No. 3

# UNIT RECONSTITUTION - A HISTORICAL PERSPECTIVE

by Dr. Edward J. Drea

Combat Studies Institute
U.S. Army Command and General Staff College

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# Preface

This CSI Report responds to a CAORA requirement for historical data to use in an ongoing CAORA study of the reconstitution of units. CAORA members focused on several questions. These were:

a) What criteria might a commander use to withdraw a unit from combat operations; what criteria constitute grounds for the commander to recommend a unit be withdrawn from combat?

b) How does the distribution of casualties within a particular unit affect unit reconstitution?

c) What is the logistical system's response to personnel or equipment losses much above anticipated levels--the reaction to "surge" casualties when reconstituting units? CAORA also requested a comparative historical background of unit reconstitution in the 20th century be included in CSI's final report.

Within these guidelines, the following methodology is employed. The definitions--reconstitution, regeneration, sustaining support, replacement, reorganization, redistributed, resupply--are used in the context related in Chapter 4, of CAORA's "Current Reconstitution Concept," and are attached as appendix 1. This study proceeds from the general description of the unit reconstitution system used in the two world wars to the particular reconstitution of the 28th Infantry Division during and after the Schmidt, Germany operation of November 1944. There is also a brief description of Israeli Army reconstitution procedures on the Sinai front in the 1973 Mid-East War, and the U.S. Army's experience in Vietnam.

The historical examples from World War I and World War II illustrate the process of unit reconstitution and provide clues about general criteria which may be useful in identifying units in need of reconstitution. A brief overview of the British, French, German, and American schemes for unit reconstitution in that those conflicts provides a comparative historical basis. The French experience in World War I is most instructive because the French high command regenerated an entire army after the 1917 military mutinies. In the World War II and Israeli examples, unit reconstitution for armored forces receives attention.

The detailed examination of the reconstitution of the 28th Division at Schmidt has three parts; part one--synthesis of the operation with emphasis on reconstition; part two--criteria for reconstitution; part three--regeneration of the 28th Division. CSI devised a list of indicators of unit reconstitution based on CSI's analysis of historical data and the examination of factors affecting combat efficiency as previously developed by other organizations, such as Operational Research Organization (ORO) and BDM Corporation. The CSI list incorporated or amended existing criteria for

unit reconstitution according to CSI's historical perspective on the study requirements.

The empirical evidence of a division withdrawn from combat because of "extremely heavy personnel and equipment losses",[1] was, in turn applied to these criteria. The resulting application of a specific historical instance of the total process of maintaining a combat effective force to the list of indicators offers a touchstone for reconstitution models in terms of what was done and what was left undone.

Caveats, like television announcer disclaimers, seem obligatory in this type of study. Throughout this report, the historical cases selected depended upon the availability of source material at CGSC. Other nations, most notably the U.S.S.R., were not included because of a lack of open data or security classification considerations. The critical aspect of this research is to ascertain criteria that commander might employ to withdraw a unit from combat. The records of the 28th Division available at CGSC are the most detailed of any division history concerning personnel replacements. Moreover the experience of the division at Schmidt met the CAORA requirement for "surge" losses, so CSI analyzed the 28th's historical experience in the light of unit reconstitution.

The available historical evidence indicates that such guidelines for reconstitution tend to be situational thus difficult to reduce solely to quantitative measurement. Furthermore the historical record is incomplete, particularly in the consistency of statistical data.[2] Human factors in warfare necessarily impose such pitfalls, and the criteria this study provides should be considered with those cautions in mind.

Unit Reconstitution--The Historical Perspective of World War I

Like all the major belligerents of World War I, the British Expeditionary Force (BEF) anticipated a short, victorious war, and consequently little thought was given to the notion of unit reconstitution. By 1915, however, events of the opening months of the war had demonstrated that a prolonged battle of attrition lay ahead. It became apparent also that troops in the front line trenches or dug-outs could not be left there indefinitely, if only because their health would rapidly deteriorate. In short, a unit reconstitution system evolved of necessity.

A BEF infantry brigade (two regiments of four battalions each) would normally spend two weeks in the trenches and reserve billets and then a week in rest camps. An infantry battalion would spend between four to eight days on duty in the trenches and then rotate back to billets just behind the front lines for rest. During a "quiet" time, an infantry battalion might expect to lose 30 battle casualties and an equal number to illness each month.[1]

World War I billets were usually abandoned farms and buildings, lacked domestic comforts, and within range of the enemy artillery.[2] The troops, however, did have limited protection from the elements and were spared the "filth and squalor" of the trench proper.[3] Later in the war more fixed shelters--tents, wooden huts, and the Nissen hut--provided shelter. While in billets, troops were on alert and could be recalled to the trenches as the situtation dictated. Additional fatigue duties included repairing roads or support trenches in their sector. Before a battalion left the trenches for a rest area, it was required to submit a detailed training program to be undertaken during the rest period.[4] The first stop on its way to rest areas was the bath house and delousing station. Washed and cleaned the men continued to the rest camps where they followed a strict routine; reveille at 0600; roll call at 0700; weapons cleaned before breakfast at 0800; arms inspection and drill until 1200. After lunch team sports occupied the men until 1600 at which time those not on duty were left to themselves until lights out at 2130.[5] Replacement packets from regimental depots joined the units in rest camps and were integrated into the unit before it returned to combat. In the camps the men were provided hot water, fresh shirts and underclothing, enjoyed mail and sundries along with band concerts and movies. The YMCA or Red Cross operated store sold basic amenities such as soap, tobacco, ect. YMCA huts had a lunch counter and a large hall with tables and chairs for letter writing and reading. After February 1915 each battalion provided its own canteen.

The length of time a unit spent in the line varied due to operational considerations. Between December 1914 and August 1916 for instance, one British colonel spent 231 days in trenches or billets and 183 days in rest camps or safe places. Another officer's diary for 1916 showed he spent 101 days in trenches, 120 days in reserve, 73 days rest, 10 hospitalized, and 17 on leave. His battalion made sixteen tours of varying length (1 to 13 days)

in the trenches.[6] A comparison with U.S. Army units, which adopted a similar system, reveals that the U.S. 1st Infantry Division spent 213 days of its 501 days in France in the line; the 2d Division, 139 of 383; and the 26th Division, 205 of 303.[7]

Major offensives and their anticipated surge casualties presented new problems in terms of unit reconstitution. The original practice had been that the battalion specialists--signallers, bandsmen, cooks, sanitary men, transport, clerks, and pioneers--would provide the permanent core of the unit and were responsible to pass on unit traditions to replacements. Furthermore, before the Somme Offensive of 1 July 1916, the high command ordered all infantry battalions to leave ten per cent of their fighting strength with the rear echelon transport to constitute the nucleus for rebuilding battalions mauled in combat.[8] This became the standard practice for the rest of the war.

The first day on the Somme, the BEF suffered 60,000 casualties, a surge beyond their most pessimistic predictions. Records indicate that the survivors of the battered rifle battalions were led to rest areas where normal procedures were followed with inspections and fatigue duty. The purpose of these actions was to keep the survivors from dwelling on the enormity of the calamity which had befallen their units. Where units had completed an operation, commanders from division level and above personally visited the men in the battalions. If successful, congratulations were in order, if not commanders told their men that their unit's gallant efforts contributed to success elsewhere on the battle field.[9] While these depleted units were reorganized with depot replacements, fresh battalions continued the offensive through November 1916.

The Germans used a system of unit reconstitution similar to the British and French except that the Germans tended to leave their divisions in the line for more extended periods of time because they had fewer troops and thus had to use them in combat for longer periods.

During the same Somme Operation in 1916, a typical German division had about one-third of its strength in deep dugouts on the front line; another third in supports (billets) within 1,000 to 2,500 yards of the front line trenches; and the other third in villages four to six miles in the rear.[10] The BEF's preliminary bombardment hurled nearly 2.7 million shells on a German frontage of 11 miles in one week but did not inflict proportionately severe casualties. The German defenders, however, became exhausted both by the endless tasks of keeping open dug-out entrances and the difficulty in obtaining food. This was due to the constant shelling that disrupted German communications and inflicted numerous casualties on ration parties carrying resupply forward to men in the the front line trenches. Men went without food for two or three day periods. Throughout the shelling the Germans did maintain their standard six-day inter-battalion reliefs but only with great difficulty.[11] German losses in fighting for

the first trench along the Somme were enormous, 400,000 in the five month campaign. This resulted in doctrinal changes which, in part, were responses to unit reconstitution.

By 1917 the German Supreme Command (O.H.L.) reserve divisions were billeted behind the line divisions they supported. The purpose of these reserve units was not relief or rotation of the advance division on a one-to-one exchange basis. They were instead essential elements of the battle, not a reserve waiting to be called.[12] They operated as combat units under the orders of the front line division commander and represented his unit reconstitution to sustain his front line division in combat operations.

In the French Army system, a rifle battalion normally spent a week to ten days in the trenches followed by relief to rest or reserve billets well behind the trench lines. Troops were supposed to receive furloughs of seven days for every four months of service, but these were subject to cancellation due to impending operations. Of all the belligerents on the Western Front, the French infantrymen probably had the poorest combat support system. French medical support was notoriously inefficient; so-called rest areas were often destroyed villages without sanitary or messing facilities where the infantryman was left to his own devices.[13] Indicative of the lack of organized rest facilities was that men often had to sleep two to a bed until the reforms of 1917.[14]

In 1917 the French Army mutinied. There were many reasons, among them appalling living conditions, staggering battlefield casualties (more than 3 million by 1917), and destroyed visions of final victory based on the futile 1917 offensive. Mutiny was a shock, but it should not have been a surprise. A series of indicators pointed to the need to rest and reconstitute the battered French infantry. Among the more noticeable was an increase in desertions--from 509 in 1914 to nearly 9,000 in 1916, to an annual rate of 30,000 in 1917. There was a significant loss of small unit leaders, by 1915 half of the French military academy classes had been killed or invalided. Sustained casualties and, on 21 April 1917, surge casualties of perhaps as many as 90,000 in a single day combined to break the French Army. Perhaps as important were the false hopes raised about victory. According to General Henri Petain, who regenerated the French Army after the mutinies, "Nothing is more dangerous than to raise the hopes of the troops when the war can prevent them from being carried out."[15]

While no complete open record of the extent of the mutinies exists, they were so widespread that one historian estimated that only two of 109 French infantry divisions were completely reliable.[16] The Army was in danger of disintegration.

The regeneration commenced with the inevitable change in command as General Petain replaced the now disgraced General Robert Nivelle. Petain

The commanding general of the Services of Supply (SOS) was responsible for the reception, classification, and training of replacements. His control ended at the regulating stations where army, corps, and division commanders assumed responsibility for the replacements until the replacements reached their front line units. The regulating officer acted under General Headquarters (GHQ) instructions and established priorities for the transportation of men and supplies to the forward units.[20]

Regulating officers forwarded this information about personnel replacements to the divisions receiving the men. Division representatives would meet the replacements at the railheads (in theory one railhead per division) and forward the new men to the proper subunits of the division. Replacements for units actually engaged with the enemy usually were held back until the division rotated out of the front line and back to the billet or rest areas.[21]

The original theory of replacement divisions collapsed under the staggering weight of unanticipated personnel casualties. One measure of the desperate need for infantrymen was that of the 58 combat divisions the United States shipped to France, 16 were either converted to replacement depot units or service troops, stripped of all men except cadre, and designated as replacements for the combat divisions.[22] Nevertheless, the flow of replacements was insufficient. In 17 days of almost continuous combat in June 1918 near Chateau-Thierry, for instance, the 2d Infantry Division suffered combat losses of 99 officers and 4,301 men. The division received 34 officers and 2,706 men as replacements, but these new men were only partially trained and completely unknown to the division's officers and NCOs.

