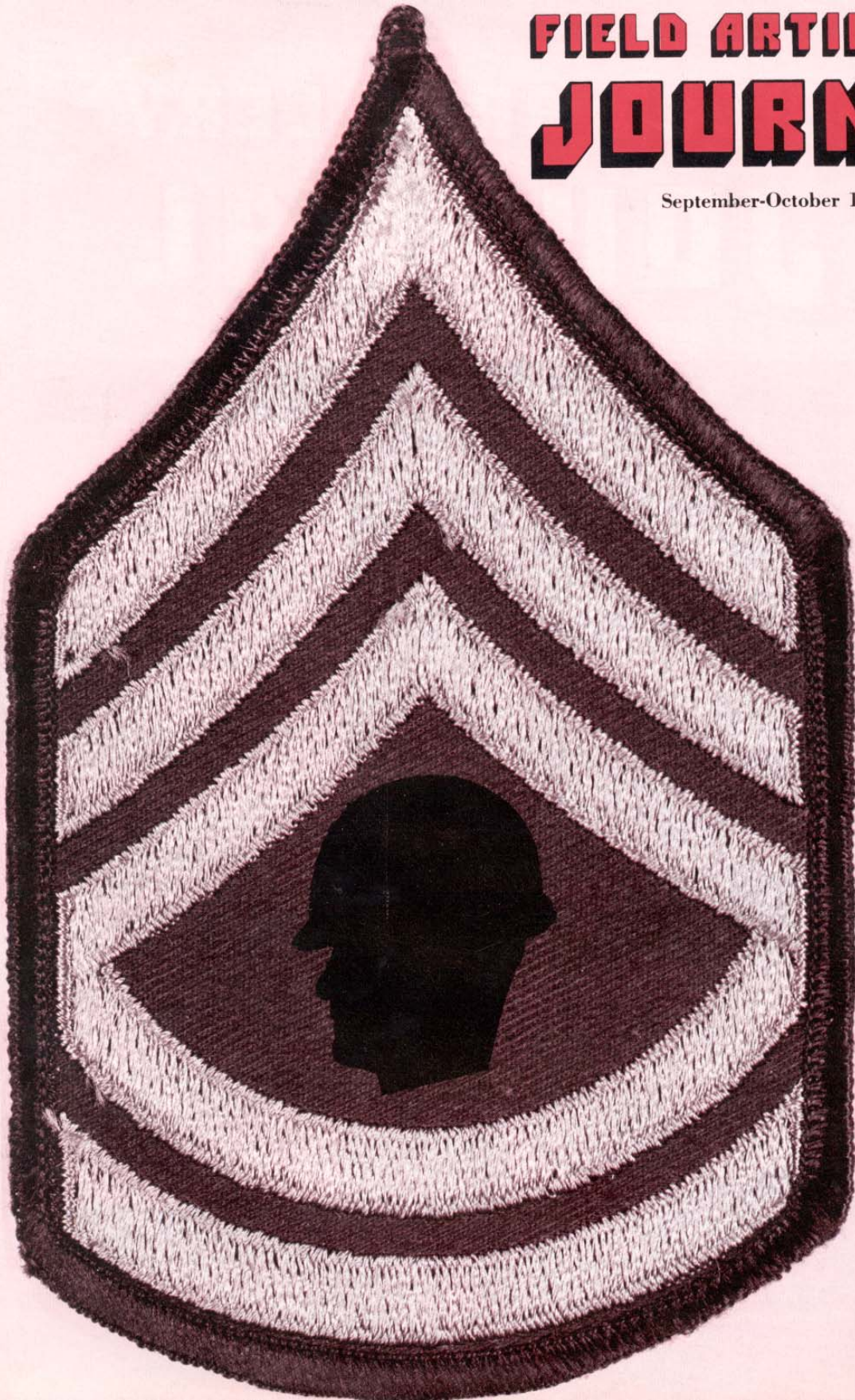


FIELD ARTILLERY JOURNAL

September-October 1976



FIELD ARTILLERY JOURNAL

Volume 44

September-October 1976

Number 5

The *Field Artillery Journal* is published bimonthly at the US Army Field Artillery School for the same purpose stated in the first *Field Artillery Journal* in 1911:

"To publish a Journal for disseminating professional knowledge and furnishing information as to the field artillery's progress, development, and best use in campaign; to cultivate, with the other arms, a common understanding of the powers and limitations of each; to foster a feeling of interdependence among the different arms and of hearty cooperation by all; and to promote understanding between the regular and militia forces by a closer bond; all of which objects are worthy and contribute to the good of our country."

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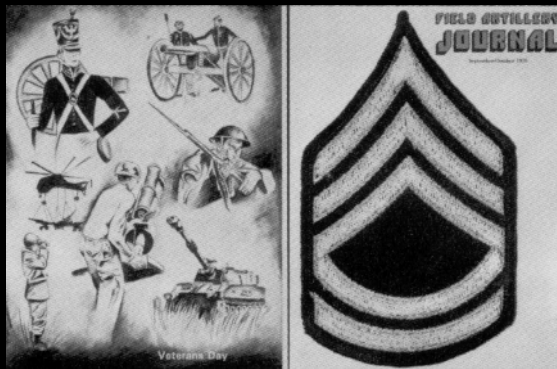
Funds for the printing of the publication were approved by the Department of the Army, 1 September 1973.

All articles and information submitted are subject to edit by the Journal staff; footnotes and bibliographies may be deleted from text due to limitations of space.

All letters and articles should be addressed to Editor, Field Artillery Journal, PO Box 3131, Fort Sill OK 73503. AUTOVON 639-5121/6806 or Commercial (405) 351-5121/6806.

The Field Artillery is pleased to grant permission to reprint articles. Please credit the author and the *Field Artillery Journal*.

Subscriptions to the Journal may be obtained through the Field Artillery Historical Association, Fort Sill, OK 73503. The rate remains \$6 per year.



The front cover (photo by LT William J. Taylor) depicts the addition of a second E7 to the firing battery. The back cover is original art by Ms. Donna Hayek and commemorates past and present cannoneers on Veterans Day.

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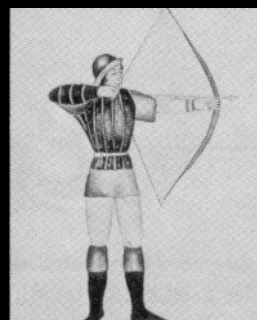
POSTMASTERS: Controlled circulation postage paid at Lawton, OK, Department of the Army, DOD 314.

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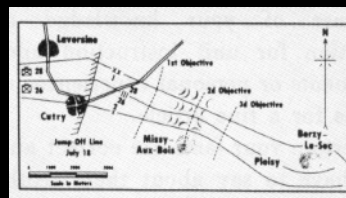
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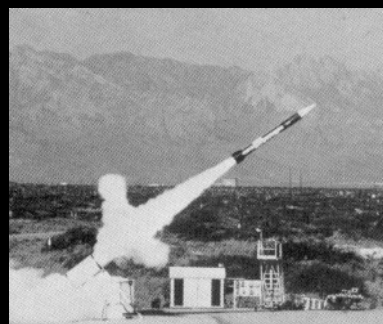
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Editor's Notes

We have a continuing need to acquire material to publish in the *Journal*. Articles need not be lengthy or authored by Redleg officers. Our readers are interested in hearing from noncommissioned officers and enlisted men, as well as personnel from other branches and services and civilians. Our magazine always has a place for articles authored by enlisted personnel, but we need material! You don't have to be a writer *per se* — furnish the material and we'll prepare it for publication.

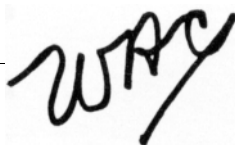
If you would like to support your professional publication, don't let a lack of self-confidence as a writer stop you. We do not have rigid rules for prospective authors, but we do offer some general suggestions that you may find helpful:

- Choose an artillery-related topic that is timely or one you feel would interest the *Journal* readership.
- You will enjoy becoming a published author much more if your subject is of interest to you.
- Select a topic that breaks new ground or present a commentary on current policies, programs or tactics. Do not present problems without including possible solutions.
- Maintain an "idea" list. When you get a good idea, jot it down with appropriate notes on approach, content, etc., and use it when you begin to write. Too often we've heard, "I had a great idea for an article the other day, but I can't quite recall . . ."
- Make use of your knowledge and experience. Preparation for unit instruction and service school requirements or personal experiences may well provide the basis for a fine article.
- Make certain your facts are correct and see what other people have to say about them. Although additional research may be required, document quotes and identify any previously published material. Some material requires copyright permission so furnish a bibliography or give informal credit.

- When you begin your article, you will find your most basic tool to be an outline. Think through what you will cover, sketch out your approach and your article will have a logical progression.
- Two goals maintained by professional writers are brevity and clarity. Do not obscure your subject with broad generalizations or discussions of needless depth. Both will bore the reader and muddy your message. This does not mean that your article must be brief — simply that brief, concise sentences with few modifiers are easier to read and understand.
- Before submitting your article, consider talking with the editor about your subject and approach. Ask us if we are interested in your idea. We will help you all we can.
- If at all possible, the final product should be typed *double spaced*. Provide a brief biography in the cover letter with your name, mailing address and phone number. Articles may be 1,000 to 2,000 words — whatever concisely covers the subject; feature articles may be more brief. Remember to inclose any photographs, art or sketches possible — it increases the chances of publication. Photos should be black and white but we can use color. Charts and line drawings need not be in final form.

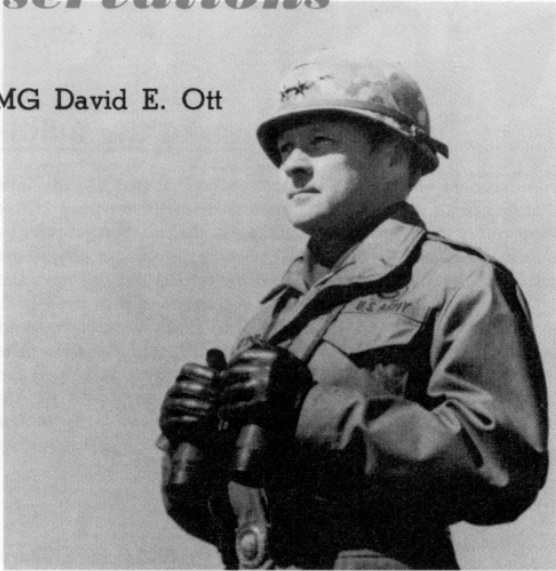
The artillery needs to tap your knowledge, experience and ideas. Get with it . . . and better our branch by sharing your views.

This issue is the first since the *Journal* staff lost 2LT David Long to another office. Dave, an armor officer, spent more than a year on the staff, making him probably the most knowledgeable armor officer in field artillery matters and making the *Journal* a truly "combined arms" publication. Without formal photographic or journalistic training, he edited most of the feature content and took many of our photographs. He was also in charge of circulation. Thank you, Dave — you'll be missed.



forward observations

MG David E. Ott



This issue contains an article on a very important change in the firing battery — the addition of a second E7 who will be known as the gunnery sergeant. There has long been a need for this NCO and I invite your attention to the article on page 8 which was written by Sergeant Major McBride. This brings me to a second point — participation in the *Journal* by our field artillery noncommissioned officers and enlisted men. A majority of the artillerymen around the world are in these grades and we are not getting the benefit of their experience and detailed knowledge of the things that keep the field artillery running. I'm talking about the shortcuts, the quick fixes and tricks of the trade in faster, more accurate ways to prepare for action. These are the things that the section chief or the gunner or the chart operator learn through daily contact with the system, unrestricted by doctrine or rigid rules of procedure normally associated with the School. We not only want your ideas, we *need* them.

At no time in the history of the artillery have the School and Field Artillery Center been so open to change and flexible in accepting innovation. In this regard, take a look at the editor's page for some helpful hints on submitting your ideas.

Another subject that I would like to discuss is the work in progress here at Sill on development of a new training circular, TC 6-20-9, tentatively titled *FA Cannon Battery Defense*. This is an extremely serious subject which units tend to "play" in peacetime during exercises and evaluations based on ARTEPs. In the past, batteries would take the cooks, clerks, maintenance personnel and anyone not directly assigned to the guns or fire direction center, place them under the control of the first sergeant

or motor sergeant, dig a few shallow foxholes, pass out the battery's crew-served weapons and call this the "battery defensive plan." The test evaluators would use their checklists, rate the unit and report the unit "combat ready." We were only fooling ourselves, as we learned in Vietnam.

The field artillery unit TOE is not designed to provide adequate position area defense. This deficiency has to be looked at under a new, bright light. A driving factor is the "threat." Artillery will continue to be placed well forward against an attack which will come with very short notice and be led by a numerically superior, armor-heavy force. This force will be supported by tactical air and artillery, not to mention electronic warfare to jam our communications. We can't do a whole lot about the threat, except study its design, strengths and weaknesses so we will recognize them and not be surprised. What we *can* do is plan and prepare to counter this threat.

As I said earlier, we used unit clerks and cooks to man our position defenses. These people may not be around. There is a study underway called CABL — Consolidation of Administration at Battalion Level — which we indorse. Its "plus" is that the battery commander is relieved of the battery administration, which has long been a detractor in keeping the unit commander from training his unit. The negative side is that it takes away approximately 20 soldiers who could be used in combat to provide survivability. All this boils down to the fact that the firing battery is likely to be attacked by a strong force without having the organic assets to defend itself. This is the problem being addressed by the Tactics and Combined Arms Department in TC 6-20-9.

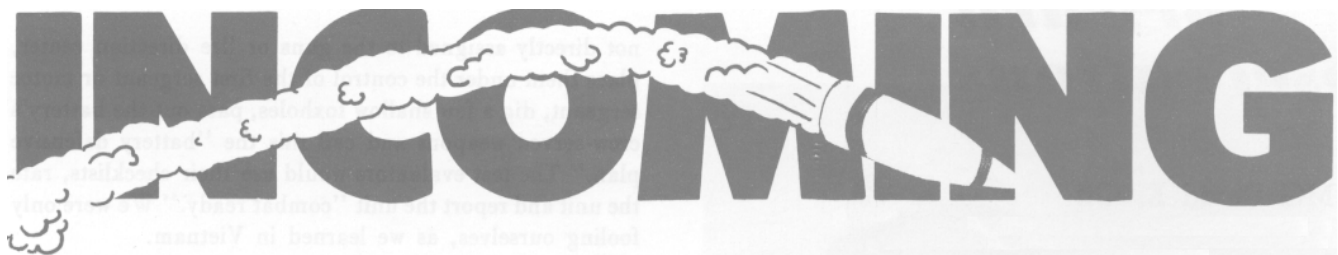
Some solutions are being studied. One is the safest method of battery defense against armor — march order to an alternate position. This literally gets the battery out from under the gun but reduces the battery's ability to answer calls-for-fire and, while on the road, puts the battery in its most vulnerable status. Another survivability measure under study is far greater dispersion of the battery position to reduce the counterfire threat.

Some other areas the TC will look at are:

- Coordination of the battery defense with the supported maneuver commander.
- Use of barriers and on-hand demolitions.
- Use of direct howitzer fire, Redeye and supporting fires from sister units.

None of these is new, but we are trying to take a realistic approach to proposing feasible solutions to this most serious of survivability problems.

The TC is in the early development stages and will not be published until January 1977. Any and all suggestions for workable ideas would be appreciated.



letters to the editor

FIST Favored

I read with great interest the "FIST!" article in the May-June 1976 *Journal*. It indicates that many inherent weaknesses of the current forward observer (FO) section, which are well known to most FOs, are finally being addressed by leaders at a high level.

During the 3d Armored Division live combined arms training test at Hohenfels in March, I served as the FO/FSCOORD for mech-infantry heavy teams during two ARTEPs. The problems I encountered very closely parallel those noted by the Close Support Study Group.

Since both the maneuver company commander and myself recognized the very limited capabilities of the FO's quarter-ton jeep, the only available place for the FO was in the CO's command "track." As a result, it was nearly impossible for the FO to position himself for optimum observation, since often the commander's needs conflict with this. During times of greatest activity, i.e., during contact with aggressor forces, the commander requires the full use of his radios to control his platoons when coordination with the fire support officer (FSO) and fire direction center is most critical. Thus, the FO is dependent on his AN/PRC-77 with its severe range limitations.

Responsiveness will be greatly enhanced when the artillery FO/FSCOORD has a dedicated net controlling and coordinating the platoon FO parties. This will be done easily with the quick-fix organization outlined in the article. The solution would free the FIST chief, the artillery lieutenant, from most of the actual adjustment of fire, which can be done by the FO sergeants of the three platoon FO teams (or the fire support sergeants in the case of tank companies) who are more likely to be on-the-spot than the FIST leader. This will free the FIST chief to concentrate on his real job of coordinating with the FSO, company commander and other elements of his party.

In my unit, 2d Battalion, 27th Field

Artillery, all of the lieutenants serving as FOs are qualified tank commanders (we qualified at the annual service firing at Grafenwoehr). By enabling our FOs to become tank commanders we have exploited fully the existence of the FO tank which is present in each tank company headquarters section. The money that would be saved by giving the company its FO tank in exchange for the M113A1 would appear to make the quick-fix solution very attractive.

Roger J. Buffington
2LT, FA
Btry A, 2-27th FA

FIST

The concepts described in "FIST" by General Pearson (*Journal*, May-June 1976) were truly encouraging. Until recently, even tankers and infantrymen did not really train with one another except in large-scale field problems, but that has changed and will hopefully improve. However, the combination of only armor and infantry elements omits a most important member of the combined arms team — the artillery. The implementation of the comments by General Pearson would greatly improve the combined arms concept.

Among some of the benefits I see for FIST are:

- A significant improvement in the awareness and appreciation of the combined arms concept.
- An increased effectiveness of the FIST due to its day-to-day familiarity with its maneuver unit, thereby becoming a part of the unit's "heartbeat and personality" — something that is lacking when the FO is merely attached for periodic spurts of training.
- An opportunity to instill in one another the needs, capabilities and limitations of each combat arm, thereby reinforcing the need for an appreciation of the combined arms concept.

Also, I feel the field artillery lieutenant's career will be enhanced through a better knowledge and understanding of maneuver elements —

not to mention the fact that he will have left the maneuver element with a better understanding of the fire support role. In fact, he will have a significant advantage over those officers who did not have the opportunity to serve as part of the FIST.

The combined arms concept can and must become a reality and the sooner the better. I salute those who developed the FIST concept and hope it will be implemented. After all, our Army is not getting any bigger, but it must certainly get better.

Ned C. Stoll
CPT, AR
Asst. Professor of Military
Science
University of Utah

FIST At Bragg

With the assistance and support of maneuver brigade and battalion commanders, MG T. H. Tackaberry has directed implementation of the fire support team (FIST) concept in the 82d Airborne Division. Div arty and each brigade were provisionally reorganized 21 July 1976. All mortar FOs, supporting radio operators and associated equipment from maneuver battalions have been attached to the supporting field artillery battery. Implementation of the FIST has become the responsibility of div arty.

Each of my direct support (DS) battalion commanders can now coordinate and control all indirect fire FO assets for the infantry brigade. All personnel involved in planning and executing indirect fires will now be trained technically and tactically by the DS FA battalion.

Each of the DS battalions has accepted the additional training responsibilities with great enthusiasm. A 40-hour block of training is being given to each FIST team. Significantly, this training is being given by the battalion fire support officers and FIST team leaders. By 1 September 1976, each FIST team will be trained to coordinate and adjust all types of indirect fire. The FIST will support the infantry company

during all field exercises involving either simulated or live indirect fire. When the 81-mm or 4.2-inch mortars are used in training, FOs from the FIST will be there to adjust fires.

Placing the FIST in the DS field artillery battalions has drawn the combined arms team closer together. Planning and coordinating training is now a joint effort between each of the infantry brigades and its DS battalion. No longer can the field artillery plan training without the infantry in support. The DS battalion training must be focused both internally and externally. Planning and coordinating this caliber of training foster a close personal relationship between the infantry and field artillery commanders and staff officers at all levels. A key ingredient to a smooth functioning combined arms team.

Carl E. Vuono
COL, FA
82d Airborne Division
Artillery

First On The Fourth?

Battery B, 1st Battalion, 15th Field Artillery, 2d Infantry Division, Korea, claims the distinct honor of firing the first round in the world celebrating our nation's bicentennial.

The first round was fired at 10:30 am, 4 July, initiating the 2d Infantry Division's 50-gun salute to the nation. While many Americans were anticipating the forthcoming celebration at 8:30 pm, Eastern Standard Time, 3 July, Battery B was already extending its tribute to the nation.

Claren S. Corey Jr.
CPT, FA
Adjutant

Firepower

Congratulations on publishing "Firepower" appearing in the May-June 1976 *Journal*. Viewed from a background including command of artillery units ranging from batteries to corps artillery in combat, I consider it the most important and thought-provoking article that has appeared in a long time. I hope it will receive wide circulation and study throughout the Army general staff. It's bound to become accepted doctrine in time. Inclosed is an item I wrote, echoing similar thinking.

Command In The Age Of Firepower

When Nazi Germany rearmed with their Panzer divisions, DeGaulle, in his famous staff paper, termed it "The Age of Mechanized Force."

Today, with the addition of aerial artillery, atomic artillery, guided missiles, etc., added to the armament of modern armies, it could be more properly called "The Age of Firepower."

Consider just some of the tasks of a commander of such firepower:

- There is the selection of units, calibers and ammunition for any impending operation.
- There is the proper integration with available air power as well as between the various calibers.
- There is the correct organization, utilization and interrelation of the various intelligence agencies and their available equipment.
- There is the great responsibility for the proper employment of atomic artillery.
- There is the proper organization for command and allocation of the different units.
- There is the preparation of the all-important fire plan, whether it be for attack or defense including the general subplans — counterbattery, air defense suppression, air defense, antitank suppression, etc.

The successful execution of such tasks as well as the success of our air power may well decide the turn of battle before the maneuvering force ever comes into action. All this calls for a commander possessing the necessary technical competence as well as vision and sound judgment. In all modern armies, the commander of this firepower is the artilleryman.

In the last 100 years, only two armies have shown a true appreciation of the importance and value of artillery — the French high command in World War I and the Russian high command in World War II. The relative size of the artillery component, the armament, the tactics and techniques all were superb in both their armies. History tells us the result.

Proper recognition in rank was accorded the artillery commanders: The French division artillery commander was a brigadier general; the corps artillery commander, a major general. The Russians even organized *artillery divisions*. Such recognition in the rank of artillery commanders is all-important if they are to have a proper voice in command conferences and battle plans. It

is of equal importance if we are to attract officers of ability and ambition.

World War I caught the American artillery woefully deficient in tactics, techniques and equipment. We had to adopt French tactics, techniques and armament. The French concept of rank for artillery commanders naturally was followed.

Since that war, our command and general staff has continually failed to show the French or Russian appreciation of artillery.

Hence, today, we find the division artillery commander to be a colonel, while a brigadier general is provided as assistant division commander and another brigadier general is allowed for supply.

The corps artillery commander is only a one-star general. All this in the age of firepower, when the division commander's most important assistant is his artillery commander.

The President said recently we are second to none in our military command and capabilities. Here's one place we're second to the Russians — the command structure of our artillery.

Our general staff had better wake up before the smart young officers are no longer attracted to an artillery not offering the proper command future.

R. P. Shugg
BG (Ret), USA
San Francisco, CA

Why Wait 10 Years?

A common phrase heard in basic and career courses is "We teach Army and branch procedures here. You'll have to check at your next assignment to learn what the local policies are."

After working with Reserve Component units for two years in MAPEXs, CPXs, FTXs and summer camps, I have discovered one common denominator between Reserve Components and Active Army — it usually takes 10 years for junior officers and NCOs to collect all the local policies. That is to say, unless they have been assigned to a particular job, few have the vaguest notion of how to prepare common recurring forms that help the unit function. Examples are:

- DA Form 581 — Request for Issue and Turn-in of Ammunition.
- DA Form 638 — Recommendation for Awards.

Incoming

- DA Form 873 — Certificate of Clearance and/or Security Determination.
- DA Form 2765-1 — Request for Issue or Turn-in.

These forms are not difficult to fill out — the appropriate regulation usually provides sufficient guidance. However, they are often filled out incorrectly or not at all because no one has taken the time to teach junior officers and NCOs the local policies which supplement the basic regulations. As a result, forms must often be resubmitted, deadlines are passed and final products seldom agree with original requests. Green bag is received instead of white bag propellant powder, the Army Commendation Medal is awarded instead of the Meritorious Service Medal and carburetor parts for a 5-ton arrive for a 1/4-ton vehicle.

The point I wish to make is that when everyone in a unit knows his job and exactly how his section contributes to the big picture, the whole unit tends to function more smoothly and efficiently. For example, when every section chief knows how the PLL in his particular unit is established and the lieutenants and captains know what to check on, then the proper PLL is identified and established. One good example of this was in the 2d Logistical Command, Okinawa, in 1968. Because of the multitude of branch and branch immaterial jobs in each directorate of the Log Command, it was difficult for junior officers to grasp the importance and contributions of their particular section. The Commanding General, MG Charles T. Horner Jr., had each directorate give a two-hour class to all company grade officers on what their particular directorates did in the Log Command. The classes were repeated until 100 percent attendance in every directorate's class was achieved. Within one month, a significant increase in production in all operations was noted. Deadlines were being met, more intra-directorate cooperation was accomplished at the grassroots level and less time was sacrificed to "I don't know who handles this" delays. Local policy had been established, and the channels for coordination made known. Those of you concerned with training should therefore consider having any local-policy subjects reviewed by the appropriate staff officer for junior officers and NCOs at convenient times, so they may learn the

particulars of their unit in a few months and not have to take 10 years to collect the bits and pieces. . . .

