been employed in positions ahead of the division artillery. In one battalion it has been customary to have a corps observation battalion register the guns on a check-point or base point, a procedure that has proved to be exceptionally accurate and rapid. Such registration has usually been accomplished with an average of seven rounds in from 15 to 20 minutes.

As in the case of the 8-inch howitzer, forward observation

posts with telephone communication have been preferred to radio. In one battalion an average of 35 miles in the wire net was reported as common. The observer-target ranges varied widely with the existing situation. In one battalion the OT ranges averaged from 2000 to 1000 yards. One difficulty in observation has been the comparatively small size of the burst. The Artillery Officer, II Corps reported that it is doubtful if "the size is equal to that of the 105mm burst." Reports indicate that the smoke dissipates rapidly, and is thus difficult to observe unless immediately located. At OT ranges up to 5000 yards, the 4.5 burst has been reported fairly easy to observe, but difficulty in observation has been experienced at greater ranges.

The gun is reported to be accurate up to ranges of 14000 yards. One battalion fired a center of impact registration at 12000 yards with the aid of a flash detachment from an observation battalion, and of five rounds observed, two plotted at the same coordinates and the remainder were so close as to render impossible any distinguishing of individual shots. Other evidence of accuracy is apparent from a report of the Commander of the 939th Field Artillery Battalion:

. . . We are pleased with the accuracy of the gun. About a week ago we found a lot of observed targets on the road east of SAN BIAIO. We got six trucks and a volkswagon, one a prime mover with its weapon in tow. The observation post could see this particular piece of road which the Germans evidently thought was not under observation. We would keep the adjusted piece laid on the road, and when the observer saw a vehicle he would simply command "Fire No. 1." The German driver would leave his vehicle and get under cover and we would then precision adjust. I was surprised at the number of direct hits we got. . .

Battery fronts averaged from 150 to 300 yards, depending on terrain available. The difficulties of occupation and displacement already noted in the case of the 8-inch howitzer were also common to the 4.5 gun. Mud has been the chief obstacle. On this subject the Commander of the 935th Field Artillery Battalion reported:

. . . We have the Diamond-T prime mover. When it rains hard we are limited to hard ground positions, because the truck does sink into the mud. It is not that it lacks power, it's a matter of traction. It has taken us as much as five hours to get out of the mud. When we came into this position about a month ago we had a spell of good weather and the ground was

dry. Then it rained. We wanted to move a gun a thousand yards for a special fire. It took us six hours of constant winching. If we could have a towed tractor per battery it would be ideal. I would prefer the four-ton to the six-ton because it is much handier. . .

46. OPERATIONAL TECHNIQUE

a. Selection of Position

In the selection of positions in Italy, the primary consideration has been defilade. The other major considerations of range, routes for displacement and supply, accessibility, and cover have also influenced position selection to a large degree. Choice in area selection has been materially restricted because of the mountainous, close terrain, poor and limited roads, and as a result of the large amount of artillery employed. But within the limitations imposed by these factors, defilade has remained the first consideration in position selection. On this subject the Division Artillery Executive, 3rd Infantry Division stated that

. . . Cover is secondary to defilade. We get as close behind the infantry as we can wherever there is defilade. It may be 400 yards or it may be two miles. To pick a position, I go up to the infantry and start working back, looking for defilade. . .

In another division, the Commander of the 158th Field Artillery Battalion asserted from experience that "in the choice of position, defilade is the primary consideration, and then cover, if we can find it," and identical comment was made by the four battalion commanders of the 34th Division Artillery.

Although overhead cover to prevent air observation is always desirable, a number of battalion commanders strongly recommend avoidance of positions under cover of large trees. Such positions frequently convert shell fire into air bursts which will result in casualties even when personnel are in slit trenches. A battalion commander reported in this connection that he had placed one battery in position in the open, and the other two back under large trees. The one in the open received heavy shelling and suffered no casualties, whereas the two batteries in the tree-sheltered positions were lightly

shelled and received quite a few casualties from bursts in the trees.

b. Occupation of Position

As in previous experience in Sicily, occupation of position in the mountainous terrain in Italy has been almost invariably attended by extreme difficulty. Poor and limited roads, restricted position areas, and formidable terrain obstacles have been common throughout. The added element of deep mud prevailing over extended periods, not present in Sicily, severely hampered both occupation and displacement. Among all units there has been imposed the necessity for the highest degree of initiative, resourcefulness and teamwork to a level not before required, even in the Sicilian mountains. Some units have through necessity occupied positions that higher commanders at first thought impossible, and among all calibers, especially in the case of heavier howitzers and guns, ingenuity and effort have been severely taxed. The Commander of the 71st Field Artillery Brigade observed on one occasion that a battalion commander

. . . did a job once in getting those 8-inch howitzers into position that I thought could not be done. I just told him that he had to, and he got them in. They got in by winching, by bulldozer, by engineer assistance, and by manpower. . .

In some instances it has been necessary to obtain assistance from engineer units in order to occupy positions that had to be used, and the Artillery Commander of the 45th Infantry Division declared that without

. . . the unfailing cooperation of the Division Engineers, the artillery simply could not have gotten into some positions. . .

In the extremely difficult terrain and deep mud, the use of tractors in addition to the organic prime movers often became necessary. General opinion among a large number of battalion commanders recommends the use of one tractor per light divisional battalion, and one per medium divisional and corps battery. In the case of the 3-inch howitzer and 155mm gun, a tractor per battery has been considered a vital necessity. These supplemental tractors should be transported on trailers.

In the 3rd Infantry Division Artillery, the Executive Officer stated:

... We have had three TD-18's with us, and they have been worth their weight in gold. We got them from the 36th. We use them principally for the mediums, but they have many times saved the situation for the lights when the tractor only could pull the load. . .

Similar experience has been reported by the Commander of the 9th Field Artillery Battalion, who recommended that

... There should be one tractor per battery in a medium battalion, on a trailer, preferably. We have the TD-18 without the trailer. It has been an absolute life-saver. . .

Even with supplemental equipment, there were instances when the occupation of position exceeded all previous experience in overcoming difficulty. As an example of what the terrain and conditions in Italy could require, the Commanding General of the 18th Field Artillery Brigade reported:

... It took the 936th three days and two nights to move out of PICILLI and into their present position. Even the tractors got stuck. When the 937th moved, they were able to get only two howitzers into position the first night. They had to get the others off the road and under nets. They got six more in during the second night with their Diamond T's. It took the 10-ton bulldozer to get "C" Battery in on the third night. . .

As previously reported from experience in Sicily, combat operations in Italy have further shown that the older, formal procedure for occupation of position is impracticable for the type of fighting that has prevailed in the present campaign. Positions to be occupied are generally indicated on a map. The battalion commander then proceeds to the area, usually accompanied by his S-3, and makes the actual selection. The battery commanders are then called forward, generally one at a time, by radio. Brief, oral orders, often fragmentary in nature have been the rule. On this subject a Battalion Commander in the 3rd Infantry Division Artillery bluntly observed:

... The old-fashioned RSOP with a long winded order on a hill, and so forth, is all baloney. We just never do it that way. Out of the sixty times we have gone into position, I have given one such verbal order. The battalion commander goes ahead with his S-3, looks for positions in the area assigned, and then radio's back for his BC's. He shows them their positions on the map,

and the executive brings the battalion up when he can get road clearance. . .

With reference to training in occupation of position, a Battalion Commander of the 3rd Division Artillery recommended:

. . . There should be practice in occupation of difficult positions, the only kind we have over here. Time after time we have taken positions one would never have thought of in the States, positions that you look at at first and say, "that's impossible," but you end up by doing it. . .

c. Organization of Position

In the organization of position, there has been but little room for choice in the disposition of pieces. The cardinal rule has been to fit the pieces to the terrain available, and at the same time secure the maximum defilade and dispersion. One consideration as a result of rain and mud has been the location of ground that will support the weight of the piece. Whenever the situation permits, and the room is available, most battalion commanders have preferred positions organized with pieces disposed in an irregular "W" formation, or staggered line. Where possible, battery fronts of 250 yards, with pieces approximately 100 yards apart, and position depths of 75 to 100 yards, have been preferred. The ideal as preferred by the commanders, however, has seldom been attainable because of limited and restricted position areas, as well as difficult terrain. In the case of the 155mm gun positions, the Commander of the 36th Field Artillery recommended that

. . . Guns should be spotted so that one plane in the course of flight cannot fly in a straight line over more than two sections. . .