Because replacement divisions had been stripped of combat troops, by July 1918 there were only two depot divisions, the 41st and 83d, available to handle replacements for all U.S. troops in France, a task beyond their means. As an ad hoc measure, GHQ established seven corps' replacement battalions between June and September 1918. Their responsibilities included receipt and forwarding of men discharged from hospitals, receipt of casuals enroute to units; establishment of a reserve supply of replacements for combat units; and completion of training for replacements who were not ready to enter combat.[23] By August 1918, the shortage of infantry replacements was still serious. In an effort to get still more combat troops to the theater, the Army sent divisions below strength and in need of manpower directly from the U.S. to France. The result was more untrained and ill-equipped American troops and that only exacerbated the problem.

Replacements ultimately came from active combat divisions that the AEF stripped of manpower for that purpose. In September 1918, the AEF used men from the 84th and 86th divisions for replacements, leaving only a cadre of two officers and 25 men for each infantry and machine gun company in those respective divisions. Despite such measures, the combat divisions were about 120,000 men short, including 95,000 infantry. The AEF reduced authorized divisional strengths by 4,000, but the demand for replacements

explained to the troops his strategy of firepower and not manpower to achieve success in limited offensives. Furthermore Petain published and distributed throughout the Zone of the Armies a broadside titled "Why We Are Fighting", a technique echoed thirty-four years later in Korea by General Matthew B. Ridgway's "Why Are We Here? What Are We Fighting For?" directive to his Eighth Army troops.[17] As Petain personally addressed each division, his staff combed the Western Front searching for loyal units which could be expected to continue to fight the Germans. The French requested the BEF attack the Germans thereby relieving German pressure on their dangerously weakened lines and provide the French breathing time to reconstitute or regenerate their units. The British complied with the French request.

For the infantryman, Petain's headquarters adopted more liberal leave policies, increasing the number of men eligible for leave to 25 or 50 per cent in large units taken to the rear for reconstitution.[18] To make leave meaningful, Petain instituted reforms to give the troops on leave rudimentary comforts. The French provided truck transportation from rest areas to railroad stations, soldiers' restaurants, barbershops, washrooms, medical service and bunking facilities for the soldier on leave. They reorganized medical services. Improved food was given to the troops and new awards and decorations issued. A new routine developed in the rest areas. During the first four days out of the line, the troops were left completely alone--to talk out their experiences among themselves or whatever they wished to do pursuant to the requirements of military discipline. After that a training cycle began with short periods of drill and instructions which gradually lengthened as the days passed. The French discovered that a division required 15 days to recover its morale after heavy losses, but if left in a rest camp more than 30 days the men became irritable. On the darker side, to insure the reassertion of military discipline, Petain authorized his complete backing to "those /junior officers/ who display vigor and energy in the suppression" of mutiny.[19] These procedures may appear elementary, but no one had ever considered them before, especially the radical notion of telling the French infantryman his role in the war. Such techniques of unit regeneration will reappear in every conflict.

The American World War I Experience

A U.S. Army division in World War I had 28,105 men, almost double the size of a French or German division. American commanders believed the larger division would be able to conduct sustained combat operations because it could suffer heavy losses and still continue to fight. Each brigade commander would control two regiments, one forward and one in reserve. As the forward regiment suffered losses, the reserve regiment could leapfrog forward to continue the offensive. As originally envisioned, each corps had two replacement divisions which were intended to receive, train, and forward replacements after they arrived overseas.

was so great that a packet of men sent from the United States in July under the automatic replacement draft had a total of only two weeks training before their departure.[24]

Supplies, Equipment, and Manpower

From September 1917, shipments of supplies to the American Expeditionary Force (AEF) were based on an automatic supply system. The G-1 of the Services of Supply in France eliminated items locally available, and then consolidated all requests into a priority cable to the War Department in Washington. Throughout the war, personnel replacements received priority over supplies and equipment. This practice resulted in the constant shortages of weapons, and materiel.

At the lower levels, the static trench warfare made unit reconstitution a "logisticians dream" because regular supply lines and schedules could be established, depots or forward railheads organized on a semi-permanent basis, and requirements calculated in fairly accurate terms.[25]

The AEF developed a system of base, intermediate, and advanced storage and divided the responsibility for supply into three phases; procurement, care and storage, and transportation. The latter was responsible for unloading troops and freight at ports and for transporting them by rail to stations, depots, and regulating stations.[26] The number of service troops was supposed to be about 25 per cent (330 thousand of 1.33 million) of the army's strength, but that figure was never achieved. The chronic shortage of infantrymen necessitated the reassignment of men working in SOS to combat units.[27] This action, however, depleted further the already understrength service troops. The AEF went full circle in September 1918, when due to the imbalance between infantrymen and SOS personnel, the AEF broke up five combat divisions so that the men could be used as either replacements or for logistical duties.[28]

The AEF divided supplies into four categories. Class 1 comprised all items of daily automatic supply (rations, fuel, fodder) and was based on reported troop strength and the number of animals in an organization (the smaller British division in 1916 had 5,000 horses). The division G-1 supplied the necessary information to army G-4 who in turn notified the regulating officer at least once a week.[29]

Company commanders submitted requisitions for Class 2 supplies, mainly clothing and bedding. Regimental commanders consolidated and approved the requisitions and forwarded them through division G-1 directly to an advance depot. Requisitions for Class 3 items, equipment, including weapons, were handled like Class 2 except that the division supply officer and army dumps and parks tried to fill such requisitions before going to an advance depot for the remainder. Class 4 supplies, including ammunition, were handled in the same way, except that those sent to depots had to pass through the G-4 at GHQ.

Once SOS earmarked supplies and personnel replacements for the forward units, regulating stations handled the shipment. A regulating station was normally a large railroad yard where cars from depots and other rear installations were received, sorted, and made into strings of cars for each division, called rames. A daily supply train carried rations, mail, replacement troops, and supplies from the regulating station to the divisional railhead. Ideally each division had its own railhead, but often a railhead had to be shared among divisions. The railhead was normally located near the division dump but this practice varied depending on the operational situtation and terrain. From distant railheads, the division used truck convoys to bring supplies and replacements forward.

The 4th Infantry Division's example illustrates how the replacement system functioned. After moving to its assigned rest area in August 1918, division subunits sent personnel requisitions to the adjutant's office for consolidating and forwarding to army headquarters. Representatives of the division met the assigned replacements at the divisional railhead and escorted them to the divisional replacement depot. Officers subsequently distributed the replacements within the division, apparently according to unit need.

As for the front line units, convoys of 14 trucks, loaded according to unit to reduce confusion, took supplies forward at night. Mule drawn wagons carried rations to kitchen areas. Troops in billets could receive hot food, and even troops on the firing line could enjoy hot food carried forward in marmite cans. Front line troops kept emergency rations in gas proof containers because gas attacks frequently rendered food supplies useless. Ordnance resupply was ordinarily accomplished at the division mobile ordnance repair shops where troops turned in weapons for repair or replacement. Clothing came forward with rations, although issue was normally delayed until troops rotated to a rest area for a bath and delousing. Unit reconstitution was a continual process of personnel rotation and resupply. By 1918 it had reached a highly developed state sufficient so long as the war remained static. The system, however, could barely cope with the great September-November offensive of the AEF.

During offensive operations, the premium was on light railroads to haul supplies forward to the advancing troops because the men could not maintain roads in the shell cratered morass of no man's land. Sixty men required 10 hours to build a quarter-mile of plank road 4 meters wide whereas 135 men could lay as much as 3 miles of light railroad track in 5 hours.[30] For major offensives, the AEF established an army general depot or each service established several forward dumps or depots.* Engineers followed the

*For the Meuse Argone Offensive, 24 ammunition depots, 12 ordnance, 9 quartermaster, 9 gasoline and oil, 8 water points, 7 chemical warfare, plus depots for medical, motor, tank, signal supplies, and 34 evacuation hospitals were established. See, Huston, p. 382.

advance constructing a rail line from the dumps to the forward positions. Naturally the battlefield conditions and shell cratered terrain made resupply to advancing infantry units extremely difficult. There were no roads forward of the original front line, so engineers and labor battalions used muscle, gravel, and sandbags to keep tracks open. They did much of this work after dark in order to keep roads open from the trenches to the rear areas so that vital supplies could flow forward and casualties move back to rear area hospitals.

Chaos ensued as everyone tried to use the few trafficable routes between the front and rear. Battlefield evacuation of wounded was a special problem. Each division had a sanitary train with a field hospital section and ambulance section consisting of 12 mule drawn ambulances and 36 motor vehicles. These not only proved wholly insufficient for offensive operations, but also clogged resupply routes as they competed for the same routes as the trucks carrying supplies forward to the advancing troops.

Ammunition was the priority item, so infantrymen often went hungry after they ate their two days of field rations. In offensive operations, troops relied on emergency rations packed 25 to a galvanized box which required no cooking. Unfortunately the nature of World War I combat formations increasing tendency toward dispersal made the distribution of emergency rations nearly impossible. Field kitchens could not keep pace with the 20 mile advance during the six week Meuse-Argone Offensive, so infantrymen went without hot food for weeks.[31]

In the wake of the advance, salvage parties used trucks and wagons from the divisional ammunition train to police the battlefield. The reclamation of the discarded or damaged materiel was in itself a major contribution to resupply. After a four day engagement in July 1918, a detail of 600 replacements collected nearly 300 truckloads of equipment to be turned over to a salvage squad at a railhead.[32]

In summation, while the concept of unit reconstitution was undreamed of in 1914, by 1918 all major participants could reconstite vast armies in the field, particularly in static situations. The reconstitution system as it existed in late 1918, however, could support large scale offensives like that in the Meuse Argonne only with great difficulty. The 120,000 American casualties suffered in the six-week Meuse Argonne Campaign, taxed the personnel replacement and supply systems to the breaking point, rendering them impotent for near term future offensive operations.

World War II Equipment Replacement: The German Case

A single military commander, the Chief of Army Equipment and Commander of the Replacement Army, was in charge of all army activities inside Germany with one exception.* He was subordinate to the commander-in-chief, but otherwise enjoyed a free hand in directing induction, training of troops, procurement, storage and distribution of military supplies, and other services required to support the Field Army which conducted operations.

The link between the Replacement and Field armies was the Quartermaster General on the Army General Staff. He provided supplies to the Field Army while requisitioning their needs from the Zone of the Interior, i.e., Germany. The Quartermaster General's responsibilities did not include equipping new formations, reequipping badly mauled divisions, supplying tanks, armored vehicles, and signal equipment, or building fortifications. The Replacement Army or Todt Organization handled these efforts.[1]

Despite the experience of World War I the Germans did not establish elaborate rear-area installations at the start of World War II, because they planned for short blitzkreig campaigns, and expected to live off the land in their conquered territories. Trained technicians accompanied the Field Army to exploit the conquered nations' economic systems for Germany's benefit.

