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MILITARY MONOGRAPH

TITLE: OPERATIONS OF THE XIX U.S. ARMY CORPS IN NORMANDY:

EMPLOYMENT OF ARMOR AND INFANTRY

FORCES: Allied: Particular Emphasis upon Troops of XIX Corps-

29th Infantry Division
30th Infantry Division
2nd Armored Division
3rd Armored Division
743rd Tank Battalion
747th Tank Battalion
113th Cavalry Group

Enemy: German Seventh Army

LOCATION: Normandy, France; Emphasis upon the Bocage.

DATES: 14 June, 1944 - 1 August, 1944

ASSIGNMENT AND DUTIES OF WRITER: Major, Operations Officer;
Asst G-3, Hq XIX Corps; GSC with Troops.

42-8

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OPERATIONS OF THE XIX U.S. ARMY CORPS IN NORMANDY:

EMPLOYMENT OF ARMOR AND INFANTRY

CHAPTER 1

PREPARATION

SECTION I

INTELLIGENCE

1. GENERAL.-- Shortly after landing in the United Kingdom with Headquarters XIX Corps in January, 1944, the author was designated as a member of the Corps planning section for Operation Neptune. A vast amount of material incident to the invasion plans was assembled by various agencies, and at an appropriate time, certain key officers of lower echelons were briefed upon that phase of the action with which they were immediately concerned.

Without disparaging the comprehensive intelligence assembled, evaluated and disseminated by higher command agencies, it is believed that certain critical omissions of information should be recognized and their effect upon operations and tactical employment of ground troops analyzed.

2. ENEMY TROOPS AND INSTALLATIONS.-- It evidently could not be anticipated from the best sources of intelligence that American assault troops, landing over the eastern beach, would be met by the withering fire of a reinforced enemy division of infantry engaged in defense maneuvers as well as

the usual static troops. The severe casualties received among key personnel by the 116th RCT and attached elements of the 115th Inf Regt., 29th Inf Division, however, influenced the character and success of operations in the XIX Corps from Omaha Beach to the heart of Germany. It is believed that a categorical statement is justified to the effect that the combat efficiency and number of casualties suffered in operations is greatly affected by the number of skilled and experienced personnel in a unit. The number of casualties has a cumulative effect in that the greater the number of green replacements in a combat organization, the greater the number of casualties. "Old soldiers never die." Old soldiers also develop qualities of leadership and "know how" which are transmitted to replacement troops for the benefit of the combat organization.

3. TERRAIN ANALYSIS: The initial terrain analysis and consideration of critical features, in respect to military operations, failed to take into consideration the fundamental characteristics as they were to affect ground operations Normandy. The key to German defenses in the Cherbourg Peninsula was not to be determined by contour lines, inundations, river systems or comprehensive defense against airborne operations, but in the ancient banks around small fields. American infantry, trained for assault landings, were unprepared to cope with a tactical problem of reducing this defense and, although the Infantry-Artillery team was well developed, a system of Armor-Infantry coordination had to be developed to meet this peculiar and unanticipated problem.

In general, the limit of vision in Normandy was restricted to the next hedgerow; thus, high ground for observation was usually a fallacy. Normandy is cut into small fields bordered by earth embankments topped by stout hedges. These banks ranged from 2 to 4 feet in height and normally 3 to 6 feet thick with ditches of 2 to 4 feet on each side. Each row offered an ideal defensive position for delaying action. Although the hedges did cause tree bursts, they offered complete concealment. These banks lent themselves to complex defensive works, since they could be tunneled with impunity because of the reenforcement by interlacing roots of trees and hedge. A simple protection against tree bursts was provided by covering the ditch with short poles laid side by side and covered with earth and sod. Improvised materials laid over the logs or poles prevented the dirt from filtering through on the occupants. The author once developed a fox hole in a hedge corner where he could stand upright under a camouflaged shelter tent and had about two feet headroom.

4. SCOPE OF MONOGRAPH.-- The scope of this monograph is defined by the development of armor-infantry tactics in reduction of enemy hedgerow positions in the course of XIX Corps operations in Normandy. The campaign of Normandy and hedgerow tactics was terminated by Operation Cobra which resulted in the breakthrough west of St Lo and the rapid exploitation spearheaded by the 2nd Armored Division across Northern France, Belgium, and Holland.

SECTION II

ORDER OF BATTLE - 21 ARMY GROUP

1. ACTIVATION. a. Command Post, First United States Army was opened 20 October, 1943, at Clifton College, Bristol, England.

V Corps-	joined 22 Oct, 1943
29th Inf Div	joined 22 Oct, 1943
1st Inf Div	joined 2 Feb, 1944
2nd Inf Div	joined 14 Apr, 1944

VII Corps-	joined 22 Oct, 1943
9th Inf Div	joined 26 Nov, 1943
4th Inf Div	joined 2 Feb, 1944
90th Inf Div	joined 1 Apr, 1944
79th Inf Div	joined 29 May, 1944

XIX Corps-	joined 14 Jan, 1944
2nd Armd Div	joined 8 Feb, 1944
3rd Armd Div	joined 8 Feb, 1944
30th Inf Div	joined 18 Feb, 1944 ¹

b. Second British Army

c. Naval Forces²

The Western Naval Task Force, composed of battle ships, cruisers, destroyers and small ships and craft.

d. Air Forces

IX Tactical Air Force (supporting attack of the First U.S. Army)

2. The XIX U.S. Corps, redesignated from III Armored Corps, departed from N.Y. P of E, 18 Jan, 1944. This headquarters comprised personnel steeped in armored tradition. The Headquarters was activated under command of Maj Gen Willis D. Crittendenberger, previously Commanding General,

¹ FUSA Opns R, 1 Aug '44, p.14
² Hq AGF, Memo CG, 2 Aug '44, p.1

2nd U.S. Armored Division. The XIX Corps retained the code name, "Armor", throughout various maneuvers in Louisiana and the entire operational phase of World War II. Despite frequent changes of command, it is safe to say that no Corps Headquarters in the European Theater took a more vital interest in Armored operations or was better prepared to cope with the many supply problems incident to armor employment.

Upon arrival in the United Kingdom, Headquarters XIX Corps, arranged assignment of numerous Corps Troops with which it had previously operated in Louisiana maneuvers. This integrity of command was to pay dividends between Omaha Beach and the Elbe.

In subsequent operations, the XIX Corps was destined to function with the 29th U.S. Infantry Division, 30th U.S. Infantry Division, and 2nd U.S. Armored Divisions as normally assigned or attached unit. The 743d Tk Bn, originally trained as a D.D. Bn, was assigned to 30th Infantry Division during operations, and the 747th Tk Bn to the U.S. 29th Infantry Division.

Other normally attached units for the type infantry division such as AA Bn, TD Bn, remained with the divisions to which they were originally assigned in so far as practicable.

SECTION III

PLANS FOR INVASION

1. INITIAL JOINT PLAN.-- The original plan for invasion of the continent was prepared under direction of the joint Anglo-American planning group known as COSSAC (Chiefs of Staff, Supreme Allied Command) and dated January 1943.

This was the currently approved plan for invasion in October 1943. On 17 Jan, 1944, a First U.S. Army Planning Group was established to function in London under direction of 21 Army Group (British). General plan for landing was amplified to provide for landing American forces on a broader front than was initially intended.

2. FIRST U.S. ARMY PLAN.-- a. On 25 February, 1944, the First U.S. Army plan was complete except for modifications. Respective Corps commanders were called to London in February, briefed in the "Neptune" plan, and directed to prepare detailed plans for their portions of the operation. Various key personnel of the respective Corps headquarters were "Bigoted" (designated as authorized to handle Top Secret documents). Three officers of G-3, Hq XIX Corps, including the author were initially so designated to carry out necessary planning and administrative details.

b. The general plan of attack required simultaneous landing on two main beaches.¹ The U.S. VII Corps, with the 4th Inf Division was to make an assault landing by sea in the neighborhood of Varreville, designated as "Utah Beach," west of the Vire Estuary. This assault landing was to be assisted by the 82nd Airborne Division and the 101st Airborne Division landing in the rear of the German coastal defenses. A beachhead was to be established near the southern portion of the east coast of the Cotentin Peninsula.

¹ FUSA Opns R, 1 Aug '44, p.26

c. The V Corps, with one combat team of the 29th Infantry Division on the right, and one combat team of the 1st Infantry Division on the left, was to establish a beachhead on the northern coast of Calvados near St Laurent-sur-Mer.

d. The 1st Engineer Special Brigade was assigned to assist operations of VII Corps over Utah and the 5th and 6th Engineer Special Brigades were designated to support the landings of V Corps and subsequent landings of XIX Corps over Omaha.