Before you fellow field graders dismiss this as "everyone knows this stuff," — ask yourself — "How much did I *really know* as a lieutenant about these items," and you'll see the reason for this [letter] — I'm sure!

Many commanders attempt to cross-train junior officers by rotating staff assignments each year, but in a normal two- or three-year tour, this means only one or two staff positions per individual and he still hasn't learned the details of the rest of the staff. Think for a minute how football teams train. First, each man practices his specialty: hiking, blocking, kicking, passing, etc.; then they [the team members] are brought together and each play is carefully talked through so that on any given play every man knows exactly what the other 10 men are doing and why. To better coordinate your team, consider telling everyone all the local plays so they can handle any situation right the first time. This will take time, coordination and command effort (what doesn't?) but the long-range benefits are obvious when you consider:

- Past inspection "gigs," the result of the person in charge not being familiar with "how we do it here."
- Returned and increased paperwork owing to "local policy errors."
- Poor maintenance because supervisory personnel did not know "what's going on" during motor stables.

Inadequate training results because not everyone in the sections knew how to report combat intelligence, characteristics and capabilities of all sections' weapons, how to use the radio *correctly*, etc. If you're still not convinced our junior leaders could be improved by such classes because "they'll pick it up on their own eventually," ask any of them:

- How soon can you expect a replacement for a key E5 or E6 if he departs according to schedule or if he gets a six-month drop?
- If no one else is available, can you locate the Policy and Procedures
- File? If the unit does not have one, can you set up one?
- How long will it take for PFC Jones' secret clearance to return?
- What is the unit's basic load or SAL? Can the unit carry it with organic vehicles?

- What is the unit's PLL and when was it last updated? By whom?

Unless you get 100 percent correct responses, reconsider the classes — for the unit's sake.

Anthony McB. Curtis
MAJ, FA
Readiness Group
Schilling Manor
Salina, KS

Radar Training

I seek information to aid in training radar personnel during IDT. I am familiar with the "tear drop" round [sub-caliber, for training] used in the mortars; however, mortars are hard for a target acquisition battalion to obtain without a TOE change.

Since I am from the Missouri National Guard, I know about the AN/MPA-4 trainer developed by Sergeant First Class Oetting and Chief Warrant Officer 2 Harmon (July-August 1975 *FA Journal*). I have learned of the LAW [light antitank weapon] adaption kit, TM9-1340-203-20. Conversion kit part number is 1340-00-420-7999. This will then fire a 35-mm round with part number 1340-00-143-6911.

Has anyone ever tracked this with a Q-4?

Duane M. Norman
MAJ, FA
135th FA Group

Any answers? Respondents should write MAJ Norman (9th and Ohio, Sedolina, MO 65301), with a courtesy copy to the Journal so we'll all know. —Ed.

Rocket Artillery

I read with interest CPT Peter M. Ossorio's article in the November-December 1975 *Field Artillery Journal* on the problems of field artillery in meeting the overwhelming Soviet threat in Europe. I was somewhat surprised, however, that no mention was made of one possible solution to this dilemma.

Rocket artillery has the potential for rapidly delivering high firepower for accomplishing many field artillery missions. Today's technology places, within our capability, a system sufficiently

Incoming

accurate to achieve the necessary defeat criteria of many area targets while operating at sufficient standoff range to make enemy acquisition of our system and his counterfire relatively ineffective.

Such systems, if properly sized, can retain the necessary mobility and range to operate just behind brigade areas but will require slightly *less* logistics support than cannon artillery for an equal weight of munitions on target. These same systems can deliver such munitions faster, thereby achieving greater shock effect and higher casualties per ton of munition. The system operates with a smaller crew and, since the system weighs only 10 percent of what cannon artillery weighs (for an equivalent firepower capability), air mobility is enhanced.

One typical complaint leveled against rocket artillery is the amount of munitions carried forward to support its operation. If we really believe that we are outnumbered (3 to 1) in tubes in Europe and seek to redress this situation, at least to the extent of providing non-nuclear response to controlling the "surge," then we must recognize that in order to shoot more munitions we must haul more munitions. We can design rockets today that can deliver these munitions more efficiently than cannon. Rockets cannot do all field artillery jobs, particularly when precision is required, but are capable of complementing cannon artillery and can significantly reduce the current imbalance in Europe.

A rocket system will not be available before 1980, but more voiced support for this requirement could hasten the day when the Field Artillery acquires this needed capability.

F.O. Cornay
COL (Ret), USA
Bellevue, Washington

Nui Hon Cao

First of all let me say that I realize that war stories, like fine wine, get better with age; but I feel compelled to state some of my feelings about the attack on an unnamed fire base General Ott discusses in his article "1967 Combat Operations" in the November-December *Journal*.

To the men of A Battery, 2d Bn, 320th FA, and to the men of my battery, C Battery, 3d Bn, 16th FA (the Army's finest) and our commanders and S3's then LTC Bolcar, MAJ John Patton and LTC Don C.

Fox and MAJ Gerry Gross, that hill sure had a name: NUI HON CAO.

Somehow the reading of the attack loses something. No one can express the pure heroism of the one Medevac pilot who came in to the fire base (Dustoff 54) or the skill of the radar warrant officer in vectoring a helicopter to a very narrow ridgeline in truly zero, zero weather.

Also, to my knowledge my predecessor, then CPT Dan Simpson, made the first airmobile lift of 155s in I Corps utilizing CH-53 Marine helicopters. This lift was made from Chu Lai to the Special Forces camp at Thien Phouc. I assumed command at Thien Phouc and made the air move to Nui Hon Cao again utilizing Marine CH-53s. While I was in command, C Battery made two more Marine helicopter moves and one luxurious move utilizing CH-54s.

Bruce A. Bourgault
MAJ, FA
Asst. Professor of Military Science
Idaho State University

Thanks for the name, Bruce. As we recall our advisor's Vietnamese, the translated name would be the "Taller Mountain."
—Ed.

Up-Load Rebuttal

Reference "The Up-Load Exercise," May-June 1976 *Journal*: I would like to take issue with many of Captain Predmore's points. His battalion is heavy artillery, obviously a general support (GS) unit, and what may work there will not necessarily work elsewhere. Due to the "WHEELS" study which stripped the FA of much of our ammo-carrying capabilities, the whole subject of ammo resupply and distribution is in question in my mind, particularly in USAREUR. Direct support (DS) units in Europe no longer have "easy-load" dropside 5-tons, but instead 8-ton GOERs. More than likely, they will also not have a 5-ton wrecker to devote solely to loading ammo — possibly a GOER wrecker or an M578 at best. From my own experience in going from an up-load to a down-load status, I would also contest his point concerning the loss of know-how to handle and maintain ammo in tactical units. Conflicting regulations for handling and storage, as well as supply system problems, contribute just as much to

poorly maintained ammunition as do guard and details. Do these ordnance units actually have the equipment, manpower and expertise Captain Predmore claims is lacking in the tactical units? I could never find out while assigned in Germany. Captain Predmore also notes that two factors determine whether the alert area can be used as a transfer point, one factor being "... the time span from an alert posture to the outbreak of hostilities." How long will that time span be?

Lawrence R. Clark
CPT, FA
S4, 1st Bn, 29th FA
Fort Carson, CO

Fire Grading Procedure

As discussed in your May-June *FA Journal*, please forward to this headquarters a copy of the new grading procedures for forward observer effectiveness.

Robert W. Oslin
MAJ, FA
Assistant Adjutant
2d Bn, 14th FA

*A copy of the new observed fire grading procedure has been forwarded per your request. If you have any questions, concerning the new grading procedure, please contact the Department of Gunnery, US Army Field Artillery School, ATTN: ATSF-G-FD, Fort Sill, OK 73503. I hope you continue to read and enjoy your *Journal*.* —Ed.

ABCA Request

I request your assistance in responding to an official request from the Spanish Army for information concerning the ABCA method of correction of fires. The Spanish Army Artillery Academy has noted that the above method is the result of a new agreement among Australia, Great Britain, Canada and the US. Any references, information or contacts concerning this new method or change in the adjustment of artillery would be greatly appreciated.

Robert E. Brown Jr.
MAJ, ADA
JUSMG-MAAG (ASO)

The New Gunnery Sergeant

Hey, battery NCOs and officers, I have some good news for you. Yes, sir, the field artillery has really come up with something that is precisely on target — an additional senior NCO supervisor in the cannon firing battery. We've needed him for a long time. Since we lost the old Chief of Detail, Top and Smoke have shouldered the responsibility of supplying the NCO punch needed to keep the battery shooting straight. New developments in equipment and tactics keep making that responsibility load heavier and heavier.

Look at the modern battlefield. Weapons are deadlier — if something can be seen, it can be hit; and, if it is hit, it will likely be destroyed. Tactics and techniques have become more complicated because of these deadlier weapons. There are new and greater demands being placed on the firing battery. We have to be able to shoot 50 percent faster than before — a single battery has to be able to fire up to three missions simultaneously, and that means all types of missions. For example, a priority target for suppression requires that a platoon of howitzers fire within 20 seconds of the forward observer's call-for-fire.

While all of this is going on, we still have to make sure we're going to be around to fire the next mission, so a lot of new techniques to improve survivability have come our way. For example, we most likely will fire the maximum charge, not only to cut down the time-of-flight, but also to keep the path of the round low and more difficult for the enemy to detect with his radars. We'll be shooting more offset registrations, offset adjustments and roving gun missions. In other words, there will be more split-battery missions of one sort or another than ever before. Even with the split positions, we must keep the howitzers spread out to help avoid detection and counterfire damage. This requires

by SGM Harvey M. McBride



a new method of determining piece locations to insure accuracy.

In addition, we have a whole bunch of new projectiles, propellants and fuzes just around the corner. But, for a long time to come, we'll have both the old and new ammunition to keep up with. When one thinks of all these things in terms of training and supervision, the need for an additional NCO supervisor really becomes apparent.

Battery Expanded

The new TOE coming out this month authorizes each cannon battery one additional E7, called the gunnery sergeant (GSG). Now that we have some help for Top and Smoke, lets look at how we can most effectively utilize our GSG. His basic duties and responsibilities are described in the new FM 6-50, *Firing Battery Operations*, as follows:

- 1) The GSG assists the chief of firing battery in executing his duties and must be prepared to perform all the duties of the executive officer (XO).
- 2) His primary responsibilities are:
 - a) Performing the duties of the chief of firing battery during split operations.
 - b) Working in shifts with the chief of firing battery during 24-hour operation.
 - c) Assisting the battery commander in the reconnaissance of battery positions by:
 - Setting up the aiming circle.
 - Reading initial deflections to the gun guides.
 - Supervising the activities of the gun guides.
 - Performing other duties in the new position that the battery commander may assign.

You may be thinking we're going to have two E7s running around getting into each other's hair. Not so! In both tactical and peacetime environments, the new GSG will be available to enhance the accomplishment of a firing battery's mission in a multitude of areas.

From a tactical standpoint, for example, this new E7 will be a tremendous asset. He can function as an assistant chief of firing battery, supervising the cannon crews during 24-hour operations. This 24-hour capability will then free the XO to position himself where the action is, either in the firing battery area or in the fire direction center. The GSG can also be used to assist the battery commander during reconnaissance of position areas by orienting the aiming circle, establishing a direction using hasty survey techniques, or, if necessary, assisting in the development of the defense plan and supervising the activities of the gun guides. Even ammunition resupply is going to be much more difficult on the modern battlefield, so he'll be helping keep the ammunition section straight. Needless to say, the GSG will be an invaluable asset during split operations, supervising one of the firing battery elements. This capability will add a new dimension to the artillery combat

operations. No longer do we need to degrade a section by pulling one of the section chiefs off his gun to assume a role for which he may not be completely trained and ready. The expertise for the leadership and supervision will be there — with the GSG.


Training

In a peacetime environment, the GSG will be right in the middle of training. He will be involved deeply in the development and implementation of battery training programs, assisting the XO and chief of firing battery. Here's an opportunity for a battery to have a highly qualified man who can devote full-time to training: from setting up diagnostics similar to those on the new Skill Qualification Tests for determining individual training levels to developing collective or section training tests using FM 6-50 and appropriate Army Training Evaluation Programs. This expertise can also be utilized in areas other than gun sections. For example, the GSG could play an important role in the supervision of operator/crew-level maintenance in the battery as well as the training of drivers and equipment operators. Nuclear-capable units may also find it advantageous to utilize the GSG for training assembly crews. His use is unlimited and his worth to the battery immeasurable.

No, the GSG is not just an assistant chief of firing battery or just one more E7 for the battery commander to use as an assistant to the first sergeant. He's a new breed of man, knowledgeable in what it takes to survive on the modern battlefield — an NCO ready to assist where needed.

Promotion Ratios

In addition to all of the obvious benefits of an additional supervisor in the firing battery, the creation of a new E7 position in MOS 13B helps alleviate a serious imbalance in the ratios of E6s to E7s in MOS 13B. In a 105 or 155-mm battery, for example, you find seven E6 section chiefs vying for one E7 chief of firing battery position. In an 8-inch battery, five E-6s work for the E7 slot. At the same time, there are almost as many E8 (MOS 13Z) positions as E7 positions. As a result, it is very hard for an E6 to get promoted, but, once he is promoted to E7, he is assured of promotion to E8. The addition of the GSG position will greatly enhance the E6's chances for promotion, as well as stiffen the competition for promotion to E8. It should also help in getting more first sergeants in the 13 career management field, a real problem today.

The sharp section chief now has two E7 slots to shoot for. The duties, however, will be broader and the expertise required for an E7 in the firing battery will be more demanding. The addition of a new E7 GSG will go a long way toward enhancing the capability and efficiency of the field artillery battery, as well as increasing the prestige of an already proud field artillery noncommissioned officer corps. 

SGM Harvey M. McBride is a senior enlisted instructor in the Weapons Department USAFAS.

Part VI

Vietnamization



FA

Assistance Programs

by MG David E. Ott
Commandant, USAFAS

In November 1969, then-President Richard M. Nixon officially established the goal of the American effort in the Vietnam conflict: enable the South Vietnamese forces to assume the full responsibility for the security of their country. Although "Vietnamization" was a new word, the concept was, in fact, a return to an earlier policy — one that had all but disappeared in the feverish escalation from aid and advice to combat support to active participation. As early as the summer of 1967, the first tentative steps toward Vietnamization were being taken. Concerned about the effectiveness of the Vietnamese Army (ARVN), Regional Forces (RF) and and Popular Forces (PF) units, General Westmoreland directed that a conference be held to air views, consider proposals and make recommendations through which assistance could be provided the Vietnamese military in order to mold it into an aggressive and responsible fighting force.

FA Assistance Programs

Senior American commanders met at Pleiku on 12 August 1967 and, on the basis of their conclusions, the Commanding General, I Field Force (IFF), Vietnam, directed that the Commanding General, IFF Artillery, ". . . establish liaison with Vietnamese units and . . . isolate problems to be alleviated through US training support." IFF Artillery immediately assigned a liaison officer to II Corps (Vietnamese) Artillery to "provide a channel for the request of supporting US artillery for ARVN operations in II CTZ [Corps Tactical Zone]." This officer was recalled when the necessary procedures had been established, and his duties were assumed by the artillery officer of II Corps Advisory Group. To provide further assistance, an "on-call" liaison officer from the 52d Artillery Group was designated.

Even as this coordination was being established, a decentralized assistance program was developing. On 28 September 1967, BG William O. Quirey directed that all field force artillery battalions establish forward observer (FO) teams specifically to train RF and PF units in the techniques of fire adjustment. Further, battalions were to provide any assistance necessary to assist ARVN artillery units to achieve maximum technical proficiency. This guidance, however, proved to be too general. Field force battalions provided only sporadic aid in the II Corps area, and effectiveness depended on the willingness of the Vietnamese participants in the program and the ability of the US units to do the job.

Four-Month Study

Meanwhile, IFF Artillery had initiated a four-month study of ARVN artillery operations in order to evaluate the

effectiveness of their support. Total assets in II Corps were one hundred and three 105-mm howitzers and forty-two 155-mm howitzers. Of these, six 155-mm and fifteen 105-mm tubes were committed to support training centers. Although all school support weapons had the secondary mission of local area support, their primary function of school support prevented their effective utilization in support of operations. In addition eighteen 105-mm pieces were positioned in platoons at Special Forces and Civilian Irregular Defense Group (CIDG) camps. The remaining guns — fifty-five 105-mm and thirty 155-mm pieces — had primary responsibility for supporting ARVN, RF and PF maneuver elements. Because this artillery also had to provide fire support for road security and the various political headquarters throughout II Corps, platoon and split-battery configurations were the prevalent formations. The size of II CTZ, some 30,000 square miles, and the magnitude of the mission proved the artillery incapable of providing even marginal fire support to maneuver forces during offensive operations.

The study examined 10 long-term operations and 72 short-term operations. Long-term operations were defined as those performed within the framework of the normal mission of the maneuver force and short-term operations as those in response to specific and immediate needs such as those based on special intelligence. Findings showed that artillery supported slightly less than half of the short-term operations. Of those operations which were listed as being supported by artillery, each maneuver battalion was shown to have received artillery support which averaged slightly more than one platoon (two guns). The average support was less than one platoon of artillery per battalion when all short-term operations were taken into consideration. The study also showed that although ARVN artillery units were thoroughly grounded in the fundamentals of gunnery, they were severely hampered by poor maintenance practices, slipshod repair parts support and inadequate communications equipment. Further problem areas were encountered in the meteorological support and survey capabilities of the Vietnamese. Based on this study, specific programs were initiated to upgrade the ability of ARVN artillery to support maneuver forces in the field. This aid was aimed at increasing the responsiveness of the firing units in answering calls-for-fire and the ability of the ground soldier to request and adjust fire. Because the mission of Vietnamese batteries continued to be security of roads and strategic installations, no attempts were made to increase the fire-massing capacity of these units.

Remedies

To remedy the problems exposed by the study, American artillery units in early 1968 initiated four assistance programs. Task Force DAI BAC I (Cannon I) was formed by the 1st Battalion, 92d Artillery, to assist Vietnamese

artillery units in the Kontum area. This program was short-term, lasting only 23-27 February 1968. Its primary mission was to ascertain the condition of the Vietnamese weapons and to demonstrate the responsiveness of Vietnamese and US artillery to calls-for-fire from ARVN, RF, PF and US units in the Kontum area. To accomplish this mission, the 1-92d Arty established a fire direction center (FDC), collocated with the Vietnamese 221st Artillery Battalion at Kontum, that could control all artillery fire in the area. The objective was to create a working Vietnamese FDC. Another team with interests in logistics and maintenance was to examine and correct hardware deficiencies. Additional teams were designated to assist in firing battery operations, communications and survey. Because of the short duration of the program, specific objectives were established for each day to insure that all areas were examined and upgraded. The program revealed that significant shortcomings in FDC procedures were caused primarily by a lack of logistical support and by poor understanding of sophisticated gunnery procedures. Firing battery deficiencies were closely tied to logistical or maintenance support. Tubes ranged in age from 13 to 27 years and averaged 10,000 rounds per tube. The task force provided the necessary logistical support to upgrade the weapons and instructed Vietnamese in advanced FDC procedures. The task force also pointed out that the remaining problem areas were founded in the weak ARVN logistical system and recommended that artillery advisers spend more time with their units and actively establish liaison with neighboring American units so that assistance could be made more readily available.

At the same time that Task Force DAI BAC I was being established, another program began to provide assistance to CIDG and Special Forces artillery platoons. Responsibility



XXIV Corps Artillery initiated an artillery instructor training program. This US-conducted training was then exported to ARVN, RF and PF-level schools.

for the program was given to the major artillery commands in II Corps. These commands provided technical assistance to the CIDG artillery platoons. Classes were conducted in fire direction, firing battery operations and maintenance. Initial success resulted in the continuation of the program on a regular basis.

Perhaps the most important of the four projects was the IFF and ARVN Associate Battery Program, which began on 14 March 1968. The program was to augment the existing advisory effort, improve the effectiveness of Vietnamese forces and open channels for better coordination of fire support and mutual understanding. Under this concept, US artillery units sponsored selected Vietnamese battalions in their locale and provided them with a responsive American headquarters from which to request technical, maintenance and training assistance.

Finally, IFF Artillery developed a program of instruction to train Vietnamese artillerymen in the use of antipersonnel (Beehive) ammunition in preparation for the time when Vietnamese firing units would be issued the special rounds. This program, however, never became functional because the Vietnamese Joint General Staff had not authorized their units to obtain and employ the ammunition.

Success

The initial success of these programs, coupled with the disastrous defeat suffered by the Communist forces during their ill-fated Tet offensive earlier in the year, allowed the embryonic Vietnamization program to grow. During the fall of 1968 military leaders in Vietnam studied after-action reports, intelligence estimates and staff studies pertinent to the Tet campaign and its immediate aftermath. From these evaluations a parallel course — one that would merge with President Nixon's some eight months later — began to germinate. On the basis of an overall evaluation of the ARVN, it became evident to these leaders that if Vietnamese forces were eventually to assume the burden of the ground war, a test of their ability to operate semi-independently would be necessary. The stress on semi-independence rather than complete autonomy was in recognition of the inherent weakness of these forces in fire support and air assets. To this end, a suitable testing ground had to be found. The area had to be secure enough to allow for unhampered transfer of forces before Vietnamese units became actively engaged but, at the same time, had to have potentially significant enemy activity to provide the Vietnamese with a viable test. Further, the testing ground had to be in an area of minimal danger to the pacification program. An ideal area was found in northern Kontum Province, with its sparse population, potential enemy threat from Laos and Cambodia and relative isolation from the psychologically important population centers of the country.

Agreement Signed

Preliminary discussions between American and Vietnamese leaders began in late 1968, and a verbal agreement was reached in January 1969 between LTG William R. Peers, Commanding General, IFF and MG Lu Mong Lan, Commander, II Corps. However, this agreement was not written, and the designated Vietnamese force, the 42d Regiment, and its command headquarters, the 24th Special Tactical Zone (STZ), failed to assume responsibility for the area by 1 February 1969, as had been agreed. Further, negotiations were hampered by the natural confusion of a change of command at IFF and it was not until 12 April 1969 that General Lu Lan indicated general agreement with a new proposal. A draft memorandum of agreement was drawn up and signed by American and Vietnamese officials on 24 April 1969. On the same day the exchange of forces neared completion and the ARVN assumed responsibility for northern Kontum Province.



Under II Field Force Artillery and ARVN III Corps Artillery joint plan DONG TIEN (forward together), one aspect of preparing ARVN for US withdrawal was to expand survey control to all artillery units in III Corps. (US Army photo by SP4 Dan Jeff)

In deference to the weakness of Vietnamese artillery (six 105-mm howitzers and six 155-mm howitzers), the agreement specifically provided that the 4th Infantry Division Artillery units would assume effective artillery coverage of National Highway 14, the major north-south artery in the highlands, and that the Commanding General, IFF Artillery, would provide general support artillery as required; support operations within the 24th STZ with a minimum of two light or medium artillery batteries; and, maintain the fire support coordination center to coordinate

all fire support means available, including operation of air advisory stations.

IFF assigned the mission of providing the specified support to the 52d Artillery Group headquarters in Pleiku. The 52d immediately provided six light, 12 medium and five heavy artillery pieces to the 24th STZ to augment organic Vietnamese batteries. Battery C, 4th Battalion, 42d Artillery, a 4th Division Artillery unit, provided road coverage. Automatic weapons were allocated from Battery B, 4th Battalion, 60th Artillery (Automatic Weapons).

Dan Quyen

With the assumption of responsibility for northern Kontum Province by the 24th STZ, the first major Vietnamese ground operation began. Dubbed DAN QUYEN by the Vietnamese, it grew out of special agent reports indicating a major buildup of enemy units southwest of the Ben Het CIDG camp, which sat precariously at the convergence of the Laotian, Cambodian and Vietnamese borders. In order to head off Communist plans to execute a strong offensive effort in the highlands, the 24th STZ was tasked to conduct operations to spoil Communist plans, protect Ben Het and compel enemy forces to retire to their Cambodian sanctuaries. The operation was conducted in three phases: Phase I (5-15 May) involved forces of three Vietnamese and two mobile strike force battalions screening the tri-border area west of Ben Het; Phase II (16 May-3 June), based on intelligence produced during the initial phase, was a six-battalion (plus) offensive operation conducted southeast of Ben Het and targeted against elements of the North Vietnamese 66th Infantry, 28th Infantry and 40th Artillery Regiments; and, Phase III (3-5 June) consisted primarily of bomb damage assessments by multibattalion Vietnamese forces and the establishment of a defensive screen around the Dak To, Tan Canh and Ben Het areas. By the end of the operation, the South Vietnamese had succeeded in mauling the Communist forces and establishing a favorable 7-to-1 kill ratio. In support of the operation, the 52d Artillery Group provided 29 tubes of artillery — twelve 105-mm howitzers, twelve 155-mm howitzers, one 8-inch howitzer and four 175-mm guns — and assigned the 1-92d Arty to establish the forward command post for US support forces. This command post was later expanded into a fire support coordination center for all American artillery in the area. From their own assets, Vietnamese forces utilized eight 155-mm and six 105-mm howitzers in support of the operation. A total of 73,016 rounds was expended by friendly firing units. Enemy soldiers captured during the campaign expressed a fear of first-round volley fire employed by both South Vietnamese and US units in the form of random time-on-target missions.