The general rule that the German Army followed was that each unit collected supplies from the next higher unit. Below division level, companies, platoons, sections, or individuals organic to the unit performed service functions, except for the motor maintenance troops in the infantry division who were assigned to regiment and battalion. Administrative troops supplied rations, forage, clothing, personnel, equipment and supplies. Ordnance troops supplied and repaired weapons and ammunition as well as certain types of equipment. Supply troops provided transportation--either horse or motor--and the labor detachments to distribute supplies. Motor maintenance troops supplied and repaired vehicles, with the exception of tanks. Special tank recovery units and workshops were located in armored units or at higher levels to facilitate tank repair and maintenance.

The reconstitution process for German armored units offers an insight into their methods.[2] Upon induction into the army, recruits were assigned to specific units of the Replacement Army. Those assigned to armor joined a tank training company where they underwent 12 weeks of training (later reduced to 8). After completion of training, the replacements went forward as a unit to their respective armored division.

As for equipment, initially the Germans planned for a centralized system of tank reconstitution with only minor repairs made in the field. Seriously

*The exception was the Army Personnel Office which controlled officer personnel.

damaged tanks would be returned to the factory of origin in Germany for refit. This system was effective in Germany's opening, short campaigns against Poland, Norway, the Low Countries, and France. In North Africa, however, and later in Russia, the centralized system was no longer practical as campaigns lenghtened and transportation over the great distances between support bases and the operational areas made the centralized system prohibative. As a result the Germans augmented the strength of maintenance units attached to the armored divisions.

Each tank company had a maintenance detachment which made on-the-spot repairs of disabled tanks. If field repairs required more than 12 hours, the detachment arranged for the armored regiment's maintenance company's recovery platoon to evacuate the tank. Recovery teams removed disabled tanks from the battlefield to collection points protected from enemy observation and fire. Depending on the extent of damage, crews would send the tanks from the collecting point to either field repair shops or the nearest railhead for transport to Germany.

The tank maintenance company, organic to a tank regiment, ran the field repair shops and set a 14 day limit to complete repairs. Usually it had a 30 to 40 tank capacity. Aside from its maintenance and repair missions, the tank maintenance company was responsible for the welfare of tank crews who accompanied their disabled tanks to the field repair shop. Until 1943 maintenance companies housed and fed crews awaiting repairs and personnel replacements. Then the armored regiments organized casual companies whose commander took the responsibility for the well being, training, and security of crews awaiting repairs of their tanks as well as new replacements. While the crew went to the casual company to await repairs, the tank driver remained with the vehicle to check the status of the work. Upon repair and matching with crews, tanks returned to their units in groups of 4 to 8 tanks commanded by an officer.

In the event of surge casualties or tank losses, the Germans attached tank maintenance and tank recovery companies to army group or army headquarters as needed to support the armored forces otherwise lacking sufficient personnel to keep the reconstitution pace abreast of surge losses.

At the start of an attack, maintenance detachments advanced behind the second echelon of the attacking force together with vehicles of the recovery platoon. Field repair shops were close to the front line, the maximum distance not to exceed 70 kilometers. This was due to excessive wear and tear on prime movers and disabled vehicles that were moved over great distances. During advances and pursuits, recovery detachments brought only those tanks disabled within a 15 kilometer radius of the repair site to the operating site of tank maintenance companies. Otherwise, the recovery teams took tanks disabled along the axis of attack to predesignated contingency collection points along the route. After the armored units broke off their attack, normally at dusk, maintenance crews reassembled to pool their

resources until the attack was resumed the following day. These crews determined which of the disabled tanks could be repaired and made available to continue the attack.

No tank was abandoned, unless completely destroyed. Otherwise recovery was mandatory, even though the tank might be used only for cannibalization.* Shortages of spare parts often led to cannibalization, especially of tanks marked for return to Germany. Each Army Group maintained its stock of tank spare parts and established advance dumps at army level. The tank maintenance companies requisitioned and drew spare parts for their regiments from either dump or depot where stock levels were replenished automatically. A lack of spare parts plagued the Germans, particularly because they found most repairs involved exchanging worn for new parts while less than 30 per cent of damaged tanks required welding or time consuming labor.

In the defense, the Germans trained combat troops to remove disabled equipment from the battlefield. If they could not accomplish that mission, recovery crews from the maintenance companies moved in after dark to remove damaged or disabled vehicles and tanks. In retrograde movements, maintenance crews evacuated by rail tanks not capable of repair in a short time.

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*German tankers did not trust depot maintenance and preferred to either deadline tanks in field repair depots for 3 to 4 weeks or canibalize them for spare parts.

The British Experience in North Africa

Originally the British sent new or repaired tanks to a Tank Delivery Regiment (TDR) for inspection and stocking and thence forward on transporters to a Tank Delivery Squadron (TDS).[3] Tanks repaired at corps echelon went to TDS for service and matching with crews who had returned from battle. TDR and TDS both lacked sufficiently experienced personnel to inspect and check the tanks properly. Tanks and crews dispatched forward from TDS travelled independently. This inadequate control of replacement tanks and mix-and-match crews (veteran crew members mixed with replacement crews or crews from different regiments) added to the confusion. By early 1942 the North African tank fighting had also shown the British that replacement tanks and crews in an armored unit, if they even existed, were consumed within the first day of a battle.

Based on past experience and the need for more effective reconstitution procedures, a number of changes appeared in the British system. First crews coming out of battle with a disabled tank were never sent beyond the TDS where each armored battalion stationed an officer to care for the welfare of his unit's crews. The unit maintenance section made minor tank repairs while the crew remained with their tanks in the battalion trains area. For repair within 24 hours, crews accompanied their tanks to brigade workshops. The Tank Delivery Troop (TDT) handled the tank at brigade; checked and serviced it; and drew supplies from the co-located quartermaster battalion for the tank. Crewmembers checked the supplies and TDT officers told crew members when to move forward as well as check points and radio call signs along their route. With the reinstitution of control on the movement of replacement tanks, the armored brigade S-4 knew when repaired or new tanks were arriving. Crews reported to the S-4 who in turn directed the crews to regiment or battalion.

Transporters carried more seriously damaged tanks to corps workshops. After repair an Advanced Inspection Unit would recheck the condition of field repairs and send the tank to TDS for resupply and re-equipping. Crews of seriously damaged tanks reported to a Corps Personnel Camp (CPC), co-located with the TDS. The CPC provided an administrative staff, tents, cooking facilities, and transportation for the crews. Within the CPC, each armored division administered and organized its own area. HQ, CPC coordinated the divisional areas with the officer-in-charge who was the assistant corps G-1.

The CPC cared for replacements and men in transit. It offered them a central canteen and recreation tent, a mobile bath unit, and a central distribution point for stores and supplies. They concentrated all these resources near the CPC to insure the proper care for a crew coming from battle as the initial phase of reconstitution. Officers from their own battalion met the crewmen. The crews received a hot bath, new clothes, new equipment, excellent food, and had recreation facilities. The purpose was to give them a respite from combat that they required.

The turn around procedure was equally simple, although the distances of fronts in North Africa created special problems. When a tank left a workshop, TDS notified corps and obtained from corps a priority for delivery. TDS then informed the appropriate divisional camp officer who decided, based on orders from his divisional headquarters, which tank regiment the repaired tank would join. That determined, a crew from the same regiment at CPC reported to TDS to pick up their tank and deliver it to its original unit.

World War II Personnel Replacement: The German System

Germany began World War II with 106 divisions averaging 16,626 men. By December 1943 the figure had reached 278 divisions averaging 10,453 men, and by April 1945, 260 with 9,985.[4] The German high command decided on this gradual mobilization to avoid the mistakes of 1914 when the almost overnight mobilization of manpower seriously disrupted the economic life of the country.[5] The Replacement Army procured and trained recruits. Personnel for field units came from specified units of the Replacement Army and those, in turn, came only from the home recruiting stations.[6] The twenty military districts in Germany each contained numerous affiliated divisions. Each regiment at the front left a rear echelon training replacement battalion (a depot battalion) at its home base. The replacement battalion would receive and train recruits then forward them to the parent regiment as a unit.[7]

Replacements always travelled in units, 1,000 man strong "marching battalions" (Marschbattaliene) that were armed and equipped for combat operations if the need arose. An officer from the parent unit met the Marsch battalion and led it to the unit whereupon the marching battalion was dissolved. The men went to a divisional field replacement battalion, each of whose three companies was linked to one of the division's three regiments. Officers and NCOs from the line regiments trained the replacements assigned to their unit. In addition to having veterans teach the newcomers, it gave the veterans a temporary respite from the front line. After training was completed, the replacements, as a unit, reported to their regiment at the front.[8]

There were no fixed rules for rotation of combat units. Following the early brief campaigns, divisions underwent Refreshment--a three week long exercise involving logistic and administrative preparations. Existing units reconstituted, received refresher training, merged their replacements, and obtained issues of new equipment to replace lost or worn items.[9] As the war lengthened, such refreshment became more infrequent. Instead of the entire division undergoing refreshment simultaneously, it became an interdivisional system in which regiments of the division rotated from the front line for varying periods of time and went to Recovery Homes for reconstitution. The company commander could also grant leave, and the Germans gave preference to the front line troops who had the longer periods of active service. The longer the active service, the more frequent the period of leave--one leave for the first 12 months, one in 9 for the second, and one in 6 for the third.[10]

The American System:

Little prior planning for U.S. Army personnel replacements seems to have occurred. Only on 29 January 1942 did a War Department memo from the Executive Officer, G-1 to the Planning Officer, G-1 War Department General

Staff acknowledge that, "Some thought should be given to the subject of establishing a rapid and direct method of supplying officers and enlisted loss replacements to our overseas forces."[11] It was not until December 1943, however, that a tabulation of battle casualties identified which combat arms would need replacements the most. Based on the North Africa campaign, infantry accounted for over 61 per cent of battlefield casualties, field artillery 6.7 per cent, and others 32.3 per cent. The War Department had assumed responsibility to maintain the replacement pool in each overseas command at the required numerical and categorical strength. But there was no evidence that any thought had been given in the early planning stages to the overall administration of the replacement pools.[12] The underlying philosophy seemed to be that men, like equipment, were interchangable parts of a vast fighting machine.

The basic strategic decision to create a small number of combat divisions (90 total with 89 seeing combat) meant that replacements received individual, not unit training because the Army lacked sufficient divisions to withdraw any from combat for training purposes. A division stayed in or near the front line until the campaign ended. Individual replacements joined the division wherever it was when they reported for duty. Furthermore the policy of keeping the combat divisions up to strength by a steady stream of replacements made unit rotation impossible and unnecessary. No passes, for example, were granted in the ETO until 1 October 1944. Rest and recreation centers for corps and divisions did not receive attention until mid October of the same year. Even then the division itself had to sponsor a rest area for its men and received little support from corps or army in the projects. Rest centers within corps had very limited capacities, 800 men in VIII Corps, 600 in V Corps, 2,400 in VII Corps, and 600 in III Corps. Unit commanders designated men as individuals to go to rest centers, while the majority of the unit remained on the line or in reserve just behind the line.

A regiment of a division or an individual battalion might be two or three miles behind the front for rest and reconstitution, but the main force of the division was on the line engaged in combat. U.S. divisions remained in the line much longer than either our allies or enemies. In February 1944 General Devers wrote to General McNair from the Mediterrain Theater, "It has been demonstrated here that the division should not be left in the line any longer than 30 or 40 days in an active theater. If you do this as has been done in this theater, everybody gets tired, then they get careless and there are tremendous sick rates and casualty rates."[13]

A form of "combat exhaustion" affected veterans who had been in continuous action. After about four months of combat these men developed the very symptoms described by General Devers--unreliability, loss of interest, decreased efficiency and carelessness.[14] Postwar studies conducted by military officers revealed that the average combat infantryman was unfit for duty after 200 to 240 aggregate combat days. Any man in

combat that long and still uninjured who displayed signs of "combat exhaustion" would require at least six months treatment to make him useful for a noncombat assignment.[15] In short, even if by some chance he survived the rigors of combat, he could never be reconstituted or regenerated for combat if left in the line that long.