3. MISSIONS.-- a. The Strategic Objective of "Neptune" operations was to secure a lodgement area on the continent from which further offensive operations could be launched. This operation comprised the final step in military operations to effect the total defeat of Germany.

b. The Specific Mission of the First U.S. Army was to seal off the Cherbourg Peninsula in order to secure the Port of Cherbourg as a base for further operations.

c. The initial mission of the XIX Corps, composed of the 2nd Armored and 3rd Armored Divisions, and the 30th Infantry Division, was to move from the near shore to the far shore, across Omaha Beach, east of the Vire Estuary to an initial assembly area in France from which tactical operations would commence. This movement was divided into three phases.

(1) Movement from Concentration Areas through Marshalling Areas and on board ships and craft.

(2) Crossing, debarking, and moving to
Transit Areas.

(3) Moving from Transit Areas to an Initial
Assembly Area.

4. ESTIMATE OF THE SITUATION.--

a. Enemy:

(1) Plan of Defense¹

(a) Principal defense line; that of
the beaches. Fire power to be concentrated on and off beaches
until mobile reserves could arrive.

(b) Mobile reserves so placed as to build
up for counterattack at any point rapidly. Strategy supplemented
to deny us all ports.

(c) Beach defense to be protected by
concrete fortifications and armor.

(2) Enemy Dispositions (See Figure 1)

(3) Quality of Troops²

In general, the enemy troops initially
encountered were from the static divisions. These comprised
a mixture of Russian, Pole, Czechs, Mongols and only cadres
of German officers and N.C.S.'s. These were rated as fair
combat troops. After the fall of Cherbourg, however, enemy
troops encountered in front of the XIX Corps were paratroopers,
Panzer Grenadiers, and troops from SS Divisions. The latter
were excellent troops, adept in utilizing the terrain to
a maximum extent, and obtaining maximum results in employment
of weapons.

¹ FUSA Opns R, 1 Aug '44, p.34
² Hq AGF, Memo CG, 2 Aug '44, p.5

b. Terrain Estimate¹

(1) The Cherbourg Peninsula is defined as that portion of land extending north of an east-west line drawn from Avranches to the Orne River.

(2) General Topography

(a) The area of the Cherbourg Peninsula is divided into three topographical zones. These are the Cotentin, the Besssin, and the Bocage.

1. Cotentin: This is the area north of the T_aute River and comprises the seaward projection of the Cherbourg Peninsula. It merges southward into the hilly country of the Bocage. The irregular coast line of the Cotentin is characterized by numerous inlets, bays and high cliffs. Many of the latter have precipitous palisades to the sea. Many of the steep sided hills of the area rise to an elevation of 500 feet. In the southeastern sector, the terrain is a low and marshy plain between Valognes and Carentan. Along the coast is a border of low lying meadow land several miles in width which was almost entirely inundated as a defense against invasion tactics.

2. The Besssin: This is a district lying to the east of the Taute River and extending to Bayeux. Its western portion is low and marshy prohibiting the movement of mechanization and foot troops to a very large extent. Toward the east, hills predominate as a terrain feature. The country-side is extensively cultivated and consists of square or rectangular pastures and orchards bordered by Hedgerows.
I Annex Ia. FUSA Opns R, 1 Aug '44, p.124

3. The Bocage: The terrain, known as the Bocage, lies south of the Cotentin and the Bessin. It is rough hilly country characterized by much cover and continued hedgerows.

(b) Ridge System: The principal ridge system extends across the base of the Cherbourg peninsula from Avranches to Argentan.

(c) Drainage: The Cherbourg region is drained to the north by the Divatte River which flows into the sea at Cherbourg. To the south-east, it is drained by the Douve and Merderet which flow southward to Carentan, and the Saire and Sinope rivers which flow east into the Bay of the Seine.

The Bessin is drained principally by the Aure and the Drome flowing northward then westerly to Isigny. It is also drained by the Soulles, Ordor and Size joining the Orne at Caen.

The Bocage is drained in the west by the Douve River flowing into Carentan from the north-west. The Aure River from Treviers to Isigny contains large areas subject to inundation.

(3) Military Aspects of Terrain:

(a) Communications- Highway communication facilities are relatively good where roads from the Cotentin join the east-west road through Bayeux and St Lo.

(b) Obstacles- Natural obstacles are marshy and inundated valleys of the Douve, Merderet, Taute, Vire, and Aure Rivers. The Vire, extending southward from

Isigny forms a natural protection for east or west flanks in any movement to the south.

CHAPTER 2

OPERATIONS

SECTION I

MOUNTING OF OPERATION

1. TROOPS.-- Troops assigned to XIX Corps were, in general, moved to concentration areas in southern England under Corps Control

2. MOVEMENT TO MARSHALLING.-- Movement to Marshalling Areas along the southern coast and to points of embarkation for movement cross channel, was accomplished under direction of Build-Up Control. This organization was known as BUCO (West) It was determined that after the invasion had started, the decision to alter priorities in prearranged build-up would rest with the Commanding General of the First U.S. Army.

3. ADMINISTRATION OF MARSHALLING.-- Marshalling Areas were located adjacent to ports of embarkation. Capacities of areas were sufficient to accommodate a two (2) day lift of the ships and craft assigned to the port.¹ All housekeeping was conducted by SOS personnel augmented by line troops scheduled for a late lift.

The marshalling area designated for Headquarters XIX Corps was located in the vicinity of Dorchester and served the port of Portland. A large tent camp was set up in a wooded area affording concealment.

4. BRIEFING.-- Briefing of all troops in the
HqAGF, Memo CG, 2 Aug '44, p.2

Marshalling Areas was effected and all personnel were confined to camp. It was the desire of the Army Group Commander, that "Every single soldier must know before he goes into battle how the little battle he is fighting fits into the large picture, and how the success of his fighting will influence the battle as a whole." After briefing, each officer, non-commissioned officer, technician and driver was given a map of the target area.

5. PREPARATION OF VEHICLES.-- Water-proofing of vehicles was completed before movement to the point of embarkation. Initial preparation and testing had been previously accomplished at home stations. A final check would be made on board ship.

6. SCHEDULE FOR HQ XIX.-- The build-up schedule for Headquarters XIX Corps provided movement in four detachments. The first and second detachments would arrive on Omaha Beach D / 5, 3d detachment on D / 12, and the last on D / 20. The 1st and 2d detachments, Hq XIX Corps, moved from concentration area, Knook Camp, Wiltshire - home station- to marshalling area located near Dorchester on 8 June, 1944, and on 10 June loaded on LSTs. These elements did not actually beach until 2000, 12 June. Debarkation was delayed by tides and by recovery of personnel from an LST containing 2nd Armored personnel and equipment. This craft was sunk immediately on course ahead of Corps Headquarters LST.

Corps Headquarters assembled and established a CP one kilometer west of Longueville, France.

Numerous headquarters personnel had landed with other elements between D Day and arrival of the Forward Headquarters Group. The Commanding General and his party had arrived D / 4 by PT boat.

The build up of XIX Corps Headquarters elements were generally in keeping with the prearranged schedules. The scheduled lift of units, however, was faulty to the extent that senior commanders ashore could not determine when or where elements of their command would land. Units did not arrive in priorities established, nor on beaches initially designated. ¹

Elements of the 113th Cav Sq and Corps Headquarters had arrived on D / 4 for the purpose of setting up a Movement Control unit as XIX Corps troops arrived.

SECTION II

INITIAL LANDINGS

1. UTAH BEACH.-- a. The 101st Airborne Division began dropping south-east of Ste Mere-Eglise about 0130 hours 6 June.

b. The 82nd Airborne Division landed west of the main road between Carentan and Cherbourg astride the Merderet River near and west of Ste Mere-Eglise at 0230 hours on 6 June.

c. The beach assault was made at 0630 hours by the 8th RCT followed by the 12th RCT, 4th Infantry Division, between Les Dunes-de-Varreville and La Grande Dune. Thirty D.D. tanks of the 70th tank battalion were launched, 5,000 yards offshore in two waves and arrived on the beach with the 1 Ibid, p.6

loss of only one tank.

d. Initial landings actually were made in error 1700 yards southeast of the prescribed beaches. Beach defenses were much stronger on originally designated beaches. Miscalculation in landing seems to have been a fortuitous accident. Utah beach was relatively flat, characterized by inundated areas, and did not present the dominating terrain held by the enemy on Omaha beach.