In an armored field artillery group, the Commander expressed preference for a semicircular disposition of pieces whenever possible:

. . . We are using a hexagonal formation or an inverted "U". The executive is in the center, no piece closer than 100 yards to him or to each other, and the depth of the battery position is about 200 yards - these are six-gun batteries. . .

Regardless of preferences, the cardinal rule of fitting position to the terrain available was the main lesson. The Commander of the 9th Field Artillery Battalion reported:

. . . Spotting of guns must fit the terrain. I have had

batteries on a front of 250 to 400 yards, once even 500 yards. Another time I had all twelve guns on a front of 600 yards, though staggered. If I have room, which I seldom have, I certainly prefer dispersion up to 500 yards, . . .

In the 185th Field Artillery Battalion, similar experience was briefly given by its Commander:

. . . You just take what you can get. Sure we like the diamond, or "W", some depth, but you must fit the terrain. Defilade is what I am after, then I consider the spotting of the pieces. . .

Provision for the protection of personnel has varied with terrain and individual preference. The slit trench is generally believed to be more desirable because of the speed and ease with which it can be dug, and also because it provides sheltered sleeping space. Where the terrain permits, it has been common practice to dig shelters into the sides of reverse slopes and terraces. Practice in the 3rd Division Artillery was described by a Battalion Commander:

. . . Our men have gone in more and more for the German-type foxholes on the side of a hill. They dig in and down, and put logs on top. Or they cover a normal foxhole with logs, leaving a hole just big enough to get through. Some of these are pretty elaborate. . . In service practice in the U.S., emphasize improving the position while firing. Give instruction in improvising wheel mats and logs that will work in the mud. . .

Advantages of the slit trench over the barrel-type foxhole were also pointed out by the Commander of the 158th Field Artillery Battalion:

. . . We have found that the bulk of our casualties occur at night. A man can sleep in a slit trench, but not in a foxhole. I order all men to sleep under cover. We dig our guns partially in, and use parapets also. If we can't get sandbags, we fill empty cartridge boxes with sand and dirt. . .

d. Selection and Organization of CP's and FDC's

In the general selection of positions, command posts and fire direction centers have been secondary to gun positions. It has been customary for battalion commanders to select first the gun positions, and then seek suitable locations for the command post and fire direction center. Facility of control, cover and concealment, and reasonable proximity to the command post of the supported unit

have been the chief considerations in the selection of command post positions. In the artillery of all divisions the commanders have insisted that battalion command posts be within effective controlling distance of the batteries because of difficulty in maintaining communications.

In the 3rd, 34th, and 36th Divisions, it is standard practice to keep the fire direction center separated at some distance from the battalion command post. The distance between the two depends on cover, terrain, and other factors. As in the organization of gun positions, no standard rule can be followed. The installations must be fitted to the requirements of the ground and the situation. On this point the Executive Officer, 3rd Division Artillery reported:

... The fire direction centers are always separated from the battalion command posts from 200 yards to half a mile. We keep a duplicate firing chart at the command post. We have what we call a "snoot 'phone" at the command post. A recorder sits at the 'phone and listens in on all missions and keeps the chart posted. The command post (S-2) and the fire direction center (S-3) are always separated so the whole thing cannot be blown up at once. . .

In the 45th Division, different procedure is followed. The command post and fire direction center are located together, but with a sandbag partition between the two elements of the installation. Among the corps artillery battalions command posts and fire direction centers are generally together when positions are occupied in areas well in the rear. When the corps battalions are pushed well forward, the two installations are kept separate.

Many varying locations have been used for command posts and fire direction centers in Italy. Quarries, caves, thick-walled houses, and sheltered sites behind steep banks have all been effectively utilized. When none of these have been available, the fire direction center is then dug in preferably to a depth of four or five feet if the soil permits, and the spoil placed in sandbags so that the sites can be revetted to a height of several feet. The use of trucks for command posts and fire direction centers has been avoided unless the truck can be sited under a very steep high bank giving adequate protection.

e. Night Operations

As in Sicily, the importance of well conducted night operations of all types was again brought out in Italy. In country which afforded the enemy commanding observation of roads and routes, the necessity for night displacement, movements, and occupation of position under darkness is readily apparent. The Commander of the 41st Field Artillery Battalion remarked that

. . . Nearly always occupation of position is at night. This should be stressed in instruction in the United States, that is, under battle conditions, with dummy mines to be avoided, and absolutely without lights, not even the little blue blackout lights. . .

Proficiency in service of the piece at night, without the aid of lights, was also an important lesson. As the situation became more stabilized, units delivered an increasing amount of night harassing and interdiction fire, as well as other night missions, and the need for crews well trained in night firing was clearly demonstrated.

The narrow, mountain roads, often dangerous with mud and sharp hairpin turns also brought out the importance of night driving. Individual driver proficiency at night, control of night movements, including the employment of guides and markers, were stressed by a number of commanders. The Commanding General, 18th Field Artillery Brigade recommended increased training in night driving for units in the United States, and advocated that this include special training for assistant drivers. In this connection he pointed out:

. . . In night driving, the average driver, with his left-hand drive, is inclined to keep to the left because he can see the left side of the road. In training in the United States, there should be more night driving, with insistence that the assistant driver be made responsible for keeping the truck on the right half of the road by advising the driver how far to the right he can safely drive. The tendency of the average assistant driver is to fold his hands and go to sleep. . .

Other commanders stressed the necessity of all forms of night training.

One Battalion Commander of the 3rd Division Artillery declared:

. . . Stress night survey. If they can do it at night they can do it at any time. Night problems must be conducted with no light, and I mean no light whatsoever.

Training should be given in the selection and occupation of observation posts at night, and in getting wire to them in the dark. . .

And another Battalion Commander with reference to the importance of night tactical problems in artillery training stated:

. . . Stop thinking that you have had a night problem when you go out for one night. Units should stay out several nights, find out how to read a map with a dim flashlight, huddled under a raincoat so that no light will show. They should also do some of the old-fashioned doughboy night compass marching, and some night survey. . .

f. Reconnaissance

The necessity for thorough and continual reconnaissance was demonstrated throughout the campaign. Constant advance reconnaissance of areas, positions, observation posts, and routes of communication, displacement and supply, became a standard practice. Night reconnaissance in forward areas was often hampered by mines. In many units it was common practice to conduct reconnaissance for new positions during daylight, and effect the displacement after dark. In many instances it was customary to reconnoiter areas still occupied by infantry in order to have position locations spotted for occupation as soon as the situation should require. Officers of group headquarters were especially useful in carrying on the work of continuous reconnaissance, and thus often relieved the brigade and battalion commanders for other duties. No "new" lessons in reconnaissance were gained from the Campaign. Experience again reemphasized the principle that artillery reconnaissance must be a never-ending, continuous process in all echelons.

g. Local Security and Antitank Defense

The threat to artillery positions from hostile armor has been far less in Italy than had been experienced in Tunisia. Opinion as a result of experience in the present campaign is divided with respect to the need of the antitank platoon within the artillery battalion, at least in the type of country and fighting that has prevailed. A number of commanders have stated that their artillery pieces are the best anti-tank weapon, and provision for antitank action is always made in the organization of positions. In one division this belief has been

strengthened by the fact that one of its battalions successfully defended its position against armored attack and destroyed seven enemy tanks with its 105mm howitzers. Although a number of units have turned in their antitank guns, a majority of commanders favor retaining the 57mm gun for organic antimechanized defense. On this point, the Commanding General, 18th Field Artillery Brigade declared:

. . .As we move further forward, we are going to get into what the British call "tankable country." I favor retaining the battalion antitank platoons and recommend they be equipped with 57's. . .

Standard provisions for local security have been followed in the organization of positions. Perimeter defense has been the guiding principle, and antitank rocket launchers have been disposed in pairs at critical points of observation and approach. The rocket launcher crews have served as warning sentries in the scheme of perimeter defense.

h. Movements in Forward Areas

Experience in the difficult mountain terrain and under bad weather conditions has shown that artillery movement in forward areas should be by infiltration of small groups of vehicles and weapons, or in some cases, by single vehicle. The Commander of the 18th Field Artillery Brigade has stated in a report on lessons from the Campaign:

. . .In bad weather, movements in forward areas must be by infiltration. Attempts to move by convoy, with narrow bridges, muddy roads, and bad turnoffs, will inevitably result in traffic jams and casualties. . .