In the Italian Campaign, the British estimated that their riflemen would last 400 combat days because they rotated their infantrymen out of the line at the end of 12 days or less for a rest of 4 days. In contrast, the American soldier in Italy usually stayed on the line without relief for 20 to 30 days, frequently for 30 to 40 days, and occasionally 80 days. A postwar U.S. Army board recommended that there should be some system to rotate men out of the line for short periods of time for rest. Frequent relief for short periods was preferrable to less frequent relief for longer periods.[16] Third Army in the ETO believed that additional planning should have been given to the matter of rest centers for troops coming out of the line. Camps developed ad hoc by the combat units, but a more systematic approach to provide adequate facilities for rest and recreation would have allowed more to have been done for the combat soldier. Third Army admitted, though, that sufficient personnel to allow rotation within the units normally were not available.[17]

Rotation for the U.S. soldier in World War II closely resembled the pattern his father was familar with from World War I. Army studies emphasized that the frontline fighter wanted fundamentals--a bath, haircut, clean clothes, and withdrawal from the range of normal enemy artillery fire--to relieve the tension that accompanies close contact with the enemy. This included the privilege to sleep in a bed, to write a letter in relative comfort, and to eat a properly prepared meal.[18] All of these functions could have been organized at rest centers.

In fact the system did not work that way. Higher headquarters shuffled a division in need of reconstitution or regeneration to a relatively inactive sector of the front. Even in a quiet sector the Americans still engaged the enemy. The 28th Division, for example, in October 1944 had been in a "quiet sector" undergoing reconstitution after heavy fighting in August and September. That October the division reported suffering 993 battle casualties--28 officers and 965 enlisted men--including 106 killed.[19] The danger of a quiet sector is evident.

If combat veterans faced these types of problems, replacements faced an entirely different set intitally. The infantry most needed replacements. Infantry losses throughout the war exceeded projections and the consequent shortage of manpower affected unit performance. Put differently, overall infantry comprised 68.5 per cent of the division's manpower, but suffered 94.7 per cent of all divisional casualties.[20] The losses were naturally heaviest in the lettered line companies which, because of the replacement shortage, normally fought understrength.[21]

A rifle battalion could expect to suffer heavy losses intitally, then at a more gradual loss rate. In Fifth Army (Italy) a rifle battalion could expect to lose from battle and non-battle casualties about 25 per cent strength after 30 days; 40 per cent after 50 days; 60 per cent after 100 days; 90 per cent after 200 days, and be virtually destroyed after 300 combat days (10 combat days = 17 calendar days).[22] During the Schmidt offensive between 2 and 18 November, the 28th Division requisitioned ten times the infantry replacements as all other branches (4,458 infantry against 420 others).[23] Infantry losses in the 9th and 28th divisions during late October and early November 1944 were so great that V Corps' 41st Replacement Battalion exhausted its supply of infantry replacements in the last week of November. Henceforth the only replacements available to the 28th Division were men returning to duty after hospitalization.[24]

Faced with replacing such personal losses, American divisions did not have a special organization to absorb and retrain newly arrived recruits and replacements were expected to pick up experience from veterans.[25] Unfortunately the lack of preparation for combat resulted in numerous cases of combat exhaustion among the replacements just before they actually entered the fighting or during their first five days in the line. Such cases were particularly high among infantry replacements who had not been thoroughly trained or indoctrinated into the unit's tradition.[26]

Moreover it was difficult for infantry replacements to blend into their new units. Veterans resented and distrusted replacement line officers. NCO replacements blocked veterans' promotion opportunities with the unit. Replacements were unknown and unproven and thus considered unreliable entities. During the gruelling fighting in Normandy, for example, the commanding general of the beleagured 4th Infantry Division refused to accept 400 replacements because they lacked proper infantry skills or were not thoroughly trained.[27] This was a recurrent problem with U.S. Army replacements. At Schmidt the 112th Infantry Regiment, which suffered the most battle casualties (1549) of any regiment during the fighting, refused to accept a group of 250 replacements for similar reasons. One factor responsible for this condition was "the apparent lack of importance attached to personnel matters by commanders and staffs in virtually every echelon of the Army, particularly the highest echelons".[28] The U.S. Army created and perpetuated a personnel replacement system that accentuated deficiencies of new soldiers introduced to combat.

After basic training in the United States, the U.S. Army replacement was given 10-12 days leave and then reported to the Replacement Depot at the embarkation ports. As individuals they were then shipped overseas to a theater depot. ETO replacements landed at Le Harve, location of the 15th Replacement Depot. About one-third of all replacements moved directly from the beach to waiting trains while the remainder stayed in the depot area for 6 to 36 hours waiting for their trains.[29]

The Transportation Corps authorized the 15th Replacement Depot one train per day. Troops usually rode in boxcars to the forward areas. The train might proceed to an Army depot where the replacements received up to five weeks refresher training. If combat units urgently needed replacements, however, the trains went directly to forward depots and from there to combat divisions. At the divisions, the division chief of staff, or his representative apportioned the individual replacements in groups or batches among the regiments. It was quite possible for a replacement to join his unit and be killed in action before his commanding officer or NCOs learned his name. If the replacement joined a unit occupying a quiet sector, he discovered that the time he spent in the replacement pipeline had rusted his combat skills and caused the deterioration of his physical condition. Riding in boxcars the men lacked exercise. Food was also poor and it was not until November 1944 that an attempt was made to serve the replacements hot meals during their journey. Before that the men subsisted on K or C rations. Thus originated the stereotype of an untrained, physically unfit replacement being dumped on a combat unit.

All armored force replacements went to the 9th Depot at Fontainebleau. They moved from the communication zone to their vehicles at the vehicular pool, division service park, or an immediate point in unusual circumstances.[30] In practice, there was difficulty matching the flow of personnel and vehicles. Communications Zone and service troops went to the 19th Depot at Etemps. The bulk of replacements, 62 per cent, were infantrymen, and they went to one of two "immediate stockage depots," each serving two armies. The stockage depot had two forward depots--one for each army supported--and each forward depot had one forward battalion per corps supported. The battalions provided replacements to the combat divisions. The normal procedure was for the individual replacement or groups of individual replacements to report to the subsistence depots from which the line units drew supplies so that the replacements might ride on the trucks hauling rations to the front.[31]

Infantrymen were the key personnel ingredient in unit reconstitution. Yet the U.S. Army belatedly recognized that it had mishandled the personnel replacement problem. "There seems to be no objection to introducing replacements into the line in very small numbers," a postwar study observed, "but our World War II practice of introducing masses of replacements was indeed shortsighted, inhuman, and in the long run grossly wasteful of manpower."[32]

Reconstitution of Equipment:

In the U.S. Army case, Army Service Forces (ASF) organized the procurement and production of supplies in the United States and shipped them to overseas theaters. Once delivered to an overseas port, theater commanders assumed the responsibility for supplying and servicing the troops within the areas of their command.[33] Army doctrine in 1942 called for the

creation in major theaters of a Communications Zone as the region that connected the fighting army with the sources of supply. The communications zone contained supply, evacuation facilities, repair shops, and other service facilities. It was, in fact, similar to the system the U.S. Army employed during World War I. The major difference in World War II was that no two theaters operated alike. As in World War I, neither did an entirely satisfactory system of supply evolve in any theater.[34]

The U.S. Army's campaign in Northwest Europe from 6 June 1944 to 7 May 1945 alternated between periods of heavy fighting but relatively little movement and fast moving pursuits with relatively little fighting. From the invasion at Normandy until Operation Cobra beginning on 25 July, the Allied lodgment on the continent was restricted in area. Resupply was relatively uncomplicated, except for the capricious channel weather which disrupted resupply operations on 19 June. Despite that storm, operations progressed slower than anticipated, so materiel resupply was not a serious problem. Personnel replacements, however, as early as July had become a significant problem, about which more will be mentioned later.

Battlefield recovery of damaged mechanized vehicles was generally good to excellent during a normal rate of advance, but during the rapid pursuit from early August to early September it proved inadequate, because units lacked the organic capability to recover battle damaged or inoperative vehicles and unit commanders felt their responsibilities for recovery and salvage should be shifted to other service or supply organizations at such times.[35]

Fuel, ammunition, personnel shortages and stiffening German resistance brought the Allied pursuit to a halt in early September. Both sides reconstituted their forces for the border battles along the German frontier, the Seigfried Line campaign. The Battle of Schmidt occurred during that campaign.

By that time personnel replacements were in short supply, and at the end of October nearly 73 per cent of Allied supplies on the continent were still stored in the Normandy area.[36] Not until the Allies rebuilt the French railroad system did resupply improve. Still the Allies lack of a suitable port facilities hindered resupply. The Transportation Corps moved supplies from the communications zone in Normandy to the fighting units by means of 198 Quartermaster Truck companies, that by December 1944 had 9,500 vehicles.[37]

The assault divisions at Normandy landed 25 per cent overstrength in personnel, in effect providing themselves with replacements until the automatic replacement and requistion system went into effect on 18 June. A similiar system had been used during the Allied breakout from Anzio.[38]

By the end of July 1944, three Ordnance group headquarters existed, the 51st, 71st, and 72d. The 71st took over the ammunition battalions and