2. OMAHA BEACH.-- a. A stiff resistance was put up by the German 353d Infantry Division, which had its three regiments disposed immediately behind the landing area. First German POWs stated that they had been in the general area for some time on maneuvers and defense exercises. This division supported the German 726th Infantry Regiment of the 716th Division. The 353d Infantry Division was supported by a battalion of 105mm gun/howitzers from the 1716th Artillery Regiment and the 513th, 517th, and 518th battalions of the 30th Schnelle Brigade (Mobile Brigade)

b. The attack on Omaha Beach was scheduled for 0645, 20 minutes later than Utah. This is because the tide is later since it approaches from the west through the channel. The assault was made by the 1st Infantry Division (less 26th Inf Regiment) on the left, and with the 116th RCT (of the 29th Inf Division) on the right. Ranger units were assigned special missions.

c. Initial waves touched the shore at 0635. Heavy seas, underwater obstacles, fully-manned enemy defenses, and loss of supporting weapons by the sinking of landing

craft made the outcome of the landing doubtful. Salt water and sand interfered with operation of many weapons. It was late in the day before beaches were cleared sufficiently to protect wading troops from strong enemy gunfire. Coastal defenses were considerably heavier than anticipated.

d. Air preparation and Naval gunfire did not have the desired effect upon enemy positions. The commander of an assaulting RCT reported:¹ "On the beach, the closest that I saw a bomb hit was 1000 yards away from the target. The business of assuring us that we had lots of covering stuff was disconcerting. Naval gunfire didn't do much damage on our sector either. Naval gunfire, in order to be effective, must be fired from close range." An officer of company grade in the 16th Infantry stated:² "At H-40, 19 tons of bombs were supposed to fall on the defenses, but did not knock out a single one. Neither did Naval gunfire. Fighters launched 1000 rockets and hit nothing; some were short, but mostly over. Obstacles at low tide were all mine capped. Couldn't find a path through the mines. Engineers clutter up the place."

e. Troops of the 16th and 116th RCTs suffered casualties and were handicapped by loss of much equipment in landing. Men had to swim or wade ashore in many cases, and heavy weapons had to be discarded. ^Many beach exits were not opened. Some sections of assault companies landed at

¹ Hq Com Z, ETOUSA, WD O BD, 5 Aug '44, p.4

² Ibid., p.9

wrong places, and consequently many beaches were congested, providing good targets to enemy forces. Snipers and machine gunners appeared to concentrate on officers and casualties among leaders were disproportionately high. Engineers were able to clear insufficient gaps and casualties from mines were high. Casualties on D-Day among the 116th Infantry and attached elements of the 115th Infantry were estimated at 60% of original strength.

SECTION III

OPERATIONS OF XIX CORPS IN NORMANDY: 14 JUNE

1. FORWARD ECHELON.-- The Forward echelon of Headquarters, XIX Corps, had been assembled by D / 6 and contacts established with adjacent units and the 29th Infantry Division. Personnel of the headquarters had previously been attached to assault divisions and V and VII Corps Headquarters as liaison, to insure their conversance with the current situation. In some instances, these officers had been delayed as much as two or three days in getting ashore with the echelons to which they had been assigned because of the critical situation on Omaha Beach. By D / 4, many of the key personnel of the Corps staff were ashore and were informed of operations.

2. BECOME OPERATIONAL.-- At 1200, 14 June, 1944, the XIX Corps became operational and attacked south at 0800B hours, 15 June with the 29th Infantry Division attacking in the corps zone, east of the Vire River. The 120th RCT, although not yet closed in the bridgehead, attacked on the corps right flank west of the Vire River

to widen the lateral corridor between Carentan and the Vire. Carentan was not yet clear of the enemy on D + 6, and for several days thereafter enemy harrassing fire was received on the bridge crossing. Carentan was the connecting link between VII Corps and XIX Corps; a situation which was emphasized by the character of the inundated terrain near the Vire estuary.

The attack of the 120th RCT advanced the right flank of the XIX Corps to the line of the Canal de Vire et Taute. Progress of the 29th Infantry Division was very limited.

Naval gunfire was employed in support of the attack of the 120th RCT and the 743d Tank Battalion, attached for operations. In the face of determined resistance, it captured the town of Mont ^Martin-en-Graignes at 1235 hours, and La Compte at 1720. The following morning La Ray was taken, and one battalion brought back to the line of the railroad to clear out enemy from defended positions in the neighborhood of Deville. That night, 16 June, the regiment established itself on a line following the Taute River and the Canal.

On the 16th of June the 29th Division advanced its right flank down the east bank of the Vire River as far as Amy, a distance of about three thousand yards. On the 17th and 18th of June, the 29th Division and the 2nd Division made further advances, overcoming isolated pockets of resistance until the line ran from Airel, south along the river and thence to La Meauffe-Le Mesnil Rouxelin-Villiers Fossard-St Georges-d'Elle-Vacquerie-Caumont. On the right of the XIX Corps, the 120th Infantry attempted to drive across the Vire et Taute Canal

at St Nicholas, but without success.

The enemy had good observation from positions south of the Vire et Taute Canal and was able to mass his fire upon our area. Actual terrain along the canal is very low and relatively open. Our line was rather thinly held with only patrols connecting our strong points between Neully and La Ray, for example. The author observed that although we controlled the ground north of the canal by fire, the enemy was able to retain isolated positions on our side of the canal from which we had been unable to evict him. The author, who had reconnoitered the area north of the canal, guided the CO of the AAA Group, assigned to XI^X Corps, to a possible position where 40mm guns could be used to fire into the embrasures of a fortified chateau. It was regarded as impracticable to risk loss of the guns, however. It is understood that a later attempt to reduce the position with AAA resulted in losses to the battery in equipment and crews. At this stage of operations, new techniques of employment were being sought.

From 21 to 28 June, an active defense was assumed on the fronts of XIX Corps and of V Corps on the left.

SECTION IV

HISTORICAL EXAMPLE OF ARMOR-INFANTRY COORDINATION AND TEAMWORK AT VILLIERS FOSSARD, FRANCE.

1. The commanding general and members of his staff, 3rd U.S. Armored Division, came ashore in Normandy and

established themselves at the CP of XIX Corps at Castille until the arrival of division troops. At least one field officer of the division had accompanied the advance echelon of XIX Corps Headquarters. Key personnel of the armored division, therefore, were conversant with the problems of hedgerow warfare. It was noted that optimism of a satisfactory solution for armored employment in hedgerow terrain was proportional to the recency of arrival on the beachhead. Throughout the phase of operations in Normandy this same hopeful attitude prevailed among armored troops. It is safe to say that although results achieved by armor under adverse conditions were commendable in every respect, they never reached the "Eldorado" of success they initially envisioned. It was this feeling of optimism which pervaded the 3rd Armored Division Staff in planning their attack at Villiers Fossard. It is believed that an armored unit could never recapture this same esprit or ebullience in the hedgerows after having once experienced a sense of extreme vulnerability in a type of jungle warfare.

2. PURPOSE OF OPERATION.-- Casualties among infantry troops in Normandy exceeded by far anything suffered in a comparable length of time during the hostilities in Europe. Troops of XIX Corps had much less regard for the Siegfried Line, Roer, or Rhine defenses than for the hedgerows. An infantry division could anticipate 250 casualties from their rifle and heavy weapons elements whether they attacked or defended. Casualties among support battalions were

frequently higher than among troops in the line since the lines were frequently so close that mortar fire on the opposing front line elements was hazardous to friendly troops; either from friendly or enemy point of view.

A salient into the front of the 29th Division in the vicinity of Villiers Fossard was causing such severe losses to that unit that it became mandatory that it be reduced.

3. OPERATION.-- a. In the area immediately north of St Lo, the enemy held a strong point on high ground projecting 2,000 yards into our lines which constituted a salient. To reduce this enemy position in the vicinity of Villiers Fossard, FO #3, XIX Corps, dated 272030B June was published which provided that one Combat Command of the 3rd Armored Division would attack and seize this objective, and the 29th Division would occupy and defend as the armored division withdrew to its assembly area.

b. Artillery Annex to FO #3. The following time-table for air bombardment and supporting fires to be used:

H-50 to H-25	Air bombardment
H-20 to H-15	Artillery fire
H-15 to H-10	Infantry rifle & hvy wpns fire
H-10 to H-hour	Artillery fire

The artillery of both the 29th Division and the 3rd Armored Division will support the attack, firing between the present front line and the objective. Corps artillery will fire counterbattery and selected targets behind the corps objective.

c. FO #1 of 3rd Armored Division, dated 272300, June, orders Combat Command "A" to attack at 290900 June to secure the division objective. This combat command will be composed of the following:

Hq & Hq Det Combat Comd "A"- Brig Gen Hickey, Comdg
32 Armd Regt
36th Armd Inf Regt
803d Tk Destroyer Bn, atchd from XIX Corps
Co A and C, 23rd Armd Engr Bn, reinforced
Co A, 45th Armd Med Bn, reinforced
Co A, Maintenance Bn, 3rd Armd Div

Upon being relieved by the 29th Infantry Div, CCA would move from rallying positions to present assembly position.

d. FO #1 of CC"A", dated 280800 ordered CC"A" to attack at 290900 to secure the designated objective south of Villiers Fossard. Composition of troops:

<u>Task Force X</u>	<u>Task Force Y</u>
3d Bn, 32d Armd Regt	2d Bn, 32d Armd Regt
3d Bn, 36th Armd Inf Regt	2d Bn, 36th Armd Inf Regt
Co A, 803d TD Bn	Co B, 803d TD Bn
Co C, 23d Armd Engr Bn (-1 squad)	Co A, 23d Armd Engr Bn (-1 sqd)
5 tank dozers	5 tank dozers

Task Force Z

1st Bn, 32d Armd Regt
1st Bn, 36th Armd Inf Regt
803d TD Bn (-2 Co's)
2 Sqds, 23d Armd Engr Bn
1 Angle dozer

Task Force "X" will operate on the left flank, Task Force Y on the right flank. Task Force Z, in Combat reserve. Task Force will take attack positions during the night of 28-29 June.