One goal of Vietnamization (approved during the June 1969 meeting of Presidents Thieu and Nixon at Midway) was providing the best available materiel to ARVN. Here, a section of the 2d Artillery Battalion, ARVN Airborne Division, fires the latest 105-mm howitzer in the US inventory. (US Army photo by SP4 Pete Freeman)

Although the operation was deemed a success, a number of weaknesses became apparent. The magnitude and complexity of coordinating, integrating and controlling available fire support means virtually overwhelmed the 24th STZ staff at the Dak To tactical operations center. Some of the blame for this failure was attributable to an inexperienced staff and the inadequate manning structure of the headquarters, but specific shortcomings were apparent as well. When the 1-92d Arty established the US fire support coordination center at Dak To, ARVN commanders were encouraged to send representatives, but only one did so. Fire support activities thus were not properly coordinated, so flexibility was lost, resources were wasted, efforts were duplicated and, frequently, targets were not attacked with the appropriate means at the proper time. This problem originated with the failure of the force commanders, in organizing for combat, to understand or appreciate the need to integrate closely maneuver plans and fire support plans and to collocate the tactical operations and fire support coordination centers. The problem was finally rectified two weeks after the operation started when the commander of the 1-92d Arty was tasked to establish an integrated fire support coordination center. This agency

quickly matured into an effective organization capable of providing timely and accurate fire support.

Additional problems were encountered in fire clearances, coordination of fire support assets at company level and requests for, and adjustment of, artillery fire. It became apparent that these deficiencies were a result of the dependence of the South Vietnamese commanders on American advisers. These weaknesses were not corrected satisfactorily, and it was clear that additional stress in training would be required to upgrade the fire support coordination of Vietnamese units.

Despite the weaknesses noted during the campaign, the performance of the Vietnamese forces proved that they could plan and successfully execute semi-independent ground operations against Communist main force units. The significance of this fact would not be apparent for another five months, when the policy of Vietnamization became the stated objective of the American command in Vietnam.

Phase II

By 1968, Military Assistance Command (MACV) had submitted its plans for Phase II of the Republic of Vietnam Armed Forces Improvement and Modernization Plan. Phase II planning was based on assumptions that North Vietnamese intervention would increase and that the missions of the allied forces would remain substantially unchanged from those that had been stated for fiscal year 1968; that is, US and allied forces were assigned to destroy Viet Cong and North Vietnamese Army forces and base areas, and South Vietnamese Army, RF and PF units were to support the pacification program. Because of these assumptions, the improvement plan was rather methodical and cautious. The proposal was submitted to the Secretary of Defense who disapproved and returned it to the Saigon planners for substantial revision.

In early 1969 the plan was resubmitted as Phase IIa, which assumed the same basic premises as those of the initial plan, but substantially increased the speed and scope of the modernization. On 28 April 1969, the Deputy Secretary of Defense gave final approval of the MACV program as modified by the Joint Chiefs of Staff, and in his approving memo stated: "Vietnamizing the war should have the highest priority. Providing needed equipment for the RVNAF is therefore of greatest importance. To assure that equipment turned over to the RVNAF can be used effectively, it must be supported by (1) training and (2) logistic support."

Phase IIa of the Improvement and Modernization Plan recognized that major shortfalls existed in the firepower

capabilities of the Vietnamese forces, and a substantial portion of the plan was devoted to rectifying this weakness. The equipment ceilings established by the plan were intended to increase substantially the artillery capability of the Vietnamese. These proposed figures were further modified when Presidents Nixon and Thieu met at Midway in June 1969. President Thieu presented the requirements as seen by the Vietnamese to President Nixon, who in turn gave them to General Abrams for study, comment and possible inclusion in the program. One of the requirements, as seen by the Vietnamese, was heavy artillery in the form of four 8-inch field artillery battalions. After this proposal was scrutinized by MACV, only portions of requests were approved. Three additional battalions of artillery — two 105-mm and one 155-mm — were added to the fiscal year 1970 activation schedule. By the end of 1969, the artillery improvement plan had undergone a number of revisions but delivery of field artillery weapons was being accomplished smoothly and ahead of schedule.

1969 Equipment Delivery Status

| Item | Phase I accelerated fiscal year 1969 | Phase II fiscal year 1970 | Approved Midway conf. fiscal year 1970 | MACV revised Nov. 1970 | Total shipped as of 31 Dec. 1969 |
|-------------------------|--------------------------------------|---------------------------|--|------------------------|----------------------------------|
| Howitzer, 105-mm M101A1 | 602 | 776 | 731 | 731 | 730 |
| Howitzer, 105-mm M102 | 60 | 61 | 0 | 60 | 60 |
| Howitzer, 155-mm M114A1 | 701 | 274 | 290 | 289 | 294 |

At the same time the master plan for Vietnamization was taking shape, the required training base to prepare the ARVN to assume a more appropriate share of the action immediately, as well as the entire combat role in the future, was receiving careful consideration from the appropriate American commands throughout the country. IFF Artillery, which had a substantial jump on the other headquarters in the establishment of a training assistance program for Vietnamese forces, reviewed its existing programs, found them to be valid and, on the basis of

additional studies, added two plans through which it intended to improve the capabilities of RF and PF units to call for and adjust artillery fire. In addition, basic fire planning was taught to the RF so they could support their own operations. Based on this program, a comprehensive defensive target list was developed throughout II Corps and, if a target fell within range of an artillery unit, fire was adjusted onto it. This program increased hamlet and village security. Before initiation of the plan, only 684 of the existing 4,208 defensive targets planned at various times during the war had been fired on. By August 1969, with the emphasis applied by IFF Artillery, each of the 52 districts in II Corps had a fire plan, 5,869 targets had been developed and 32 percent of the targets had been fired on. The effectiveness of the program was demonstrated during the week of 11 August 1969 when eight friendly hamlets drove off Viet Cong attacks by simply calling for previously fired-in defensive targets.

Coordinated Assistance

In III CTZ, IIFF Artillery was also examining the Vietnamization of artillery support. Until the summer of 1969, assistance to Vietnamese artillery had been limited to small contact teams concerned primarily with assisting the Vietnamese to solve maintenance and logistics problems by making American supply channels available for immediate, pressing needs. However, during the summer of 1969, through the efforts of the commanders of IIFF Artillery and III Corps Artillery, the need for a coordinated assistance program was examined. Such a program would complement the IIFF and III Corps Operation DONG TIEN (forward together). A combined working committee was formed to develop a plan for the program, define its concepts and establish policies and procedures for coordinating all mutual support projects. This would increase the capabilities and effectiveness of the combined artillery team in III Corps. The objectives of the program, as seen by the committee, were to improve coordination and mutual understanding between allied artillery units; to improve fire support effectiveness by combining planning and coordination of fire support, standardizing techniques and improving the quality of training; and, to increase artillery firing capabilities.

To accomplish the program objectives, the planning committee developed nine mutual support projects:

- Exchange visits of battery personnel.
- Combine fire support coordination centers.
- Develop procedures and coordination requirements for planning combined fire support.
- Standardize operational readiness evaluations.
- Combine unit refresher training program.
- Standardize tube calibration procedures.

- Standardize registration policy.
- Combine meteorological data.
- Combine survey control.

The proposed projects were translated into concrete programs and initiated in a low-key manner through the associate battery concept. Key personnel from both US and Vietnamese units visited their "sister" battery to gain a better understanding of each other's problems, observe battery operations and exchange views. This exchange of ideas led naturally to the establishment of the standardized operational readiness evaluations (OREs). A checklist was developed to measure the effectiveness of artillery units. The checklist was particularly effective because it matched performance against an established standard rather than against another unit, minimizing the possibility of embarrassment or loss of face — an important consideration with the Vietnamese. To prepare units for OREs, unit refresher training was initiated. Mobile training teams were created and dispatched to isolated areas to give instruction. Classes were kept small so that thorough instruction could be given to key personnel and specialists. On-the-job training was conducted whenever possible.

In order to standardize procedures and improve the accuracy of Vietnamese artillery fires, the committee developed a plan to insure that all weapons were calibrated annually. Second, a standardized registration policy was adopted throughout III Corps and emphasis placed on persuading Vietnamese units to accept American registration practices.

To refine artillery accuracy further, teams provided assistance to Vietnamese units to develop the capability to use meteorological data. All US met stations in III Corps began to conduct dual-language broadcasts four times daily. Finally, a combined effort was initiated to extend survey control to all artillery units in III Corps.

By May 1970, the DONG TIEN program was well underway and had scored a number of successes. More than 88 percent of the howitzers employed by Vietnamese artillery in III Corps were calibrated; survey was established at 67 of the 122 Vietnamese firing positions (an increase of 55 percent in six months); met data were employed by a majority of the Vietnamese units; and, a substantial number of ARVN artillery units were using American registration techniques.

With the refinement and improvement of Vietnamese fire support, the necessity to control these fires became apparent. Combined fire support coordination centers were created in various provinces throughout III Corps. These centers included Vietnamese, US and other allied forces' artillery representatives, US Air Force representatives and, where necessary, US Navy personnel. In addition to planning fire support and clearing fires, they provided a readily accessible means for the interchange of fire requests

between ARVN and US units. These agencies significantly increased mutual support and reduced reliance on US artillery.

In addition to DONG TIEN, three other significant programs were initiated. The CIDG Artillery School was opened at Trang Sup on 1 September 1969. It was created to train CIDG artillerymen to assume fire support responsibility for seven Special Forces camps. The school was staffed and operated by the 23d Artillery Group, which designed a compact but thorough 10-week course. The school conducted three sessions during which 186 CIDG artillerymen were trained and deployed to designated camps. With the irregulars assuming artillery duties at these outposts, Vietnamese Army artillerymen were relieved to return to their regular force structures. In September 1969, III Corps Artillery began training ARVN artillery batteries in air movement techniques and jungle operations. Training was completed in December 1969, and the first battery assumed direct support of the 3d Mobile Strike Force, a mission that had been the responsibility of the US Jungle Battery, a composite battery of three 105-mm and three 155-mm howitzers. This III Corps training program enabled six guns to be returned to force artillery assets. Finally, the Fire Direction Officer's School, conducted by FF Artillery for its own officers, was made available to Vietnamese personnel. This week-long course assisted in standardizing artillery procedures in III Corps by providing comprehensive instruction in the latest gunnery techniques used by US artillery. By May of 1970, 56 Vietnamese officers had been graduated from this school.

At the same time, considerations for Vietnamization were being examined in Military Region I. With the impending redeployment of the 3d Marine Division, the Vietnamese role would increase significantly. From November 1969 until 9 March 1970, the primary exchange of ideas and programs took place between XXIV Corps Artillery and Vietnamese 1st Division Artillery because, until its redeployment in March 1970, III Marine Amphibious Force was the principal American headquarters in the northern provinces. This interplay between the Americans and Vietnamese consisted of decentralized programs initiated at all levels through personal contact and coordination established by the US commanders.

In early 1970, XXIV Corps Artillery, in anticipation of the impending departure of the Marines, began to study the feasibility of a more intensive and centralized Vietnamization program. A XXIV Corps regulation was prepared by corps artillery to outline the minimum requirements for insuring effective coordination of US and Vietnamese fires. The regulation included provisions for establishing liaison between supporting artillery elements and territorial force headquarters down to subsector level. At the same time, work was initiated to revamp the artillery

and airstrike warning system since a dual system existed within the Vietnamese and US chains of command. As American withdrawals continued, inordinate difficulties might be experienced by both US and Vietnamese pilots unless the system were effectively Vietnamized. After careful study, the colocation of the respective warning agencies was adopted as the most practical solution — one that would allow for the most orderly eventual transfer of responsibility to the Vietnamese when US strength in Military Region I no longer justified the combined effort.

During March 1970, XXIV Corps Artillery initiated an artillery instructor training program in support of the Vietnamese artillery refresher training project. Representatives of all artillery battalions in the Vietnamese 1st Division and the Quan Da Special Zone underwent three weeks of instruction to prepare them to conduct training in their own organizations. Separate courses were presented in fire direction procedures, firing battery operations and maintenance. Upon completion of the instructor training phase, each battalion formed a mobile training team which was augmented by one US officer and one US noncommissioned officer. These teams then moved to the field to conduct refresher training at battery locations.

One month later a team of officers from XXIV Corps Artillery and I Corps Artillery (Vietnamese) conducted a survey to determine the proficiency of RF and PF personnel in artillery adjustment procedures and the desirability of conducting training in the subject. The team interviewed Vietnamese officials and US advisers in all five provinces. All agreed on the necessity for FO training and agreed to support a combined US and Vietnamese program to provide such training. Two programs were instituted, one for RF and one for PF. XXIV Corps directed that the 23d Infantry (Americal) Division incorporate the RF training into its RF and PF leadership and orientation course. The goal of the course was to train observers from sector headquarters, subsector headquarters, battalion headquarters, company group headquarters and company.

The first class started on 10 June 1970 and 889 RF officers were scheduled to undergo training.

Training for the PF was assigned to I Corps Artillery which designed a comprehensive three-day course stressing basic essentials and live firing. A total of 3,138 PF leaders was scheduled to learn adjustment procedures in an eight-week period beginning 15 June 1970.

Further, agencies responsible for existing programs that had been established to support American units were directed to shift their emphasis to Vietnamese artillery batteries. In February 1970, the corps artillery firing battery inspection team began providing technical assistance to Vietnamese units. Detailed technical checks of fire direction procedures, firing battery operations, maintenance and safety were made at each battery visited.

On-the-spot critiques were given during the inspections and formal reports were submitted to I Corps Artillery. Logistical support was limited primarily to technical assistance and emergency aid to insure that the Vietnamese supply system was exercised. Whenever emergency assistance was given in the form of supplies or repair parts, one of the contingencies under which it was granted was that the Vietnamese unit initiate parallel supply action in its logistics channels to insure that the demand was recorded.

Even as these programs were being initiated, MACV was finalizing the Republic of Vietnam Armed Forces Improvement and Modernization Plan for fiscal year 1971. An analysis of Vietnamese combat capability conducted as part of this plan revealed that a primary shortfall existed in artillery. The study projected weaknesses in firepower for the coming three fiscal years in the following areas:

| 1971 | 1972 | 1973 |
|----------------------|------------------|------------------|
| Medium artillery | Medium artillery | Medium artillery |
| Heavy artillery | Heavy artillery | |
| Long-range artillery | | |


In addition, the rapid expansion of Republic of Vietnam Armed Forces cut drastically into their experienced manpower pool and, in turn, diluted the leadership and technical base of newly created artillery units. To offset this problem, MACV emphasized the improvement of instruction at the Vietnamese Artillery School and approved its expansion. During 1970 the Artillery School enrolled 2,327 students, well above the 1,715 initially planned for the year. Instruction was improved and new programs were prepared. A copy of the program for the US artillery advance course was obtained from Fort Sill, edited to emphasize essential portions and provided to the director of instruction for updating the battalion commanders' course. Several new gun emplacements with concrete ammunition and personnel bunkers were built in the school demonstration area.

In June 1970 the most significant training improvement occurred when the school began to coordinate service practice, fire direction and gun crew training during live fire exercises. This arrangement saved ammunition and training time and released support troop gun crews to perform maintenance. Their training improved noticeably after the commandant directed that classes be inspected daily and written reports be submitted.

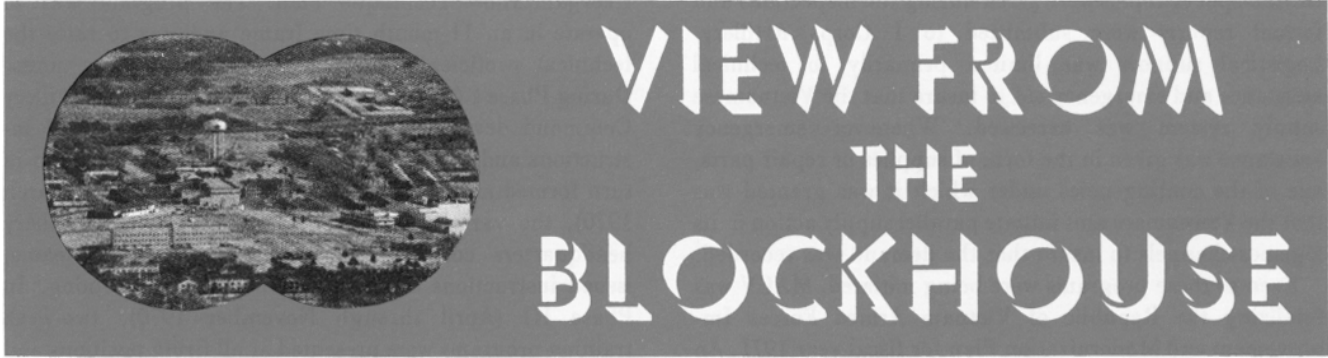
RVNAF Program

In consonance with the American Vietnamization plan, the Republic of Vietnam Armed Forces Artillery Command implemented a new training program entitled the Reorganization Technique Plan. The program was to operate in an 11-month time frame and was to raise the

technical proficiency of all Vietnamese artillery units. During Phase I (January and February 1970), the Artillery Command developed the concepts and disseminated instructions and lesson plans to the artillery units, which in turn formed mobile instruction teams. In Phase II (March 1970), the various division artillery and corps artillery headquarters consolidated the mobile training teams, issued instructions and conducted instructor training. In Phase III (April through November 1970), two-week training programs were presented at all firing positions and a proficiency test was administered. To insure the adequacy of the training, the corps or division artillery headquarters administered a unit test 30 days after the mobile training teams had completed the training and individual testing of all firing elements.

Once MACV had established the added emphasis necessary to create a strong training base, it examined the problems of the projected artillery shortfalls. It became apparent that the fragmented positioning of artillery, as practiced by South Vietnamese Army units to secure lines of communication and strategic centers of population, detracted from the artillery's support of offensive operations. Even with the activation of new artillery battalions, the ratio of artillery tubes to maneuver battalions did not increase significantly. Further, the requirement to man artillery platoons in static locations cut into the manpower pool of Vietnamese forces and created difficulties during new unit activations. To offset this weakness, MACV approved the addition of 176 two-gun fire support platoons to replace Vietnamese artillery in fixed sites. Each platoon was authorized 29 spaces to be provided from RF assets. By year's end, 100 of the 176 platoons were activated and, of these, 53 were deployed throughout Vietnam. Training of the territorial artillerymen varied among military regions. In Military Region I, contingency plans, which had been formulated by XXIV Corps Artillery to train these forces, were activated. In Military Region II, training was accomplished at the Artillery School and the Vietnamese division training centers. IIFF Artillery reoriented the CIDG Artillery School. In Military Region IV, the Vietnamese Corps Artillery established a training center for the RF artillerymen. With at least part of the light artillery problem solved, planners in Saigon attacked the Vietnamese long-range firepower weakness. After thorough investigation, Project ENHANCE was promulgated. This plan authorized the activation and deployment of five 175-mm gun battalions. Three of these battalions were scheduled for deployment in Military Region I. Two of these battalions were to be trained, equipped and deployed along the demilitarized zone in 1971 to replace withdrawing American units. The remaining two battalions were projected for Regions II and III. 

Notes from the School



Meteorological Observation Training Leaves Sill

Fort Sill's last Meteorological Observation Class has graduated from the US Army Field Artillery School (USAFAS).

The 17-week course will no longer be taught at any Army post, but the Army will continue to train meteorological observers in an interservice school at Chanute Air Force Base, IL. The school will train meteorological observers for the Army, Air Force and Navy.

Seven instructors and some of the equipment from Fort Sill were transferred to Chanute AFB. Meteorology will still be taught at Fort Sill through two other courses. The 14-week Meteorological Equipment Mechanic and Repairman Course prepares soldiers for maintenance of electrical and mechanical meteorological equipment used in field artillery ballistic meteorological sections. The eight-week Artillery Ballistic Meteorology Course trains soldiers in installing and operating equipment to supply meteorology data for field artillery units.

As a result of the course relocation, USAFAS will decrease its annual meteorology training load from 380 to 300 students.

FAOAC Qualification Program

The Field Artillery Officer Advance Course (FAOAC) Qualification Program for FAOAC 1-77 (beginning 9 January 1977) is underway. This is the third use of this program since it began with FAOAC 1-76 in April 1975. The purpose of the program — to insure that officers entering the Advance Course possess some knowledge of selected field artillery subjects — remains unchanged. The program requires that officers selected to attend the course be given a qualification examination after reporting to Fort Sill. The specific subjects to be tested are outlined in a welcome letter from the USAFAS Commandant. The letter and a specially

designed study packet are sent to each officer approximately five months prior to this reporting date. Surveys show the majority of officers spend about 55 hours on the study.

Students have responded favorably to the program and have, with few exceptions, met the entry requirements. Officers who come to the course from non-FA assignments or units above battalion level seem to benefit most. The entry level requirements are all subjects previously taught in the FA Officer Basic Course or Officer Candidate School and most officers quickly relearn them.

The advantage of the program is that the School can concentrate on the advanced training that students need rather than spend valuable time reteaching basic subjects. The result is more professionally oriented and competent officers.

This program conforms with TRADOC directives to reduce resident training time and increase training effectiveness, and TRADOC is studying the feasibility of implementing a similar program for all service schools.

FAOAC Contemporary Reading Program

With a shortened FA Officers Advance Course (FAOAC) geared toward training the student to perform in a modern battlefield environment, many non-artillery courses have been deleted. The elective program, for instance, has been eliminated from the program of instruction. However, to offer the student an opportunity to involve himself in more than strictly artillery instruction, the Contemporary Reading Program was introduced to FAOAC class 1-76 and will continue with FAOAC 2-76. The program is designed to promote and enhance individual study, to allow the student to develop a more broad-minded base and to challenge the student's thought and reasoning process. The program is offered on a volunteer basis.

The reading material consists of approximately a dozen current military books that focus upon ideas, attitudes and philosophy pertinent to the military environment. Books,

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such as *War Of Atonement*, *Armed Forces Officer* and *Taking Command*, are some examples. Students may work with up to three books and meet on their own time in reading discussion groups chaired by a senior service school graduate assigned to the school. Ensuing discussions stimulate good thought and provide participating students the opportunity to speak candidly with senior officers on topics related not only to the respective reading selections, but also on the army in general.

Participants from FAOAC 1-76, approximately 25 percent of the class, found the program both rewarding and stimulating in nature. Twenty-one percent of FAOAC 2-76 has volunteered for the program. This is another USAFAS training method which is easily exported to the field and should provide commanders with stimulating subjects for officers calls and other leadership training.

Leadership Symposium — A New Approach

How do you stimulate leadership instruction? Today's performance-oriented training calls for various innovative methods in which the soldier can fully participate. In May 1976, USAFAS introduced the Leadership Symposium to FA Officer Advance Course (FAOAC) students.

In the first FAOAC Leadership Symposium, 16 case studies were developed by members of the class. Eight panel discussion groups were formed, consisting of division artillery/group commanders, battalion commanders, leadership instructors from several military schools, prominent civilians and faculty advisors. Panel-student discussions centered around problems of the OER and promotion system, loyalty to subordinates versus obedience to seniors, situational ethics, career versus duty, fraternization, officer professionalism and integrity. Both panel members and students stated the experience was beneficial and indicated that the symposium was a positive method to discuss leadership problems.

Battalions or batteries could effectively use some of the teaching techniques by conducting periodic three- to five-hour symposiums or workshops, using a group moderator or panel.

The first step is to select several realistic unit problems and write short case studies, using fictitious names and units. For example, suppose you are the first sergeant of an 8-inch battery in Europe and your unit is scheduled to take the Defense Nuclear Technical Proficiency Inspection (TPI) in two days. You find Sergeant First Class Smartsagger, the assembly team chief, intoxicated in the warhead vehicle while on duty. You realize this is grounds for disqualification under the Human Reliability Program outlined in AR 50-5; however, there is a personnel shortage

and without Smartsagger, who is an experienced, knowledgeable soldier, the battery probably would receive an unsatisfactory rating on the TPI. What should you do? What are the issues? Discussion of this case study could lead into such topics as honesty, cover-up, first sergeant and battery commander relationships, problems with the TPI program, alcoholism in the Army or problems in giving senior NCOs Article 15s. All of these topics relate in some way to leadership.

Discussion groups of five to eight men could be organized by work section or rank structure. Each group should identify the problem, discuss the alternatives and render a group consensus. Another method could be to select three to five persons to form a panel; personnel selected could include a battalion or battery commander, command sergeant major, JAG or WAC representative, chaplain, soldier of the month, etc. In this situation, the case studies should be used only as a point of departure for discussing moral and ethical issues. No *one* panel member should dominate the discussion. A variation of this method is for members to integrate into the individual work group discussions, rotating from group to group. At the end of the instruction, the panel members summarize the discussions and answer questions.

The USAFAS Leadership Symposium provides the students the opportunity to freely exchange opinions, ideas, perceptions, feelings and values — a valuable learning experience which is exportable to the field.

Suppression Of Enemy Air Defense

The suppression of enemy air defense (SEAD) has become one of the most pressing tactical problems of our time. Threat forces employ a variety of highly mobile, sophisticated air defense systems capable of severely hampering our tactical air and Army aviation operations. The field artillery community has long recognized that, with our ability to deliver accurate, long-range, indirect fire, we should have a primary role in the suppression effort. Until recently, however, no doctrine existed to delineate responsibilities and assign tasks. In March 1976, recognizing that an integrated Army/Air Force effort would be required to locate and exploit the vulnerabilities of enemy surface air defenses, the commander of the Training and Doctrine Command (TRADOC) and the commander of Tactical Air Command (TAC) directed the formation of a SEAD Joint Task Force (JTF) to develop a procedures manual for the suppression of enemy air defense in combat operations. Working at Nellis Air Force Base, NV, the JTF produced a draft manual which has been presented to the TRADOC and TAC commanders. Pending minor revision,

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this manual should soon be available for TRADOC/TAC staffing.