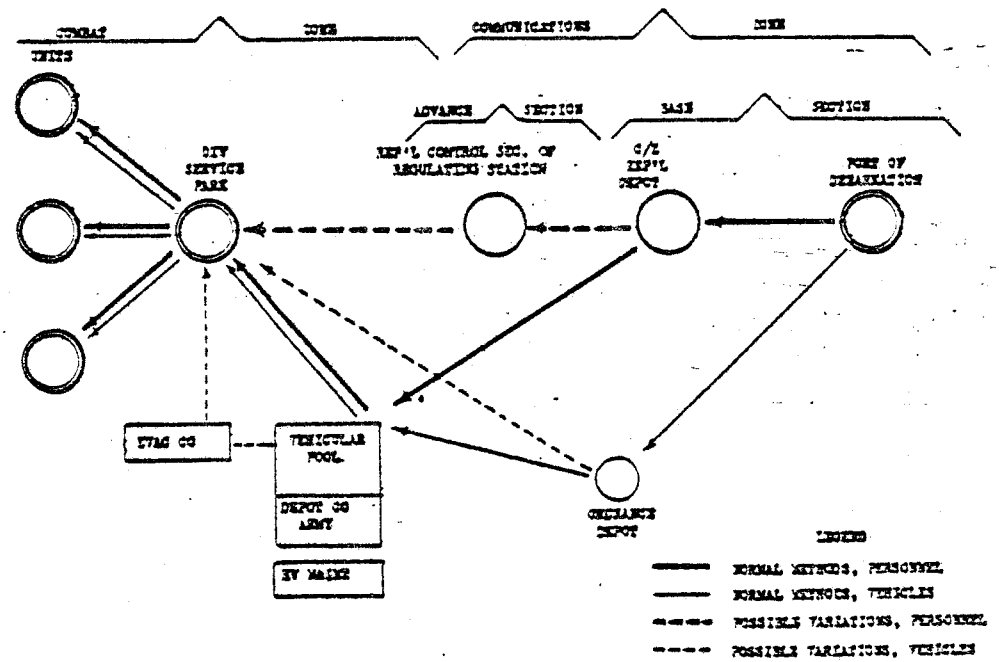
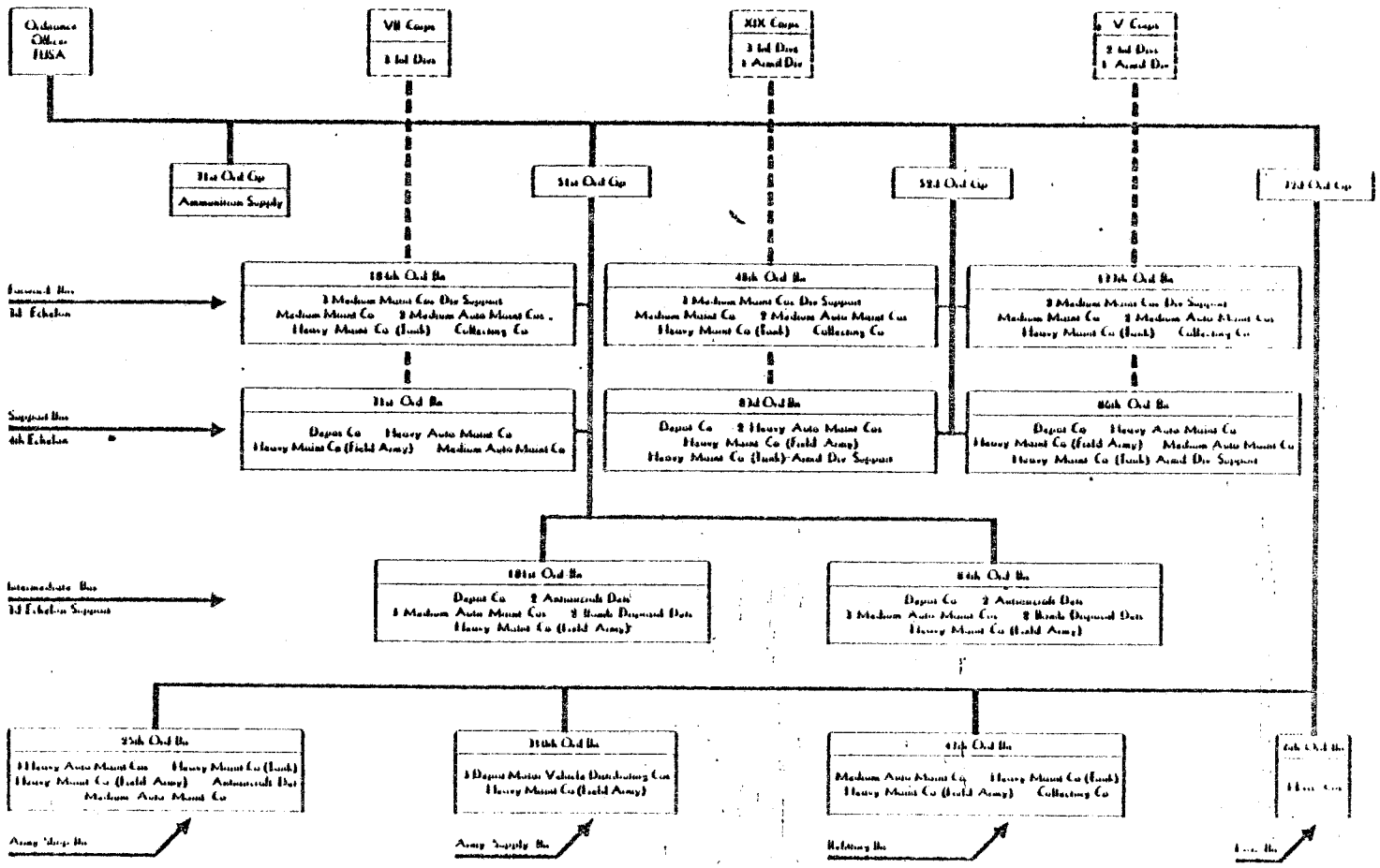



FIGURE 13.—Personnel and vehicle replacement flow chart for armored units.

## Chart 4—Ordnance Group Organization for First U.S. Army, 15 August 1944



supervised all army ammunition operations, including Ammunition Supply Points (ASP) and army depots. The 72d assumed operations in the main army area and commanded the four battalions that ran the main shop and depots where inspection and refitting occurred.[39] (See Flow Chart, following page.)

Behind each corps there were two battalions, a forward battalion to do 3d echelon maintenance and operate a collecting point; the other to do 4th echelon maintenance and act as a support battalion for heavy tank maintenance and operate a forward depot.[40] The forward ordnance battalion was responsible for recovery and evacuation of ordnance materiel within the corps. In mid-July an evacuation company was formed to bring back heavy materiel from collecting points, move supplies between the main shop and forward depot or to line units, and, if required, help the forward collecting companies.

Division and army established collecting points manned by qualified personnel to classify items for evacuation to higher echelon, immediate repair, or not repairable.[41] When required repairs could not be made at the units, the unit exchanged the item prior to evacuation, as available. U.S. Army infantry divisions had no organic heavy ordnance equipment, but the medium tank battalion and tank destroyer battalion attached to infantry divisions were only very reluctantly, if ever, released.* First U. S. Army resorted to the conversion of four ordnance evacuation companies into ordnance collecting companies by reducing the number of tank transporters needed for longer hauls, and increasing the general purpose vehicles, winches and tow-trucks. These units recovered abandoned or unservicable equipment from the battlefield when the using arms lacked the capabilities to do so. The ordnance collecting companies then delivered the damaged equipment to forward collecting points or to maintenance companies.[42]

ASPs normally held the minimum ammunition necessary to support anticipated operations. Corps stocked 2 and 1/2 days' units of fire and recommended the number of rounds for an ASP to maintain. Army restocked ASPs based on corps' reports, and corps ammunition officers kept army advised of expected "surge" demands. In addition, salvaged or damaged U.S. ammunition was returned by collecting companies to ASPs for recycling.

Each army in 12th Army Group (1st, 3rd and 9th armies) had established a regulating station to receive requisitions for all classes of supply from the armies and forwarding these to the Communications Zone. A regulating station in World War II was a traffic control agency to insure orderly and

*According to the pooling concept attached units were provided specialized equipment as needed for a particular operation after which, in theory, the assets reverted to a central pool. Experience did not bear out the theory.

systematic movements into and out of the combat zone.[43] The regulating station officer received, passed on, and enforced priorities for the movement of supplies. Normally the regulating station was a railhead so the regulating stations also had to conduct reconnaissance for new railheads and their preparation as the armies moved across France. From the regulating stations, supplies moved forward by rail or truck to corps depots, thence to truckheads and ultimately to the forward troops.[44]

In the static conditions of World War I, railheads had been the significant resupply points. In the mobile warfare following the Allied breakout from Normandy and pursuit of the Germans across France, truckheads and mobile ASPs appeared. A truckhead was the term for a forward distributing point. Designated forward truckheads served each corps, usually at locations the corps quartermaster designated, but never less than ten miles from the front lines.[45] To support the breakout, 2d Armored Division assembled 84 trucks--25 carrying gasoline, 57 ammunition, and 1 with diesel and 50 weight oil. Key supply personnel and control and supply vehicles joined the mobile truckhead.[46] During the pursuit across France, First Army' displaced its Class I truckheads once every four days in a leapfrog fashion by platoons.

To overcome the difficulties of extended supply lines, in August 1944, First Army used six medium automotive maintenance companies to create twelve truck hospitals. These were located about 20 miles apart on the main axis of communication and had a wrecker point half way between hospitals. A platoon operated each station and maintained road patrols ten miles on either side of the station to locate disabled trucks. About 40 per cent of the work was second echelon, the remainder third, with some fourth class. After the Allies broke the Seigfried line and advanced into Germany, First Army established a tank relay station at Giessen, Germany in the spring of 1945 to service replacement tanks being sent forward. Messing and shelter for 500 men a day were available.[47]

A mobile ASP supported VII Corps during the pursuit. Corps attached a Quartermaster Truck Battalion with five companies and 225 trucks to the 71st Ordnance Group. The Truck Battalion established a two echelon ASP. The forward echelon issued ammunition directly to combat units from its 125 trucks, sometimes at artillery gun or tank positions, and sent its empty trucks and requests to rear echelon about twenty miles farther back. The rear echelon filled the request and sent convoys back to an ammunition depot 100 miles to the rear. In eleven days from 14-25 August, the mobile ASP handled 13,156 tons of ammunition--6,615 received and 6,541 issued.[48]

The slower moving infantry divisions each had an organic quartermaster company that had three truck platoons and a service platoon with 16 two and

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*The 12th Army Group's size varied from one to four armies during the campaign, but usually was two armies, the 1st and 3rd.

one-half ton trucks each. The division's service company had principally auto mechanics and mess personnel. These organic trucks normally supplied infantry divisions. The Quartermaster Company drew Class I and II supplies daily at an army truckhead and distributed them to the vehicles of the combat units at a divisional distribution point.[49] The service platoon of the Quartermaster company transferred supplies from divisional trucks to those of combat units.

Line infantry companies depended for normal resupply on the arrival of jeeps and trailers each evening, enemy and terrain permitting. Resupply was accomplished under the cover of darkness with rations, water, radio batteries, and dry socks going forward to the line troops. A resupply of ammunition was likely to accompany the quartermaster resupply, although the battalion ammunition and pioneer platoon maintained an ammunition distributing point where a detail could be sent to pick up ammunition as needed. All armies customarily reinforced the infantry division's Ordnance light maintenance company with an Ordnance medium maintenance company that was transferred from army to army as divisions shifted.[50] Personnel replacements, if urgently needed to replace losses, could expect to go forward to their new units with the resupply teams; otherwise they joined the unit when it rotated out of line. When possible hot meals were sent up in marmite cans and platoons and squads would go back successively for their meals. During heavy fighting the men subsisted on daily distributions of K or 10 in 1 rations. If the jeeps could not get close enough to front line positions, headquarters' platoons and reserve companies would hand carry the vital supplies forward.[51]

Reconstitution in armored divisions was somewhat easier because trucks could meet tanks and off-load supplies at predesignated points. In static periods the 2d Armored Division accomplished reconstitution, in this case 29 November to 15 December, as follows.[52] The division commander continually rotated his front line units to afford maximum time for rest, maintenance, and general rehabilitation of equipment. Units not occupying the division's forward positions received replacement equipment and conducted training. Advanced training included demonstrations of tank-infantry tactics with co-ordinated artillery, air, and tank destroyer support. Training focused on anticipated operations so during this period the men of the 2d Armored Division practiced driving landing vehicles (LVTs) and treadway bridge construction in preparation for the Rhine River crossing.