(1) Narrative of Operations. The Commanding Officer, TF "Y", divided his force into two assault groups

and a reserve group. Each of the assault groups consisted of a company of tanks (two platoons of medium tanks and one platoon of light tanks), one company of infantry, platoon of engineers, a platoon of tank destroyers, and two tank dozers. Each assault group was, in turn, divided into two assault platoons composed of a platoon of tanks, a platoon of infantry, a squad of engineers, two or three tank destroyers, and a tank dozer. The reserve group was approximately the same as the two assault elements.

(2) The 115th Infantry Regiment, 29th Division, which had previously outposted the LD, released all available information to Task Force "Y". The 353d Fusilier Battalion was indicated in the line. It was reported to be organized into small combat groups along the hedgerows and in the corners of the fields. A careful study of available 1/25,000 maps and aerial photos were made and checked against ground reconnaissance in the area. Exact organization of enemy defenses could not be determined in detail, however,

After the air and artillery preparation, both assault forces attacked from the LD at 290900. During this air and artillery preparation the enemy moved up close to our lines to minimize its effect. Both assault groups, therefore, ran into sharp opposition from small arms and mortar fire immediately after the jump off and considerable casualties were suffered by the infantry.

(3) The left group advanced slowly and steadily. The tanks were kept at least 20 yards from the flank and

forward hedgerows and infantry were deployed behind and between tanks and the adjacent hedgerows. These tactics were successful in preventing the enemy from employing bazookas effectively. After the attack had advanced over two or three small fields, the effect of small arms was reduced, but mortar fire became more intense. Friendly artillery fire called upon Villiers Fossard and on the crest overlooking the creek was effective in stopping mortar fire. This group then reorganized and advanced with slight resistance to the north side of the creek, where they halted and dug in under orders from the task force commander.

(4) The right assault group had advanced a short distance from the jump off when it encountered intense small arms, very accurate mortar fire, and four 88's with artillery support. The left platoon was pinned down a short distance from the LD, and the group commander decided to draw back the right platoon and reorganize. The ensuing attack progressed satisfactorily until it reached a position just north of the creek. Here extremely accurate mortar and artillery fire struck them as they were preparing to cross the creek.

Friendly artillery concentrations were fired on Villiers Fossard and surrounding areas, but the enemy continued ineffective mortar and artillery fire until late in the afternoon despite the fact that every effort was made to locate his OP's along the crest. Finally, about 1700 hours, we effected a crossing over the creek and Villiers Fossard

by-passed on the right.

(5) East of Villiers Fossard, the left group had found cover under the crest of the ridge and had waited there from 1000 hours until 1600 without suffering any personnel casualties. Its last two tank dozers, however, were out of action because of mechanical failures and two others had previously bogged down in crossing the creek. For the remainder of the day TNT was employed to blast through the hedgerows. This required that the assault forces wait at most of the hedgerows while the engineers blew holes for the tanks to go through. During these periods of waiting the infantry suffered the highest casualties. Lack of dozer equipment also caused the group commander to attack the fields with the lowest hedgerows. For this reason and the fact that these small fields are cut up so irregularly, the left force overlapped and encroached upon the right group's sector. Since the right group was in the rear it was not realized until the two groups had "buttoned up" for the night that the left group was practically astride the right group's line of advance.

(6) Early in the morning of 30 June, an assault force from Task Force "Z" was sent in between the left of TF "Y" and the Moon-sur-Elle - St Lo road marking the boundary between TF "X" and TF "Y". The left group of TF "X" waited until the right flank, now reenforced, caught up, but the enemy had been provided an opportunity to dig in and the impetus was never regained.¹

¹ Hq AGF, Memo CG, 2 Aug '44, p.6

After all three elements were deployed in the line, they attacked abreast and advanced until they reached the creek north of Bourg d'enfer. A crossing was made on the right and the armored attack was halted. The 29th Division was ordered to relieve the 3rd Armored Division on the line.

4. CASUALTIES.--

On 29 June, TF"Y" suffered casualties approximately as follows:

	KIA	MIA	WIA	Total
2nd Bn, 32d Armd Regt	5	0	13	18
2nd Bn, 36th Armd Inf Regt	16	2	69	87
Co A, 23d Armd Engr Bn	3	0	2	5
67th Armd FA Bn	1	0	2	3
	<u>25</u>	<u>2</u>	<u>86</u>	<u>113</u>

About 70% of Task Force "Y"'s casualties on 29 June were from shell fragmentation and only 19% from s/a fire.

Consolidated casualty figures for the 3rd Armored Division attest to the efficiency of German mortar concentrations.

These figures break down about as follows:

	s/a	H/E	Gren	Total
June 29	29	121	0	150
June 30	9	200	12	221
July 10	0	30	0	30
	<u>38</u>	<u>351</u>	<u>12</u>	<u>401</u>

Elements of the 3rd Armd Div passed through the 29th Division and, after securing the designated objective, was again relieved by the 29th.

It is significant that the infantry elements of the 29th Division, which did not participate actively in the engagement, received about the same casualties as the force committed.

Previous action, in and around the Villiers Fossard

salient had shown that casualties for an attacking force were only slightly higher than when the division remained ensconced in a defensive position.

5. ANALYSIS OF GERMAN DEFENSE AND CONCLUSIONS.---

a. An analysis of German defensive positions in this area carried out by members of the G-2 and G-3 sections, XIX Corps staff, indicated the following: With over 2 weeks to organize the position, the Germans dug in only one hedgerow in front of the Villiers Fossard crest. This hedgerow had nothing in it which could not have been done with simple entrenching tools. This selected hedgerow had the following characteristics:

(1) It was under direct observation from the German OP's and support emplacements along the Villiers Fossard Crest.

(2) It was within infantry weapon support range of the Villiers Fossard crest.

(3) It was on the south side of the hill immediately north of the town. That is, it was on the negative slope.

(4) It had covered lanes of retreat to the Villiers Fossard position. Both flanks of the hedgerow were protected by LMG's sited with a 180 degree arc of fire. Along the hedgerow, LMG's had mainly frontal fire only. (normally 30 degrees) The German counter reconnaissance screen had been so thorough as to preclude friendly troops from gaining any appreciable knowledge of their positions.

Weather had prohibited aerial photography for some time previously.

German observers were found in trees. Telephone wires were laid from hedgerow to hedgerow. After the operation, the author learned in conversation with an acquaintance that this officer standing under cover of a tree fired his pistol at the turret of one of his tanks to attract the attention of the tank commander so that he might direct fire at an enemy position. As the tank commander opened the turret, a German observer killed him from a position in the tree above the officer's head.

The German field fortifications were simple and shallow, but frequently with overhead cover of poles and earth which provided excellent protection against our artillery. While so protected, however, they could not man their firing niches. As soon as our artillery or mortar fire lifts, they can again take up their firing positions with telling effect.

AT mines, teller, magnetic and wooden were found in positions in and around Villiers Fossard, but not in the fields or along hedgerows. Anti tank personnel were scattered in small numbers over the area. German artillery was not heavy, but mortars were responsible for a large portion of our casualties.

b. The commanding general of the 3rd Armored Division had the following comments to make about the operation:

"...Our mission was to reduce the salient north of St Lo. Task Forces were formed consisting of infantry, tanks, engineers, and bulldozers. A company of tanks was given to an infantry company and we scattered engineers and dozers as far as they would go although these were inadequate in number. In addition to the hedgerows, the enemy had pill-boxes and AT guns. Their mortar fire was accurate and troublesome. We finally discovered that they had mortar observers posted, usually in trees, in hedgerows, two or three rows back from the fighting line. These observers had telephones. We had to breach the hedgerows with explosives. We first tried 25 pounds of dynamite, but found it was not enough and went to 50 pounds. We eliminated the salient, but tried to keep going and got into trouble. The tanks advanced into an open space which had been used as an air field. This was too small for the tanks to maneuver in, but sufficiently large for the enemy to coordinate his fire. They let our tanks come out into the open 500 yards then fired. Twenty-seven of our tanks were destroyed or damaged. Fourteen were lost by bazooka fire. At one stage of the operation, a task force came under heavy mortar fire. The force lost 100 men before the commander adopted the strange expedient of moving into the open. Mortars registered in on the woods and walked up and down causing tree bursts. They did not have observation in the field, however, and our losses ceased."¹

L Hq 12 AG, I R, 24, p.1

SECTION V

HISTORICAL EXAMPLE: CROSSING OF VIER RIVER AND ATTACK FOR HIGH GROUND VICINITY OF ST LO, 7 - 10 July, 1944

1. 7 July.-- By 6 July, 1944, forces of the VII and VIII Corps had virtually cleared the Cotentin, and after capturing Cherbourg, had moved southward and had closed in on La Haye-du-Puits.