Some of the major concepts set forth in this manual are: Working as a team, Army and Air Force elements prepare a plan for suppression. The plan may be for a concerted suppression campaign encompassing an extended area or a more limited effort in support of priority air missions. The overall commander will establish priorities, assign general missions and allocate the resources to support the SEAD campaign plan. The corps tactical operations center is the focal point for the coordination of SEAD by Army assets. Since corps normally retains only Lance missile units under its control, field artillery cannon units with the corps are tasked through the division. These units receive their guidance and are controlled during execution by the division artillery tactical operation center.

What does all this mean to individual field artillery units? Air defense targets may be engaged as part of normal offensive or defensive fires such as preparations, counter-preparations, groups of targets and series of targets; or, they may be engaged as a program in support of a coordinated air-ground operation. Some field artillery assets may be placed in an "on call" status to provide rapid response for the engagement of targets of opportunity.

When published, the manual will give specific details in the areas of detection, coordination, Army and Air Force procedures and command, control and communications. The manual will fill a great doctrinal void and is one which will be of extreme interest to the entire field artillery community.

New Look For BNCOC

The Field Artillery Basic NCO Course (BNCOC) will take on a new look beginning January 1977. In an effort to make the BNCOC available to more soldiers in the high density combat arms MOSs, TRADOC, in coordination with the major Army commands, is developing a BNCOC which will be exported to NCO academies worldwide.

The purpose of the new course is to train students to be technically and tactically proficient in their MOSs and to organize, supervise and train personnel at the section level. Priorities for course attendance are:

- E4s and E5s in E6 positions.
- E6s who have not previously attended a Noncommissioned Officer Education System (NCOES) course.
- E5s in E5 positions.

E4s and most E5s must have previously completed a primary NCO course (this requirement may be waived for some E5s).

The new BNCOC will be organized into three phases:

- Phase I will run approximately one week and will consist of train-to-train instruction and testing of student competency in critical MOS skills.
- Phase II, approximately two weeks, will be devoted to overcoming MOS skill deficiencies as indicated by the Phase I tests. As reinforcing instruction in train-to-train, students who achieve high scores on tests will become peer instructors for Phase II MOS instruction.
- Field application of the skills and knowledge acquired in Phases I and II will come during the week-long Phase III. The 13E fire support students will participate in the movement-to-contact portion of the REALTRAIN exercise with armor, infantry and engineer students. Simultaneously, the 13E fire direction and 13B students will be participating in reconnaissance, selection and occupation of position; direct fire and battery defense training; and, additional train-to-train instruction using the Sony Rover TV Trainer and the M31 Trainer. The students rejoin for the remainder of Phase III which consists of a mini-ARTEP and an FA system orientation, designed to acquaint all students with the various elements of the system.

The potential 13B and 13E students will be required to pass an entry test in order to attend BNCOC. This test will cover skills that should have been learned in AIT and subsequent on-the-job training. The test is to be administered and graded at unit level. The purpose is to identify skill and knowledge deficiencies of prospective students that must be overcome prior to attending the BNCOC. Maximum training benefits to the soldier and the unit can then be gained by BNCOC attendance.

Additional information can be obtained by writing: Commandant, USAFAS, ATTN: ATSF-CR-PM, Fort Sill, OK 73503; or calling: Office of Program Management, AUTOVON 639-3878/5714.

The USAFAS Evaluator

As a result of the Instructional Technology Symposium conducted in May 1975 at Fort Eustis, VA, the TRADOC schools have reorganized under School Model 76. In the generalized training process which TRADOC now follows — the Systems Approach to Training — evaluation plays a significant role; and, in the School Model 76, there is a completely new organization — the Directorate of Evaluation (DOE).

DOE evaluates instructional systems, reviews results of Skill Qualification Tests and Army Readiness Training and Evaluation Programs, makes field visits and reviews overseas commanders' reports. DOE is essentially a small organization (21 personnel) which exercises quality control through collection and analysis of training effectiveness

data and has an oversight responsibility to see that the field artillery training system is operating properly. Even though the directorate is small, it is on the same level as the other USAFAS directorates — the more independent the evaluator can be, the more useful and accurate his data will be, and an impartial evaluator is in a better position to verify that correct procedures are being followed. In the systems approach to field artillery training, emphasis is placed on whether the trainees are learning what was intended and whether what they have learned is of expected benefit to the receiving command. The evaluator determines the answers to these questions through internal and external evaluations. A negative answer would suggest revisions in instruction.

Internal evaluation is planned and conducted primarily to determine whether the instructional development goal has been reached. Data are collected not only to assess student progress but also, more importantly, to improve the quality of instruction. The evaluation process consists of systematically collecting pertinent training process data, student performance data and information from students, instructors and other informed personnel; evaluating this data; and, making recommendations. The internal evaluation is made to determine if the instruction provides the student with the necessary knowledge and skills. If it does, then an external evaluation is made. Internal evaluation is conducted before and during the actual instruction, but external evaluation is conducted after the students complete the instruction and are assigned to jobs.

An external evaluation is accomplished to determine whether personnel *can* do the job for which they were trained. If the answer is "no," DOE will collect data from graduates and their supervisors. Data are collected from graduates who have been on the job at least 30 days to determine how well the instruction prepared them for the jobs and to give them time to learn; also, it gives supervisors time to form a clear picture of how well the new graduates can perform. However, the evaluator should not wait more than three months to collect this data.

By careful analysis of internal and external evaluation data, the problems can be determined and appropriate revisions made in the instruction. The responses to questionnaires/surveys and field interviews by supervisors of the graduates play a significant role in helping to close the loop. DOE will be seeking the support of commanders and supervisors in the field to assist in collecting data by completing and returning questionnaires/surveys. Commanders will also be asked to encourage unit personnel to do likewise. Successful evaluation of training to insure that it is properly comprehensive is dependent on feedback from the field. This feedback will not only improve the training at USAFAS, but also will result in significant training assistance to commanders by improving training programs exported to units.

Cold Tube First Round Study

Field artillerymen have long recognized that the range achieved with the initial round fired from a cold tube is often quite different from the range achieved after the tube is "warmed." In combat, the inaccuracies in these initial rounds potentially degrade the effectiveness of field artillery, compromise surprise and afford the enemy an opportunity to seek cover.

The Field Artillery School has directed the US Army Field Artillery Board to study the muzzle velocity characteristics of initial rounds fired from various cannon weapons. The overall objective of the study is to determine the practicality of improving first round accuracy by applying correction factors to initial rounds based upon variables known at the weapon position at the time of firing such as ambient temperature, powder temperature and tube wear.

In March 1975, the FA Board began a data collection effort at Fort Sill which involves monitoring selected firings from a variety of weapons on a continuing basis. The weapons include the M102, M101A1, M109, M109A1, M110 and M110A1. For each weapon type, the muzzle velocities of the first 10 rounds of the day are being recorded with an M36 chronograph for different environmental conditions. The muzzle velocity data are being analyzed to determine those factors significantly affecting initial round muzzle velocity variation and to determine correction factors.

Analysis conducted on the firings to date indicates that an initial round cold tube effect did occur in many of the Fort Sill firings. Average tube effects observed are shown in figure 1. The average cold tube effects represent the average difference in muzzle velocities between the first and second rounds fired. No statistically significant difference

Figure 1 — Cold tube effects.

| Howitzer | Charge | Cold tube effect (m/sec) | Standard* deviation (m/sec) | Mid-range | |
|----------|--------|--------------------------|-----------------------------|------------------|-----------------|
| | | | | Range effect (m) | PE _R |
| M102 | 5 | +1.7 | 2.6 | +22 | 9 |
| M109 | 4G | +1.9 | 1.2 | +37 | 11 |
| | 5G | +1.3 | 1.7 | +19 | 11 |
| | 6W | +1.4 | 1.6 | +24 | 23 |
| M110 | 4 | +1.0 | 2.6 | +13 | 12 |
| M110A1 | 4 | +1.7 | 1.5 | +23 | 12 |
| | 5G | —0.9 | 2.3 | —16 | 14 |
| | 7 | —3.6 | 2.4 | —75 | 19 |

*Includes approximately 68 percent of the population observed.

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was observed between the muzzle velocities of subsequent rounds. Corresponding mid-range effects and mid-range probable error (PE_R) data from the firing tables are also provided. Comparison of the mid-range effect and the mid-range PE_R tends to underscore the operational significance of potential inaccuracies in initial rounds due to excessive muzzle velocity variations.

While the FA Board has collected a considerable amount of data, estimates of cold tube effects are unfortunately still rather imprecise due to the many variables. Further, the high degree of variability in the effects observed indicates that considerable refinement will be required before correction factors can be determined (as indicated by the relatively high standard deviations). It may take several years to develop a data base adequate to test cold tube effects for sensitivity to all variables which might be known at the weapon and to determine corresponding correction factors.

Units having operational field data which might be useful in furthering this study are encouraged to submit the data to: President, US Army Field Artillery Board, ATTN: ATZR-BDLS, Fort Sill, OK 73503.

Submissions should include as much of the following information as possible: type howitzer; equivalent service rounds prior to firing; tube condition (oily, clean, dry); projectile, fuze and charge fired; projectile weight (squares); last charge fired; date and approximate time of last firing; barometric pressure; ambient temperature; powder temperature; air density; and, muzzle velocity measured by the M35 chronograph.

Army-Wide Training Literature

USAFAS is updating its training literature program in response to recent doctrinal changes. Training literature encompasses a wide variety of formats including field manuals (FMs), training circulars (TCs), Army Training and Evaluation Programs (ARTEPs), soldier's manuals (SMs), DA forms and graphic training aids (GTAs). The tables which follow present completed projects and those slated for completion in fiscal year 1977. Anticipated publication dates are expressed by the quarter of the fiscal year (e.g. 771 is first quarter 1977). Actual distribution of the training literature occurs 60 to 90 days from date of print.

Table 1 lists those completed publications which currently should be ready for fielding. Publications will be fielded via pinpoint distribution. DA forms should be ordered using DA Form 17 from the AG Publications Center nearest your area:

Commander
US Army AG Publications Center
2800 Eastern Blvd.
Baltimore, MD 21220

Commander
US Army AG Publications Center
1655 Woodson Road
St. Louis, MO 63114

GTAs should be ordered using DA Form 3161 from the training aids service office (TASO) in your area. After initial distribution has been made, units reorder field manuals from Baltimore using DA Form 17.

Units should insure that pinpoint distribution accounts (DA Form 12-11A) are updated with the required number of copies for the various types of field manuals. Units should also be aware that in ordering manuals from Baltimore, or forms from St. Louis or Baltimore, there is a time lag of 60 days before the computer is programmed with the data. DA Form 17s returned with a "cannot identify" means that the publication has not yet been entered in the computer. Units should wait 30 days and resubmit their requests.

Soldier's Manuals

The initial distribution of SMs will be based upon computer outputs from MILPERCEN, Reserve Component Personnel and Administration Center and the National Guard Bureau. This automatic distribution to individuals, called the PUSH system, is contained in DA Circular 310-87, 22 Jun 76. Essentially, all TOE and TDA units containing artillery MOSs will be identified by the computer, and these units will be mailed the required copies of the applicable SM. This should insure that all artillerymen receive their manuals at the first print. However, if copies are not received, they can be ordered by units from the Publications Center at Baltimore using DA Form 17. Thereafter, individuals may order single copies of SMs from USAFAS by sending in a tear-out card which will be contained in each manual. Individual copies are to be ordered in cases where there is a job reclassification or where an individual needs a copy of a higher skill level publication; in other cases they should be ordered through the unit. USAFAS will be a limited storage and distribution point for individual requests until responsibility is transferred to Fort Eustis, VA, at a later date. As shown in Table 5, there are 10 sets of SMs, each containing three volumes for individual soldiers and one volume for the commander. For example, FM 6-13B will have a —1/2, a —3, a —4 and a —CM.

Rescinded Publications

Several publications have been rescinded and a number of others will be rescinded shortly: FM 6-40-2 (C), FM 6-78, FM 6-102, FM 6-160 and Army Subject Schedule 6-31. Publication of FM 6-40-5 will rescind TC 6-40-1; FM 6-50 will rescind TC 6-50-a; FM 6-20 will rescind TCs 6-20-1, 6-20-2 and 6-20-4. Action has been taken to rescind FM 6-70.

Future Developments

Update of the USAFAS training literature program will continue through fiscal year 1979. It is estimated that at the end of this period, USAFAS will have reduced its FMs from a total of 49 to 30. Equipment operating and maintenance procedures will no longer be in USAFAS FMs but will be in applicable Army Materiel Development and Readiness Command User's Manuals. This means that howitzer manuals will be phased out by the User's Manuals. Fielding of Skill Qualification Tests will begin during the latter part FY 79. They will replace the current MOS tests and will be based on SMs.

TABLE 1 — Current Training Literature

| Number | Title | Remarks |
|--------------|---|--|
| FM 6-40-5 | Field Artillery Cannon Gunnery | New |
| FM 6-50 | The Field Artillery Cannon Battery | New |
| TC 6-4-1 | The Threat | New, for FO, maneuver units |
| TC 6-4-2 | The Threat | New, for artillery commanders and staffs |
| TC 6-40-6 | Aerial Observer Team Operations | New |
| DA Form 4504 | Record Of Fire | New, replaces DA Form 3622 and DA Form 4007 |
| DA Form 4505 | 155-mm Nuclear Computation-MET Correction Technique | New |
| DA Form 4506 | FDC Template For Hasty Fire Plan, Field Artillery, Graduated In Mils And Meters, Scale 1:25,000 | New, for FDC hasty fire plan when FO requests fire using GTA 6-4-1 |
| DA Form 4513 | Record Of Missions Fired | New, replaces DA Form 4199 |
| GTA 6-1-1 | Firing Battery Supervisor's Reference Square | Revision, available in FY 771; replaces GTA 6-1-1, 1 Sep 74 |
| GTA 6-4-1 | Gridded Template | New, used to transmit FO hasty fire plan to FDC |

TABLE 2 — Field Manuals

| Number | Title | Scheduled Publication Date | Remarks |
|-------------------------|---|----------------------------|---|
| 6-2 | FA Survey | 774 | Revision replaces FM 6-2, 19 Jun 70 |
| 6-15 | Artillery Meteorology | 774 | Revision replaces FM 6-15, 25 Mar 70 |
| 6-20 | Fire Support For Combined Arms Operations | 771 | Revision replaces FM 6-20, 30 Aug 73 |
| 6-36 | FA Battery, Lance | 774 | Change, removes duties of crewmen, which will be in TM |
| 6-40 | FA Cannon Gunnery | 771 | Change, updates manual with information from FM 6-40-5 |
| 6-40-3 | Operation of the Gun Direction Computer M18, Cannon Gunnery Application | 772 | Change, adds sample problems to support Revision 5 of FADAC tapes |
| 6-40-4 | FA Lance Missile Gunnery | 774 | New publication, provides users with Lance system gunnery procedures |
| 6-56 | Pershing Organizations | 774 | Revision, replaces FM 6-39, 28 Jun 72, unclassified |
| 6-56-1 (S) | Pershing Organizations | 774 | Classified supplement to FM 6-56 |
| 6-121 | FA Target Acquisition | 774 | Revision, replaces FM 6-121, 1 Nov 67 |
| 6-122 | Artillery Sound Ranging And Flash Ranging | 774 | Change, updates manual to coincide with FM 6-121 |
| 6-140 | FA Organizations | 771 | Change, updates manual with impact of FMs 6-40-5 and 6-50 |
| 6-141-1 and 6-141-2 (C) | FA Target Analysis And Weapons Employment: Non-nuclear | 773 | Change, updates manual with FA scatterable mines and other developments |
| 6-161 | Radar Set AN/MPQ-4A | 774 | Change, removes material duplicated in TMs and in FM 6-121 |
| 6-162 | Radar Set AN/TPS-25 | 774 | Change, removes material duplicated in TMs and in FM 6-121 |
| 6-300 | Army Ephemeris 1977 | 771 | Revision, replaces FM 6-300, 29 Aug 75 |

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TABLE 3 — Training Circulars

| Number | Title | Anticipated Printing Date |
|---------|---|------------------------------|
| 6-1 | FA TACFIRE | 771 |
| 6-2-1 | Modern Battlefield Survey | 771 |
| 6-10-1 | FA Communicators On The Modern Battlefield | 771 |
| 6-20-9 | FA Cannon Battery Defense | 772 |
| 6-20-10 | The Fire Support Team (FIST) | 772 |
| 6-40-7 | FA Direct Fire Trainer | 774 |

TABLE 4 — Army Training and Evaluation Programs

| Number | Title | Scheduled Publication Date | Remarks |
|--------|---|----------------------------------|---|
| 6-307 | FA Target Acquisition Battery | 774 | New |
| 6-365 | FA 155 SP, Direct Support Units | 772 | Revision, replaces ARTEP 6-365, 17 Sep 75 |
| 6-595 | Lance Missile Units | 774 | New |
| 6-105 | FA 105 Howitzer, Towed, Infantry, Airmobile, Airborne Divisions And Separate Brigades | 771 | Change, updates ARTEP 6-105, 1 Jun 76 |

TABLE 5 — Soldier's Manuals

| Set | Soldier's Manuals and Commander's Manual Title | Scheduled Publication Date |
|-----------|--|----------------------------------|
| FM 6-13 B | FA Cannon Crewman | 773 |
| FM 6-13 E | Cannon Fire Direction Specialist | 773 |
| FM 6-13 F | Fire Support Specialist | 773 |
| FM 6-15 D | Lance Missile Crewman | 773 |
| FM 6-15 E | Pershing Missile Crewman | 773 |
| FM 6-15 J | Lance/Honest John Operations Fire Direction Specialist | 773 |
| FM 6-17 B | FA Radar Crewman | 773 |
| FM 6-17 C | FA Target Acquisition Specialist | 773 |
| FM 6-82 C | FA Surveyor | 773 |
| FM 6-93 F | FA Meteorological Crewman | 774 |

Commanders Update

LTC J. B. Lincoln
1st Battalion, 6th Field Artillery

LTC D. P. Tillar
1st Battalion, 12th Field Artillery

LTC N. B. Deatkine
1st Battalion, 16th Field Artillery

LTC L. E. Minnich
3d Battalion, 16th Field Artillery

LTC T. R. Stone
2d Battalion, 17th Field Artillery

LTC J. S. Manganaro
2d Battalion, 20th Field Artillery

LTC R. A. Bliss
1st Battalion, 21st Field Artillery

LTC D. B. Williams
1st Battalion, 29th Field Artillery

LTC G. L. Tennis
1st Battalion, 35th Field Artillery

LTC J. E. Graham
2d Battalion, 37th Field Artillery

LTC R. W. Boes
1st Battalion, 39th Field Artillery

LTC L. G. Cini
1st Battalion, 75th Field Artillery

LTC S. Delikat
1st Battalion, 78th Field Artillery

LTC W. Pannell
1st Battalion, 82d Field Artillery

LTC J. E. Whiteside
3d Battalion, 1st Training Brigade
Fort Jackson

LTC F. Trevino
5th Battalion, 3d Training Brigade
Fort Dix

LTC W. R. Bunting
14th Aviation Battalion

LTC Erven S. Tyler
Specialist Training Battalion
Fort Sill

LTC Dahl J. Cento
Staff and Faculty Battalion
Fort Sill

City Fighting Tactics

The Battle Of Aachen

by CPT Monte M. Parrish

Probable birthplace of the emperor Charlemagne, the ancient and imperial city of Aachen, Germany, had been regarded with reverence for centuries. At least 32 German kings and emperors had been crowned in its famous cathedral. To Germans of the World War II era, the city represented a heritage precious to national socialist ideology — a symbol of Nazi faith. From 26 August to 14 September 1944, Allied forces conducted a pursuit across Europe from the Seine River in France to the western border of Germany (figure 1). Along this border was the Siegfried Line, a system of interlocking pillboxes, minefields and antitank obstacles stretching from Holland to Switzerland. Located near the intersection of the Dutch, Belgian and German borders, Aachen lay between two bands of this defensive wall, guarding a broad plain that led eastward to Cologne and the Rhine River. In October 1944 the city was encircled by two divisions of the US First Army. Severe house-to-house fighting preceded Aachen's surrender on 21 October.

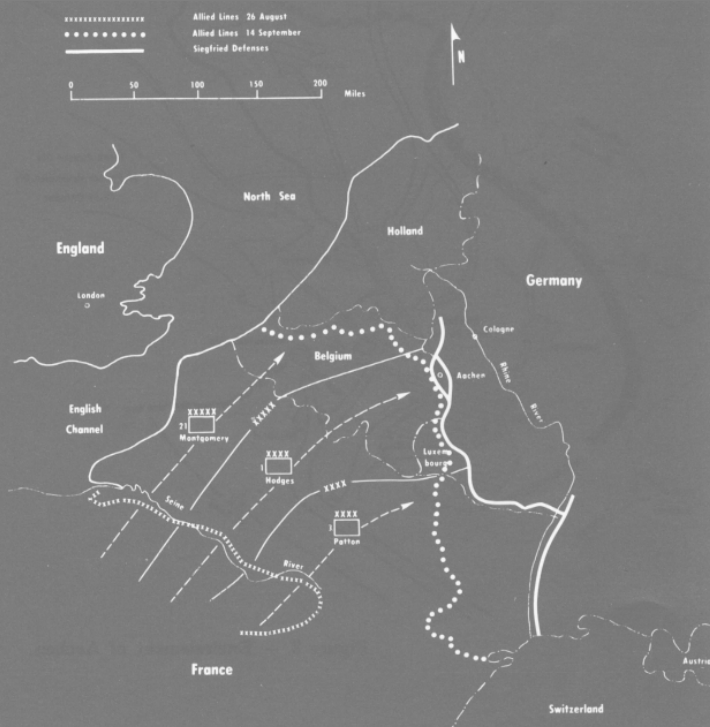
Encirclement and Reduction of Aachen

The Allied pursuit to the Siegfried Line set the stage for a lull in First Army offensive operations. Wide troop dispersion and logistical problems plagued most units. Commanders felt it necessary to reorganize and concentrate combat power at critical points along the Siegfried Line in preparation for an advance to the Rhine River. General Hodges, the First Army commander, felt that isolation of Aachen was a prerequisite for such an advance. The city's roads were not essential to support the advance, and its railroads had been demolished by air attacks. Aachen was, however, heavily fortified and guarded a natural approach to Cologne and

the Rhine River. The initial plan was to encircle and bypass the city, leaving behind enough troops to force eventual capitulation.

The scheme of maneuver called for a 30th Infantry Division attack in the north, a 1st Infantry Division attack in the south and a linkup of the two divisions in the vicinity of Wuerselen (figure 2). The 1st Infantry Division pushed into Germany southwest of Aachen 12 September. In spite of the offensive lull, limited objective attacks were conducted. North of Aachen, the 30th Infantry Division reached the German border on 18 September but would not attack for two weeks. On 2

Figure 1 — Allied advance to the Siegfried Line.



October the 30th Infantry launched a massive attack east across the Wurm River in the vicinity of Rimburg. Turning south, attacking elements reached Uebach on 4 October and the high ground southeast of Alsdorf on 7 October. The following day heavy resistance was encountered north of Wuerselen. Bad weather resulted in critical shortages of ammunition, fuel and food for both American divisions. Since the weather also grounded Allied aircraft, the Germans were able to bring in food, munitions and reinforcements. By 7 October the 1st Infantry had progressed northward past Eilendorf. Elements of the division attacked on 8 October, taking Verlautenheide, Crucifix Hill (Hill 239) and Ravels Hill (Hill 231) by 9 October. On 10 October the Aachen suburb of Haaren was taken, cutting one of the two remaining supply routes. Less than two miles separated the two forces, but a counterattack by the 116th Panzer Division and the 3d Panzer Grenadier Division delayed the closing of the gap until 1615 on 16 October. Poor weather, logistical problems and a fierce German counterattack made the

isolation of Aachen extremely difficult and costly.

The bypass plan was now considered impractical. The Allied offensive lull had allowed the Germans to reinforce the Siegfried defenses, and encirclement proved to be more difficult than expected. American lines were dangerously overextended, and mere containment of the city required the equivalent of a division of troops. Additionally, indications were that German propaganda was attempting to make Aachen a national rallying point. The First Army commander decided to reduce the city immediately, and the mission was given to the 1st Infantry (figure 3).

The city was defended by the German 246th Division, commanded by COL Gerhardt Wilck. The enemy force consisted of roughly 5,000 men, five tanks, nineteen 105-mm howitzers, eight 75-mm pieces and six 150-mm guns. On 10 October a First Army courier delivered an ultimatum to the German commander. Public address systems blared the message to German soldiers and civilians. They would have 24 hours to surrender, or American artillery and airstrikes would bomb them into submission. Colonel Wilck chose not to reply. The ultimatum expired at 1200 on 11 October, and a massive air and artillery bombardment followed.

Forces for the reduction were limited. Because most of its units were disposed on the elongated front east of the city, the 1st Infantry had only two infantry battalions, the 2d and 3d Battalions of the 26th Infantry Regiment, available for the operation. Since the encirclement northeast of Aachen was incomplete, the 26th Infantry commander was ordered not to get inextricably engaged in the city. The two battalions had to assume such a wide attack frontage that all companies were committed. Any reserve would have to come from the division reserve battalion, and the incomplete encirclement had priority.