47. GUNNERY

a. Principles and Technique

The Campaign in Italy brought out with greater emphasis than before the soundness of gunnery principles and technique as prescribed in the Field Artillery School and in standard training literature. The fire direction center again provided a measure of control, direction, and flexibility unsurpassed in any previous campaign.

b. Flexibility and Massing of Fires

Artillery operations in Italy have been characterized by the use of mass fire. Effective, flexible control has been maintained throughout by fire direction centers of battalions, and fire control centers of brigades, and divisions. The massing of fires up to seven battalions after the adjustment of observed fire by one battalion or by one forward observer has become routine when targets have warranted much density. Forward observers have been trained to call for and adjust the fire of battalions other than their own, and the maintenance of flexible, complete communications has permitted the rapid massing of all units within range whenever the situation has required. As mentioned in Paragraph 45b, supra, the outstanding example of coordinated mass fire occurred in the CAMINO-MAGGIORE attack, in which the fire of all guns in three corps, totalling more than 900 pieces, was massed on this objective.

The massing of fire from all artillery within a corps, commonly called SERENADE in II Corps and BINGO in VI Corps, has not been unusual. The effect of such fire has been outstanding in the taking of formidable objectives, and the Artillery Commander of the 36th Division made the following comment:

... Another type of fire is SERENADE. It is effective, and comes down at irregular intervals, every piece, heavy and light. As a result (of this mass fire) CAMINO was captured quickly. This mass of fire was needed. SERENADE has surprise, mass, and density. Drop it two or three times on a bunch of Germans and they'll surrender. . .

c. Forward Observation

As in previous campaigns, forward observation continued to be the principal means of adjusting fire in Italy. In periods of good weather with fair visibility, fires directed by this method in the American units of Fifth Army have often averaged more than 85% of all missions fired. This average naturally fluctuated with conditions of visibility and observation, but even in periods of rain and low visibility observed fires often averaged above 60% of the total.

The main lessons of the Campaign with regard to forward observation have been the value of flexibility, cooperation among observers,

and the necessity for proficiency in the use of maps and target designation by map. When a forward observer reports a target, standard practice has been for the controlling agency to use the battalion or battalions which offer the best possibility for effective fire. As a result the average forward observer may expect to adjust his own battalion less than half the time. Division artillery observers frequently adjust corps artillery battalions, and vice versa. This flexible practice has made target designation by map an almost invariable necessity, and accordingly all observers must be trained in the use of maps, especially for this purpose. Full cooperation among the observers has proved most effective in the delivery of fire. On one occasion an observer had completed his adjustment and was about to go into fire for effect when the target was obscured by a cloud. An observer on an adjacent hill advised that he could see the target, and reported on the fire for effect, thus virtually continuing the mission.

Flexibility in adjustment by forward observation as achieved in the Campaign is well illustrated in the comments of the S-3, 3rd Division Artillery:

... We keep out three forward observers per direct support battalion, and at times, three for the general support. Our forward observers have adjusted corps battalions and theirs have adjusted ours. Our battalions have been adjusted by Infantry forward observers as many as fourteen missions in one day. Some missions were observed and adjusted by Infantry corporals. We had one started by a private of the 7th Infantry on the left flank of the division. The communication was thus: from the private to his company switchboard by voice, there relayed to the infantry battalion, and then to the infantry regiment. The direct support battalion was out of range, so the mission went to the division artillery switchboard, and then by SCR 193 to the corps fire control center. They passed it on to a 155mm corps gun battalion. The mission took an hour and twenty minutes, and it got the results. . .

The necessity for thorough training of forward observers in target designation by map, especially in foreign maps of 1:50000 scale with ranges in meters, was stressed by all commanders. The Commanding General, 18th Field Artillery Brigade recommended:

... By all means, in training in the U. S., forward observers should be taught to use maps. Never let them go without a map, and make them keep themselves located on

the map as they move. All targets should be designated by coordinates, because you cannot tell which battalion will fire on a particular target. If the observer senses from a base point or reference point, unnecessary delay may result while his own FDC converts the sensing to coordinates. Therefore, a majority of the time the base point shift is not applicable. . . .

Similarly the Commander of the 158th Field Artillery Battalion reported as a result of experience:

. . . Forward observers frequently fire other battalions than their own, including corps artillery. Therefore, the target must be designated by coordinates. Forward observers must be trained in maps, and know how to call for fire on a target by map. We have had new officers who were dangerous because they could not use maps - their map training has been deficient, also their training in reading photos. . . .

The need of more thorough training in maps was also emphasized in a report of the Commander of the 9th Field Artillery Battalion:

. . . Map reading should be improved, and this applies to officers more than to enlisted men. That is one thing the OCS has not produced, and it is a subject to which they should give more attention. That is the only deficiency our officers have had that could have been remedied before they come to us. They should be trained to work with the 1:50000 map and with meters. . . .

d. Normal Barrages

Normal barrages have been habitually prepared whenever the situation has reverted to the defensive, or whenever there has been a pause in the infantry operations for reorganization. Standard procedure as prescribed in TM 6-40 has been followed without variation. On this point the Executive Officer, 3rd Division Artillery made brief comment:

. . . We prepare normal barrages for the lights about 200 to 400 yards in front of the infantry. You cannot improve on the standard technique as taught. . . .

e. Rolling Barrages and Moving Concentrations

Experience has shown that the firing of successive standard concentrations is generally preferred to the true normal barrage, and has been found to produce the same general effects. The true rolling barrage, however, has been fired on several occasions, and has been considered useful as cover for river crossing operations. One specific example of such fire was the rolling barrage laid down ahead of the 34th Infantry Division during the crossing of the VOLTURNO River southeast of

VENAFRO. The barrage was begun on the far bank of the river, and was held there in such a manner as to mark physically the line of departure for the infantry who advanced to the river in the dark. It provided effective cover in the night crossing.

f. Time Fire

The adjustment of time fire in the mountainous terrain, especially under conditions of bad weather and poor visibility has been difficult. Its deadly effect, however, has been fully recognized and it has been used throughout the Campaign whenever conditions have permitted its observation. It has been considered especially effective when mixed with white phosphorus and percussion high explosive. The Commander of the 71st Field Artillery Brigade commented on the effectiveness of time fire when conditions permitted adjustment, but also pointed out the difficulties of adjustment in the prevailing terrain and weather, and the fact that at long ranges, the proportion of duds was high. In the 3rd Division Artillery, the Commander stated that during one period his battalions were firing approximately 20% of all observed missions with time fire.

g. Unobserved Fire

As the general situation on the front became more stabilized, the use of unobserved fire became more important and prevalent. A large proportion of the unobserved missions comprised night harassing and interdiction fire. The Campaign demonstrated clearly that the extensive use of observed fire methods, especially forward observation, has not diminished the importance and value of unobserved methods, nor the necessity for sound training in them. The prolonged periods of bad weather which cut down observation and visibility also rendered unobserved methods increasingly important. The Executive Officer, 3rd Division Artillery, declared:

. . . We have fired recently a lot of unobserved fire, mostly interdiction, and always with map data corrected, using metro. Because of weather conditions, in recent weeks the majority of fire has been unobserved, except for the 41st F.A. Battalion, which has had beautiful observation. . .

h. Firing Charts and Graphical Firing Tables

All battalions have used a firing chart and the graphical firing tables in conjunction with the chart. The charts in common use are not true observed fire charts as defined in TM 6-40. Actually they are supplements to the universally used 1:50000 map. Base and check points are plotted on the chart, together with observed concentrations and such call or scheduled fires as are likely to be asked for by the Infantry. The grid system on the 1:50000 map is used on the chart. Usually the K is stripped and the target is plotted from stripped data. When the target is likely to be fired on again in a short time, stripping and replotting may be accomplished later in the day.

In many units, firing charts were also maintained by the individual batteries. This was universally true of all batteries in the 3rd Division Artillery, in which all commanders regarded such practice as a necessity to insure continued effective fire in the event communication between the battalion fire direction center and the batteries should be cut. The Artillery Executive of this Division declared that

. . . The batteries must be able to run their own fire direction centers when the wire to the battalion is out. The batteries keep their own firing charts. The computer sends down the adjusted data and the scout corporal keeps the chart. When necessary, the battery executive acts as S-3 and the scout corporal is the HCO and VCO. We needed a battery fire direction center one time only, but we needed it badly then, and it worked. . .