Through 15 December the division carried out replacement and repair of casualty tanks and salvage of equipment. This work was vital because losses throughout the campaign ran higher than planners anticipated so constant shortages of equipment and men plagued First Army. Every day in the ETO the U.S. Army lost 1,200 small arms, 1,300 bayonets, and 5,000 tires. Every month 700 mortars, 375 medium and light tanks, 900 2 1/2 tons, 15,000 jeeps, 100 cannon and 150 tubes had to be replaced.[53]

## ORDNANCE SERVICE, COMMUNICATIONS ZONE, EUROPEAN THEATER

### Period Covered: 6 June 1944 to 28 February 1945

Summary of Statistical Reports showing the number of weeks, out of a total period of 39 weeks, in which various critical major items were below authorized T/E plus reserve levels.

| MAJOR ITEMS | WEEKS REPORTED SHORT |
|---|---|
| **Combat Vehicles** | |
| Medium Tanks | 39 |
| Light Tanks | 4 |
| Armored Cars | 39 |
| Half Tracks | 39 |
| **Small Arms, Mortars, etc** | |
| Mortar, 60-mm | 26 |
| Mortar, 81-mm | 17 |
| Gun, Mach., Cal. .30 Flex | 12 |
| Rifle, Auto., Cal. .30 (BAR) | 8 |
| Gun, Submachine, Cal. .45 | 12 |
| Rifle, Cal. .30 M1 | 4 |
| Launcher, Rocket, Anti-Tank | 12 |
| Binoculars, All Models | 35 |
| Compass | 17 |
| Watches, Pocket & Wrist | 35 |
| **General Purpose Vehicles** | |
| Trucks, one and one half ton & under | 35 |
| Trucks, two and one half ton & over | 39 |
| Trailers, one fourth ton & one ton | 12 |
| **Artillery Weapons** | |
| Anti-Tank Motor Carriages | 31 |
| Field Artillery Motor Carriages | 26 |
| Anti-Aircraft Artillery, Multi Gun, Motor Carriages | 17 |
| Towed Medium Field Artillery | 21 |
| *Heavy Field Artillery | 9 |

*-Extracted from G-4 Periodic Reports, 12 US Army Group.

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To meet the resupply difficulties in October 1944 First U.S. Army directed that armored divisions turn in all medium tanks in excess of 200, although the Table of Equipment authorized 236 per division.[54] Furthermore replacement tanks would be issued only after the number on hand dropped below 200. On 15 October, the 2d Armored had 211 medium tanks available despite losses of 120 medium tanks since June 1944. They had to return the excess 11 tanks to First Army which consolidated all turned-in equipment in the main army vehicle and artillery park. There ordnance maintenance companies processed the turned-in equipment, repaired equipment, and newly arriving major items of equipment. In this manner, First Army created a pool of vehicles and tanks.

Replacement crews for armored divisions theoretically had their flow coordinated with that of replacement vehicles. According to the manual, replacements moved from the communications zone replacement center to the vehicular pool, division service park, or an intermediate point in exceptional circumstances.[55] First Army, however, reported difficulty in matching the flow of armored crew replacements with armored vehicles and recommended that crew be requistioned as individuals.[56]

Operational needs for tanks were always high and in November 1944 a revised system of tank resupply went into effect. The 522d Ordnance Heavy Maintenance Tank Company began work in Nancy, France and operated as a provisional base tank repair shop.

TABLE XIX

REPAIRABILITY OF TANK CASUALTIES-ALL THEATERS

(Sampling)

| | | Sample | NUMBER REPAIRABLE | PERCENT REPAIRABLE | NUMBER NON-REPAIRABLE | PERCENT NON-REPAIRABLE |
|---|---|---|---|---|---|---|
| TOTALS BY THEATER | | | | | | |
| US: | Italy-Gunfire | 32 | 9 | 28.1 | 23 | 71.9 |
| | Mine | 24 | 16 | 66.7 | 8 | 33.3 |
| | Mortar | 1 | 0 | 0.0 | 1 | 100.0 |
| | Hollow chg. | 3 | 2 | 66.7 | 1 | 33.3 |
| | ETO - Gunfire | 722 | 337 | 46.7 | 385 | 53.3 |
| | Mine | 210 | 159 | 75.7 | 51 | 24.3 |
| | Mortar | 7 | 7 | 100.0 | 0 | 0.0 |
| | Hollow chg. | 152 | 105 | 69.1 | 47 | 30.9 |
| UK: | N. Africa-Gunfire | 242 | 129 | | 113 | |
| | Mine | 48 | 31 | 64.6 | 17 | |
| | Italy-Gunfire | 94 | 51 | 54.3 | 43 | 45.7 |
| | Mine | 42 | 30 | 71.4 | 12 | 28.6 |
| | Mortar | 2 | 1 | 50.0 | 1 | 50.0 |
| | Hollow chg. | 10 | 7 | 70.0 | 3 | 30.0 |
| TOTALS BY COUNTRY | | | | | | |
| US: | Gunfire | 754 | 346 | 45.9 | 408 | 54.1 |
| | Mine | 234 | 175 | 74.8 | 59 | 25.2 |
| | Mortar | 8 | 7 | 87.5 | 1 | 12.5 |
| | Hollow chg. | 155 | 107 | 69.0 | 48 | 31.0 |
| UK: | Gunfire | 528 | 304 | 57.6 | 224 | 42.4 |
| | Mine | 208 | 171 | 82.2 | 37 | 17.8 |
| | Mortar | 8 | 7 | 87.5 | 1 | 12.5 |
| | Hollow chg. | 45 | 35 | 77.8 | 10 | 22.2 |

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GRAND TOTALS BY CAUSE

| | | | | | |
|---|---|---|---|---|---|
| Gunfire | 1282 | 650 | 50.7 | 632 | 49.3 |
| Mine | 442 | 346 | 78.3 | 96 | 21.7 |
| Mortar | 16 | 14 | 87.5 | 2 | 12.5 |
| Hollow chg. | 200 | 142 | 71.0 | 58 | 29.0 |

The company repaired and serviced all tanks brought there and forwarded them to the army pool. When a using unit turned in a tank for repair, they received a tally which authorized them to pick up a newly repaired tank from the pool. By such methods, tactical units could be kept at authorized strength with scarcely any loss of time.[57] The tank crew, however, faced the burden of breaking in an unfamilar tank, learning its mechanical idiosyncracies, and a nagging sense that perhaps something had been left undone.

To support a tank attack, two recovery squads and two wrecker squads positioned themselves close to the tank assembly area. Heavy transportation squads stayed 2 or 3 miles to the rear. The recovery units attempted no repair work and instead removed all recovered material to a corps collecting point. As with the Germans and British, recovery operations began at night to avoid enemy fire.[58]

| | Medium Tank T/E Strength | First Army Authori-zation | Medium Tank Operative Daily Average | Medium Tanks Lost |
|---|---|---|---|---|
| AUG 1944 - TOTAL | 1358 | 1358 | 1282 | 223 |
| SEPT 1944 - TOTAL | 1184 | 1138 | 1026 | 139 |
| OCT 1944 - TOTAL | 1454 | 1362 | 1201 | 132 |
| NOV 1944 - TOTAL | 1054 | 931 | 846 | 133 |
| DEC 1944 - TOTAL | 1730 | 1588 | 1320 | 398 |
| JAN 1945 - TOTAL | 1400 | 1368 | 1210 | 184 |
| ½ of FEB 1945 TOTAL | 1064 | 1064 | 942 | 42 |

GRAND TOTAL LOSS FOR PERIOD AUGUST 1944 TO FEBRUARY 1945 1251

Reclamation of battlefield equipment was a major factor in sustaining units in combat. The three armies of 12th Army Group each had three salvage collecting companies and three salvage repair companies, one per corps and one for army. The collecting company maintained 3 or 4 man details at Army Class I supply points of the supported corps. They received salvage evacuated by unit ration vehicles, sorted the salvage, and sent it to salvage centers.[59] Small arms shortages were quite severe, and during October 1944 Third Army emphasized battlefield recovery of small arms. Third Army instructed all units to turn in excess weaponry, and held unit commanders responsible for unauthorized weapons retained by men in their command. Company commanders designated recovery squads within each company to collect and turn in all abandoned small arms. Ordnance personnel made periodic visits to all aid stations, hospitals, collection points, and cemeteries to collect weapons.[60] Their results were impressive.

| Item | On Back Order 6 OCT | On Back Order end OCT |
|---|---|---|
| Sub-machine gun | 1200 | None (700 on hand) |
| 30 Cal. machine-gun | 800 | 90 |
| Binoculars | 4250 | 2446 |
| Compass | 366 | 190 |
| Tanks (medium) | 40 | 10 |

Anti-tank platoon personnel policed the battlefield behind the advancing infantry troops. The equipment they recovered was used to replenish unit stockage, with all surplus going to salvage. Units used their forward medical installations to salvage miscellaneous organizational equipment from casualties, especially binoculars and watches which were difficult items to replace.[61]

## Part III
## The 28th Infantry Division at Schmidt

At Schmidt, Germany, the 28th Infantry Division suffered very heavy casualties in a short period of time, and for that reason CSI selected it as an excellent example to illustrate the reconstitution process for a particular unit. From 2 through 9 November 1944, the 28th Infantry Division fought a major offensive action at Schmidt. After 9 November, the division did conduct local attacks until 14 November, but it was incapable of further sustained combat operations. Higher headquarters withdrew it from the fighting. The division entered the operation with 13,932 effectives, and on 13 November listed 13,447 effectives despite 5,028 cumulative losses (3,637 battle, 1,391 non-battle) suffered from 2 November to that date.[1] The overwhelming majority of casualties occurred in the rifle battalions among infantrymen. A 1944 infantry division had roughly 6,000 riflemen, so that between 2 and 7 November the 28th Division lost nearly all its infantry fighting strength.

The 28th Infantry Division attacked Schmidt on 2 November as its 109th Infantry Regiment assaulted German positions in wooded terrain to the north in the direction of Huertgen; its 110th Infantry also attacked over wooded terrain to the south; the 112th Infantry pushed west out of the woods and across the Kall River into a narrow salient between the 109th and 110th regiments and seized Schmidt on 3 November. Neither the 109th nor 110th made much progress. On 4 November German counterattacks drove the 3d Battalion, 112th Infantry, from Schmidt to Kommerscheidt. Meanwhile, the 2d Battalion, 112th Infantry occupied Vossenack Ridge, protecting its sister battalions' northern flank. (See map next page)

Under heavy and sustained German artillery fire, the 2d Battalion vacated its positions on 6 November. The next day remnants of the 1st and 3d battalions withdrew from Kommerscheidt, and on 8 November the division commander ordered the entire 112th Infantry to withdraw back across the Kall River for reconstitution. After the withdrawal and subsequent unit roll calls, the magnitude of the regiment's losses became clear to divisional headquarters. Forty-six officers and 829 enlisted casualties (including 434 missing in action) were reported for the single day of 10 November.[2*] In fact almost all of the casualties reported on 10 November had occurred earlier in the fighting near Schmidt. Battalions of the 112th Infantry were reduced to company size formations and the unit was incapable of further operations. Despite divisional orders that brought the regiment up to strength through personnel replacements, the 112th was unable to carry out an attack scheduled for 10 November. The 1st Battalion, 109th Infantry attacked instead, but with only partial success and additional casualties. By that time, the 109th's other two battalions were restricted to patrolling actions. The 110th Infantry to the south tried until 12 November to

*An infantry regiment had 3,118 officers and enlisted members.

dislodge German defenders, but its companies were so depleted and its attacks such feeble, piecemeal efforts that virtually no change in the lines was effected.[3] The official unit report asserted that the division's morale was "excellent" after the fighting,[4] but a postwar study maintained that as of 14 November 1944, "the 28th Division was reported destroyed as a fighting machine."[5]

From this overview of the Schmidt operation, a detailed examination of reconstitution procedures to sustain the 28th Division in combat at Schmidt follows. The purpose is to demonstrate how reconstitution worked at the division level in an actual operation that involved "surge" casualties. A detailed look at the engagement will also help identify criteria that a commander might recognize as indicating that a unit requires reconstitution. Those factors from the Schmidt experience will be applied to the criteria developed for reconstitution in the second part of this narrative. Part three describes the methods used to regenerate the 28th Division from its combat ineffective state.