Planning for the coordinated attack of the fortified city began as early as 2 October. A methodical reduction was envisioned in which every building would be cleared. Attackers were warned to overlook nothing — every building was to be considered an enemy stronghold until proven otherwise. Attached to each rifle company were three tanks or tank destroyers, two 57-mm antitank guns, one flamethrower and two additional bazooka teams. Companies were assigned zones of action with one platoon-sized assault team normally assigned to a street. Each team had one tank or tank destroyer and one heavy machinegun. Checkpoints and contact points were designated at prominent buildings and street intersections. No advances were to be made beyond these points without proper coordination with adjacent units. Light artillery and mortars were to be employed in close support to isolate the area under immediate attack. Targets were preplanned on suspect

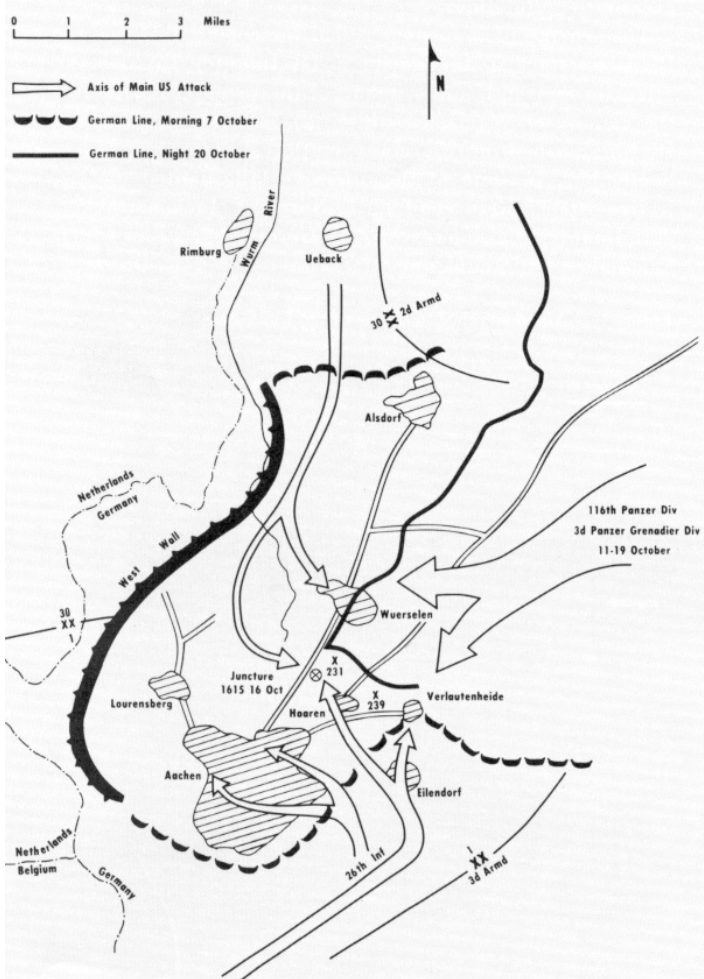


Figure 2 — Encirclement of Aachen.

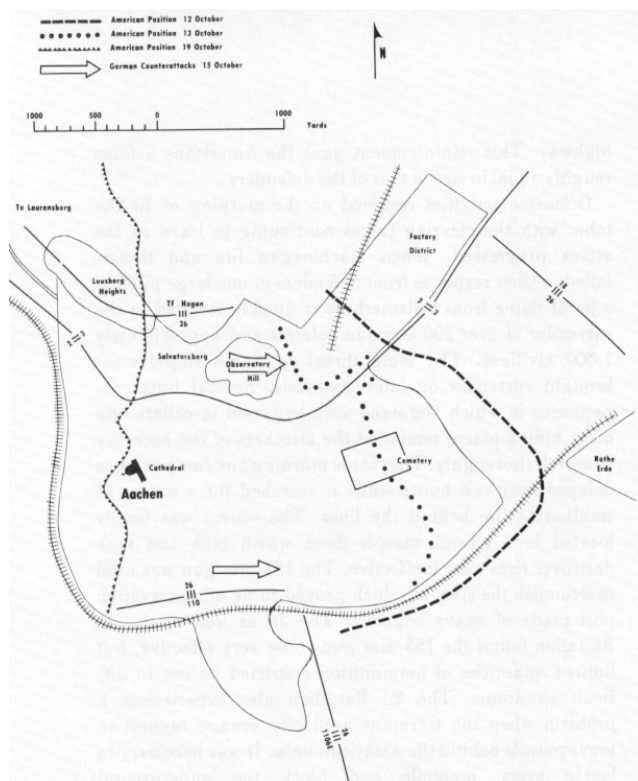


Figure 3 — Reduction of Aachen.

enemy locations and prominent terrain features. A total of 26 artillery battalions participated. Approximately 15,000 of the city's prewar population of 165,000 remained. Anticipating that civilians would be a problem, the planners established procedures for evacuating all persons including captured German soldiers, male civilians, women and children. It would be a slow, tedious process, but a potential behind-the-lines enemy threat would be minimized. Centralized battalion ammunition dumps were to be moved behind the advancing attackers to facilitate large expenditures of ammunition.

Allied efforts to gather intelligence proved rewarding. Maps of the city were procured and distributed to the attacking battalions as early as 6 October. Regular patrolling proved valuable in the formulation of attack objectives. Patrols penetrated deep into the city as early as 4 October, establishing that enemy strongpoints existed at Observatory Hill, Salvatorsberg and Lousberg Heights. Antitank positions, observation posts, machinegun positions and minefields were located in the southern portion of the city. Prisoners taken by patrols reported that enemy morale was low but that reinforcements flowed steadily through the gap northeast of Aachen.

During the Allied air and artillery bombardment on 12 October, the 3d Battalion took the high ground northeast of Rothe-Erde and established a foothold in the factory

district northeast of the city proper. Most of this objective had been cleared by the evening of 12 October. On the morning of 13 October, two companies of the 2d Battalion conducted simultaneous assaults over a steep railroad embankment and established a foothold in the southeastern part of the city. The battalion was able to get its attached platoons of tanks, tank destroyers and antitank guns across the low, exposed swampy ground and over the embankment before the Germans could react with their tanks. The 1106th Engineer Combat Group conducted feints toward the southern outskirts of the city. Achievement of surprise was crucial to the successful establishment of the foothold. The German commander later stated that he expected the main attack to come from the south. By the time he realized it had come from the east, it was too late to reposition his forces. The 2d Battalion attack continued without pause after the foothold was established. By the evening of 13 October, the 2d Battalion was well into its first objective, the cemetery, and the 3d Battalion had reached the base of its first objective, Observatory Hill.

During the first day of city fighting, the infantry quickly learned that the street was the worst place to be. Fields of fire were restricted to streets and alleys, but the heavy masonry and stone buildings provided good cover and concealment. Avoiding the withering fire of the streets, they blasted holes in walls in order to move from house to house. Large quantities of explosives were required to support this activity. Exposure of tanks and antitank weapons also posed a problem; these weapons adopted a technique of using cleared side streets, nosing around corners for short periods to support the advancing infantry and moving rapidly to newly cleared wide streets. When elements of the 3d Battalion discovered that some apartment houses and air raid shelters were relatively unaffected by tank and antitank gun fire, they brought forward a self-propelled 155-mm gun. When one round practically leveled one of the buildings, the regimental commander sent one of the guns to support the 2d Battalion as well. Rubble and damaged buildings were obstacles to movement and had to be cleared. Engineers worked constantly removing obstacles, mines and boobytraps. Glass and other litter punctured tires and forced medics to use tracked cargo carriers to evacuate wounded.

On 14 October the attack resumed with artillery supporting from positions south of Aachen. The clearing forces found that the positioning of this supporting artillery was important. With the guns located to their left and the gun-target line parallel to their front, they could drop shells into the same block in which they were working without danger from short rounds. Delay fuzes allowed shells to penetrate

one or more floors before exploding. The Germans exited the strongholds rapidly under this fire, subjecting themselves to well-aimed small-arms and automatic weapons fire as they fled. Failure of the two clearing battalions to establish contact on the ground caused a delay that was not rectified until the following morning. Arriving at a predesignated point of contact with the 3d Battalion, elements of the 2d Battalion were unable to proceed because the defenders were trying to get around their right flank. Half of a company was required to prevent this penetration. During the night the 3d Battalion commander found that elements of his southernmost company had been waiting patiently several hundred meters north of the designated juncture point.

On the afternoon of 15 October, a counterattack was launched against the southernmost company of the 2d Battalion. The attack penetrated approximately two blocks, but after two hours of fighting, the attack was stopped and the line restored. During the period 14-15 October, the Germans used the gap northeast of the city to reinforce with a convoy of eight assault guns and one infantry battalion. Late in the afternoon of 15 October, the German garrison employed these troops in a battalion-sized counterattack against two companies of the 3d Battalion. Supported by mortar fire and tanks, the Germans pushed the Americans back from Observatory Hill. Close hand-to-hand fighting ensued, but by 1700 the 3d Battalion commander reported that his battalion had stopped the German effort and could resume the advance on Observatory Hill. Preplanned artillery fires were instrumental in repelling these counterattacks.

The commitment of the two German panzer divisions against the encircling forces east of the city, however, temporarily halted the clearing effort. Both battalions were ordered to cease offensive operations and to be prepared to defend to their rear. Both were given on-order missions to reinforce the units east of the city. The German attack was stopped and the gap successfully closed late on 16 October, but the offensive operations within the city were delayed until 18 October. During this time, the extended left and right flanks of the 26th Infantry were reinforced. On 17 October the 1106th Engineers, who had been blocking the southern approaches to the city, moved a battalion northward to make contact with the 2d Battalion. Additionally, a battalion of the 110th Infantry, 28th Infantry Division, was attached to the 1st Infantry and employed in a flank security role between the engineers and the 2d Battalion, 26th Infantry. In the north Task Force (TF) Hogan joined the attack along the right flank of the 3d Battalion, 26th Infantry. Composed of two battalions of mixed armor and mechanized infantry from the 3d Armored Division, TF Hogan was given the mission of assisting in the capture of Lousberg Heights and cutting the Aachen-Laurensberg highway. This reinforcement gave the

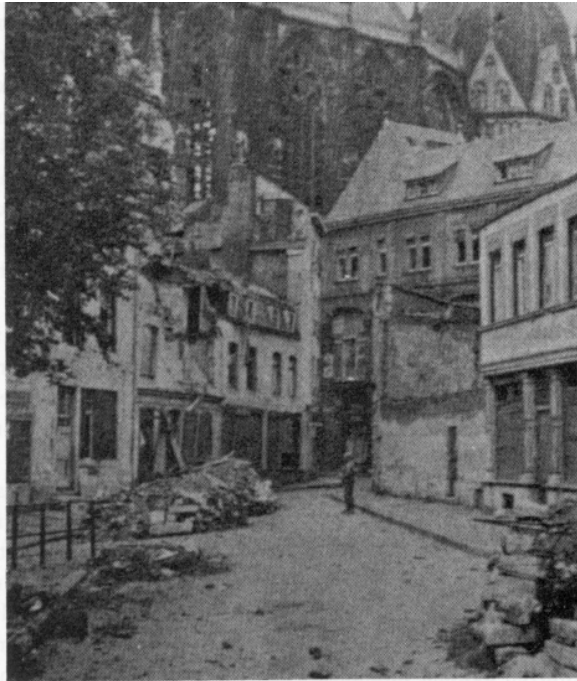
Americans a force roughly equal in size to that of the defenders.

Offensive activities resumed on the morning of 18 October with the clearing forces continuing to learn as the attack progressed. When machinegun fire and threats failed to elicit response from defenders in one large pillbox, a jet of flame from a flamethrower quickly resulted in the surrender of over 200 German soldiers and approximately 1,000 civilians. The mere threat of flame employment brought surrender on later occasions. Several bitter experiences in which Germans were bypassed in cellars and other hiding places reminded the attackers of the necessity to search thoroughly. That same morning one company was delayed over two hours while it searched for a source of small-arms fire behind the lines. The source was finally located in a church steeple upon which tank and tank destroyer fires were ineffective. The 155-mm gun was used to demolish the steeple, which proved to be an observation post made of heavy concrete. The 2d as well as the 3d Battalion found the 155-mm gun to be very effective, but limited quantities of ammunition restricted its use to difficult situations. The 2d Battalion also experienced a problem when the Germans used city sewage tunnels to move patrols behind the American lines. It was necessary to locate every manhole and block the underground passageways to prevent this infiltration.

In the north the 3d Battalion reduced the remaining resistance on Observatory Hill, capturing the Hotel Quellendorf, a large food and ammunition cache and a 20-mm antiaircraft gun. On 19 October the battalion siezed the Salvatorsberg objective against token resistance. At the same time TF Hogan was beginning to overrun the poorly defended Lousberg Heights. In the south the 2d Battalion had advanced past the cathedral.

Despite American gains, the Aachen commander was ordered to "hold the city to the last man and, if necessary, allow himself to be buried under its ruins." On 19 October, however, the higher German commanders pulled the counterattacking divisions out of the encirclement area and abandoned the defenders to their fate. Colonel Wilck issued an order demanding a fight to the last man and the last bullet, but the order did little to delay the end of the rapidly crumbling resistance. American units seized the main railroad station and subdued a final strongpoint near the Technical University in the northwestern corner of Aachen; on 20 October they reached the railroad tracks in the western portion of the city.

On the morning of 21 October, members of the 3d Battalion brought their 155-mm gun forward to attack a large air raid bunker. The bunker proved to be the headquarters of the German defense, and the German commander was eager to surrender before the gun was employed. Resistance ended at 1205 on 21 October. A total



Aachen Munster, popularly known as the Charlemagne Cathedral.

of 11,637 German prisoners were taken, 3,473 within the city. American casualties numbered approximately 6,000; 498 of these were incurred by the two battalions of the 26th Infantry. Of the 498, 75 were killed and nine were missing.

Analysis and Criticism

The Decision To Encircle. The decision to isolate the city at the outset gave the First Army a great deal of flexibility. Once this operation was complete, the attackers could bypass or reduce the city at their option. If encirclement had been accomplished with a minimum of effort, the fortified city might well have been bypassed and the drive to the Rhine River started. When heavy resistance to the encircling elements forced abandonment of the bypass plan, the restriction of German reinforcement capability still gave the attackers the advantage. Encirclement also gave the attackers the ability to accomplish tactical surprise in gaining a foothold for the reduction. The defenders expected an attack from the south and could not reposition for the attack from the east. In spite of the fact that encirclement was incomplete when the reduction began, the attackers could have entered the city from almost any direction.

The Decision To Reduce. The decision to reduce rather than bypass the city may appear controversial when the possibility of surrender without the tedious street fighting is considered. The Allies could not use the damaged

railroads, and highway supply routes could be established elsewhere. The crucial factors, however, were that weather, logistical problems and strong German resistance made encirclement much more difficult than expected and that large numbers of troops were required to maintain the resulting extended frontage. An entire division was simply too great an asset to tie down in a seige-type operation. In view of the order from the German high command to defend Aachen to the last man, the possibility of surrender without a fight was even more remote. A long, unsuccessful attempt to gain this surrender using passive measures might indeed have given the propaganda-makers fuel for establishment of a national rallying point. Although the reduction was costly in terms of time and resources, it was the best course of action under the circumstances.

Timing Of The Reduction. The reduction of Aachen began on the morning of 13 October, three days before the encirclement of the city was completed. Although the gap was small, the Germans were able to reinforce the defenders with a battalion of infantry and supporting artillery as late as 15 October. When commitment of two German panzer divisions threatened the overextended lines of the encirclement, it became necessary to give the 26th Infantry a be-prepared mission to defend, an on-order mission to reinforce and an order to cease offensive operations for almost 48 hours. The German attack which caused the delay in closing the gap admittedly could not have been foreseen. In hindsight, however, the physical and psychological advantage gained by reducing after the gap was closed would have been significant. The defenders might have surrendered more quickly, and the attackers would have had fewer delays and German reinforcements to contend with. After a reorganization and consolidation on encirclement objectives, the 1st Infantry would probably have been able to give the 26th a reserve within the city.

Failure To Use A Reserve. Although the 1st Infantry had a reserve battalion, the criticality of the situation northeast of the city precluded its use by the 26th. Companies were assigned such wide zones of action that there simply were no troops left for a reserve force within the city. Situations continually arose in which the employment of the reserve would have prevented delays in the reduction. When hidden defenders appeared behind friendly lines, the reserve elements could have dealt with the threat. When contact between the two battalions was lost, the reserve could have restored it. Reserves might also have been committed to assist in stopping counterattack penetrations. It is conceivable that, had reserves been available for flank security, at least part of the reinforcement of the reduction would not have been necessary.

Organization For Combat. Attacking elements of the 26th Infantry were tailored for the situation. Platoon-sized assault teams cleared their assigned streets effectively.

Attachment of tanks and antitank weapons as low as company and platoon level proved to be essential. Flamethrower and bazooka teams were also effective. Problems encountered with rubble in the streets could have been solved by attaching engineer elements at company or platoon level, but the overall organization for combat must be considered an asset.

Clearing Techniques. The units conducting the reduction of Aachen were able to foresee and plan for most of the city fighting problems; other solutions became apparent as the attack progressed. The attacking units realized in the beginning that, because the city was large and heavily fortified, a methodical, house-to-house reduction was appropriate. As a result of the emphasis placed on thorough clearing, there were few instances of enemy resistance behind lines. German use of sewage tunnels was apparently unexpected, but the problem was quickly solved by locating and blocking the tunnels. The attackers foresaw the requirement for increased firepower and large expenditures of ammunition. Accordingly, firepower at company and

Colonel Wilck and his headquarters group following their surrender.



platoon level was supplemented, and consolidated


ammunition dumps were moved forward as the attackers moved. Control problems were anticipated, and checkpoints and contact points were established at easily identifiable locations. Wide zones of action were undesirable but unavoidable because of commitments northeast of the city. The attackers quickly learned that both men and tanks should avoid the streets whenever possible. The use of effective clearing techniques gave the Americans a definite advantage.

Fire Support. Liberal use of fire support gave the attackers a great advantage. The massive air and artillery bombardment preceding the attack significantly reduced both the German ability and desire to resist. Close support batteries were positioned so that short rounds were not a threat. Fires were employed so close to friendly troops that coordination of artillery with small-arms and automatic weapons fire was possible. Delay fuzes allowed rounds to penetrate buildings before exploding. Self-propelled artillery was used in the direct fire role with much success. In spite of an ammunition shortage, 155-mm guns were employed against pillboxes which were unaffected by tank and antitank weapon fire.

Intelligence. The intelligence-gathering effort was begun early and exploited fully. Weapons locations, fortified positions, observation posts, obstacles and strongpoints were located, and the information was incorporated into the scheme of maneuver. The existence of enemy strongpoints at Observatory Hill, Salvatorsberg and Lousberg Heights would have been unknown in the absence of intelligence from patrols. Maps of the city were distributed early, thus giving the attackers the advantage of knowing the location of key buildings and streets.

Effects and Implications

The US First Army's tactics and techniques in the elimination of Aachen as an obstacle to the advance across western Europe must be considered appropriate and successful. The attackers encircled the city, giving themselves the option of reducing or bypassing. When stubborn German resistance made the bypass alternative untenable, the Americans achieved tactical surprise in the conduct of an efficient reduction. Organization for combat was appropriate, and effective clearing techniques were employed. Fire support was applied liberally, and intelligence efforts minimized the German advantages. Weak points in the tactical plan were in the timing of the reduction and the failure to employ a reserve properly.

City fighting has historically been costly and time-consuming. The American approach to the capture of Aachen kept these undesirable characteristics to a minimum. 

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HEAVY ARTILLERY

by CPT John C. Abshier

Since the dawn of history, man has attempted to harness mechanical power to extend the ability of his muscles to throw missiles at his adversaries. The use of ingenious machines against the walls of Jerusalem in the eighth century BC is recorded in the Scriptures. Later, more sophisticated devices, such as catapults, ballistas and trebuchet, became a common part of siege trains in Europe and the Mediterranean area. With these crude weapons, the basic principles of artillery were laid down. The function of artillery to extend man's standoff distance and throw-weight capability was only slowly assumed by cannons. During the Hundred Years War (1339-1453), the cannon came into general use for siege; however, being cumbersome and inefficient, it played little part in mobile battles. By the mid-1440s, siege cannon had grown into formidable bombardiers. One Turkish cast-bronze cannon at the siege of Constantinople in 1453 weighed 19 tons and hurled a 600-pound stone ("Sultan Mehmet the Conqueror," May-June 1974 *Journal*). However, the 60 oxen and 200 men required to move this monster greatly reduced its usefulness in mobile warfare.

In the seventeenth century, the Swedish warrior Gustavus Adolphus saw the need for mobile cannon to accompany his troops and divorced anything heavier than a 12-pounder from his field artillery. He learned the value of fire concentration and frequently massed cannon into batteries for smashing hostile infantry formations, while his cavalry neutralized the ponderous, immobile enemy guns with a whirlwind charge. The great French artilleryman, Jean Baptiste de Gribeauval, revolutionized his country's artillery, beginning in 1765, by creating distinct materiel for field, siege, garrison and coast artillery. During the twentieth century, artillery assumed its role as King of Battle.

It is apparent in this thumbnail evolution of cannon that the desired characteristics of artillery in some areas are diametrically opposed. The tactician has insisted on greater and greater payload to be delivered to greater and greater ranges. On the other side of the coin, he has simultaneously insisted on greater mobility, faster rate-of-fire and better reliability. While each characteristic is of significance to



the tactical commander, tradeoffs have always been required. The tradeoffs made in mobility, survivability, accuracy, range, rate-of-fire and shell weight have resulted in the development of three classes of artillery — light, medium and heavy. Periodically people have questioned the need for these classes. Wouldn't it be better to eliminate one class to simplify ammunition supply, parts supply, crew training, fire planning and so on?

Light artillery maintains its niche as the supporting system for light airborne/airmobile forces. The small projectile is compensated by its mobility, light weight and high rate-of-fire.

Heavy Artillery Attacked

Recently, heavy artillery has come under attack by proponents of medium artillery. They argue that recent improvements in medium artillery cannons and ammunition and the nature of the nuclear battlefield have made the 8-inch unnecessary — and that the 8-inch battalions would be more effectively utilized if converted to additional medium units. Since advanced systems and technology involve conjecture, this article primarily will address current and near-term developments. Particular weapon systems to be evaluated are the M109A1, 155-mm SP howitzer, the XM198, 155-mm towed howitzer and the M110A1, 8-inch SP howitzer.

Mobility

Mobility of heavy artillery has come a long way since Mehmet's 60 oxen and 200 men of 1453. Mobility must be sufficient to support the ground-gaining arms. The Army Materiel Command (AMC) mobility model (giving equal weight to the speed achieved by a vehicle and the percentage of area which can be traversed cross-country at those speeds) is used to predict mobility in a typical European terrain. A comparison of the mobility of artillery weapons systems with that of the M60A1 Main Battle Tank is shown in Table 1. This data is based on the European analysis, general terrain data and wet season, with all vehicles loaded to rated combat load. For other types of terrain and during some climatic conditions, these values will change. Mobility is judged a draw with each of the SP cannons having better off-road mobility and the XM198 capable of being displaced quickly by air.

Table 1 — Mobility Comparison

| | |
|--|------|
| M60A1 | 1.00 |
| M110A1 | 0.87 |
| M109A1 | 0.82 |
| XM198 towed by M548 (tracked vehicle) | 0.53 |
| XM198 towed by XM813 (5-ton, 6×6 truck) | 0.65 |
| M101A1 towed by M35A1 (2-1/2-ton, 6×6 truck) | 0.46 |

Survivability

Any weapon, no matter how poor, is better than one that is out of action. Survivability is dependent upon many factors. It can be conceded that the M109A1 is the most survivable due to its armor protection for crew and onboard ammunition. The XM198 and the M110A1 appear to be equal in survivability. The XM198 will be road-bound more often than the M110A1 and, therefore, more vulnerable during displacements. The firing stations for the crew of the M110A1 are high above the ground and receive less protection from parapets. The extremely poor reliability, availability, maintainability (RAM) showing of the M110/M107 has biased many artillerymen against those systems, although this is a fault of the prime mover, not of the weapon. In any event, 18 product improvements on the M110A1 have resulted in increases in mean miles and mean rounds between failure thus improving the RAM characteristics of the systems.

Cost

In the last few years, the Army has been forced to live with inflation in its budget. This, coupled with rapidly rising personnel and operational costs, has resulted in significantly less money being available for weapons systems. However, the differential in weapon cost is not a significant factor. The XM198 cost is \$108,907 plus a proportional cost of the prime mover. The cost to build a new M109A1 or M110A1 is about \$200,000.

A popular field artillery mission statement is to "put steel on the target." Several primary effectiveness factors in accomplishing this mission stand out: accuracy, range, projectile weight, rate of fire, reaction time, projectile effectiveness and number of cannons that normally fire as a unit, i.e., battery and/or battalion.

Accuracy

All other factors listed that affect a cannon's effectiveness are for naught if it doesn't hit the target. The question of "accuracy" is a confusing one filled with misconceptions and comparisons of apples to oranges. However, if errors are expressed as a percentage of range, current field artillery cannons have similar precision and mean-point-of-impact (MET + VE) probable errors. If weapons are ranked according to accuracy, the ranking will change as the range at which they are compared is changed.