Standard and improvised graphical firing tables have been used throughout, and have been in universal demand. The new tables have been distributed to a number of units. They have been highly satisfactory in the light battalions. In the 4.5-inch gun battalion, the tables contain an error in K, and in one medium howitzer battalion it was reported that the new table does not provide data for ranges above 15000 yards. In the main, the graphical firing table has been proved to be a most valuable asset in the rapid delivery of accurate fire. It has contributed much to the efficiency of the fire direction center system.

i. Counterbattery

Counterbattery missions assumed a role of increasing

importance throughout the Campaign. As the situation became more and more stabilized the need for effective neutralization and silencing of enemy artillery increased, and with the large amount of corps and long range artillery available, counterbattery action was effectively carried out. In this connection the Commanding General, 71st Field Artillery Brigade, observed:

. . . We feel that good aggressive counterbattery is the best protection. The Corps Counterbattery Section is right here with us. It has wire lines direct to many of the battalions. Counterbattery is the thing with which we put our plans into effect. The counterbattery locations are the result of many inferences, information from flank observation posts, flash and sound when suitable, shell reports, and photo study. . .

The need for the 8-inch howitzer and 4.5-inch gun as counterbattery weapons, pointed out in the lessons of the Sicilian Campaign, was met in Italy, and these weapons have been effective for the purpose. It has been customary for the Corps Counterbattery Section to be located close to the command post of the reinforcing corps brigade, and as indicated in the above quoted comment, to maintain close communication with the corps battalions. The value of shell reports as an aid in identifying the nature of enemy batteries was clearly disclosed. Close coordination between the observation battalions, forward observers, counterbattery sections, and reinforcing battalions all served to make the counterbattery missions effective.

j. Time on Target (TOT)

The practice of massing fire on a target and allowing for time of flight so as to cause all rounds to reach the target simultaneously, has been highly satisfactory. This procedure has been conducted as follows: After a battalion has fired an observed mission on a target that warrants special attention, a number of battalions may then be massed on the target. The watches of all battalion S-3's are synchronized, and the time for the fire is announced. Allowance for time of flight is made so that all projectiles will arrive at the target at the same time. Such procedure is generally referred to as a "TOT of so many battalions," and is applicable to scheduled fires

as well as call missions. The S-3, 45th Division Artillery reported:

. . . We had a lot of massing of fires in our last two weeks in the lines. We had seven battalions, our four and the three of the 178th Group. . . We are sold on the TOT procedure. We allow for time of flight so that they all come down together. We synchronize the time and all battalion S-3's wear split-second watches. . .

Concentrations delivered with TOT procedure have been especially effective in producing large numbers of casualties. The element of surprise as a result of the timing gives no opportunity for the enemy to escape the full density and mass of the simultaneous impact of fire.

k. Survey Methods and Technique

Artillery survey in Italy has been generally confined to position areas. Very little survey of target areas has been conducted. No new lessons or improvements in survey method and technique have resulted from the campaign. Practically all commanders stressed the necessity of sound training in all methods of survey, with emphasis on simplicity of method and speed in execution. Night survey training has been emphasized in the recommendations of all commanders. It has been particularly noted in their comments that although target area survey has not been necessary to any great degree in Italy, it should not be neglected in training. On this subject the Commanding General, 71st Field Artillery Brigade declared:

. . . Just because we haven't used much target area survey -- we have used some -- there is no reason to slack up on it in training. It is extremely important and must be taught. You must check on the time, get your survey in fast, as in this country you never know when clouds or fog will obscure the view so that you have to pass suddenly from observed to unobserved fire. . .

Cooperation between the division artillery survey parties and the corps observation battalions has been highly satisfactory. It has been customary for the observation battalion to provide place marks for the division survey sections as points of origin for division survey. Within the corps, a most satisfactory measure of cooperation has been developed between the survey elements of the corps engineers and the survey parties of the observation battalions. This has been especially effective in joint operations in running survey from accurately located

place marks on high mountains, which has necessitated much labor and long traverses.

48. ARTILLERY AIR OP

The utility of artillery observation aircraft in Italy has been outstanding. Although the high mountains have to some extent limited the operations of these craft, at the same time they have frequently been indispensable as the only means of obtaining observation. Despite the unfavorable weather conditions that have often prevailed, the results obtained over long periods have been exceptionally satisfactory.

Experience in Italy has shown that the best results, especially for spotting enemy batteries, have been obtained during flights at dawn and at dusk. Observers have reported that gunflashes are more readily detected at these periods, and at the same time the uncertain light affords a greater measure of protection for the observing craft. It has been reported also that days during which ground haze prevails are better for observation of hostile battery positions than those which are bright and clear. Muzzle flashes show up more sharply in ground haze than in bright, unobscured sunlight. Artillery air officers have not recommended special training in night landing, but strongly advocate thorough instruction in landings in late dusk, since it is advisable to fly many missions at this time.

Another practice which has proved exceptionally effective has been the conduct of air adjustment at night in periods of bright moonlight. This method of operation has been productive of excellent results on a number of occasions. Such missions have been possible only where the landing fields have permitted reasonably safe take-off and landing at night. The scarcity of such fields has limited the possibilities of night adjustment, which could otherwise have been exploited more fully.

The average number of missions flown by individual observers in one day has been two. Five missions in one day has been considered

a high figure. Missions generally require slightly more than an hour, and one flight of five hours during which four missions were fired has been recorded. The principal targets adjusted on by air observation have been enemy batteries, although area targets, troop concentrations, and vehicles have also been attacked in this manner. Dependence on artillery observation aircraft for observed fire has varied with the terrain, weather, and the existing situation. Some commanders have declared that these aircraft have been positively indispensable, and during periods of favorable weather and good visibility, an exceptionally high percentage of observed missions have been conducted by air adjustment. In late November, 1943, the Air Officer, 18th Field Artillery Brigade, reported that

. . . In the last three weeks more than 90% of all observed missions have been conducted by Cub observers, and of these a high percentage was also originally located by these same planes. In the course of one day, a single plane has spotted twenty guns. . .

In periods of bad weather and poor visibility, however, the number of air missions has been materially reduced. In January, 1944, the highest percentage of observed missions conducted by air observation in the 71st Field Artillery Brigade was 24%, and during the first week of that month the figure was less than 3%.

Enemy efforts to interrupt the operations of the artillery planes and destroy them by attack with fighter craft have been far greater than in any previous campaign. This effort has increased noticeably during the latter part of the Campaign, and may be taken as a clear indication of the effective results of our fire directed by these observation planes. One method of attack not previously encountered has been noted on several occasions. One fighter plane will attack the observer from above, while a cooperating fighter remains at a lower altitude to attack the observer as he descends to evade the first attacker. This system of enemy attack has been successfully used against our observers several times. The enemy's determined effort to drive the artillery observers from the air was the subject of a report by a Brigade Air

Officer in November, 1943:

. . .Until recently we flew our cub planes well out over the German rifle lines with comparative safety and with unexpected immunity. However, since about the middle of October, the picture is somewhat changed. We have received word from the Fifth Army G-2 that the Luftwaffe has as a recent prime mission the knocking down of our cubs. Their actions have borne out this statement fully. I know of a number, at least five, who have been attacked successfully in the last month. . .

Standard evasive tactics and descent to low altitudes have been followed in avoiding these increasing attacks, and in addition, both VI and II Corps have established what are called "island of safety" in forward areas for the protection of artillery observation planes. These consist of definitely located areas known to all air OP pilots, which are strongly protected by antiaircraft fire, including half-track antiaircraft weapons. The primary mission of the antiaircraft units defending these areas is to fire on enemy planes which are attacking artillery OP aircraft. All observer pilots have been instructed when attacked to proceed to the area over these "islands of safety." It is reported that in the first two days of operation of these safety areas, observation planes have taken refuge over them some ten times, and that one ME 109 has been destroyed and another probably destroyed by the antiaircraft fire from units defending the areas.

It has been clearly shown throughout the Campaign that the extent of artillery air observation over the enemy lines, and the duration of flight missions that can be safely conducted, varies in exact ratio to the enemy air effort to destroy the observation planes. As the hostile attacks on the observers increase, conduct of flights over hostile positions must be accordingly restricted. Thus far, the losses in observation planes have been acceptable in the light of results accomplished and the number of planes available.