Part I-Operations at Schmidt

On 1 November 1944 the 28th Infantry Division was rested after nearly a month in a relatively inactive sector, and was almost at full strength, being 7 officers and 18 enlisted men understrength. The division had been in combat three plus months and had seen heavy fighting in France in August 1944 and at the Seigfried Line in September 1944. Cumulative casualties to 1 November were 8,775, including 6,130 battle losses.[6]

On 1 November there were 825 officers and 13,107 enlisted men available for duty. In addition, for the attack on Schmidt the division had been substantially reinforced by the 630th Tank Destroyer Battalion (728 officers and men) and the 707th Tank Battalion (718 officers and men). The division also received 47 weasels (M 29 Cargo Carriers) in recognition of the rugged terrain in which resupply would have to be conducted. Eight battalions and a separate battery of V and VII corps artillery were available, and six battalions of VII Corps artillery would participate in the preparatory fires. The IX Tactical Air Command would provide close air support to isolate the battlefield. Such lavish support was available because the 28th Division was the only division attacking the Germans along a 27 mile front and, for several days, the division's engagement was the only offensive action taking place on the entire 170 mile western front.[7]

First Army's general offensive to clear German forces remaining west of the Rhine was to commence on 5 November. It was hoped that the 28th Division's attack, scheduled to begin on 1 November, would divert German reserves and thus open the way for the main thrust.[8] In fact bad weather precluded air support and forced postponement of the First Army's attack until 10 November, or the first good weather day thereafter. The original diversionary intent of the Schmidt operation was lost.

The 28th Division's tactical plan for divergent series of attacks was a deviation from standard doctrine. It was necessary because of the lack of troops for the operation and the necessity to perform three initial missions--defend the north flank, clear the south flank, and seize Schmidt.[9] At the small unit levels, however, the commander's intent was either not clear or not properly explained. When the 3d Battalion, 112th Infantry entered Schmidt on 3 November there was confusion over whether they should pursue the retreating Germans or consolidate their positions. A rifleman from Company L, 3d Battalion remembered that there was "a lot of indecision about what we were supposed to do--stay or push on."[10] By the time orders reached them to consolidate, darkness had settled so it was too late to site fighting positions or post sentries. Consequently the tired men spent that night in the buildings of Schmidt.

Schmidt fell easily into American hands, but the subsequent intensity of the battle was beyond the expectations of the men. Three factors--misinformation about the enemy situation, rough terrain, and bad weather--accounted in large measure for the failure of expectations to match reality. Corps and division G-2 and G-3 officers told the men that IX Tactical Air Force would isolate the battlefield and prevent German reinforcements from reaching to Schmidt area. The G-2 told unit commanders that they would be "fighting a grabbag formation of German infantry."[11] This was untrue, but irrelevant. In the rugged, forested terrain, even grab-bag packets of determined German defenders could stop the advance of much larger units.

The men moved into the dank, dense Heurtgen Forest on 26 October 1944 to relieve the 9th Infantry Division and to prepare for their attack on Schmidt. The 9th Division suffered 4,500 casualties in the Heurtgen Forest from 5 through 11 October.[12] Conducting the relief, men of the 28th Division saw in the gloomy thick forestation and undergrowth the litter of the debris of battle; emergency ration containers, artillery shattered trees, loose mines along muddy roads and trails. The troops they relieved showed the signs of desperate fighting--crushing fatigue, nervousness, and a dirty and unshaven appearance.[13] The men of the 9th Division were exhausted; so tired that, according to one account, men coming out of the line could not even lift their feet to step over corpses of members of their own units. Instead they stepped on the corpse's face and continued their trudge to the rear. Battalion commanders were reduced to near "gibbering idiots" and became completely apathetic.[14]

Nor was this impression limited to sympathetic observers. First Army acknowledged that the "perpetual gloom of the forest destroyed morale."[15] The configuration of the terrain which had sharply defined, roller-coaster-like ridges, valleys, and gorges compounded the "stupifying effects of fighting in the woods."[16] In such terrain, units found it nearly impossible to maintain contact; squads got lost and the area was conducive to German ambushes. The Americans, moreover, could not employ direct fire artillery, a fire support technique to which they had become accustomed.

Untrained for operations in wooded areas, the 28th Division's 109th and 110th Infantry fought man and nature. A captured German appraisal of the American troops noted, "In combat in wooded areas the American has shown himself completely unfit."[17] One historian, himself a former infantry company commander in the European Theater of Operations (ETO), wondered if the forest fostered a psychological malaise affecting commander and soldier alike.[18]

The hindering wooded terrain impeded resupply efforts. Engineers had to work around the clock to keep the few roads intersecting the woods trafficable. Resupply to front line units was also difficult, particularly for the 112th Infantry across the Kall River. Only a single bridge spanned the Kall and only an unimproved track ran from the resupply point to that bridge. This dirt trail was too narrow to support sustained heavy vehicle and tank traffic, although engineers and maintenance personnel did manage to get several tanks and tank destroyers across the Kall. The weasel tracked cargo carriers proved most effective, but even their supply runs at night would take 3 to 4 hours for a 4 mile trip to resupply the 112th. In addition to the rugged terrain, the weather conspired to turn roads into muddy bogs.

Immediately preceeding and throughout the Schmidt operation, the weather was cold, damp, misty, and generally uncomfortable, although not quite freezing. Before the operation, from 15 to 20 October, the 28th Division lived in the rain. A 3d Battalion, 112th Infantry informal history recalled that rain on 17 October "dampened the spirits of the entire company."[19] As S.L.A. Marshall wrote, "moral values change with every shift of the weather. Rain and heavy skies are as greatly depressing to the will of fighting troops as they are impeding to the mechanics of movement."[20]

There had been so much rain that the ground was saturated and water staved on the surface. Beyond the psychologically depressing atmosphere, the foul weather and supply shortages combined to swell the sick-call lists. The 28th Division was short 9,000 pairs of artic overshoes, and the overshoes would not be issued until 14 November, after the unit had been withdrawn from the Schmidt fighting. Consequently the number of cases of immersion foot (trench foot) was "tremendous."[21] Besides that, the men had been living in foxholes and tents for the days preceeding their attack. The bone chilling dampness of the wet ground and constant exposure to the raw German autumn had left many men with respiratory diseases ranging from head colds to walking pneumonia or even more incapacitating ailments. In many instances, sick men were attacking in weather that could only worsen their already weakened physical condition.

At the operational level, the wet weather hindered resupply efforts, close air support, and artillery observation. The weather stayed dismal throughout the battle.

On 28 October, the 3d Battalion, 112th Infantry saw its first sunrise in 40 days, but on 30 October grey, misty skies returned. The next day it rained forcing postponement of the 28th's attack because IX Tactical Air Force would not fly support. On 2 November, the day the attack commenced, it was cold and misty, not quite raining. Mist and low clouds precluded close air support. The next day's weather was similar, with temperatures hovering near freezing and heavy mists hanging on wooded draws. By this time the infantrymen were engaged in close combat and, with the exception of the two battalions of the 112th Infantry whose men were sheltering in buildings in Schmidt, the infantry was at the complete mercy of the elements. The nature of small-unit combat exacerbated the effects of weather.

The infantrymen at Schmidt carried one blanket and their overcoats in a horseshoe roll on their packs. But the infantryman invariably tried to lighten his load, particularly when being shot at, and discarded everything he could possibly do without. This resulted in a huge waste of clothing and equipment. It seems to have depended on the individual infantry unit on how effective it was on collecting surplus equipment from troops upon their entry to combat. Surplus equipment would then be stored and returned to survivors after the battle. Normally anti-tank personnel policed the battlefield behind the front line elements and recovered equipment which was in turn used to replenish unit stockage, with all surplus going to storage.[22] At Schmidt the terrain and the tactical situation of the 112th Infantry in a narrow salient precluded effective battlefield policing. Thus after one or two days of fighting, many men of the 28th Division no longer had overcoats or blankets to keep themselves warm, those items having been lost or abandoned during the heat of the action.

By 3 November a mist threatening to turn to drizzle settled over a morass of mud that mired supply vehicles and stuck to the boots of the infantrymen thereby increasing their physical labor and exertion. No close air support was available. Artillery observers could not see marking smoke and had difficulty adjusting fire. The following day the weather improved and air support was available after 1200 hours. Later in the day the weather again closed in and caused cancellation of planned airstrikes. The best weather for air support during the entire operation was on 5 November, but the next day adverse weather returned and air was unavailable until 1200 hours. On 7 November a cold winter rain fell in the morning and low clouds on 8 November precluded support. On 9 November the weather turned worse, a cold rain changing to snow after daylight with increasing snowfall throughout the day. Adverse weather plagued the entire operation, restricting fire support, resupply, and sapping the strength and health of the infantrymen fighting the battle.

Furthermore the restricted visibility allowed German reinforcements to reach Schmidt unimpeded by U.S. tactical aircraft. In addition, U.S. artillery could not locate and thus neutralize the German artillery which dominated the battelfield with disasterous results for the Americans.

On 4 November the German 116th Panzer Regiment counterattacked the Americans holding Schmidt. American infantry fired bazooka rounds and watched helplessly as the rounds bounced off the thick-hulled German tanks. Instead of meeting ragtag infantry formations, the 28th Division found itself engaging German combined arms counterattacks. The absence of anticipated air support and ineffectual artillery support and the lack of faith in their organic anti-tank weapons demoralized the 112th Infantry.

The intensity of the battle exceeded the expectations of the veterans of the 28th Division. One said that fighting in the Normandy breakout was bad, but nothing like Schmidt.[23] The 109th and 110th Infantry regiments faced the special problems of fighting in woods--sundered formations, poor command and control, confusion, and the ability of small pockets of determined Germans to inflict heavy casualties and disrupt American attacks. Across the Kall River, the 112th Infantry was in Schmidt on an otherwise open plain. They were simultaneously exposed to German gunners on the plain and isolated from their sister regiments.

Only three American tanks had been able to cross the Kall River by 4 November, the remainder either suffering mechanical breakdown or unable to move on the narrow, congested Kall Trail. American armor then could not provide support against the German counterattack on the morning of 4 November. Neither could airpower, because a requested airstrike failed to arrive on time.

Meanwhile the Germans shelled the exposed American salient in Schmidt from three sides with artillery and mortars. German tanks added their direct cannon fire to the bombardment. The Americans in Schmidt lost telephone contact with the 2d Battalion on Vossenack ridge and with the the 3d Battalion Command Post which was located on the road between Schmidt and Kommerscheidt.[24]

Following a 30 minute artillery bombardment, German tanks led infantrymen in a counterattack against the 3d Battalion, 112th Infantry holding Schmidt. Company K, 3d Battalion broke and fled under the German attack. A bazooka team and six supporting riflemen climbed out of their foxholes and ran toward other members of the company yelling that tanks were coming. According to one survivor, "the platoon seemed to disintegrate," and riflemen streamed into the woods southwest of Schmidt.[25]

Company I was ordered to pull back and cover the gap opened by K's rout, but Company I's men instead fled to Kommerscheidt, then held by the 1st Battalion, 112th Infantry about one mile northeast of Schmidt. Rumors and confusion about the battalion commander deserting his men filled the panic-stricken men.[26]

At Kommerscheidt the 1st Battalion halted the fleeing mob running at them by physical force and drawn pistols. They finally rounded up about 200 men of the 3d Battalion to augment the defenses at Kommerscheidt. The

Germans continued their counterattack, but the American defenders received fire support from the 229th Field Artillery Battalion, the three tanks that had managed to cross the Kall, and some air support. This additional firepower enabled the Kommerscheidt defenders to regenerate the men from the 3d Battalion by reorganizing the unit.[27] The commander of the 1st Battalion shifted the depleted units of the 3d Battalion to support the 1st Battalion and form a composite unit. In a matter of hours, then, men had panicked, fled, and returned to fight off a German counterattack. As for the men who fled into the woods, about 30 stragglers made it back to their unit. The rest were killed or captured, 133 prisoners being taken by the Germans on 8 November.