Range

Range requirements are increasing. Improvements in target acquisition are rapidly extending our area of knowledge farther beyond the FEBA. It is desirable to engage these targets at maximum range before they can influence the battle. Another requirement for increased range is to maintain the capability for lateral massing of fires since the nuclear battlefield will require an increased

Table 3 — Comparison of Rates of Fire and Pounds of Munitions Delivered by One Battery

| Weapon | Battery One Volley | Number of Rounds/Weight of Rounds | |
|---------------------|-----------------------|-----------------------------------|----------------------------------|
| | | Max Rate of Fire (3 Minutes) | Max Rate of Fire (10 Minutes) |
| XM198 | 6/570 | 72/6840 | 114/10,830 |
| M109A1 | 6/570 | 72/6840 | 114/10,830 |
| M110A1 (4-gun btry) | 4/182 | 18/3654 | 32/6496 |
| M110A1 (6-gun btry) | 6/1218 | 27/5481 | 48/9744 |

dispersion of forces. Table 2 summarizes range characteristics. Generally, the extended-range projectiles are characterized by increased cost and decreased lethality in comparison to conventional rounds.

Table 2 — Range Characteristics

| Weapon | Conventional Ammunition | Extended-Range Ammunition |
|--------|-------------------------|---------------------------|
| M109A1 | 18.1 km | 24.5 km |
| XM198 | 24.0 km | 30.0 km |
| M110A1 | 21.0 km | * |

* Range is classified.

Effect

Assuming we have the range and accuracy to hit the target, what will be the effect? The French biologist, Rene Quinton, then an artillery commander, wrote: "Fire that kills needs the element of surprise." In analyzing the effectiveness of fire, troops standing for the first volley are assumed prone for all succeeding volleys. FM 6-141-1, *Nonnuclear Employment of Field Artillery Weapons Systems*, says that surprise fire is approximately twice as effective as fire against warned personnel when employing HE ammunition. The final draft for the new FM 6-141-1 says that surprise fire is approximately 10 times more effective when using improved conventional munitions (ICM). However, some targets have limited mobility and freedom for counteractions. For these targets, sustained fire is a more valid measurement of effectiveness than one battery volley. Table 3 summarizes the amount of steel placed on target for one battery. In analyzing Table 3 it should be remembered that ICM rounds are increasingly becoming the standard artillery shell. The payload ratio (weight of submunitions to total projectile weight) is greater for the 8-inch than the 155-mm. For example, two 155-mm shells have 176 M42 grenades while one 8-inch shell has 195 M42 grenades.


Many FDOs have received the following message from an FO: "Of course I want fire now. If I had wanted it later, I would have asked for it later." The thousands of pounds of munitions that a battery can deliver are wasted if the target

is gone. Attacks on tanks by laser guided munitions require rapid response to prevent the FO from losing line of sight to the tanks. Unsuppressed enemy direct fire weapons will exact a heavy toll of friendly forces. To achieve responsive fire we assign battalions in direct support and dedicate firing batteries. The M109A1 is the best cannon for direct support/dedication of heavy forces. It has the shortest emplacement time of the weapons evaluated in this article. Its 6400-mil traverse allows it to quickly shift fires across a broad front. The armor protection of the M109A1 enables continuous fire even when receiving counterbattery fire. Its on-board ammunition increases responsiveness during displacements.

With urbanization of much of the world, fighting in built-up areas will become increasingly common. The 8-inch is the best weapon to attack concrete structures and fortifications. The 8-inch round will remove approximately three times as much concrete as a 155-mm round (according to TM 9-1907, *Ballistic Data Performance of Ammunition*). The 8-inch will also penetrate more soil than a 155-mm.

An area of effectiveness, which is difficult to discuss because of security classification, is nuclear capability. Suffice it to say that the 8-inch is more effective because of the larger projectile.

From this evaluation of medium and heavy artillery, it is noted that they are similar in several areas: mobility, reliability, cost and accuracy. However, there are significant differences in other areas. The M109A1's survivability, higher rate-of-fire and responsiveness lend it to the direct support role. The range, single shell/single volley effectiveness, ICM payload ratio and nuclear effectiveness of the M110A1 make it a necessary part of the field artillery. Even from this brief discussion, it should be readily apparent that the question is not whether or not heavy artillery should be eliminated but rather, what is the proper medium/heavy mix for the US Army. This question is the subject of intense study not only at Fort Sill but throughout the research and development community. The answers are to be provided in the Legal Mix V study due to be published soon.

Who needs heavy field artillery? You may . . . depending on the mission to be accomplished! 

NCO

Reclassification

Brigadier General Charles K. Heiden, Director of Enlisted Personnel, USA MILPERCEN, visited Fort Sill recently to discuss NCO reclassification and the approach to solving personnel problems related to the formation of new target acquisition units. General Heiden met in separate sessions with senior members of the Field Artillery School, the III Corps Artillery staff, instructors and recent graduates of FA reclassification courses. The keynote of the visit was refreshing frankness and candor. The following are items that surfaced from these discussions. —Ed.

The transition of the force structure from 13 to 16 divisions without an increase in Army-wide manning has caused the shortage of combat MOSs. Combat support and service support MOSs must be converted to combat jobs. Some FA MOSs are as much as 40 percent under authorized strength in grades E5 and above. While this is no news to the "field," it is important to realize that DA is not only aware of the problem but also giving considerable attention to correct the situation. Making a solution to the problem more difficult are such things as enlistment contracts, PCS/TDY fund restrictions and requirements that individuals nominated for reclassification be able to make the transition to fairly technical fields (13E, 17C, 82C, etc.). Also, the process must be fine-tuned to keep track of the number of personnel reclassified to insure that the MOSs are *not* overfilled so that promotions are not stifled. The goal is about 95 percent fill. Having once served as an enlisted man, General Heiden is personally committed to this goal. Another problem involves conducting this important training at sites other than Fort Sill. The average division is not well equipped to conduct the training mainly due to a lack of qualified instructors (part of the reason for the reclassification action), sophisticated training aids and range facilities for firing. Another aspect of the problem, and by no means a small one, is the wishes of the individual and concern for his family.

The situation is "getting well"; the reclassification in 13B MOS will be tapering off, and 13E is almost cured. MILPERCEN is in the process of locating NCOs with 13E secondary MOSs and converting these personnel to primary 13E MOSs. Approximately 300 have been converted to date.

For the individuals being reclassified, General Heiden reported that less than one percent are not satisfied for one reason or another. Many are pleased to be out of overstrength MOSs where they were having great difficulty getting promoted (especially at the higher ranks) and were frequently serving "out of their MOSs." The comments made by the retrainees were mixed. Some were excited to be learning new skills — impressed by the "guns," with a chance for new assignments to places the old MOS was not authorized — even a few were "Okies" and glad to be in a branch home-based in Oklahoma. The bulk of the comments from those who were displeased related to the short notice they received, despite personal letters dispatched from MILPERCEN 90 days prior to the action being taken. Because of the great disparity in the old MOSs and new ones, many felt two to three weeks in an FA unit prior to the training would have been of benefit for the "big picture."

What "washouts" there are fall into two categories — those who didn't try and those who could not absorb the material. The former are being looked at for elimination. The latter are being placed in other combat MOSs with less technical natures. None of the washouts are returning to their previous MOSs.

Finally, on reclassification, General Heiden went to great lengths to explain to the retrainees (and, by inference, their new commanders) that there are no "duds" in the program. Prior to selection, the NCOs' records were screened for evidence of success in their previous specialties.

Target Acquisition Reorganization

DA and Fort Sill are working on MOSs in the 17 and 82 series. Here the problem is not only senior personnel for

cadre and the training base surge, but also the lower ranks for requirements created when new units are formed in small, very specialized fields.

The training is driven by two major factors — math background requirements for induction into the 17 and 82 series MOSs and the timing of the new unit activations.

The FA School is examining the math requirements to see if they are valid considering the widespread use of calculators and computers to perform many of the calculations previously done manually or with the aid of tabular data. Filling these two MOSs has been one of the FA's major problems for years, so the unit activations are not creating a new monster.

The training will not be designed as a "get-well-quick" fix, but will be time-phased to coincide with the unit activation schedule. This allows a more orderly process and will preclude the wave effect and accompanying disruptions within the target acquisition community. Several graduates of the initial training will be retained at Sill to form training cells. Again, funding for this TDY and PCS is tight. One idea is to select students from the divisions where the units

Reclassified Sergeant Scores III Corps Record


When the commander of III Corps Artillery, BG Charles F. Gorden, selects a gun section for a Field Artillery Section Combat Readiness Exercise (FASCRES), that section has to move its equipment and gun to the field to fire a mission. In response to a FASCRES order, SSG Charles Gill, A Battery, 3d Battalion, 18th Field Artillery, moved his 155-mm self-propelled howitzer section and proceeded to break a III Corps Artillery record. It was the section chief's second time in the field.

"I was scared at first," explained the 28-year-old sergeant. "I had just been reclassified and graduated from the corps Chief of Section School . . . we had only one class on FASCRES during the school. I was hesitant about being retrained. I was a track vehicle mechanic before being reclassified, and it's just like going to any new job. Nobody really wants to leave something you do well. But I did pick up a lot of information on artillery and I was in a position to use my training, so the FASCRES was kind of enjoyable."

The day of the test, a unit is notified and a section is chosen by General Gorden, designer of FASCRES. Sections are given grid coordinates and a map with instructions. The


will be activated, train them in a TDY status and return them to that unit. This will save PCS funds and result in less individual and family turbulence.

The problem in filling the units is immense. There are not enough personnel currently in the Army with the required MOSs, and those we have are not in the locations of the activations. The first course to train these personnel is scheduled to start in November 1976. It will last eight weeks and have room for 30 students, several of whom will be retained at Sill to develop the training base. Advanced individual training sites can accommodate the recruits, but getting the unit cadre and instructors will be the first problem.

The personnel game is never easy. There is always a lag between the "operators" deciding on a new organization or capability and the time the trained personnel in the required numbers are made available at the right place. But, as evidenced by General Heiden's thorough orientation at the School, people are working to minimize the problems resulting from the force structure changes and the target acquisition battery activations. 

section chief must move his crew and equipment to the firing point. After his section was selected, Sergeant Gill had to move to the field (with no help from the battery) and prepare to shoot.

The battery commander reports that it usually takes two or three adjusting rounds to hit the target when a battery goes from zero notification. Sergeant Gill and his section fired five missions with only 10 rounds and broke the record.

Regular duties of a section chief are to supervise his crew and act as safety NCO for the section's gun. During a FASCRES, the section chief must assemble his crew and equipment; locate the firing point, targets and route of march; occupy the firing point; lay the gun; and, use a tabular firing table to compute firing data. 



US Army photo by SSG Rick Hayeland.

Army Mine Planter Service

"Warranted" Officers

The warrant officer designation has long been recognized by various navies of the world. The warrant officer in the navy traditionally was a technical specialist whose skills and knowledge were essential for proper operation of the ship, but who did not hold a commission to command. That is, he was "warranted" as an officer rather than "commissioned" as an officer. The warrant officer grade in one form or another has been in continuous use in the US Navy since that service was established.

Army Mine Planter Service

In the US Army, the warrant officer lineage can be traced back only to the headquarters clerks of 1896, later designated Army field clerks. However, the recognized birthdate of the Army's Warrant Officer Corps is 7 July 1918. On that date, an Act of Congress established the Army Mine Planter Service as a part of the Coast Artillery Corps and appointed warrant officers to serve as masters, mates, chief engineers and assistant engineers of seagoing vessels. An Act of 1920 expanded the use of warrant officers, authorizing their appointments in clerical, administrative and band leading activities. In effect, the Act of 1920 designated the warrant officer grade as a reward for enlisted personnel of long service and as a haven for former commissioned officers of World War I who lacked either the education or other eligibility requirements to retain their commissions after that war.

Between 1922 and 1935, no warrant officer appointments were made except for a few band leaders and Army Mine Planter Service personnel. In 1936, competitive examinations were held to replenish lists of eligible personnel and some appointments were made again. Warrant officers who were qualified pilots were declared eligible for appointments as lieutenants in the Air Corps in 1939. By 1940, warrant officer appointments were made in significant numbers for the first time since 1922, but the total strength of the Warrant Officer Corps decreased until 1942 because many warrant officers were transferred to commissioned status during that period.

Where would we artillerymen be without our warrant officers? A rhetorical question, but we sometimes take them for granted or, worse, fail to think of them as essential members of the Redleg community.

To give you a thumbnail sketch of the Warrant

Act of 1941

The second truly important piece of legislation affecting Army warrant officers was passed in 1941. An act in August 1941, amplified by an Executive Order in November of that year, provided that warrant officers could be assigned duties as prescribed by the Secretary of the Army and that when such duties necessarily included those normally performed by a commissioned officer, the warrant officer would be vested with all the powers usually exercised by a commissioned officer in the performance of such duties. The 1941 act also established two warrant officer grades, chief warrant officer and warrant officer junior grade, and authorized flight pay for those whose duties involved aerial flight.

Warrant officer appointments were made by major commanders during World War II, and warrant officers served in some 40 occupational areas during that war. In January of 1944, the appointment of women as warrant officers was authorized, and by the end of the war there were 42 women warrant officers on active duty.

Incentive

After World War II, the concept of using the warrant rank as an incentive rather than a reward was instituted. It was to be a capstone rank into which enlisted personnel could advance. This use of the warrant officer grade, combined with the earlier concept of using the grade as a reward for long and faithful service resulted in mixed utilization; i.e., in practice, warrant officers became largely interchangeable with junior commissioned officers or senior enlisted personnel.

Four Grades

The Career Compensation Act of 1949 provided two new pay rates for warrant officers. The designations of warrant officer junior grade and chief warrant officer were retained, but the grade of chief warrant officer was provided with pay rates W2, W3 and W4. In the Warrant Officer Personnel Act of 1954, these three pay rates also became grades and the warrant officer junior grade became just warrant officer (W1), providing the four warrant officer grades of today.

Warrant officers were used extensively during the Korean War, but by 1953 it had become apparent that granting the warrant officer grade as either a reward or an incentive was inadequate. A new concept, consistent with functional Army requirements, was needed as a basis for continuation of the Warrant Officer Corps. From 1953 until 1957, the Department of the Army conducted an analysis to

Officer Corps, the Journal provides a portion of the 39th Edition of The Officers Guide. This excerpt, written by LTC (Ret) Lawrence P. Crocker, was published by Newsliner, the newspaper of the US Army Warrant Officers Association. —Ed.

determine whether the warrant officer program should be continued and, if so, in what form and for what purpose.

Highly Skilled Technician

In January of 1957, as a result of the Department of the Army study, a completely new warrant officer concept was announced which affirmed the need for the warrant officer and the continuation of the Warrant Officer Corps. It stipulated that the warrant officer grade would not be considered as either a reward or an incentive for enlisted men or former commissioned officers, and it defined a warrant officer as ". . . a highly skilled technician who is provided to fill those positions above the enlisted level which are too specialized in scope to permit the effective development and continued utilization of broadly-trained, branch-qualified, commissioned officers." The new concept was formally announced in DA Circular 611-7 of 12 April 1960. It remains the basis for the warrant officer program of today, although much progress has been made since then in the areas of pay, promotion, utilization and education for warrant officers.

13 Percent

In today's Army, warrant officers comprise about 13 percent of the total officer corps. They are skilled specialists who are essential to the proper operation of the Army and its increasingly complex equipment. Warrant officers serve in some 89 specialty (MOS) areas in 13 career fields:

- Administration
- Aviation
- Communications-Electronics
- Criminal Investigation
- Graphics
- Health Care Delivery
- Intelligence
- Marine Operations
- Mechanical Maintenance
- Services
- Supply
- Weapons Maintenance
- Utilities Maintenance

The career patterns of warrant officers differ from those of commissioned officers since the warrant officers can expect repetitive assignments within their specialty which is essential to sustain and increase their technical expertise.

MOS Classifications

Within a particular career pattern, there are usually many warrant officers with different MOS classifications. For example, within aviation operations there are rotary-wing pilots for attack helicopters; rotary-wing pilots for transport helicopters, both heavy and medium; and, rotary-wing pilots for light observation helicopters. There are also fixed-wing pilots for single- and multi-engine

aircraft and for surveillance aircraft. There are aircraft repair technicians who are rated pilots for fixed-wing aircraft, and aircraft repair technicians who are rated pilots for rotary-wing aircraft.

Fort Sill

Normally all new warrant officers will attend the Warrant Officer Orientation Course at Fort Sill, OK. Exceptions include warrant officers involved in airdrop and aviation operations; missile systems, medical equipment and mechanical maintenance; and physician's assistant programs. They receive their orientations at special preappointment courses.

The next step in a career pattern will depend on the MOS the warrant officer holds; for example, mechanical maintenance — entry MOS 631A. The warrant officer in this program is monitored by the Ordnance Branch of the Officer Personnel Directorate. After completing the orientation course, he is trained in his specialty at the US Army Ordnance Center and School at Aberdeen Proving Ground, MD. He is then assigned to units and activities requiring the maintenance of wheel vehicles only, such as Transportation Corps truck companies and battalions, nonmechanized infantry battalions and administrative motor pools. During this time, he will learn organizational maintenance procedures which will be relatively uncomplicated from a technical standpoint.


When he has completed about five years' service, he will attend the Mechanical Maintenance Career Course and then be assigned to positions of increased competence in maneuver or artillery battalions and other units having both wheel and track vehicles.

At the end of the eleventh year of his career, he can switch to MOS 632A, automotive repair technician, or continue in his original specialty. In either of these specialties, he can normally expect to complete his career with assignments as an instructor at a service school, as a motor maintenance advisor on the staff of a MAAG or military mission or as a technical advisor for various test activities.

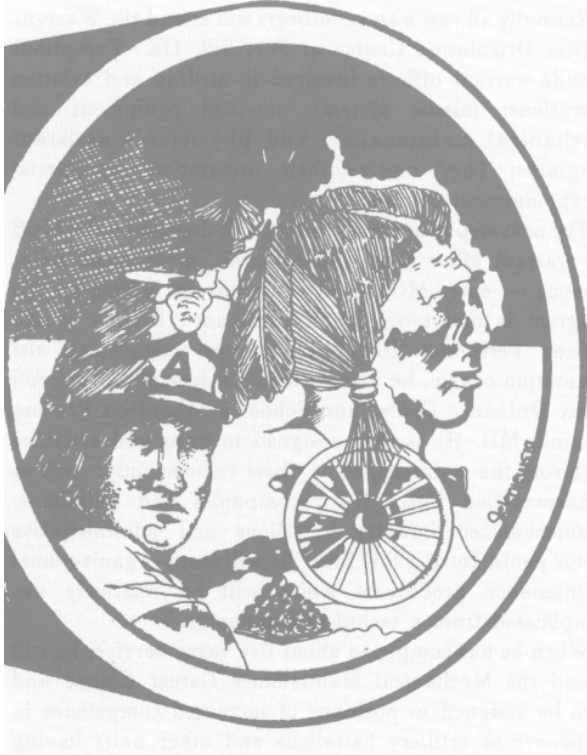
Technical schooling and training is not the only educational avenue open to the warrant officer. The opportunity for civil schooling is open and encouraged.

In civil schooling, the Army's goal is for all warrant officers to obtain at least an associate degree prior to completing 15 years of active Federal service.

The Warrant Officer Corps fills a vital need in today's Army — warrant officers provide a continuity that is not available from commissioned officers and a high degree of technical skill that is not available from enlisted specialists.

DA Pamphlet 600-11, Warrant Officer Professional Development, is highly recommended reading for all who wish to learn more about the history, the workings and the bright future of the Warrant Officer Corps. 

Chapter Four



Winning The West

by COL (Ret) Robert M. Stegmaier

When Spain controlled New Mexico, it permitted only specified ports to receive supplies from other countries. The United States was therefore precluded from a very lucrative trade.

With the successful Mexican Revolution of 1821, the road to Santa Fe was cleared. The long trail from St. Louis to New Mexico was fraught with Indian dangers. Horses or mules and, a bit later, wagons were used in caravans. Rifles provided most protection; rich caravans, however, took along artillery. In his book, *The Great River*, Paul Horgan quotes: "We had two swivels mounted upon one pair of wheels . . . one of these was a long brass piece made to order, with a calibre of but an inch and a quarter, yet of sufficient metal to throw a leaden ball . . . a mile with surprising accuracy. The other was iron, and a little larger."

The first trade caravan (Marmaduke-Storrs expedition, 1824) carried along one piece of artillery. It experienced no Indian troubles and, therefore, had a very profitable trip. As a result of widespread publicity of the caravan's success, Congress appointed a committee to negotiate, with the Osage, a right-of-way along the Santa Fe Trail.

In 1829, CPT Bennett Riley was ordered to protect the Santa Fe route. He accompanied the caravan of Charles Bent as far as the Arkansas River and took up a defensive position near Chauteau's Island. The caravan, crossing the river into Mexican territory, soon was surrounded by Indians. At this time, Plains Indians were familiar with rifles but not with cannon. At dusk, Charles Bent loaded his artillery piece with powder and small pellets. When it fired, the Indians' horses bucked and ran away panic-stricken. Taking advantage of the confusion, horsemen rode through the area cleared by the cannon and made it safely to Riley's camp. The following morning, Riley's infantry fired one 6-pounder long-range and the Indians fled.

Throughout that summer, Riley's camp was besieged by Indians. The men were virtual prisoners. The 6-pounder, however, instilled in the Indians healthy respect for artillery. Manned by 2LT D. Searight and an experienced crew, the cannon dropped roundshot into Indian ranks a mile away. Grapeshot stopped close-in charges. Even ricochet shots skipping across the Arkansas River surface scattered warriors infiltrating along the bank. Riley's troops proved that oxen were as effective as horses in hauling wagons; besides, the Indians had little interest in the capture of oxen.

In 1832, Charles Bent and his brothers established Bent's Fort in the midst of the Santa Fe Trail. In its two towers were portholes for use of small field pieces covering the four walls and capable of making any direct assault costly in lives. The brothers maintained excellent rapport with the war-like Cheyennes and therefore experienced no Indian trouble. In the following year, Bent's convoy was guarded

westward by Captain Wickliffe's 144 soldiers and one field artillery piece; hostile action was nil.

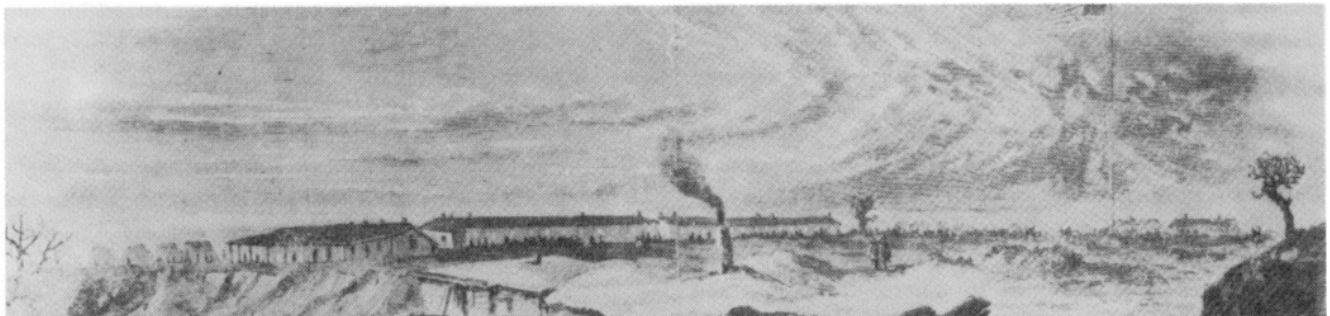
In 1834, GEN Henry Leavenworth sought out the wild Indian tribes to assure peace to convoys using the westward trails. Even while the mission was underway, Leavenworth's party was endangered on the Santa Fe Trail. Captain Wharton, enroute westward with a wagon train, discovered some accompanying traders dragging out a piece of artillery to fire upon approaching peaceful Comanches. Wharton forbade the firing and peace was maintained; fortunately so, as Leavenworth's expedition succeeded in getting all wild tribes — Comanches, Kiowas and Wichitas — to come to Fort Gibson to sign treaties.

In 1839 and again in 1844, it is recorded that Josiah Gregg carried artillery in his convoy. Gregg recounted an experience in 1844 with Indians: "A dozen cannoneers now surrounded our 'artillery' which was charged with canister At last, after raising and lowering the 6-pounder several times, during which time the Indians had time to retreat beyond reach of shot, the match was finally applied, and 'bang' went the gun, but the charge grounded midway. This was followed by two or three shots with single ball, but apparently without effect We came off . . . unscathed from the conflict"

At Fort Phantom Hill, TX, when northern Comanches threatened, a trench eight feet wide was cut around the garrison and the artillery (two 6-pound brass cannon) was placed on a parapet in the center, ready to sweep the environs. The Comanches, although 2,500 in number, bypassed the fort.

General Kearny and the Army of the West met no Indian opposition traveling the Santa Fe Trail in 1846. Major Gilpin (founder of Fort Mann) and his Santa Fe Indian Battalion (a Missouri outfit) were assigned responsibility for keeping communication open to Kansas. In June of 1847, an artillery detachment with two guns and 60 men was hit by Comanches; the Indians were routed. On 17 June, 500 Comanches attacked; again artillery and rifle fire prevailed. Combined forces kept the vital supply line leading to southwest United States open.

Fort Larned.