The Campaign has shown that thorough precautions must be taken to prevent destruction and damage to the observation aircraft by sudden storms and gales when the craft are on the ground. On January 1, 1944, a sudden and violent gale, approaching a 50-mile wind velocity severely

damaged a large number of these aircraft on their landing fields. As a result of this experience, the Artillery Officer, Fifth Army, has recommended that in case of sudden gale when there is not available shelter, such as buildings behind which to anchor the planes, some protection can be obtained by assembling a wall of trucks on the windward side of the planes for shelter. Other precautionary measures as a result of this incident were recommended by the Artillery Officer, II Corps:

. . . Experience derived from that occasion (the gale of 1 January) proved the effectiveness of several precautionary measures. Planes placed at an angle to or broadside to the direction of the wind fared better than those headed or tailed directly into the wind. Digging in wheels reduces the angle of attack and lifting forces of the wind. A truck or other windbreaking obstacle placed on the windward side of the plane is also effective. . . .

49. COMMUNICATION

The difficulties in establishment and maintenance of communication in the rugged mountain terrain noted in the infantry experience were also present in the artillery operations, though to somewhat lesser extent. The outstanding lesson has been the necessity for highly flexible complete communications nets in order to permit the required degree of flexibility in control and direction of fire. Experience has shown that the maintenance of these flexible communications has required more signal equipment and facilities than the standard allowance. This point was stressed in a report of lessons from the 18th Field Artillery Brigade, in which the Commander stated:

. . . The normal wire communication system prescribed in training literature is a minimum requirement. It must be reinforced by laterals, double trunks, and lines to neighboring units, regardless of the type of units concerned. There cannot be too many wire channels to subordinate, higher, and supported units. Shell fire, traffic, and unforeseen causes make a reinforced wire communication system essential. . . .

Within the division artillery it has been common practice to lay two lines from the battalion fire direction center to each battery. The establishment of lateral lines between batteries has also been almost universal procedure. Whenever possible, every effort has been made to have two channels of communication to observation posts,

especially to such observation posts which locate a large number of targets. Experience has taught that speed in the laying of wire must be sacrificed to careful maintenance and servicing. A Brigade Commander pointed out that "broken lines, no matter how rapidly they are laid are often no better than no line at all." The difficulties previously experienced in rough country with the light W-130 wire were again present in Italy. This wire proved to be too flimsy and easily damaged, and was often unreliable. The Artillery Commander, 34th Infantry Division declared that

. . . To attempt to replace to any extent our W-110 wire with W-130 will be a great mistake. The W-130 simply will not stand up under any kind of traffic, and even when it is laid over an area where there is no traffic at all, it rapidly deteriorates, especially in rainy weather, and must be replaced with W-110. . .

In the more stabilized situations, wire is laid to all observation posts, including these for the forward observers, and wire is considered the primary means of communication, supplemented by radio.

On the whole, radio communication has been satisfactory. The use of radio relay, and flexibility of radio communication to provide for the highest degree of speed and efficiency in the delivery of fire, have been stressed. In the 18th Field Artillery Brigade, a common channel is used by all forward observers to insure this required flexibility. On this point the Commander of that Brigade reported:

. . . There must be a common channel of radio communication between all observation posts and all battalion fire direction centers within a brigade or group. Without this common channel, fire direction centers and wire lines become congested with relayed missions. It is perfectly normal for an observer to fire a battalion not his own. This is especially true of air observers. . .

The long periods of wet weather caused considerable trouble in radio communication, and many commanders recommended that better means of waterproofing the sets for operation under wet conditions should be developed. The SCR 300 appeared to be the only set with which no trouble from dampness has been encountered.

The necessity for constant, all-day and all-night operation was clearly disclosed throughout the campaign. A Brigade Commander thus commented in a report on combat experience:

. . .Radio communication must be maintained on a 24-hour basis, even though traffic may be light. Emergencies when reliable radio communication is necessary arise frequently. A shell near a switchboard can destroy all wire communication. A constantly available channel of radio communication provides good insurance. . .

Communication experience with the observation aircraft again showed the need for a longer range set than that now employed. In the artillery of the 3rd Infantry Division, the SCR 300 has been tried, and has proved to be highly satisfactory. In the 71st Field Artillery Brigade, the Commander gave the following experience in connection with radio and the air OP:

. . .Originally for the Cub planes, we had the Army "A" channel and battalion channels. We now use brigade and battalion channels. This works much better, because with our base set on the Army "A" channel, we can get the division artillery direct. Formerly the Army "A" channel had everyone on it, and transmissions were cluttered. Now the plane on the brigade channel can be shifted to its own battalion channel in cases where many missions are going on. . .

50. MISCELLANEOUS

a. Nearly all battalion commanders recommend the allotment of a limited number of packboards to artillery units for use in supplying observation posts in mountainous country.

b. The value of the Army Ground Force Tests has been recognized by all commanders. One Brigade Commander declared that there has been "nothing more valuable for training" than these tests, and another Brigade Commander likewise stated that they were one of "the best things ever devised."

c. Colored smoke for marking targets and facilitating adjustment has been tried with satisfactory results. A number of Division Artillery Commanders have recommended the supply of colored smoke for the 105mm howitzer. Issue on the basis of about 2% of a unit of fire has been suggested. Preferences as to color are red, violet, and green,

in the order indicated. Yellow smoke is not desired, as it is said to resemble the appearance of mustard gas, and may also be confused with withered vegetation and grass.

d. The dissemination of leaflets by artillery projectile has been increased. Officers from the Psychological Warfare Branch have reported that results have been satisfactory with the 105mm projectile, and numerous deserters have come into the lines with the leaflets.

e. It is reported that worn rims of steel helmets produce a strong visible glitter or glint in the sun, and may give away the location of observation posts. It has been recommended that helmet rims worn bright in this fashion be painted or covered with mud or cloth.

f. The use of dynamite charges in unoccupied areas for the purpose of simulating artillery fire to divert enemy fire on dummy positions has been tried and the results have often been satisfactory. This procedure has served to draw fire away from real positions, and also aids in discovering the location of German artillery and mortar positions by drawing their fire.

SECTION VII : ARMORED UNITS

51. GENERAL

Mountain terrain and close country in Italy have greatly limited the employment of armored units. A major lesson from the Campaign has been the necessity of fitting the tactical employment of armor to the prevailing ground and existing conditions. Tanks have been profitably and effectively used despite the terrain limitations, although their employment has not followed the broad concept of armored action. Experience has shown that the individual situation and terrain must determine the course of effective tank operations. In Tunisia, especially in the open country of the southern sectors, the major lesson was the failure to use the armored division in

sufficient strength or in concentrated mass. In Sicily, though concentrated mass action was precluded by the terrain, the nature of the campaign made speed and pursuit outstanding elements of the lesson-experience. In Italy, neither of these principles could be applied. The close, mountainous country has permitted neither speed, nor pursuit, nor mass action. Tank employment has been confined to the action of small units, in secondary roles, and on special missions. From the experience of these three campaigns, the broad lesson remains that in the employment of armored units, flexibility based on sound general principles is as applicable in the same degree as to any other arm.

52. COOPERATIVE ACTION WITH ELEMENTS OF THE INFANTRY DIVISION

Of outstanding importance in Italy was the need of cooperative action between tank units and elements of the infantry division, as distinguished from the normal action of tanks and armored infantry within the armored division. The deficiencies of infantry training in cooperation with tanks, above noted in Paragraph 38, were also present in the separate tank battalions which operated in support of infantry divisions. Commanders of both arms repeatedly pointed out the need of joint training before units enter combat, and recommended such training for units that will fight together. This subject was stressed in a report of the Commander of the 753rd Tank Battalion early in January:

. . . Tank battalions should train with the divisions to which they are attached. We found that if we were with the same division for some time, we soon got to know the standing operating procedures. Training, combat experience, and personal contacts with personnel are very vital to insure teamwork and combat efficiency between tanks and the units to which they are attached. We found that when we were relieved from one unit and attached to another it took some time to get accustomed to new methods, staff work, and procedures. After we have been in training and in combat with an organization, we have mutual understanding and accept each other as part of the same unit. . .

The problems of achieving the level of teamwork required between the attached tank units and the infantry they support have been increased materially by frequent changes in attachment. In this connection, the Commander of the 751st Tank Battalion reported that his organization as

of January, 1944,

...has in turn been attached to the 3rd, 34th, 36th, and 45th Infantry Divisions, to the 1st Ranger Group, to the 23rd Armored Brigade (British), and at the present time it is with the 2nd Tank Group and attached to the 45th Infantry Division. . .