Within Kommerscheidt the commander of the 1st Battalion reorganized the 1st and 3d battalions into two defensive sectors. He commanded one sector and a captain, the Company I commander, led the other.[28] The men held against German counterattacks until the morning of 7 November when they too were driven from Kommerscheidt.

Meanwhile on Vossenack Ridge, the 2d Battalion, 112th Infantry had been under heavy and sustained German artillery fire. By 5 November the cumulative effect of the constant pounding had shattered men's nerves. Soldiers had to be ordered to eat; many cried like children, and the battalion commander sat in a basement with his head in his hands. Just before dark on 5 November, artillery killed six men in a line of two-man foxholes. The rest of their shaken company pulled back into the town of Vossenack, leaving a 100 yard gap in the defenses. Officers ordered the reluctant men back into their foxholes. The men went, but soon returned, crying, to the imagined safety of the town's buildings.[29]

The next morning there was no dawn shelling, only small arms fire. About thirty minutes later, however, German artillery fire began falling on the battalion's positions. Company G broke and fled, followed pell mell by the other line companies and the reserve. Men pushed and shoved each other, threw away their equipment, and abandoned their wounded. From this terror stricken mob, only 70 men could be mustered for combat. The rest hid in woods or tried to recross Kall River. It is doubtful that the Germans even attacked the 2d Battalion that morning. The strain of battle had become too great, and the men fled.[30]

Tanks and tank destroyers had crossed the Kall River on 3 November, but in limited numbers so the American infantrymen felt let down by their own armor. The defenders at Kommerscheidt would desert their forward foxholes unless they saw American armor up front supporting them. Americans were skittish without their tank support.[31] The 3d Battalion, 112th Infantry insisted that they lacked "adequate tank and anti-tank support." This perception persisted despite the loss of 16 or 24 tank destroyers of the 893d Tank Destroyer Battalion and 31 of 50 M-4 tanks of the 707th Tank Battalion.[32]

Artillery support was not altogether satisfactory due to its inability to neutralize the deadly German artillery. Division artillery alone fired over 46,000 rounds in support from 1 through 6 November and nearly 50,000 rounds from 7 through 16 November.[33] These fires did help break-up German counterattacks. On 4 November they supported the forces in Kommerscheidt with at least 462 rounds and helped to repulse that German counterattack.[34] Air support was generally unsatisfactory, mainly because foul weather prohibited its effective employment. Those times when air support was available, most men agreed it was effective support.

Resupply: Equipment and Personnel Replacements:

The 28th Division's established its division supply agencies and division clearing station at Roetgen, about 10 miles straight line distance east of Schmidt. (See map following page) Military police directed resupply convoys from Roetgen south through Lamersdorf thence northwest to Richelskaul and Germeter, the latter about three miles northeast of Schmidt on the entrance to the Kall Trail.[35] The rugged terrain made resupply for any of the infantry regiments difficult, but especially for the 112th fighting in Schmidt. The division commander ordered the engineers to keep the single road open to one-way traffic, but five disabled tanks and four disabled tank destroyers along the narrow trail negated much of this effort. The engineers used bulldozers and explosives in attempts to improve the trail, but wet weather coupled with the heavy vehicles driving on the roadway virtually crumbled it.

Members of Company A, 707th Maintenance Battalion worked three hours to repair a thrown track of a tank broken down on the narrow trail. The tank then lurched forward a few yards and again threw a track. The maintenance men were perhaps overly concerned about the heavy equipment and were reluctant to abandon the equipment or destroy it. Consequently resupply convoys had to work their way gingerly around the disabled hulks.[36]

Resupply vehicles operated at night to avoid enemy observation and fire. The 707th Tank Battalion's supply convoys consisted of 3 weasels, 1 jeep, and 1 2&1/2 ton truck to carry rations, ammunition, gasoline, and water to the tanks and their crews. It took them about three to four hours to cover the two miles. The resupply convoy stopped near Company K's positions and hand carried supplies from their vehicles to the tankers.[37] Infantry resupply relied on three weasels and continued until 6 November despite German artillery fire and ambushes laid by German infiltrators. The first resupply vehicles reached Kommerscheidt at 0430 on 4 November.

Even so Company L, 3d Battalion had nothing to eat on 4 November and did not receive any food until 5 November, a lapse of 34 hours.[38] Probably the least an infantryman can expect is to be fed. If that need is not fulfilled, he becomes convinced that the unit has lost all interest because it no longer even tries to supply the basics. It is no accident that pictures of World War II infantrymen show gaunt, bodies and tired faces.

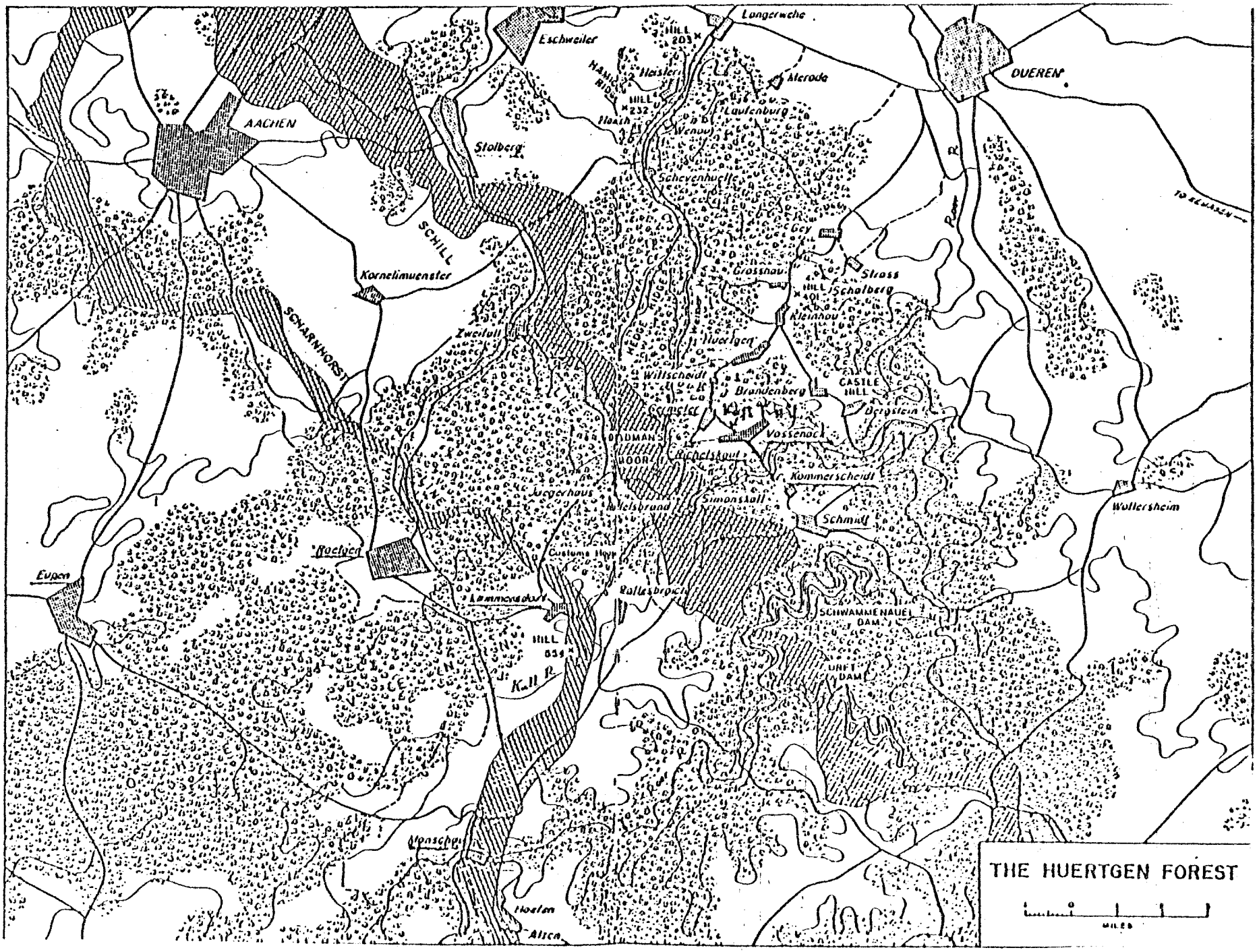
Most infantrymen suffered radical loss of weight. They were starving by expending more calories than they were taking in through rations. Field rations were sufficient to sustain the enormous energy requirements of a rifleman in combat, but soldiers in combat might not receive their rations regularly or refused to eat such rations.

At a pace of less than a mile-an-hour, the resupply columns set out in darkness for Kommerscheidt. Two enlisted men of the 3d Battalion, 112th Infantry operated the only forward ammunition dump, located near Vossenack, for five days.[39] When the resupply vehicle arrived at the dump, these two men loaded the trucks or weasels and sent them forward to the troops. After 0300 on 6 November, however, no resupply reached the 112th Infantry until the survivors withdrew across the Kall on 8 November.[40]

Space on resupply vehicles was never wasted. After distributing rations and ammunition, units used the now empty vehicles to evacuate their wounded to the forward medical detachments. These detachments had followed behind the attacking infantry and established field aid stations. From these stations medics went forward to aid the infantrymen. At the forward aid station doctors checked casualties and classified them for return to duty after treatment or evacuation to the division clearing station at Roeten. From 2 through 14 November, 3 officers and 127 men were returned to duty after brief hospitalization. After the 28th Division began reconstitution, from 15 to 22 November, they received another 4 officers and 213 men returned to duty.[41] Finally salvage teams visited the forward medical installations to gather miscellaneous organizational equipment from casualties.

Personnel Replacements and Reconstitution:

Casualties: While casualty figures should provide the best guide for a commander about the status of his forces, accurate casualty figures are normally unavailable until several days after the fact, if ever. At Schmidt the 28th Division lacked information about events at foxhole level that exacerbated this natural lag in reporting. Furthermore, one commander deliberately supplied misleading information to division in order to conceal the extent of his regiment's reverses.[42] The following is the official report of casualties and requistions for replacements by day for the 28th Division during the Schmidt fighting.[43]


THE HUERTGEN FOREST
MILES
AACHEN
DUEREN
Eschweiler
Langerwehe
Alerode
Laufenburg
Stolberg
SCHILL
Kornelimuenster
SCHARNHORST
Zweifall
Hueertgen
Gey
Grosshau
Stress
Schalberg
Kleinhau
Wittscheidt
Brandenberg
CASTLE HILL
Vossenack
Kommerscheidt
Simonskall
Schmidt
Wollersheim
Roetgen
Eupen
Lammersdorf
Rollesbroich
SCHWAMMENAUEL DAM
URFT DAM
Kall R.
Monschau
Hoefen
Alsa
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TO ZEVENAEN