Action in the zone of the XIX Corps from 1 July through 6 July had been restricted to active defense. On the morning of 7 July, however, the XIX Corps struck to the southwest across the Vire River with the 30th Infantry Division and the 113th Cavalry Group on its right. The 29th Division, on the Corps left attacked simultaneously in conjunction with the 2nd Infantry Division of V Corps.¹ The 30th Division had the mission of crossing the Vire River in the vicinity of Airel and the Vire et Taute Canal on a narrow front to secure high ground in the vicinity of Pont Hebert, making the main effort in the direction of St Jean de Daye, St Giles, and St Lo. A bridgehead was established the same day, and a penetration effected as far as St Jean-de-Daye, exploiting to the west and south, and CC"B" of the 3rd Armored division was crossed near Airel.

2. 8 JULY.-- On the morning of the 8th of July, the 119th and 120th regiments had turned south and the 117th was prepared to effect a turning movement. Based upon conclusions of British intelligence to the effect that the enemy was crumbling, CC"B" of the 3rd Armd Div was committed

I Hq AGF, Memo CG, 2 Aug '44, p.7

to exploit a breakthrough. Considerable confusion resulted as the armor passed through the 119th regiment and tank casualties were received from friendly fire as well as infantry casualties being suffered from armor.¹ Although the 30th Infantry Division had occupied a defensive position north of the Vire et Taute Canal and had been disposed along the east bank of the Vire to Airel for some time, neither the infantry troops nor the Armored Combat Command "B" had participated in a substantial attack until this operation. The attendant confusion brought about no amount of good will between the two forces in this engagement. The armor penetrated south to Vents and Pont Hebert, but were recalled for lack of infantry support.²

3. 9 JULY.-- On 9 July, CC"B" was attached to the 30th Infantry Division. Subsequent to the attachment, the commander of the armored unit was relieved of command.

4. CONCLUSIONS.-- The simple maneuver of passing armor through infantry to exploit a possible breakthrough cannot be successfully effected without a mutual understanding and training of both armor and infantry. Natural prejudices are likely to manifest themselves to the mutual disadvantage of associated troops unless ground elements are thoroughly indoctrinated and trained in teamwork. This indoctrination must be effected from the basic private of respective arms to the rank of general officers.

¹ Ibid, p.7

² Ibid, p.7

SECTION VI

BATTLE FOR ST LO - TANK OPERATIONS VICINITY OF ST ANDRE DE L'EPINE.

1. SITUATION.-- St Lo is the principal road center at the base of the Cherbourg Peninsula. It is dominated by high ground to the south and east thereof. The enemy had shown a determination to hold the road St Lo - Bayeux. The key to the east ridge is Hill 192. The enemy was strongly dug in along the entire front with the following strong points; Hill 192, Hill North of St Andre de l'Epine, and la Luzerne. The boundary between V Corps on the left, and XIX on the right, ran just west of Hill 192. On 15 July 1944, the two Corps effected a coordinated attack to seize Hill 192, elements of the XIX Corps then swinging to the right and moving west down the ridge of St Lo.

The assault of Hill 192 was assigned to the 38th Infantry Regiment on the right flank of V Corps. The 116th Infantry on the left of XIX Corps was to assault the western slope of the hill and effect a change in direction of 90 degrees toward St Lo.

2. BRIG GEN COTA'S TACTICAL PRINCIPLES OF TANK EMPLOYMENT IN HEDGEROWS.-- Support of the 29th Infantry Division operations in this area was provided by the 747th Tank Battalion, normally attached. Methods of tank-infantry employment had been developed by the 747th Tank Battalion under the general direction of Brig Gen Norman D Cota, asst Division Commander of the 29th Division. These tactics

were adopted in principle throughout the beachhead.

In substantiation of this statement: On Aug 8, 1944, G-3 of the 4th Infantry Division said, "...We are using the same hedgerow technique in our 703d Tank Battalion as is being used in the 747th Tank Battalion of the 29th Division and find it highly successful." He added, "in addition we call for time fire from our artillery to be brought down on the buttoned up tanks when they are caught naked."

3. GAPPING HEDGEROWS WITH DEMOLITIONS.-- A letter to the ^Commanding General, 29th Infantry Division, initiated by Headquarters 121 ^Engr C Bn, 29th Infantry Division, dated 7 July, 1944, outlines the development of breaching of hedgerows to that date. This report is summarized as follows:

a. A solution is required for employment of tanks on a broad front. These hedgerows surround all fields and are reinforced by many shrubs and trees. Because of their height and the mass of vegetation, armor must pass through established gates.

b. On 24 June, the 747th Tank Battalion supported an attack of the 115th Infantry using demolition charges to permit their advance through the hedgerows. At first, the charges used were 25 pounds each and employed in pairs, eight feet apart, placed externally on the hedgerows approximately $1\frac{1}{2}$ feet above ground level. These charges were placed by engineer troops. In the future it was decided that 50 pounds should be used to ensure successful gapping on the first trial.

c. A logistical study based on this premise indicated that ten tanks abreast requiring 100 pounds per obstacle totalled a half ton of explosive for each hedgerow. For a mile of typical terrain, thirty-four hedgerows, would be encountered requiring a minimum of 17 tons of explosive, all to be carried at least 100 yards and hand placed. To avoid a longer hand carry would require transporting the explosive during the attack close behind the supporting tanks.

d. An alternate possibility was to reduce the charges by three fourths and burying it in the hedgerow. The increased efficiency so achieved, was considered impracticable because

(1) Time involved might be prohibitive
(2) Presence of large roots and vines in the bank might prevent preparation of holes.

(3) Additional time required would probably result in increased casualties among engineers and require more reserves.

e. After trials and experimentation the following method was developed:

Two prongs, four feet in length and six inches in outside diameter, were welded to the front armor of the tank about $1\frac{1}{2}$ feet above the ground level and parallel with the longitudinal axis of the tank. These prongs were butted into the hedgerow and after the tank withdrew, charges of 15 pounds packaged in a 105mm shell casing were inserted and detonated.

f. Following points were developed in trials.

(1) No failure of prongs when used to punch holes.

(2) Tank had increased pushing power from pinning action.

(3) Scarifying action of small hedgerows permitted passage without explosives.

(4) Where the small ditches were encountered next to the hedgerow, the prongs prevented the dropping of the tank nose.

4. EXAMPLE OF TANK EMPLOYMENT.-- a. The 2nd Battalion, 116th Infantry, with a company of engineers and tanks attached, launched an attack upon an objective south of St. Andre de l'Epine. The operation was based upon the tactical doctrine espoused by Brig Gen Norman D. Cota to the effect that infantry must precede tanks by at least seventy-five yards to the front and flanks, to prevent their vulnerability to bazookas and AT fire. The tank then supports the advancing infantry by fire of all its weapons.

b. (1) The movement was started on a front of 400-500 yards with two tank platoons abreast on either side of the axial road. This gave a coverage of two to three fields on either side of the axial road. The two platoons, the leading elements of the two companies abreast of the assault battalion, moved along by successive hedgerows with a squad moving across each field of fire and movement covering the entire field in a deployed formation.

(2) The tanks, equipped with spikes welded to the final drive, moved forward to the hedgerow ramming holes into it and were on a line with the infantry for the jump-off. One tank supported each of the three squads, with the two tanks of the second section one hedgerow behind. The one supported the first section to the front and the other covering the front and exposed flank.

(3) An engineer squad accompanied each of the three forward tanks and were equipped with 15 lbs prepared charges of TNT in 105 shell cartons and 20 second time fuses. The cargo carrier, M-29 (weasel) were two fields back with extra charges.

(4) Infantry mortars, both 81mm and 60mm were located two fields in rear of the front line along a lateral hedgerow or sunken road. Forward observers were with the leading infantry platoons.

(5) Machine guns were used to cover the exposed flanks.

(6) At H- two minutes, the tank guns fire an H.E. shell in each hedgerow corner and then fire along the lateral hedgerow to the front with machine guns. The fire just cleared the top of the hedgerows. The infantry mortars fired a concentration two hedgerows ahead to disrupt the enemy's defense in depth. At H-Hour, the infantry jumped off from the hedgerow deployed in skirmish line and started across the field by short rushes covering with fire from

small arms. Two BARs per squad were used and were moved forward on both flanks paying particular attention to the hedgerows parallel to the advance. When the squad reached to within 15 yards of the hedgerow, the infantrymen tossed grenades over the row to get the enemy in his hole on the other side; then rushed the hedgerow line.

(7) The tanks continued to cover the advance of the infantry in the field ahead by fire until masked by friendly troops. Then they backed off and the engineer squad placed a charge in each of the holes left by the spikes, connected them with primacord and fired the charge. The tank then moved immediately forward through the hole and moved to the next hedgerow held by the friendly infantry, supporting by moving fire where not masked.