53. SMALL UNIT OPERATIONS

Armored action in Italy has been confined almost entirely to small unit operations in support of infantry, either in attack or in defense. Elements engaged in these operations have varied generally from platoons to single tanks, since the close country and mountain terrain precluded the employment of larger groups. Commanders have stressed the need of thorough training of the small unit, in order that the armor may be fully exploited even in country where it cannot be used in its conventional role of mass. The Commander of the 753rd Tank Battalion reported as a result of experience in Italy:

...We should place more emphasis on section and platoon training. We have found, particularly in Italy, that a great many times only a section or a platoon can be used due to the restricted areas of employment and attack. We have to a great degree been restricted to roads and trails in this country. In the attack, our advance has been slow and we always try to overwatch the advance of each element by another element, . .

Identical experience has been reported by the Commander of the 751st Tank Battalion, who commented in almost the same terms:

...The employment of the battalion in the mountainous country has been in small units. The platoon, section, and sometimes even one tank has been used. The nature of most of the country we have been going through has confined action to roads and trails and has permitted only a few vehicles to get into action at any one time. We always try to overwatch the advance of any element, even if it is only one tank. . .

54. SPECIAL TANK MISSIONS

The nature of the fighting and the country involved often required the employment of tanks on special missions. Among these were the attack of emplacements and pillboxes with direct fire, whenever the tanks could be maneuvered into effective position. Successful missions of this sort were accomplished on a number of occasions,

and the Commander of one tank battalion stated that "we have found the fire of the 75mm tank gun to be very effective against the enemy pillboxes. The gun is accurate enough to get direct hits at medium ranges on pillboxes and put them out of action." The employment of tanks to assist infantry in town and village fighting has been common practice in Italy. Direct fire from the tank guns has been effective in destroying enemy strong points in the thick-walled houses and in sweeping streets. The exercise of great care in avoiding antitank guns and tank traps in these compact, narrow-streeted towns, and the use of strong covering support fire have been important in these missions. A battalion commander has described his experience in this type of action:

. . . In the attack on SAN PIETRO we were supported by a tank destroyer company in direct fire support, and the tank company which was to make the attack used a number of their tanks for direct fire support of the tanks making the attack. Targets were assigned to each platoon, and in some cases to each vehicle. Practically all houses and terrain features which were logical sites for antitank guns were taken under fire by both tanks and tank destroyer guns. One house, which was not placed under direct fire proved to have an antitank gun concealed in it, and caused considerable damage before being knocked out, . . .

Another type of special mission for which the armor was successfully employed was the advancing of single tanks to draw hostile fire, especially from larger caliber guns, and thus disclose positions that would otherwise remain silent and masked. These tactics were generally used just prior to large attacks, in order to locate gun positions in advance, so that they could be dealt with before the main attack began.

The use of tanks as strong points in perimeter defense, often dug in to serve as armored pillboxes, has proved effective and valuable in a number of instances in Italy. It is recognized that under normal conditions, this method of employment is contrary to standard armored doctrine. However, in the situations in which these tactics were used, conditions both warranted and required such employment of the tanks available, and they did excellent service in this unusual role.

55. INDIRECT FIRE -- EMPLOYMENT OF TANKS AS ARTILLERY

Despite the mass of organic and reinforcing artillery available

in Italy, it has been found often profitable to exploit the fire power of tank guns as supplemental artillery. Such employment has been less extensive among the tank units than it has been with tank destroyers, but on a number of occasions medium tanks have been effectively used in their secondary role as artillery. The need of adequate training and equipment to accomplish such missions successfully has been brought out in the reports of a number of commanders. In one instance a tank battalion was called on to fire indirect missions at ALTAVILLA and PAESTUM, and these were delivered by using an improvised system similar to that employed in mortar firing. In general, all commanders recommend thorough training in indirect fire methods to permit rapid and effective assumption of the secondary role of artillery whenever a situation should require.

56. EMPLOYMENT OF TANK TROOPS AS INFANTRY

In late December, 1943, the situation at one sector of the line was such as to warrant the use of a tank battalion as infantry. In this instance the terrain was such as precluded entirely the use of the tanks, and the crews and additional personnel were armed with small arms and fought as infantry in the line. This incident was thus described by the Commander of the 751st Tank Battalion which was the unit so employed:

. . . On December 25, the Battalion was ordered to take over a defensive sector position from the 3rd Battalion of the 180th Infantry. A provisional company of 250 men, plus an additional 70 men for service troops, a mortar platoon and an assault gun platoon was formed from the battalion. . . . Armament of the provisional company was with the organic weapons of the battalion and consisted of about 80% sub-machine guns, 20 M1 rifles, and the remainder carbines. We had in addition 12 light machine guns and one German machine gun which we had captured. . . . The vehicles and other equipment of the battalion were held in a bivouac several miles to the rear, with the remainder of the battalion to keep them serviced pending the time when we should use them again. . . .

Although this was highly unusual employment for tank troops, this unit performed good service in this particular mission. Training in fighting as infantry can prove to be a valuable asset to any armored troops,

and the Commander of another battalion also declared in a report on campaign experience:

. . . Another phase of training that should be emphasized is fighting on foot for tank crews. There have been many times when tanks are knocked out or disabled, that the crews have had to get out and continue forward on foot with their small arms weapons. . .

57. STEEL TRACKS

In units reporting on the subject, opinion was unanimous in favor of steel chevron-type tracks. This type proved to be more serviceable and dependable than any other type; especially in the rough mountainous terrain. As second choice, the rubber chevron-type is preferred. Block-type tracks have been found to wear out more quickly and are more subject to skidding on the muddy, slippery roads in the mountains.

SECTION VIII : TANK DESTROYER UNITS

58. GENERAL

Employment of tank destroyers in their normal role has been very limited since the beachhead operations following the initial landings. As pointed out in Paragraph 17, supra, the destroyers that landed early performed a high order of service in the critical period of the beachhead consolidation, and were of great value in carrying out their primary missions during the operations in the SALERNO plain. As the advance entered the mountainous hinterland where the threat of hostile armor was no longer present, destroyer units were employed in secondary roles because of the terrain and the situations that the mountain country created. The major lesson from tank destroyer operations has been the extensive and successful use of these units as supplementary and reinforcing artillery.

59. EMPLOYMENT OF TANK DESTROYERS AS ARTILLERY

Although destroyers were used as supplemental artillery in a few instances in Tunisia, the Italian Campaign has been the first time that these organizations have been used on a large scale in this role. The

results have been highly satisfactory, especially in reinforcing the fires of the organic division artillery. When used for appropriate missions, a tank destroyer battalion in the role of artillery has increased the fire power of its supported division by the equivalent of three additional light battalions. Throughout the campaign units have been employed extensively on various occasions for interdiction, "Serenade" fires, normal concentrations, and harassing fires. Because of the long range of these guns, and their accuracy, they have been especially useful in interdiction and harassing missions. In this connection, the Artillery Commander of the 1st Armored Division declared in a report that one of the major lessons from the campaign was

. . . the value of using tank destroyers in their secondary role as reinforcing artillery. While the Division Artillery was supporting the 36th Division attack on MT. CAMINO and MT. DEFENSA, all three companies of the 701st Tank Destroyer Battalion were attached to the field artillery battalions and fired through the field artillery battalion fire direction centers. The 3-inch guns of the tank destroyers thus delivered timely and accurate fire during the attack whereas they could not have been used at all in their primary role. . . .

In another report the same officer observed with reference to the utility of the destroyers in this important secondary role:

. . . The tank destroyer and tank artillery action should not be limited to mere support of their respective actions. There are many times when other types of action can be supported and therefore the employment should not be limited to observed fire for neutralization in support of tank and tank destroyer action alone. A great deal of the employment of the tank destroyer battalion attached to this Division has been in support of normal artillery action, such as interdiction, "Serenades", harassing and similar types of fire. . . .

The experience of the 645th Tank Destroyer Battalion as supporting artillery has been briefly described by its Commander:

. . . One company had three four-gun "batteries" and another had two six-gun "batteries" about 2000 yards south of VENAFRO, and a third company has a six-gun "battery" near FILIGNANO and another six-gun "battery" about 3000 yards south of VENAFRO. Each company had its own fire direction center at the company command post. At the fire direction center we have a computer for each four- or six-gun "battery." The company commander acts as the artillery S-3 and the executive officer or reconnaissance sergeant does the computing. Most of our fires are scheduled or call fires, so we do not have to work so fast as the fire direction

centers of the division artillery. . .