In 1859, when the Texas Reservation Indians were threatened by John Baylor and his mob, the determined stand of CPT J. B. Plummer, with detachments of infantry, cavalry and artillery, caused abandonment of the plan. Immediately after the Texans retired, the Indians attacked without success. Subsequently these reservation Indians were removed peaceably to the vicinity of Fort Cobb under command of artilleryman MAJ Geroge (later "Rock of Chickamuaga" fame) Thomas.

During the Civil War the wild tribes were largely dominant in the southern plains; convoys had to have military protection.

In 1864, Kit Carson attacked the Kiowas near Adobe Walls. How effective the artillery was in this encounter is shown by this Kiowa observation: "If you did not have the two guns on wheels we would have beat you. These guns make an unequal fight. Give us two guns on wheels and ammunition and then come against us. It will be an equal fight."

War on the southern plains, however, was precipitated by three other 1864 actions — the one at Fort Larned, one by Lieutenant Eayre and one by Colonel Chivington.

Fort Larned had a policy that Indians, unless granted permission, would not approach within certain limits. Satank, a Kiowa chief, either ignorant of the rule or presumptuous thereof, crossed the line. A nervous sentry leveled his rifle and quickly received two arrows. The Kiowas ran off the Army's horses. A bit later, Left Hand, an Arapaho chief, came to offer his helpful services in gaining return of the stolen animals. As he approached, an artillery piece was fired at him. No one was hurt but this destroyed the Arapaho's friendliness.

At Ash Creek (Black Kettle's village), the Cheyennes noted the approach of Lieutenant Eayre with 100 members of the First Colorado Cavalry and two mountain howitzers. Lean Bear went out peacefully to talk. The soldiers fired and Lean Bear fell. Enraged, the Cheyennes attacked. Grapeshot was fired, but the aim was bad. Black Kettle ran out crying: "Do not make war." George Bent, who was present in the Indian camp, said: "If Black Kettle had not stopped the fight, not one of Eayre's men would have escaped." As it was, the First Colorado Cavalry made a

hasty retreat to the protection of Fort Larned. Some angry tribesmen followed them all the way — the odds without Black Kettle's intervention would have been 5 to 1.

At Sand Creek, later in 1864, with the Cheyennes (Black Kettle's band) located near Fort Lyon, the Coloradoans under command of COL John Chivington planned an attack. Two howitzers accompanied the expedition. Taken completely unaware, the Indians fought valiantly. Howitzer fire was effective against a strong defensive position afforded by the banks of Sand Creek and against concentrations of Indians. Individually, the Cheyennes had better rifles than the attackers. Artillery, surprise and early capture of the horse herd accounted for the success of the Colorado troops.

In 1866, some Indians came to Fort Dodge requesting ransom for a Mrs. Box and her young daughter. Major (later General) Sheridan decided ransoming was too profitable and too encouraging for the Indians. He invited about 100 Indians to enter the fort and closed the gate. The mountain howitzers had been double-loaded with grapeshot and canister and depressed so as to sweep the ground where the Indians were located. Some of the soldiers were marching back and forth, with guns loaded and bayonets fixed, while a number of others, with revolvers concealed under their blouses, were sitting around watching the proceedings. The main portion of the garrison was concealed in the dugouts — the men all armed and provided with 100 rounds of ammunition per man. The Indians were armed with tomahawks which they had carefully concealed under their blankets. When Sheridan told them they would be hostages until the captives were freed, the Indians jumped to their feet, threw aside their blankets and prepared to fight. They made a dash for the few soldiers in sight, but, when soldiers came pouring out of the dugouts and opened fire, the Indians surrendered. One of the chiefs was taken up on the palisades of the fort and compelled to signal to his warriors to bring Mrs. Box and her child to the fort.

In 1867, when General Hancock went into the southern plains with seven companies of the 37th Infantry, 11 troops of the 7th Cavalry and a battery of the 4th Artillery, he informed the Cheyenne chiefs he came in peace. The chiefs, seeing the howitzers, remarked that they did not think artillery looked like peace. When General Hancock asked Roman Nose if he wanted war or peace, Roman Nose replied: "We do not want war. If we did, we would not come so close to your big guns."

In 1867, the Peace Commission called for a gathering of the wild tribes at Medicine Lodge. The wild Indians were to be given rights to live on reservations. Of this arrangement, Satanta, a Kiowa chief, remarked that they did not need rights to live in their own country. The Commission listened; one general pointed to a horse-drawn gun and stated: "Tell them that's my passport." Governor Sam



Satanta, A Kiowa chief.

Crawford of Kansas, a military man in his own right, made this observation: "When Satanta left the Council with a wicked expression all over his face, COL John K. Larkin and I walked out and over to the camp of our infantry and artillery and suggested to the officers in command the propriety of ordering their men to camp and holding themselves in readiness for any emergency that might arise Satanta, Tall Bull and others contemplated an attack . . . but, seeing the troops kept close in camp and the artillery trained in their direction, their courage failed them."

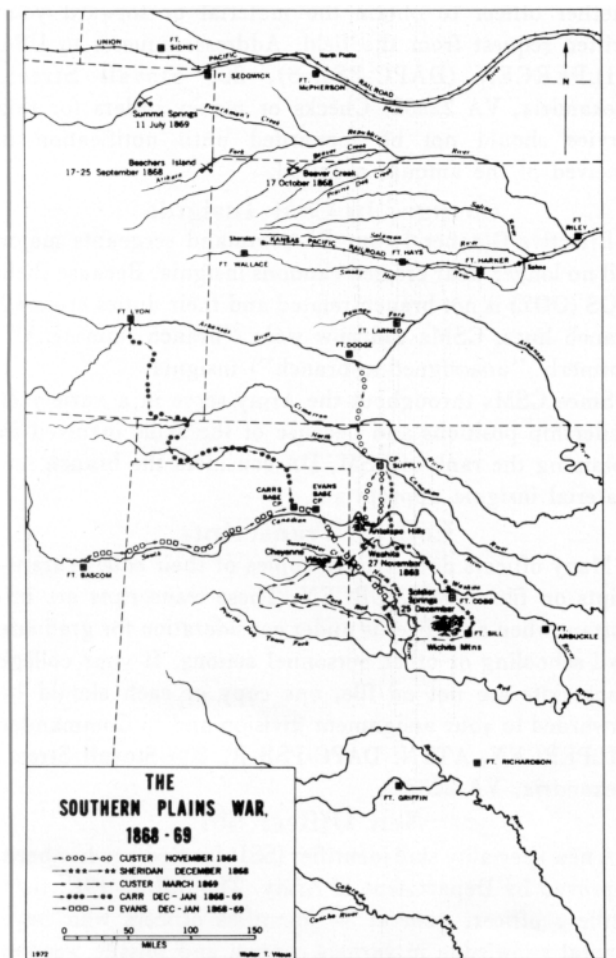
When the parley ended, Satank, a Kiowa warrior chief made this speech: "The white man grows jealous of his red brother. The white man once came to trade; he now comes as a soldier. He once put his trust in our friendship and wanted no shield but our fidelity. But now he builds forts and plants big guns on their walls"

The 10th Cavalry, investigating a massacre of seven men, marched 32 miles in two days under constant Indian fire. Reinforcements with one howitzer under Sergeant Pittman arrived on the second day. Three shots from the howitzer scattered the attackers and enabled the reinforcement to return safely to Fort Hays.

In 1868, General Sherman ordered his artillery and ammunition consolidated at Fort Larned as the Indians

were becoming hostile. The Cheyennes went on a murderous raid in the Saline and Republican River valleys and war against southern plains Indians was declared. General Sheridan, aware of normal Indian retirement to peaceful secluded winter camps, decided on a winter maneuver. The camp to which the Indians were going was Fort Cobb in Indian Territory. Here Captain Alvord erected a redoubt with two pieces of artillery to dominate the assembly of the thousands of expected hostile Indians.

Artillery played little part in the 1868 war, except for the Fort Bascom contingent. Four mountain howitzers accompanied the latter expedition moving eastward through Llano Estacado country. At Soldier Springs, an army unit ran into a hostile Comanche camp at the north fork of the Red River. As the attack progressed, the Comanches fell back to the western edge of their village. There they grouped and with fierce resistance slowed the attack. MAJ A. W. Evans called up two artillery sections. The first shot was a dud; the second struck in the center of resistance, wounding those immediately around it and terrifying the others. Their horses stampeded; the battle became a rout with several Indians astride each of the few animals remaining under control.



Until 1874 events involving artillery in Indian Territory were quiet except in 1870 when the Camp Supply horse herd was raided. Two cavalry columns were sent out — one up Beaver Creek and another up Wolf Creek. To maintain contact between widely separated forces, the post commander dispatched Lieutenant Maxon with 18 men up the center; the Indians concentrated on this party. Lieutenant Smither, with a cavalry company and a howitzer, hurried to the rescue. The Indians, not relishing additional artillery fire, disappeared.

By 1874 the reservation Indians — Cheyennes, Comanches and Kiowas — were getting difficult to handle. All Indians were required to become registered or they would be classified as hostile. By August, General Sheridan decided on a war against those designated hostile; the area west of the 98th meridian was to be the scene of search and attack operations. The units involved — the 4th, 6th, 8th and 10th Cavalries — were commanded by ambitious men — men like Mackenzie, Davidson and Miles who had been generals in the Civil War and were again aspiring for stars. Once again, artillery played only a minor part in the war. Miles was the first to deploy. He traveled in August from Camp Supply south to the Red River. There he encountered Cheyennes in well-protected ridge positions. His Gatling guns and howitzers softened up the defenses; his cavalry swept over them; and, the Indians retreated and finally disappeared in the unknown territory of the Texan Llano Estacado.

The war turned into one of pursuit. Indian lodges were overrun. Lodge poles, an item obtainable only by incursion into dangerous Colorado territory, were burned. Few casualties resulted, but maintaining the scorched-earth policy and keeping the Indians on the run forced them to return to the reservations.

In November, CPT Frank Baldwin, with a wagon train manned by infantrymen and guarded by cavalry and a Gatling gun, found his advance northward blocked by a Cheyenne village. He placed the artillery and the infantry into wagons, told the teamsters to be sure to keep up with the cavalry and charged wildly. The Cheyennes were driven 12 miles before the cavalry returned. In the village, the troops discovered two German sisters whose other two sisters had been rescued by Custer in 1869.

The last use of artillery on southern plains Indians occurred in 1875 when the Cheyennes resisted, rather than submit to being sent to Florida. Colonel Neill at Darlington Agency surrounded the Cheyennes with three troops of cavalry and raked their position with Gatling gunfire. The Cheyennes returned to Army control.

Combined arms had at last moved the southern plains Indians onto reservations and sent some, as prisoners for a few years, to Fort Marion, FL. The fight in the southern plains was over, due in large part to overpowering gunfire.



REDLEG Newsletter

LTC Command Selections

The names of 79 Redlegs selected for field artillery troop commands were released by DA message in April 1976. The selection board considered 831 FA officers for command positions. All selectees had commanded at battery level and all were graduates of CGSC or an equivalent school. Seventy-five percent of the selectees have advance degrees. The field artillery selectees by year group are:

| | | | | | |
|----------------|-----------------|-----------------|-----------------|----------------|----------------|
| $\frac{59}{2}$ | $\frac{60}{37}$ | $\frac{61}{17}$ | $\frac{62}{13}$ | $\frac{63}{9}$ | $\frac{64}{1}$ |
|----------------|-----------------|-----------------|-----------------|----------------|----------------|

The average age of the lieutenant colonel command selectees was 38.7 years.

In addition to the selectees for field artillery troop command, 10 Redlegs were selected for aviation troop commands. There were 938 officers considered for 32 command positions. The FA selectees by year group are:

| | | | | | |
|----------------|----------------|----------------|----------------|----------------|----------------|
| $\frac{58}{1}$ | $\frac{59}{1}$ | $\frac{60}{2}$ | $\frac{61}{2}$ | $\frac{62}{2}$ | $\frac{63}{2}$ |
|----------------|----------------|----------------|----------------|----------------|----------------|

Evaluation Report

An important provision of the Officer Evaluation Report (OER) system is that officers are to receive a locally reproduced copy of completed OERs. When the OER is not prepared until after departure for a new duty station, it is up to the losing command to forward a copy to the officer's new address. Unfortunately, this system is not perfect and reports do get lost. If you haven't received a copy of your latest report, query your former command after a reasonable time has elapsed to determine whether it was forwarded. If it was mailed but lost, the unit personnel officer — who is required to maintain file copies of all reports for 120 days after the closing dates — should be able to mail another copy to you.

SRB MOSs Pared

A net loss of selective reenlistment bonus (SRB) MOSs resulted July 1 due to a MILPERCEN change of the bonus rolls. Twenty MOSs were dropped from the SRB rolls while 11 are being added. The changes reflect a tuning of bonus payments as an incentive for reenlistments in shortage skill areas.

Zone A SRB payments apply to soldiers who reenlist between the 21-month and six-year service marks. Zone B applies to reenlistments between six and 10 years of service.

Added to zone A SRB rolls with a "two" multiplier are field artillery MOSs 17C and 17D. Added to zone B at the "one" multiplier level are MOSs 55G and 13E. Among those MOSs with reduced multipliers is a reduction from "five" to "four" in 55G.

Regardless of ETS, soldiers who reenlist after July 1 will receive bonuses at the new levels.

Copies Of Evaluation Reports

When you review your Official Military Personnel File (OMPF) at MILPERCEN, you can obtain free of charge one copy of any OER to support a planned personnel action. However, if you need more than one report, you will be charged a minimum of \$2 which entitles you to six pages of copied material. An additional five cents is charged for each page over six. The same fees apply if you are not able to appear in person and must therefore either authorize another officer to obtain the material or forward your written request from the field. Address requests to USA MILPERCEN (DAPC-PSR-S), 200 Stovall Street, Alexandria, VA 22332. Checks or money orders for this service should not be forwarded until notification is received of the amount required.

Changes in CSM Insignia

Effective October 1, our FA command sergeants major will no longer wear crossed cannons insignia. Because their MOS (OOZ) is not branch-related and their duties cross all branch lines, CSMs will now wear "branch immaterial" (formerly "unassigned-to-branch") insignia.

Since CSMs throughout the Army serve in a variety of leadership positions and because of the skills involved in obtaining the rank of CSM, DA considers the branch immaterial insignia appropriate.

College Transcripts

Many officers do not have copies of their college transcripts on file in MILPERCEN. These transcripts are important when an officer is under consideration for graduate civil schooling or other personnel actions. If your college transcripts are not on file, one copy of each should be forwarded to your assignment division and to Commander MILPERCEN, ATTN: DAPC-PSR-R, 200 Stovall Street, Alexandria, VA 22332.

New Officer SSI

A new speciality skill identifier (SSI) for Redlegs has been approved by Department of Army. The SSI — 13E, field artillery officer, general — identifies officers who have general knowledge in various cannon and missile weapon

systems. Duty positions include senior FA artillery commanders, FA headquarters unit commanders and FA staff officers, instructors and advisors. Implementation instructions will be released later.

Battery/Company Commanders

Field Artillery Branch needs to know when a field artilleryman is scheduled to assume command of a CONUS battery or company. This allows the officer to be stabilized (if he is not scheduled for another important assignment) so that he can complete a normal one-year command tour. Adjutants should notify Branch by calling AUTOVON 221-0116/0118/0187/7817.

CGSC 1977-78 Selection Procedures

The Command and General Staff College (CGSC) board that selects students for the 1977-78 school year will make its final selections from a list of eligible officers provided by two independent sources: a DA CGSC screening board that met in June and the 1976 major AUS promotion selection board.

Eligible officers include all promotable captains, majors and lieutenant colonels — regardless of component — who have not completed more than 16 years commissioned service as of 1 September 1977. Reserve officers must not have mandatory release dates (MRDs) earlier than 1 January 1977.

The DA CGSC screening board is reviewing the personnel files of about 5,700 eligible majors and lieutenant colonels. It will prepare a list of about 2,350 nominees. A separate list of some 950 will be selected by the 1976 major AUS board from among those it picks for promotion to 0-4.

A consolidated list of 3,300 nominees — about three times the number of CGSC spaces allotted to the Army — will be sent to the DA CGSC selection board. The board will select officers judged best qualified to fill the college spaces available.

All eligible officers, regardless of their availability, will be considered. Finalists who are not available — for example, those who have not met stabilization guidelines — normally will be deferred until the following academic year. The official files of deferred officers will be annotated to indicate they were selected for a CGSC-level resident course and attendance was delayed.

Announcement of officers selected to attend 1977-78 CGSC-level courses is expected in December via a DA circular which will include the names of officers deferred until the next academic year.

The CGSC screening board includes nine senior field grade officers — 0-5s and 0-6s. Members represent a spectrum of combat arms, combat support and combat service support specialties. The 0-4 selection board is headed by a general officer and 14 senior field graders. The nine-member DA CGSC board that will make the final selections is headed by a general officer and eight colonels.

It will be in session until September 17. All the boards include minorities, women, aviators and reserve component officers.

Officers selected may decline to attend for personal reasons by writing their career divisions, but they will not be reconsidered for attendance.

Here's what the CGSC-level school schedule looks like for the 1977-78 school year:

| School | Report | Graduate | Quotas |
|--|-----------|-----------|--------------|
| Command and General Staff College | 8 Aug 77 | 9 Jun 78 | 800 |
| Armed Forces Staff College #62 | 16 Aug 77 | 20 Jan 78 | 81 |
| Armed Forces Staff College #63 | 31 Jan 78 | 30 Jun 78 | 82 |
| College of Naval Command and Staff | 22 Aug 77 | 30 Jun 78 | 24 |
| Air Command and Staff College | 14 Aug 77 | 2 Jun 78 | 36 |
| Marine Corps Command and Staff College | 10 Aug 77 | 2 Jun 78 | 10 |
| USA School of the Americas | 16 Jan 78 | 10 Dec 78 | 3 |
| TOTAL | | | 1,036 |

This information applies only to MILPERCEN-managed officers. It does not apply to branches managed by the Judge Advocate General, the Chief of Chaplains and the Surgeon General.

Officer Record Brief

Widespread misunderstanding exists among officers concerning data changes to the Personal Qualification Record (PQR) and Officer Record Brief (ORB). The belief is that corrections and updates to the PQR will automatically trigger a corresponding change to the ORB, and vice versa. While the two records appear to be linked directly because much of the information contained on the forms is identical and frequently changes simultaneously, these records are maintained within separate data bases. The information on the PQR is maintained by local personnel officers using SIDPERS or a manual reporting system; the ORB data is maintained on the Officer Master File at MILPERCEN. When a routine change occurs on the PQR, a Report of Change (DA Form 2876) must be submitted by the personnel officer to effect a corresponding change to the ORB. Naturally, changes can be made to either record when they are reconciled during an annual audit. Remember that errors discovered on your PQR or ORB must be brought to the attention of your personnel officer to effect corrections. The personnel officer has the knowledge and means to correct both records.

AND

*Reprinted from **Perspectives In Defense Management**, publication of the Industrial College of the Armed Forces. Presented is a condensed, edited transcript of a presentation to the college. —Ed.*

by Lynn T. White Jr.

In the panorama of history, "technological change is not inevitable and human behavior in relation to it is not predictable. People have differing and complex structures of value, and each society shapes technology in its own way."

. . . Technology is not just a thing in itself. It is a social activity like art or religion or politics, one way in which a society expresses itself. So, it is important not only to think about the impact of technology upon society, but also about what a society does to technology . . . what our society wants to do and what it is capable of doing with its technology may be more important than what technology is doing to our society.

I am a medieval historian, and I claim no expertise in such modern phenomena as computers or the population explosion History cannot answer contemporary questions. You will never hear a professional historian say, "History teaches us that" Only amateurs and dilettantes, or nonhistorians, begin a statement that way. Historians know that every specific historical situation, even when somewhat analogous to some other situation, contains unique elements. Each historical situation is like an alloy. A little difference in the proportions of what goes into an alloy may make all the difference in what you can do about it or with it.

History cannot give solutions. What it can do is sharpen our wits about the kinds of questions which ought to be put to the contemporary situation. The real disasters occur when people look at a contemporary situation in strictly historical terms, and say, "In World War II it worked this way; therefore, it's going to work this way now."

Drawings and art research by Donna Hayek.

TECHNOLOGY

CIVILIZATION

The effects of technological change go much deeper into the human psyche than we usually recognize. In every society many things that happen never get put into writing; this is true in our own society as well as in that of the Middle Ages.

Brakes And Breakthroughs

On the case for accelerating, and the case for slowing down technological change:

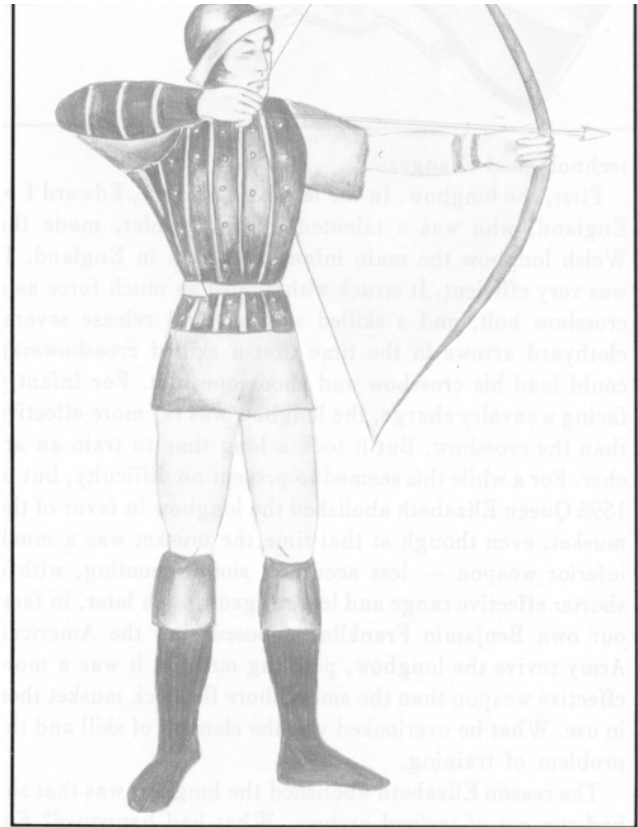
Actually, it's not so much a question of one versus the other, as questions of the extent to which technological change can be either speeded up or braked. The great success of the Manhattan Project has sold most Americans on the notion that if you throw in enough money and manpower you can do anything. But as Einstein and a few others pointed out to Franklin Roosevelt, the basic technology of building a fission bomb was known to scientists around the world. The issue was not *whether* it could be built, although a few bugs still had to be worked out, but *who* would build it first.

So there is no real analogy between our two most publicized national projects: to apply atomic fission and to cure cancer. When I talk with my colleagues who are plasma physicists and medical biologists, I find that they are practically unanimous in condemning the way in which Federal funds are being diverted from basic research to such mission-oriented programs. As one of my colleagues remarked, "Their mission is okay, but they are totally disoriented because the necessary fundamental knowledge doesn't yet exist." This is as true in engineering as it is in science.

Sometimes, very rarely, all the necessary elements of a new technology become available at one time and permit a great breakthrough. In the Middle Ages the most notable deliberate invention by a man who saw that all the elements were available was that of Johannes Gutenberg in the 1440s. The spinning-wheel had come into Europe from China in the late 13th century and had greatly speeded up the production of thread. Thread was the most expensive single item in unpatterned cloth-making. The spinning-wheel cheapened ordinary unpatterned cloth This meant that in the late 14th century there was an immense expansion in the production of linen. As a result, linen rags, the best raw material for paper, were plentiful.

So the manufacture of paper also exploded, with lower costs and vastly increased consumption. It was terribly expensive to make a big book of parchment or vellum. A book as large as Gutenberg's famous Bible would have used the hides of 200 to 300 sheep or calves. And making parchment or vellum was tricky work, requiring skilled hand labor; it couldn't be mechanized. Paper was much cheaper.

By Gutenberg's time the major cost of bookmaking, by



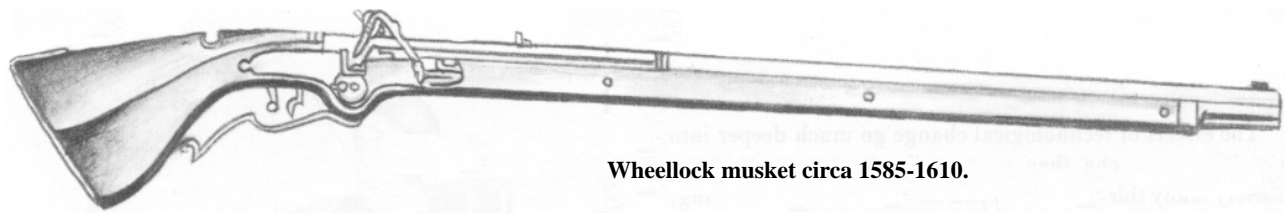
Archer with medieval longbow.

far, was the wages of the scribe. Most books were then made by professional scribes, rather than by the monks. In short, the spinning-wheel had created a situation in which it was economically desirable to develop a mechanical form of writing. Gutenberg was a jeweler by trade. He knew all the techniques of fine casting: rings, bracelets, the parts of necklaces — very delicate work. He applied these techniques to the casting of movable metal type. It took a lot of skill and big capital investment. But it was worth it because success would mean underselling the scribe-written book. Gutenberg cracked the problem in the late 1440s and the result contributed to a cultural explosion.

The point is that all the elements were there, waiting. Only the bugs had to be worked out and that was done within a few years technological change is not inevitable and human behavior in relation to it is not predictable. People have differing and complex structures of value. Everybody talks about the impact of technology upon society, but we neglect the way society shapes technology. Each society shapes technology in its own way.