(8) At the next hedgerow the tank moved in, fired one H.E. shell into each corner and then traversed along the hedgerow with machine gun fire. The opening up of machine guns by tanks was the signal for infantry to jump off for the succeeding hedgerow in the manner described in par (6), immediately preceding. The procedure was followed until the objective was reached. The support company followed to be committed, to reinforce, or maneuver around the stalled flank of the leading element as the situation might dictate. The support tank platoon followed the most hazardous flank and was prepared to reinforce it or to maneuver with the support company.

5. TACTICAL LESSON DRAWN BY COMMANDING GENERAL
29TH INFANTRY DIVISION.--

The 2nd Battalion, 115th Infantry and Company "A" 747th Medium Tank Battalion, attached, attacked St. Andre de l'Epine in the same operation, advanced 3,000 yards, completed a 90 degree change in direction to the right without losing a tank. The Commanding General of the 29th Inf Division deduced from this operation that tanks should operate in pairs, not abreast, but in column, with one field separating the, so that when one runs out of gas or ammunition the other can take over. That is, the tanks leap frog each other.

6. CONCLUSIONS.-- a. Tanks draw concentrations of H.E. and where infantry stalled on the hedgerows they suffered severe casualties.

b. This operation requires great expenditure of ammunition and provision must be made for replacement of the tanks in the line.

c. The demolition blast draws fire and the tank should clear the gap into the next field before the smoke clears, thus avoiding possible AT fire. Infantry should avoid the gap.

d. Bulldozers are used to support and are only used where sunken roads make demolition impracticable.

e. Supporting artillery should be controlled by a forward observer with the leading elements of the infantry.

7. DEVELOPMENT OF THE "RHINO".-- Engineers of the 29th Infantry Division had discovered prior to 7 July that the tanks equipped with sharpened prongs could sometimes lift out hedgerows without requiring demolitions. Some damage was suffered to the prongs, however, which were bent in the process. It was suggested that heavier prongs, when available, or bumpers of railroad iron might be successfully employed.

Engineers of First U.S. Army developed this idea into a series of sawed-off angle irons which acted as huge teeth welded to the final drive housing of the tanks. An alternate model was the bumper of railroad irons as suggested by the 747th Tank Battalion. This development was considered top secret and was to be exploited to its greatest advantage in Operation Cobra.

SECTION VII

OPERATION COBRA:-

1. STRATEGIC ASPECTS.-- Operation Cobra, which was to pave the way for a phenomenal advance of the 2nd Armored Division from Normandy to the Siegfried Line, was originally set for 18 July, but postponed by bad weather. This First Army attack was to be launched with VII Corps in the center, VIII Corps on the right, and XIX Corps on the left of the main effort. The exploitation would subsequently pivot

on the U.S. V Corps, which would then be relieved and the XIX Corps would operate on the left of the American Armies until the Siegfried line was breached and the U.S. Ninth Army became operational.

2. CONTROL.-- The VII Corps was given control of the 9th, 30th, and 1st Infantry Divisions as well as the 2nd and 3rd Armored Divisions for the jump off. Accordingly the coordination of operations for D-Day was a VII Corps responsibility.

3. PHASES OF OPERATION.-- a. The Army plan called for the 9th and 30th Infantry Divisions to break through the crust of enemy resistance and fan out to block off the flanks of the break through area.

b. Phase II, of the plan, envisioned an exploitation by the two armored divisions and one motorized infantry division. Elements of the right armored division, designated as a combat command of the 3rd Armored Division, was to pass through Marigny and strike south as far as Cerisy-La-Salle and then turn west and seize the high ground to the west of, and including, Coutances. Elements of the left armored division designated as a combat command of the 2nd Armored Division were to pass through St Gilles, turn southwest at Le Mesnil-Herman, pass through Hambye seizing the high ground on the eastern bank of the Sienne River northwest of Gavray, capture the

town of Brehal, and block all movement of enemy reinforcements to the north.

The motorized infantry division, as a whole, was to follow the left column, or 2nd Armored Division, turn south-west at Canisy and take up a position in the vicinity of Notre-Dame-de-Cenilly.

The right column was to operate in conjunction with one battalion of the 1st Infantry Division, and the left column was to form a task force with the 22nd RCT mtz, of the 4th Infantry Division attached, was to move through the gap on two routes. The other combat command of the 2nd Armored Division was to move via Pont Hebert- St Gilles - Canisy road prepared to seize objectives between Cerences and St Denis-le-Gast, to move on Coutances to reinforce the 3rd Armored Division or to move to the south-east to reinforce the 2nd Armored Division.

4. RESULTS OF OPERATION.-- After the jump off on 28 July, which was considerably marred by unfortunate bombing of XIX Corps troops, then under control VII Corps, more distant objectives were assigned to the XIX Corps on 28 July. On this date 30th Infantry Division and CC"A" of the 2nd Armored Division reverted to control of the XIX Corps then consisting of the 28th and 29th Infantry Divisions in addition to Corps Troops.

5. SCOPE OF MONOGRAPH REFERENCE COBRA.-- Beyond this brief resume of the strategic employment of the armored divisions concerned, it is not contemplated that the results

thereof, can be properly analyzed in this brief monograph. However, it is believed that the tactical employment of armor and infantry in this operation should be noted in connection with the general strategic outline.

6. EMPLOYMENT OF ARMORED-INFANTRY TEAM.-- An interview with the commanding officer, 22nd Infantry regiment, on 8 August, 1944, is quoted in substance as follows:

a. There should be more training of infantry elements directly with armored units before they are thrown together in operations. In the breakthrough on the St Lo-Perriers Road, troops of the 22nd Infantry fought off tanks in the Russian manner. Credit is given to CC"A", 2nd Armored Division, for developing the system employed successfully. The first wave of tanks penetrated the enemy lines unaccompanied by infantry. Infantry on tanks, in the second wave, protected them from German bazookas and hand launchers. When necessary the infantry could get off the tanks and fight on foot with a regular infantry fight covered by tank fire. In the third wave, there were more infantry on tanks as moppers up.

Advantages of the system are:

(1) German machine guns are always sighted for grazing fire about two feet off the ground. If you have the infantry up behind the tank turret, they are above this grazing fire and are protected from the front and partially from the flanks.

(2) Men riding the tanks are moving targets. They move at irregular and unpredictable speeds and follow a

changing course.

(3) From any distance at all, it is difficult to silhouette infantry on tanks if branches and camouflage are on tanks. Infantry cannot be seen from a distance of 100 yards sometimes.

(4) The Germans are trained to get into their holes when tanks roll over them and shoot at the following infantry. Instead our infantry is riding on top of them and can even get off and in their holes.

(5) The Germans do not lay mortar fire on tanks, but they do in the fields. The doughboys are up above the spray of the German mortar ground burst.

(6) The doughboys get much better observation. They are blind on the ground, but can see much more when up on the tanks.

(7) There is the psychological effect of looking down on your adversary.

In this operation, eight men rode on a medium tank and six on a light tank, all on the rear deck. It took only ten minutes to train the soldiers. Therefore, we button up these tanks, get time fire from the artillery on them and follow with the tanks carrying the men. The artillery observer rides with the leading wave and controls the fire setting his fuses a little high. To insure control of tanks by the infantry battalion commander and the tank commander, the CO, 22nd RCT, put them both in the same tank. The infantry

battalion commander had his SCR-300 radio which he hung on the outside of the tank and worked directly with that part of his battalion which followed, in trucks or on foot. Infantry company commanders could talk to tank platoon commanders by telephones hung on the back of tanks. The 22nd RCT fought this way with CC"A", 2nd Armored Division for eight days and nights in the sector, between St. Gilles and Marigny, and foot troops loved the system. One disadvantage is that it does not capitalize on the full strength of the normal infantry regiment since it fails to utilize the heavy weapons company, the cannon company, the anti-tank company and the anti-tank platoons of the battalion headquarters company. It employs only the rifle companies of a normal infantry regiment.