We fired 4600 rounds as artillery in the attack on MT. MOLINO. We fired a preparation at 0615. "C" Company had an OP forward on HILL 970 and registered the whole battalion. Its observer-target range was about 5000. He used telephone communication from his observation post to his vehicle at the foot of the hill about a half mile, then SCR 610 to the battalion. We cannot fire map data corrected as our range tables do not show the necessary corrections. They should be revised to allow it. From 10000 to 12000 the gun is very accurate. There is little dispersion at the longer ranges. . .

Details as to the method of employment of the destroyers as artillery in support of the division artillery were also furnished in a report of a Division Artillery Commander whose attached tank destroyer battalion has been extensively used in this role:

. . . We have been using the tank destroyer battalion in support of our division artillery for a period of about three weeks in our present positions. We have attached one of the destroyer companies to each of the three artillery battalions, and connected the company into the fire direction center of the artillery. The positions for the guns of the tank destroyers are scarcer than those for our 105mm's because of the characteristics of the 3-inch gun trajectory. In most cases our battery positions had to be selected first and the target assignments made later on in accordance with the more or less forced selection of the battery positions. The tank destroyers have often been given preference as to position in order that we could use them effectively. Also the number of positions available for the destroyers were considerably more scarce than those for the 105's. In many cases we had actually to winch the guns into the positions selected. Some of the positions would have been considered in peace time as impossible, but it was a question of either using what could be found or not firing. . . Much of our firing has been done at the longer ranges, some of it at distances up to 12100 yards. The additional 2000 yard range of the tank destroyer gun has been very helpful at times when we were not able to reach the target with our howitzers. . .

Further details on the operations of destroyers in the artillery role have also been given in the comments of the Commander of the 701st Tank Destroyer Battalion in late December:

. . . During the past few weeks we have done no direct firing at all with the Battalion. We have been attached to the 1st Armored Division Artillery, and in turn the companies have been attached to each armored artillery battalion. The company operates directly from the fire direction center of the artillery battalion, and in turn give their orders to the platoon fire direction centers. We are using a full telephone set-up to each of the guns and do not use radio. We have been using high explosive ammunition altogether. A great deal of the firing has been unobserved, but in the observed fires I have used my own observers from the

reconnaissance platoon in some cases and in other cases the fires have been observed by observers from the artillery. On some occasions my observers have conducted fire for both the tank destroyer guns and the artillery and it has been excellent practice for them.

When we are firing "Serenade" or other types of fire requiring extra ammunition, the rounds are delivered to the guns and our organic loads are left intact in the vehicles.

At any time that tank destroyer units are operating in their secondary roles they should operate directly under the Division Artillery command. Fires, missions, targets, and details should be assigned to the destroyers as part of the plan of fire and not as an afterthought. The coordination of fires and missions should be such as to take into consideration the various characteristics of the weapons employed and their application to the terrain. In our present set-up the destroyer battalion commander assists the company commanders in their coordination with the artillery battalion to which they are attached. The destroyer companies when they receive orders from the artillery fire direction center, assign their missions to one or more platoons through their platoon fire direction centers.

We have our own survey sections of one per company and one per battalion headquarters. We are equipped to run normal survey, although we need a few more items of equipment. The battalion survey section establishes control points in the company areas, and the companies in turn establish the base pieces.

There have not been many opportunities recently in which we could operate in our primary role, and it has been of great benefit to be able to fire in our secondary role. . . .

Experience and comments with respect to the employment of tank destroyers as artillery, from the artillery point of view, are covered in Section VI, Paragraph 45c, supra.

60. USE OF SMOKE SHELL

Many tank destroyer commanders have expressed the need of smoke shell, especially in the firing of artillery missions. The relatively small burst of the 3-inch high explosive shell has been difficult to observe at long ranges, and smoke for adjustment and marking of base points would be very useful. The Commander of the 701st Tank Destroyer Battalion reported that

. . . We need smoke in addition to the types of ammunition mentioned in War Department Circular No. 125. In wet weather such as we have been having for a long time it is not possible to observe fire when using HE, particularly when we are firing at the longer ranges. . . .

And the Commander of the 601st also stated that "We need smoke for both direct and indirect fire missions, and also for observation at long ranges or in wet terrain."

61. COMMUNICATION

When employed as artillery, tank destroyer units have established normal wire communication nets similar to those of an artillery battalion. Radio has been secondary, except for communication for observation posts and forward observers, liaison officers, and general control. The establishment of wire nets for fire control and direction has necessitated the use of more signal equipment and wire than is normally required in the destroyer units. Experience in one battalion was expressed as follows by its Commander:

. . . We need a portable reel of W-130 wire on each M10 in the company when we are engaged on secondary missions. There should be about 150 yards of wire on the reel. When we go into position a man can take the end of the wire and run at once to the platoon or company fire direction center and connect up. Our SCR 610 sets have been tied in with the artillery on a possible number of nine overlapping channels, and we have had very successful results. We are using three over-laps at present, but are not using radio a great deal for communication as we have full wire nets installed. . . .

62. TANK DESTROYERS IN ANTITANK ROLE IN ITALY

Although the destroyer battalions were widely used in their secondary role there were occasions in Italy when they were employed in their primary mission, especially in the beachhead extension and in some operations in areas where tank threats developed. As a result of such experience a report on lessons from the campaign presented the following points which represent a consensus of opinion and experience from the staff and company commanders of the 701st Tank Destroyer Battalion:

a. Target Designation

In the antitank role in forward areas target designation can be speeded up and a target designated without confusion by firing a round of APC tracer at or close to the target. The platoon leader or individual who observed the target alerts the chief of section and lays the gun. After one or two rounds are fired to designate the target, the gun is kept

quiet. The chiefs of the other sections then lay their guns on the target. At a prearranged signal all guns open up and fire a designated number of rounds on the target.

b. Reconnaissance

Daylight reconnaissance is the only type of reconnaissance that is satisfactory for the selection of antitank gun positions. In reconnaissance for antitank positions and positions for artillery roles, the supply route is as important as the gun position. Daylight reconnaissance of routes will permit destroyers to occupy positions in support of infantry attack during darkness, and will thus prevent the necessity of moving destroyers in daylight under enemy observation.

c. Use of Observation Post near Guns

When the destroyers are used in the antitank role, an OP in the immediate vicinity of the guns gives an advantage over enemy vehicles. It gives the gun crews sufficient time to prepare for action, lay guns in general direction, take careful aim at the target and wait until the target comes within range. The same is true in picking up pillboxes and sitting tanks.

SECTION IX : MINE WARFARE AND BOOBY TRAPS -- ALL ARMS

63. GENERAL

a. In the enemy's determined resistance and effort to stop the Allied advance in Italy, his use of mines has continued to increase more than ever as he has been forced back from one prepared position to another. All experience in this Theater has indicated a steady trend towards an ever-increasing use of this weapon. As the employment of mines in Sicily was more extensive than had been experienced in Tunisia except for the absence of large antitank minefields, the use of mines in Italy has exceeded their previous use in Sicily. The prediction as a result of the lessons of Sicily, that we must expect a continuing increase in the use of mines as the enemy is driven back to

his own soil, appears to have been well founded.

b. The terrain fought over in Italy has been especially well suited to the employment of mines as a powerful delaying and casualty weapon. The limited and restricted road net, the mountainous, close country with few trails and secondary roads, the terrain conformation and nature of available approaches to objectives, and the numerous bridge sites and by-passes have all presented situations admirable for the employment of various types of mines. The element of rapid withdrawal and pursuit which characterized the fighting in Sicily has not been present in the Italian Campaign thus far. The sowing of mines and booby traps has therefore not been hurried. It has been deliberate, thorough, and widespread.

c. The general pattern of minelaying in Italy has fairly well paralleled that encountered in Sicily. The nature of the terrain has precluded the establishment of extensive minefields such as were encountered in southern Tunisia. As in Sicily, the most heavily mined areas have been roads, valleys, natural approaches to objectives, trails, logical troop and bivouac areas, and in and about demolitions and blown bridges. Abandoned towns and villages have been thickly mined and booby-trapped. Again in his withdrawal the enemy had the advantage of knowing the most likely sites for artillery positions, and these were nearly always thickly strewn with mines and traps. Unlike the Sicilian experience, there were no mined dry river and stream beds to cross. On the other hand, mined river banks had to be negotiated in the several river crossing operations during the Campaign.

d. The one major lesson of the Campaign has again been a repetition of the lessons from both Tunisia and Sicily, the fact that mines must be dealt with by all arms in the combat zone, and that all arms and services operating in the combat zone must be trained and equipped to protect themselves from the mine menace. Training in mine warfare, and the equipping of all troops with the means to detect and clear mines has become clearly a basic necessity. Again it must be pointed out that the

work of the engineer units was excellent, but they cannot be expected to clear all areas for all troops. The clearing of main routes and major obstacles and conduct of special operations appropriate to engineer units is all that can properly be expected of them.