CHAPTER 3

CATALOGUE OF CONCLUSIONS AND TACTICAL LESSONS DERIVED THEREFROM:

1. AIR SUPPORT.-- a. Although hampered by weather, the air support was generally good in the Normandy Campaign. Normal methods for marking front lines were to use cerise panels and colored smoke, The red smoke, most satisfactory for marking, was usually a critical item. To pin-point a target for an air strike, artillery smoke was employed on pre-arranged schedule. The Air Corps ran a daily "milk run" photo mission when weather permitted which covered a definite sector on both sides of the front lines. Photo mosaics

were compiled by G-2 as a result of these missions.

b. Unfortunate results occurred at Cherbourg and St Lo by drifting of smoke and dust. An American officer reports on the Cherbourg operation: "Before we jumped off on the high ground before Cherbourg, smoke of bombing drifted on us and even though our artillery was firing white phosphorous, the air could not see and dropped bombs on us."¹ Many troops believed at Cherbourg that the American planes were captured air craft flown by German pilots. This rumor was subsequently discredited. At St Lo, the air was not only confused by the smoke, but also mistook one road in friendly territory for a parallel road designated as a bomb line.

c. Although the following statement was made by the Air Support Officer of XIX Corps prior to Operation Cobra, it is nevertheless believed sound; "The only sure method of preventing occasional bombing of our own troops is complete and proper briefing of pilots. After 26 June, close support groups based in Normandy will permit such briefing. The air strike on perimeter of Cherbourg was made by pilots from England briefed through Uxbridge. This is too far away for air support."²

1 Hq Com Z, ETOUSA, WD O Bd, 5 Aug '44, p.8

2 Ibid, p.8

2. AMMUNITION.-- a. It was noted that infantry troops in earlier operations in Normandy were carrying HC smoke rifle grenades.¹ WP was found to be more satisfactory in the bocage country. WP ammunition was regarded as highly desirable for practically all weapons including the bazooka. This was about the most effective way of bringing the enemy out of their fox holes.²

b. Certain troops fired British HE in the 57mm gun and found it very effective. This was the only infantry regiment weapon with a flat trajectory like the 88mm. Because of the relatively small number of enemy tanks and presence of pill boxes encountered, particularly in the Cotentin, the 57mm was not used much.³

3. ANTI-AIRCRAFT.-- The amount of Antiaircraft Artillery was based upon the amount of air which it was estimated the enemy could put into the air against us initially. This proved to be excessive. A battalion of 90mm guns were attached to the XIX Corps Artillery for the Vire crossing at Airel and were used as AT weapons.⁴

1 Hq AGF, Memo CG, 2 Aug '44, p.8

2 Hq Com Z, ETOUSA, WD O Bd, 5 Aug '44, p.9

3 Ibid, p.6

4 Hq AGF, Memo CG, 2 Aug '44, p.10

3. AMPHIBIOUS TANKS.-- a. Training: The author visited the American DD Tank Training School at Torcross, England, where extensive experiments were also carried on. As a result of conversations with the S-3 of the school and after accompanying this officer on training exercises, the author was prepared to make a reasonably accurate and comprehensive report on capabilities and limitations of these craft to the armored section of the First U.S. Army.

The S-3, referred to above, was the surviving senior officer of the 743d Tank Battalion when a landing was effected on Omaha Beach. A point emphasized by this officer was that months of specialized training had been required to prepare troops for the initial landing. All tactical training in tank employment had been sacrificed to this end, yet immediately upon landing the DD units would revert to standard tank employment.

b. Operational Control. The S-3 emphasized that the decision of whether to launch the craft should be delegated to an officer conversant with their capabilities and limitations.

The commanding officer of an assault infantry regiment landing on Omaha Beach stated:¹"The DD companies did not know how to work with infantry because we never worked with them once. The DD's were a complete flop in landing. Waves were sometimes 10 feet tall and were bucking cross currents. The decision to launch was left to senior army officers who had never seen them before." The S-3 of the 743d Tank Battalion had informed the author that DD tanks could not be

launched with a greater than force three (3) sea or wind. Despite the alleged desire of high ranking Naval personnel, it is understood that the S-3, then senior officer commanding the 743d Tank Battalion, succeeded in landing his tanks on the beach directly from the LSTs with a loss of only five tanks. On the other hand, virtually all tanks and personnel of the 741st Tank Battalion which were launched, were capsized and lost. Personnel had been instructed in use of the Momsen Lung for escape from the tank. The technique of escape (similar to methods of submarine) consisted of permitting the vehicle to fill with water, then opening the hatch to escape. The S-4 of the 6th Engineer Special Brigade informed the author that he had recovered over one thousand vehicles from Omaha Beach during the lowest of the low tides in 1944. He stated that the tanks had turned over on the side jamming the hatch and prohibiting escape of trapped personnel.

Future amphibious operations should not place too great demands upon training time for specialized operations; intelligent operational control should be assured, and positive escape facilities should be provided for a submerged vehicle.

5. ARMORED DIVISION.-- Terrain in Normandy precluded the use of armored divisions as such. Prior to Operation Cobra, single combat commands of the 3rd Armored Division were used with only limited success. Tank Battalions

Then commonly referred to as GHQ troops, were assigned to Infantry Divisions on a more or less permanent basis. This accepted practice was proved valid in subsequent operations in the European Theater.

The tank dozer proved virtually a sine qua non for armored operations in close terrain as well as for clearing out rubble of streets with advanced elements. Before the development of improved methods of concentrated explosives, it was necessary to assign one to each platoon in the assault echelon.

6. ARTILLERY.-- Because artillery ammunition was strictly rationed in early operations in the beachhead, instructions were issued to fire only "observed" fire. This could not be accomplished at times, due to lack of ground observation and non operational weather for air. On these occasions the Germans, who had an intimate knowledge of the terrain, employed effective harrassing fire without subjecting themselves to counterbattery. The L/5 and "Cub" planes were invaluable in this country due to lack of ground observation. Good results were also obtained from high performance craft. Photographs made from small planes aided in fire control.

7. CHEMICAL.-- The 4.2 Chemical Mortar Battalions were normally assigned, one to each Corps. They normally fired HE and WP. They were used in close coordination with the infantry well up front. Their attachment was highly desired by all division commanders.

8. QUARTERMASTER GRAVES REGISTRATION.-- The Assistant Corps Quartermaster was the Corps Graves Registration Officer. Platoons of the Company were broken down for attachment to the respective Divisions prior to debarkation from U.K. The first Corps cemetery was located at la Cambe. This was the cemetery established by the 29th Division and contained 3800 graves on 20 July. Following a policy of as few cemeteries as possible and no isolated burials, the graves registration problem was a compromise between transporting bodies and reducing the number of cemeteries. The high percentage of casualties at first outdistanced facilities causing Q, personnel to work in gas masks. This precipitated one of two false gas alarms. Reconnoitering for a cemetery site in the beachhead, the Corps Adjutant General, accompanying the G-1, was caught by mortar fire and evacuated for amputation. Performance of Graves Registration Companies was superior and established an acceptable precedent.

9. LEADERSHIP.-- Terrain comparable to the hedgerows and orchards of Normandy places a very high premium upon vigorous leadership in the small unit to include the squad. Qualities of leadership, manifest themselves by performance and demand recognition whether they have been inculcated by training or are inherent in the individual. Replacement lieutenants frequently relied heavily upon the experience and judgement of their n.c.o.'s until they became oriented. The assistant Corps historian reported that he interviewed a

basic private who had commanded a rifle company consisting of fifteen men for three days. All fifteen were strangers to each other by name. The private was relieved by an officer of company grade who was alleged to have had little training since induction having served in an administrative capacity until alerted for overseas movement. This officer reported at battalion headquarters in the afternoon and was assigned to the company after dark. Arriving at the front line hedge-row, the officer shook the first body he saw to ask his position and identify the unit. It was that of a dead "Kraut" in his company front line. The historian stated that this officer received replacements and conducted a successful assault on St Martinsville, near St Lo, the following morning. The author believes that nothing could be more eerie than a Normandy battlefield at night, complemented with the stench of many dead cows, pigs, and donkeys. Since the hours of darkness are a normal time for replacement of personnel the rapid movement of officers from the Repl Bn to the front places very high demands upon the individual's "guts".

A high rate of casualties places unusual responsibilities upon the regimental commanders. The CO of the 120th Inf said on 15 June at Mont St Martin:¹ "I have been kicking the squads forward all day long. I had to do this because some of my junior leaders were scared. I think our boys will be all right tomorrow, however, because they have had one scrap under their belt."

1 Hq Com Z, ETOUSA, WD O Bd, 5 Aug '44, p.3

A high ranking officer is quoted as follows:¹ "All they want over here is 2nd lieutenants so they can promote them on the battlefield. There is no substitute for training and command experience regardless of battle experience. Our greatest need here is for company commanders who have to go and train these inexperienced leaders right on the battlefield and I spend most of my time kicking people forward." Another statement from a general officer:² "Our weakest support is in leadership of squads, platoons and companies. Higher leaders have to go forward. As a result, I have lost a lot of battalion commanders. Because of this, some of our colonels have to teach battalions how to fight right on the battlefield."

10. LIAISON.-- Contact between front line regiments and battalions was at times faulty. The same was true between divisions. The author has received faintly audible phone calls from regimental commanders of the flanking unit of an adjacent corps on the right of XIX Corps. These officers were asking for position and situation information of immediate importance. Investigation indicated that a liaison officer from the left division of the adjacent corps had been sent to the right division of the XIX Corps front, The liaison officer was not accorded an hospitable reception and was withdrawn by his parent unit without formal notification to anyone concerned. The situation was hastily repaired and then taken up with the adjacent corps.

It is believed that an observer recommendation³ that contact between adjacent unit be a dual responsibility from
* See footnote p.53

right to left and conversely, be favorably entertained.

Liaison between the Corps G-3 and lower echelons, to include leading infantry battalions and combat commands, was effected by a Combat Liaison Section. This is a specific function to obtain and expedite combat information for the commanding general and is distinct from the liaison from lower to higher command. These officers were equipped with radio and sent back immediate messages to Corps by M-209 converter. It is mandatory that G-3 Operations of Corps have such information before the time requisite for evaluation and submission through divisional or regimental channels. It is manifest that such information sent by the converter shall be consistent with the demands of cryptographic security. The function of securing immediate combat information was initially executed by G-3 Operations of Corps, but several days operations exhausts available personnel.