64. EXPERIENCE OF INFANTRY UNITS

As in former experience, infantry units in Italy learned to take care of themselves with respect to mines when operating cross-country. All units have been equipped with detectors, and the organization within units to detect and remove mines has varied. In the 45th Infantry Division, the Commanding General reported:

. . . I have four "mine platoons" in each infantry regiment. They have no other duties. There are 20 mine detectors and 50 men in each. The infantry regimental commander keeps his mine platoons up with the assault elements. The personnel of these platoons become expert in knowing where to look for mines and how to lift and disarm them. The Germans place mines in good bivouac areas, around bridges, on probable by-passes, and in trails. The rule is, don't use a good bivouac area until it has been cleared by the mine platoon. . . .

In special situations, such as assault landings, and in river crossings, the infantry elements have learned that they must press forward the assault and take their chances and losses from mines when there is no practical way that the areas crossed can be cleared. In the crossing of the VOLTURNO, the Chief of Staff of the 34th Infantry Division reported:

. . . We had to cross at night, or we would have been cut to pieces. The infantry just had to cross and push ahead through the minefields, taking their losses. There was no other solution because they had to move fast enough to get across the river, across the low ground on the other side, and up to the high ground before daylight. If you get caught in low ground like that in daylight, the casualties are worse than from mines. . . .

In this connection the S-2 of one of the regiments which participated in the crossing of the river and the passage of the minefields on the far side, paid high tribute to the troops in following terms:

. . . Our men are wonderful. They will go anywhere an officer will lead them. When they will move at night through the minefields as they did in the latest crossing of the VOLTURNO, they will do anything. The next day you could follow our battalions by the bloodstained leggings,

the scattered equipment, and the bodies where the men had been blown up by mines. But the infantrymen went on through and captured the hills above the river. . .

A fallacy that in some way gained circulation that mules will not step on mines planted in trails was thoroughly exploded by the experience of the pack trains operating in the Italian mountains. It has been definitely shown that mules possess no more immunity and powers of avoidance from mines than the soldiers that lead them. A number of mules and horses have been lost through stepping on S-mines, and pack train troops have reported numerous instances of such losses.

65. EXPERIENCE OF FIELD ARTILLERY UNITS

The experience of field artillery units with respect to mines in Italy has been generally similar to that in the Sicilian Campaign. As the enemy has been forced back, he has had knowledge of the most suitable artillery position areas in the ground he has abandoned, and has accordingly mined such areas heavily whenever possible. These positions have been thickly strewn with tellermines, wooden box mines, antipersonnel mines, and various types of improvised booby-traps. In one position occupied by the 936th Field Artillery Battalion, no less than thirty-two tellermines were removed from the ground on which one gun was later placed in position. In another battalion area, four S-mines were found hooked to one trip wire in the position location of one howitzer. The approaches to positions have been frequently mined and trapped, especially in turn-around locations. Another example of artillery experience was recorded by the Commander of an 8-inch howitzer group, who reported that

. . . In one battery position a tellermine was located by a detector. When the usual precautions were taken to remove and disarm it, a wire was found which led to eighteen cases of dynamite buried in the position area. Each case contained 25 kilograms of explosive. . .

In the reconnaissance of forward areas for positions and observation posts, artillery personnel has been constantly exposed to mines. In one brigade, two battery commanders have been killed by mines while engaged in forward reconnaissance. The Campaign has shown clearly that the menace from these weapons must be taken into account by all reconnaissance

parties, and provision to cope with this problem should be made when reconnoitering for positions, routes, and observation posts.

Experience in Italy has indicated that sound training for artillery in mine detection and clearing has become an increasingly important subject of instruction. The present average allowance of detectors for artillery units has been ten per battalion, and most commanders recommend an increase in number, largely because there are always some detectors which are turned in for repair. A major lesson from the artillery point of view has been the fact that areas which have been long occupied by our own troops cannot be considered free from mines until carefully swept. Also, artillerymen must be trained not to stray from their swept positions. Areas that have once been in enemy hands always contain a potential menace from mines, and this has proved particularly true in the case of artillery positions and adjacent ground.

66. EXPERIENCE OF ARMORED UNITS

Although the close country in Italy has prevented the enemy from laying extensive antitank minefields such as were found in Tunisia, nevertheless, mines have proved to be a serious problem for armored units. In many instances the terrain has definitely canalized tank movement, and this has forced tank commanders to see that mined areas have been cleared before advance, or in cases of necessity, press through the mined ground and accept the losses. The experience of the 753rd Tank Battalion has thus been described by its Commander:

. . . Antitank mines have been our big problem, and up to the present time we have found no absolute solution for them. In an advance when we can get the Engineers to sweep ahead of us a great many mines can be located and removed, but of course that slows up the advance of the tanks and makes support very difficult in some situations. Many times we just have to take our chances on losing some of the tanks and hope to get through with the remainder. . . In the battle of SAN PIETRO we lost some tanks because of mines, as in that particular battle we were ahead of everything and could not send out clearing parties. Some of the mines had apparently been buried a long time, and in some cases leading tanks would pass over mines and those following would explode them and be put out of action. . .

All the men in this battalion have been thoroughly instructed in mine detection and removal. The reconnaissance platoon has received special training in addition to that received by the other units, and they have been of great help in mine removal. All our replacements as they are received are tested in mine removal and detection, and given further instruction if required. . .

In another tank battalion, the Commander reported that the anti-tank mines had been especially troublesome, and in one case lost a tank from a buried air bomb, or similar large-size explosive charge. On the subject of mines he reported the following experience:

. . . We have had trouble with antitank mines. They are one of our biggest problems. Not all of them act in the same way. We have had one tank burn after running over a mine, though usually the mines do not damage much more than the tracks and suspension. In another case one of my tanks was completely blown to pieces when it ran over a mine. It looked as though the mine had been connected to a buried air bomb. The explosion blew the turret off the tank and the tracks and most of the suspension system. . .

When it is possible we have the engineers sweep for mines, but this is not always possible when we have to attack ahead of the infantry. We have a great deal of trouble at night when we advance as we can't find the mines, and they are very freely used by the Germans, especially along the routes we have to use in this close country. . .

67. TYPES OF MINES ENCOUNTERED

A number of different types of mines have been encountered in Italy, some of which have been new. The different models of the teller-mine have been freely used by the enemy, and there has been an increased use of wooden mines of both German and Italian design. In the latter stages of the Campaign the wooden-type mines have largely exceeded the number of standard metal tellermines used, and have given increased trouble in clearing. The Engineer, VI Corps, has made the following comments on the mines encountered:

. . . The Germans are now using mainly wooden box and S-mines. S-mines have been encountered lately in quantities never seen before. We are now running into increasing numbers of Italian wooden box mines equipped with German bakelite igniter sets for pressure, pull, and release. They are often in fields, not just scattered around. For example, a whole olive grove will be mined and booby trapped with S-mines, wooden box mines, or both. Since the landing at SALERNO, about 20% of all mines encountered have been wooden box type. The German wooden box type is about 12 inches square by 5 inches thick, and contains about 10 pounds of Triton or similar explosive. The Italian ones are not quite so big. We can still pick up the wooden box

mine with the mine detector if the detector is very accurately tuned and the operator is very careful. However, troops don't trust the detector to find wooden box mines -- as soon as they find one, they probe the entire surrounding area. . . .

Recent surveys indicate an increased use of wooden mines of all types, and one report in late January shows that wooden mines have represented about 40% of all mines discovered during that period.

The S-mine has been extensively employed, and has been the most prevalent of all antipersonnel mines used by the enemy. They have been found in all kinds of locations and in varying quantities from a few scattered mines to elaborate fields containing as many as 300.

In some areas newer types of improvised concrete antipersonnel mines have been discovered. One type has consisted of a spherical concrete case 10 inches in diameter enclosing standard German and Italian explosive charges equipped with standard types of igniters. Shrapnel has been used as aggregate in these concrete mines. Another type has consisted of a spherical concrete mine, 13 inches in diameter, cast in two halves which are bolted together with steel rods. These have contained about nine pounds of explosive, and were equipped to receive detonating devices. Those found of this type were in a store of mines, and the type detonator or igniter was not present.

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NOTES AND MEMORANDA

NOTES AND MEMORANDA