11. MATERIEL.-- a. Assault guns of the infantry cannon company should be self propelled and equipped with coaxial machine guns for close support in this type operation.¹

b. Brig Gen Cota, assistant division commander of the 29th Infantry Division (later designated as CG, 28th Inf Div) said: "In this country the towed cannon lacks observation

* Footnotes to page 52, preceding:

1 Hq Com Z, ETOUSA, WD O Bd, 5 Aug '44, p.7

2 Hq 12 AG, WD O Bd, '44, p.6

3 Hq AGF, Memo CG, 2 Aug '44, p.10

1 Ibid, p.8

for indirect fire and cannot get close enough for direct fire because the weapons aren't armored. This calls for a self propelled weapon."¹ Gen Cota added: "...We cannot get these towed jobs through the hedges; therefore, we keep them back to help the mortar and artillery fire."

Brig Gen ^Harrison, assistant division commander of the 30th Infantry Division stated: "There has been much mishandling of the M3 How. We should have self propelled mounts. We could pinpoint the enemy weapons and hit and run. ^The nearest thing we have to the German 88mm is the 75mm. We should have a gun rather than a how. The M3 takes too much time-- what is needed is an accompanying gun."²

12. REPLACEMENT.-- a. ^In many cases replacements were fed into the front lines too rapidly. Replacements arriving late in the afternoon would be fed into the front lines during the night. When possible the 29th Division kept replacements in the rear area to undergo "battle indoctrination courses" under competent combat sergeants. There they were taught the tricks of the trade, given an opportunity to hear and see enemy weapons, and subjected to intermittent enemy artillery fire.

b. G-1, V Corps reported their replacement battalion sent pool officers to the combat areas for indoctrination and instruction and they came back with liaison information.³

c. After conversations with soldiers of the
¹ Hq Com Z, ETOUSA, WD O Bd, 5 Aug '44, p.2
² Ibid, p.2
³ Hq Com Z, ETOUSA, WD O Bd, 5 Aug '44, p.4

116th assault regiment and other in the line the author feels impelled to quote a statement from the commanding general of an assault division: "In the next war, bring in enough divisions so that you can rest them and pull them out to absorb replacements. The present system of fitting in replacements destroys morale because finally the old men just peter out. Most casualties have been in the rifle companies. In several rifle companies of this division there is no a man or officer who landed on D-Day."¹ This division encountered little opposition on landing, incidentally.

13. SNIPERS.-- Among other major differences of opinion of tactics in hedgerow warfare, the lack of established doctrine on control of snipers is typical. It should, of course, be recognized that common rumors were to the effect that many snipers were Frenchmen in civilian clothes, some of whom were wives of German soldiers. In general, these stories were discredited.

The CO of an assault regiment says: "The worse thing we have run into is snipers. You must clean them out as you go. An advance should be made in columns and followed by a sniper clean up. Snipers don't shoot at patrols. Keep moving on a broad front in compact groups. Get rid of the idea of by-passing determined resistance, clean up as you go. This business of having a reserve clean up causes shooting into leading elements."²

1 Hq 12 AG, WD O Bd, 20 Aug '44, p.6

2 Hq Com Z, ETOUSA, WD O Bd, 5 Aug '44, p.14

A Corps Commander with combat experience in three theaters advised: "Forget the snipers. New men are afraid of them, but they should pass though and let someone in rear take care of the."¹

While the CO of the 1st Division assault regiment recommended a clean up of all strong point in the initial phases, the author of the report indicated in attached bibliography as Hq Com Z, ETOUSA, WD O Bd, 27 July '44, concluded: "The German depends upon maximum cover and concealment and elasticity rather than depth. By-pass him and get at his rear if you can."

Another combat experience of a senior officer: "Wd can't see snipers in trees. Tanks run into suspected trees and shake them, when they are shaken out the infantry pop them."²

Out of this confusion, one positive method of flushing snipers is established- flushing them from trees by fire reconnaissance of tanks.

14. SUPPLY OF RATIONS AND CLOTHING.

Troops were fed K or C rations until 20 July when "B" rations were received two or three times a week. Ten in one or B were no good in combat for infantry because squads had no way to cook it.

Troops had great difficulty keeping warm at night because of lack of extra clothing and blankets. The combat jacket was extremely conspicuous and was frequently worn inside out or painted for camouflage.

¹ Hq Com Z, ETOUSA, WD O Bd, 5 Aug '44, p.1

² Ibid., p.19

15. TACTICAL EMPLOYMENT OF TANKS AND INFANTRY.---

a. Operations of the Tank-Infantry team in Normandy was usually conceded as definitely poor.¹

b. Animosity and recrimination between armored troops and infantry, with reference to certain incidents cited in this monograph are recurrent even at The Armored School among junior personnel as of this date.

c. It is universally conceded that a comprehensive program of combined armor-infantry training, particularly among small units, must be carried on prior to combat. Training before Normandy was inadequate in this respect.

d. Telephone communication between armor and infantry on the ground was not employed in early operations of Normandy. (At least not universally) An effective means of simple communication is mandatory.

e. Tanks are an effective base of fire for advancing infantry. Infantry, however, should precede tanks to the next hedgerow to protect against bazookas and hand launchers provided the tanks are not covered by air bursts of their own artillery.

f. Infantry should stay away from bulldozer holes. Do not advance along rows paralleling the direction of advance because the enemy lays bands of fire along them. Squads must deploy across open fields.

g. Advance the tanks during initial artillery barrage and infantry small arms fire. The enemy unwittingly will aid in accomplishing this.

will aid in accomplishing this.

h. Normandy was a series of little battles for fields enclosed by hedgerows. The enemy tunneled into the corners of the fields, shooting fast and moving to new positions.

i. Infantry tend to crowd up along hedgerows with misconceived ideas of safety. Avoid this in so far as practicable because the enemy registers in the trees getting tree bursts.

j. Infantry or armor must follow their preparatory barrage closely. Despite established doctrine, infantry did not achieve this normally in the Cherbourg Peninsula.

k. A unity of command is required when armor works with infantry. In the operation of 3rd Armored Division against Pont Hebert, the armor complained that infantry troops would not follow them and consolidate and infantry affirmed they they were prohibited from advancing because armor blocked the roads. Similar allegations were made in many instances.

l. Greatest progress with lowest casualties were effected by battalion commanders of the 3rd Armored Division at Villiers Fossard, who stayed well away from hedgerows. Units with highest losses tried to work along hedgerows. They also lost tanks from bazooka fire. The successful battalions sprayed every tree in sight with machine gun fire eliminating observers. ¹

1 Hq 12 AG, I R, 24, p.1

m. Medium tanks were used for reconnaissance by the 3rd Armored Division in lieu of light tanks. It was believed that heavier armor could shove small elements aside and get information back quickly and in detail.

BIBLIOGRAPHY AND LIST OF ABBREVIATIONS THEREFOR

1. Memorandum for the Commanding General Army Ground Forces, G-1, G-3; Hq AGF, 2 Aug., '44. Subject: "Report on Operations of XIX Corps in Normandy and Comments Based upon Interviews and Personal Observations."

/s/H.W.Johnson, Lt Col, G.S.C.
W.S.Renshaw, Lt Col, G.S.C.

*Abbreviated: Hq AGF, Memo CG, 2 Aug '44

2. Observer Report, Hq Communications Zone, ETOUSA, War Department Observer Board, APO 887, 27 July, 1944, w/1 Incl thereto: Exhibit "A": "German Defense in Hedgerow Terrain"- Hq XIX Corps, G-2, APO 270.

/s/ Charles H. Coates, Col Inf

*Abbreviated: Hq Com Z, ETOUSA, WD O Bd, 27 Jul '44

3. Immediate Report No 24 (Combat Observations) Hq 12 Army Group, No Date; Subject: "Conference with Maj Gen Leroy H. Watson, Commanding General, 3rd Armored Division.

*Abbreviated: Hq 12 AG, I R, 24

4. Headquarters Twelfth Army Group, War Department Observer Board, APO 655, 20 Aug, 1944. Subject: "AGF Observer Report No 191- Notes on Interviews with Various Commanders in Normandy, August 5-10, 1944.

*Abbreviated: Hq 12 AG, WD O Bd, '44.

5. Hq Communications Zone, ETOUSA, War Department Observer Board, APO 887, 5 August 1944. Subject: "Notes on Interviews with Various Infantry Commanders in Normandy, France, 6 June - 8 July, 1944.

/s/ Charles H. Coates, Col Inf

*Abbreviated: Hq Com Z, ETOUSA, WD O Bd, 5 Aug '44

6. First United States Army, Report of Operations 20 October 1943 - 1 August 1944.

*Abbreviated: FUSA Opns R, 1 Aug '44