How New Weapons Were Born

. . . Curious episodes in the history of weapons in the Middle Ages illustrate the elements of contingency in



Wheellock musket circa 1585-1610.

technological change.

First, the longbow. In the late 13th century, Edward I of England, who was a talented military leader, made the Welsh longbow the main infantry weapon in England. It was very efficient. It struck with almost as much force as a crossbow bolt, and a skilled archer could release several clothyard arrows in the time that a skilled crossbowman could load his crossbow and shoot one bolt. For infantry facing a cavalry charge, the longbow was far more effective than the crossbow. But it took a long time to train an archer. For a while this seemed to present no difficulty, but in 1595 Queen Elizabeth abolished the longbow in favor of the musket, even though at that time the musket was a much inferior weapon — less accurate, slower-shooting, with a shorter effective range and less rugged. Much later, in fact, our own Benjamin Franklin proposed that the American Army revive the longbow, pointing out that it was a more effective weapon than the smoothbore flintlock musket then in use. What he overlooked was the element of skill and the problem of training.

The reason Elizabeth abolished the longbow was that she had run out of trained archers. What had happened? For about the first hundred years after Edward I developed the longbow, through the first part of the Hundred Years War in France, the manpower supply held out well. Then something ominous happened. In 1365, Edward III prohibited bowling, quoits, handball, football, club-ball (which was something like baseball), hockey and cock fights, and he told the English common people to start practicing archery for the good of Merrie England. Another decree in 1388 abolished tennis and dice. Needless to say, none of this worked. The decline of archery continued. Why? For the answer we have to look more closely at what was happening to English peasant life.

In the late 13th century, European agriculture was already in the process of shifting from the ox to the horse as the chief draught animal, especially in the richer areas. The horse normally walks twice as rapidly as the ox. With a horse team for ploughing or harrowing you could go out twice as far from your house to the field as you could with an ox team in the same time.

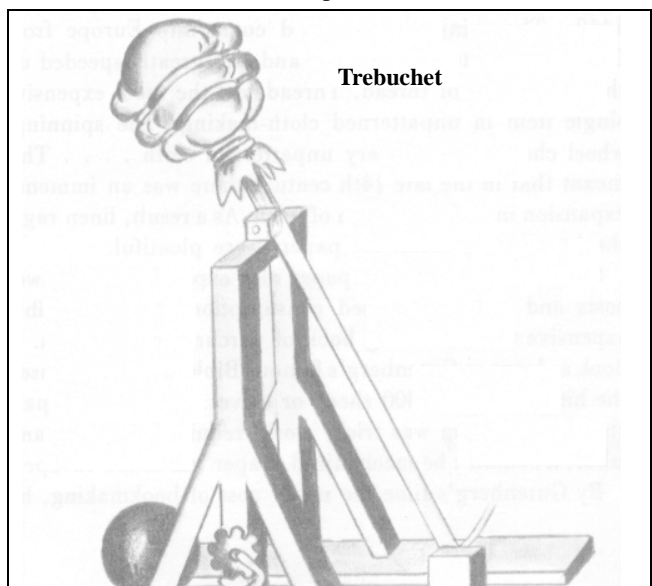
It was thus possible for peasants in Western Europe to begin abandoning little hamlets of four, five and six families and to cluster into larger villages that offered greater protection and sociability. They continued to cultivate the same fields, but, to put the matter in mathematical terms, the rule of the ratio of the radius of a circle to its area came into play.

Archery was the best sport available for a hamlet. A couple of guys could go out and shoot at a target and have a

good time. On the other hand, you couldn't play many team games in so small a settlement. But in a village, team games such as those prohibited by Edward III became popular. What's more, while a hamlet could not support a tavern, a sizeable village could, and this was very distracting. The boys didn't go out to the target range as often as they did before.

Then, in the middle of the 14th century, came the Black Death and subsequently a number of other devastating plagues. By the end of the century population was perhaps half of what it had been in 1348 when the Black Death struck, and the labor force, not swiftly but inexorably, tended to concentrate on the richer soils in larger communities, abandoning even more of the small hamlets. This process further hastened the decline of archery.

In short, in late medieval England, despite the agony of which the Black Death was a symbol, the tempo of peasant life, indeed the tempo of all life in England, had accelerated. This was Chaucer's England, a fast-moving society. Nobody much was going out to shoot at the butts; they were having too much fun doing other things. So England simply ran out of archers, and the Army had to adopt a much inferior weapon, the musket, which could be handled by any drunk picked up from the London gutters and dried out. All he had to do was load it (that took a little coaching), point it in the right direction and pull the trigger. What about cannon? Greek and Roman artillery had depended on torsion and tension. This was all right in the hot dry summers of the Mediterranean area, but in damp weather bowstrings and twisted cords stretch and lose power.



Trebuchet

Sometime in the latter part of the 9th century, a new kind of artillery, the trebuchet, came in from Asia, possibly China, via the Islamic countries. The trebuchet had a long throwing arm mounted on a tripod like a lever on a fulcrum. A lot of ropes were attached to the short end, and at the tip of the throwing arm was a large sling to hold the projectile, usually a rock. When somebody blew a whistle, the operating crew would yank the ropes, bringing the throwing arm violently up to hurl the rock in a high arc toward the target. Since the trebuchet could be used even in the pouring rain, it was much better suited to northern Europe where it rains constantly both in winter and in summer.

Just before 1200, some engineer (the word, incidentally, was just beginning to emerge in the European languages at that time), devised a way to substitute gravity for the muscles of the trebuchet's operating crew. He attached a pivoted caisson filled with rocks or earth to the short arm. It took only a few men with a capstan and a pulley arrangement to pull down the throwing arm and raise the caisson. When the throwing arm was released, the caisson fell, sending the projectile on its way.

This was an enormous improvement, because if the length of the firing arm were kept steady, the weight of the rocks in the caisson constant and the projectiles the same weight, shape and size, one could hit the same place on the wall of the besieged castle or city every time. By 1244, in the arsenals of the King of England, two sizes of trebuchet balls were being cut by masons to calibrations supplied by military engineers. This was the cannonball before the cannon. The trebuchet was a very effective siege weapon.

Then suddenly, in 1326, the first gunpowder cannon showed up. Probably powder came from China, but it is my personal belief, subject to rectification, that the cannon itself was a European invention. The next cannon we know about appeared the very next year in England, and before very long every ruler was using them.

Now, if there had been a committee on technology assessment to appraise the value of the cannon, the yardstick would have been the trebuchet. By then the larger trebuchets could throw stone balls of several hundred pounds' weight really significant distances. Any practical military man comparing the two would probably have said, "Stick to the trebuchet; this cannon is a sure loser." After all, the cannon was costly to cast; its chemical fuel was very expensive to make; and, it was terribly unreliable and dangerous to its users: cannons blew up all over the place and, in fact, continued to blow up right on into this century. Even worse, gunpowder, which consists of charcoal, sulfur and saltpeter, when transported would jiggle and the light particles of carbon would sift up to the top, making it necessary to resieve the powder before using it, which was not the safest thing to do in the enthusiasm of battle.

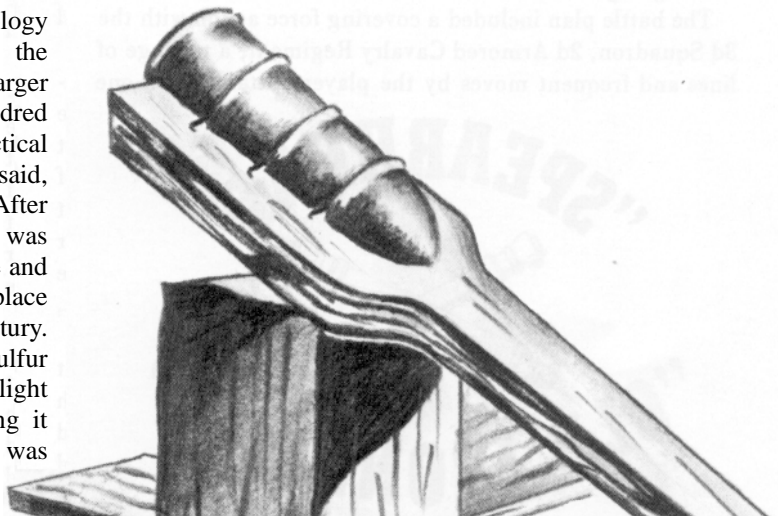
It was not until 1429 — 103 years after the first appearance of the cannon — that we find any evidence of "corned" gunpowder, as it was called; that is, powder compressed into small pellets which preserved the three ingredients in their correct proportions. Corned powder had the added advantage that the air spaces between the pellets produced a faster combustion. But, I repeat, this was 103 years after the first cannon. Clearly, the trebuchet was much the better weapon for a long, long time. And yet, by 1400, according to a recent study, the trebuchet had practically vanished, long before anything like a decent cannon had been developed. Despite this, everyone insisted on having these expensive, inefficient cannon. Why?

One reason, apparently, was the splendid roar and flash of the cannon: it was irresistible in both senses. Also, since war is a form of politics, the very expense of cannon made them a status symbol. Third-rate rulers couldn't afford them. So, if you wanted to impress the competition with your importance, you had to bankrupt yourself buying cannon. It was all pretty irrational. Not until about 125 years after the first cannon appeared in Florence was the cannon developed to the point where it could match the trebuchet, which had virtually disappeared about 50 years earlier.

You needn't laugh at our medieval ancestors. Sociologists have been talking for some time about America's "love affair" with the automobile Engines have no morals, but a society, if it is to be healthy over a long period, must pay close attention to the human implications of the engines and devices that it develops and uses



Dr. Lynn T. White Jr. is University Professor of History, University of California at Los Angeles.



RIGHT BY PIECE

Div Artys Cooperate

GRAFENWOEHR — USAREUR's two armored divisions joined their "mailed fists" and recently completed the most ambitious Army Readiness and Training Evaluation Program (ARTEP) ever designed to test direct and general support (GS) artillery battalions.

Artillery units of the 1st and 3d Armored Divisions combined efforts at Grafenwoehr for a test under the new ARTEP that overshadows standard training manual doctrine.

"The artillery ARTEP is designed to evaluate a battalion's ability to perform its mission of supporting the maneuver battalions. Our units were involved in the 1st Armored Division maneuver battalion ARTEPs as one of the command elements. However, we have to do a great deal of live fire for our own evaluation, so an ARTEP for artillery had to be structured and run separately from the major division test," said LTC Anthony C. Germann, operations officer, 1st Armored Division Artillery.

"We wanted to get two battalions working together, but our GS battalion was not at Graf, so we coordinated with the 3d Armored Div Arty, and the 1st Battalion, 40th Field Artillery, was tasked to reinforce our 1st Battalion, 22d Field Artillery. That's been the big plus — the two div artys working together," he said.

The battle plan included a covering force action with the 3d Squadron, 2d Armored Cavalry Regiment, a passage of lines and frequent moves by the player battalions. In one

15-hour stretch, a battery moved eight times to prevent the enemy from fixing its location.

Commander of the 1st Armored Div Arty, COL Robert C. Foreman, said: "This ARTEP is great. The troops are just loving it. They're moving, shooting, communicating. This ARTEP is much more ambitious than the ones you read about in training manuals.

"Our objective is to be combat ready, and we're headed in the right direction. Our firing batteries are very strong, and our command and control in the moving, fluid scenario has made all the difference in the world.

"This doesn't just happen. I think the ARTEP reflects the trend of young officers' thinking.

"Frankly, we've shown the flexibility of artillery. We've taken a joint mission and exchanged liaison officers and radio frequencies with no problems at all," Colonel Foreman concluded.

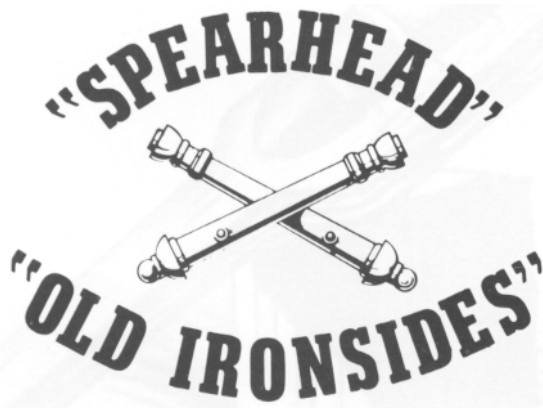
LTC Noel D. Gregg, commander of the 1st Battalion, 22d Field Artillery, had been an umpire for earlier Army Training Tests which the ARTEP replaced: "This ARTEP is not a radical departure from what field artillery had been doing, but it is so much more realistic. It's a much better vehicle for a commander to use for training his men as well as for evaluation." He added that the key elements of the ARTEP were the emphasis on responsiveness and survivability.

"The ARTEP is not just a test of our soldiers," explained CPT Warren J. Wall, commander of B Battery, 1st Battalion, 22d Field Artillery. "It's a real life situation to them — they get more understanding of their mission. They learn faster, and the knowledge and experience stays longer."

PCS Status Due Brigades 75 and 76

WASHINGTON — The Army's Brigade 75 and Brigade 76 will change from a rotational to a permanent change of station (PCS) status when planned moves within and to Germany are completed.

Department of Army officials report Brigade 76 will assume the PCS status in October when its second increment deploys to Germany. Brigade 75 converts to the



PCS status in late 1977 when it moves to north Germany to join NATO forces there.

Conversion to a PCS status means that troops may take their families with them. They will now serve a regular tour in USAREUR — 39 months for single soldiers and those accompanied by dependents and 27 months for married service members not accompanied by dependents.

Brigade 76 will travel to Germany in two deployments to be completed in the fall. The first deployment — two artillery battalions from Fort Sill — is complete.

Soldiers in the initial deployment with Brigade 76 will serve six months TDY and then rotate stateside. Those in the second group, set to travel in the fall of this year, will serve a regular USAREUR PCS tour; 25 percent will go in TDY status to be replaced by PCS personnel in spring 1977. Headquarters for Brigade 76 will be in Weisbaden, just west of Frankfurt. The artillery units are in Augsburg in southern Germany.

The 3,800-man Brigade 75 from the 2d Armored Division will be stationed in the town of Garlstedt, 20 miles south of the port city of Bremerhaven. Most of the married personnel will live in German-built housing leased by the Army.

The Army in Europe will now have the equivalent of five combat divisions. Both brigades will operate as separate units under USAREUR command. They will revert to their original designations: Brigade 75 becomes 3d Brigade, 2d Armored Division; and, Brigade 76 becomes 4th Brigade, 4th Infantry Division.

Artillery Training At West Point



USMA — Field Artillery instruction for most West Point cadets is concentrated in Third Class (Sophomore) Cadet Field Training during the cadet's second summer at the Point. In fact, for many of the approximately 20 percent of each class who select Field Artillery, this constitutes their only exposure to the branch before commissioning.

Training, conducted at Range 2 on the West Point Reservation, is the responsibility of the Field Artillery Committee, USMA Office of Military Instruction. Assisting in the summer training are officers from various departments under the Dean of the Academic Board and an infantry



Photo by Bob Matteson.

fantry battalion task force which includes elements of two field artillery batteries.

Yearlings, as third class cadets are called, receive two and one-half days of instruction and hands-on training. They are first introduced to field artillery by the senior instructor and view a demonstration of an emergency mission. Although this is the cadet's first exposure to field artillery, the objective of the training is not only to orient each cadet in the function of each branch but also to develop in each cadet, selected AIT-level soldier skills.

A typical platoon goes through nine hours of Phase I training. Observed fire instruction, taught to groups of seven or eight cadets, begins with an explanation of the call-for-fire, proper use of the binoculars and the mil relation in shifting from a known point. After a sample mission is explained step-by-step, live firing with the 14.5-mm M31 trainer begins.

Next, the platoon is taken to the fire direction area where training is conducted in five fire direction centers (FDCs). After demonstration of an adjust-fire mission, each member of the model FDC explains his duties, discusses the equipment he uses and talks the cadets through a practical exercise (PE). When all duties have been discussed, missions are practiced. The period concludes with a graded examination, which, with other such examinations, counts toward the coveted field artillery trophy awarded annually to the cadet company which performs best during field artillery training.

Firing battery instruction is the final block of Phase I. The battery executive officer (XO) explains how to lay the battery by using both the orienting line and magnetic methods. The cadets then go to the six section chiefs who elaborate on the XO's explanation, and then the section chiefs supervise the cadets in a PE during which each cadet has the opportunity to lay the howitzer both as an XO and as a gunner. This period closes with a cannoneers hop.

Right By Piece

During Phase II, the cadet has an opportunity to use his newly-acquired field artillery skills in a live-fire exercise. A typical platoon begins with adjustment of fire. The majority of the platoon is taken to McNair observation post (OP), a bunker within the surface danger area, where four instructors grade the adjustment of fire in a Fort Sill-style observed-fire shoot. The remainder of the platoon, consisting of those cadets who demonstrated exceptional ability during Phase I, are taken to OP5 where the angle T is 1600 mils as opposed to the 200 mils used at McNair OP. Again the cadets adjust fire, and most cadets are afforded the opportunity to shoot an additional mission from an OH-58 helicopter. The ability to call for and adjust fire is an essential skill, the satisfactory completion of which is required for the cadet to pass Third Class Cadet Field Training.

A "split shoot" forms the second part of Phase II, and the cadet's time is divided evenly between firing rounds as a section chief and as a cannoneer and computing data in the FDC. During the FDC portion of Phase II, FADAC is introduced and used by the cadets.

The final portion of the cadet's instruction at Range 2 is devoted to reconnaissance, selection and occupation of position (RSOP) which begins with a short demonstration of a battery occupying a position. Cadets then take over and conduct a two-position RSOP in which the performances of cadets acting as battery commanders, XOs, AXOs, first sergeants and chiefs of firing battery are evaluated. All leadership positions are held by cadets, and the supporting FA battery personnel are on hand to answer questions and guide them.

No matter which branch he may finally choose, the cadet who successfully completes the instruction presented on Range 2 had a solid appreciation of the job of a field artilleryman.

Guard Receives Modified SP Howitzers

LETTERKENNY ARMY DEPOT, PA — The first of approximately 500 Army National Guard 155-mm M109 self-propelled howitzers (modernized under a multimillion dollar Guard "repair and return to user" conversion program at Letterkenny Army Depot) was recently turned over to BG Joseph R. Jelinek, deputy director of the Army National Guard.

Letterkenny Army Depot is the prime depot for repair or overhaul of self-propelled artillery. These Guard howitzers are being converted to an M109A1 configuration, providing for an extended range weapon through improved sighting



and fire control systems. To extend over a four-year period, the program is designed to modernize the Guard's howitzer units so they will be comparable to the Guard's active Army counterparts.

TC 6-50-1 At Graf

GRAFENWOEHR — The artillery cannot afford to forget that it supports armor and must move with them. The new training circulars being published by the Field Artillery School have provided an impetus to artillerymen worldwide. A unit in Germany practicing the new concepts has found a tactic more fitted to the anticipated fluid war.

C Battery, 6th Battalion, 14th Field Artillery, 1st Armored Division, recently spent 30 days thoroughly practicing and evaluating movement and flexibility of the unit using the principles in TC 6-50-1, *Firing Battery Operations*. The results provided some ideas which counter those outlined in the TC.

Previous training had revealed one major equipment deficiency — the M561 Gamma Goat was far from the ideal vehicle for a battery operations center (BOC). In lieu of the M561, C Battery borrowed an M113 APC from the infantry for the tests. The M113 used was equipped with an AN/VRC-47 radio and provided numerous advantages over



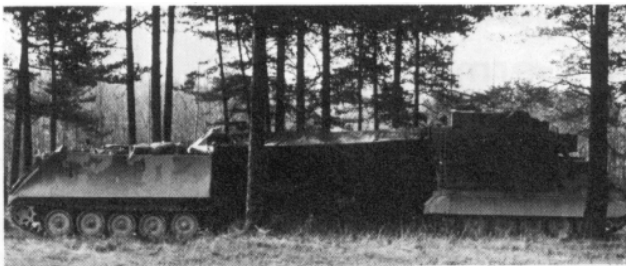
The hot element/platoon on the move under the direction of the M113 battery operations center.

Right By Piece

the Gamma Goat to include:

- Cross-country mobility equivalent to that of the M109A1.
- Better interior working conditions for an alternate FDC.
- Internal communications during movement.
- Increased night light discipline.
- The ability to "button up" during enemy activity.

Previous participation in exercises such as REFORGER had shown that in fast-moving situations the battery commander (BC) was forced to reconnoiter continuously. TC 6-50-1 had not allowed for this when the BC was given the M561 with which to lead two howitzers forward. In this testing it was found more desirable for the BC to use a quarter-ton truck and place the executive officer in charge of the M113 BOC.



M113 battery operations center is colocated with the fire direction center in battery position.

Also prior to the test, the unit organized the firing battery into three platoons. Though not a new concept, it is not used extensively. By the end of the month, each platoon became an integral unit and the habitual relationships developed between the howitzer sections facilitated command and control of the unit during movement and firing.

Emplacement-to-first-round times were reduced by as much as 50 percent. A typical movement occurred as follows:

- 1) BC, on reconnaissance, finds a suitable unit location and calls the "hot element" forward. (This element consists of the BOC, one firing platoon — two M109A1s and two M548s — and communications personnel as necessary.
- 2) The hot element moves to and occupies the forward position. Advance party personnel from the other sections move forward with the organic vehicles of the hot element.
- 3) After the hot element is in location, the remainder of the unit is called forward.

Though similar to TC 6-50-1, the actual process of the move is expedited by both the BC's previous reconnaissance and the continuous platoon relationships used by the unit in the field. Additionally, the hot element concept is used for a variety of other purposes.

Traditionally, the artillery has liked the "roving gun" concept for both offset registrations and for nuclear missions. C Battery found in its testing that, when a single hot element was used for both purposes, a number of advantages were gained:

- 1) In case of loss of one howitzer due to mechanical difficulties or enemy activity, the second howitzer could complete the mission.
- 2) The second howitzer provided a limited recovery vehicle capability in case of mechanical problems.
- 3) In an emergency mission, the platoon provided significant firepower compared to a single piece.
- 4) The second howitzer provided improved security for the element.

At the end of the testing, the unit moved smoothly and quickly. All platoons were capable of functioning efficiently as the hot platoon or with the main body. The BC's control was improved using the platoon concept and a minimum of instructions was necessary for any mission.

Within the firing battery position, a number of initial problems were encountered. The largest of the problems resulted from the separation of the BOC and the FDC while in a static position. The problems were:

- Firing data were not always current between the two elements.
- Both the XO (BOC) and the assistant XO (FDC) were fairly fixed in their locations, handling operational traffic at the BOC and firing traffic at the FDC.
- Coordination of simultaneous missions was not always smooth and required excessive talk between FDC and BOC.
- Manning both locations required excessive manpower.
- A steady stream of messengers was going from BOC to FDC for coordination.

To solve these problems, the BOC was joined with the FDC when both were in the same firing location. It was realized that the survivability gained by the separation of the elements was compromised; however, firing data were continuously current between the two elements, the XO was free to supervise his firing battery properly and an economy of personnel became apparent. The freedom of the XO became increasingly important since the BC was usually away on reconnaissance.

When the 30 days' work with the new ideas concluded, the unit had achieved new highs of readiness and flexibility. The variations from TC 6-50-1 used by this unit definitely improved its ability to function regardless of the situation.

2-8th FA Breaks The ARTEP Ice

CAMP ROBERTS, CA — The 2d Battalion, 8th Artillery (105 TOWED), underwent the first battalion-level artillery Army Readiness and Training Evaluation Program

Right By Piece



Eerie shadows of a camouflage net speckle a howitzer section of Battery C, 2-8th FA, during the first artillery ARTEP conducted by the 7th Division.

(ARTEP) administered by 7th Infantry Division since reactivation of the Division at Fort Ord, CA, in November 1974.

The 2-8th FA, commanded by LTC William W. Breen, motor marched to Camp Roberts and was alerted for the evaluation at 0600 hours. The scenario gave the battalion the tactical mission of direct support of the 1st Brigade of the 7th Infantry Division in both offensive and defensive operations. The unit employed many forms of support ranging from the dedicated battery concept to direct fire in accomplishing the mission.

After 20 hours of continuous moving, shooting and communicating, the evaluation was terminated and the battalion was judged to be combat ready. COL Robert D. Hammond, 7th Div Arty commander, observed that the battalion had successfully demonstrated the required training level in delivery of fire, tactical operations and fire support coordination.

Now that the ice has been broken, the remaining units in the div arty are preparing to equal or surpass the results of the 2-8th FA.

Helicopters Move National Guard Battalion

SCHOFIELD BARRACKS — For the first time in the history of the Hawaii Army National Guard, an entire field artillery battalion was moved by helicopter this summer. The move was a joint airmobile exercise with members of the 2d Battalion, 11th Field Artillery, 25th Infantry Division.

The purpose of the exercise was to give the men of the Guard's 1st Bn, 487th Field Artillery the experience of

moving with their equipment under simulated battlefield conditions.

With the assistance of the 25th's Chinook helicopters, 150 men and 12 howitzers and personnel carriers were carried in 27 loads. The entire operation took two hours. Once in place, the howitzers were fired by the men of the 1-487th.

The Hawaii Army National Guard's 29th Infantry Brigade, when called to active duty, would become the third infantry brigade of the 25th Infantry Division under the Army's Roundout Program. In this exercise, the Army provided the Guard with helicopters, military instructors and coaches, and the Guard provided the manpower.

Brigade 75 In Germany

GRAFENWOEHR — The 1st Battalion, 3d Field Artillery, 2d Armored Division, was the first unit to arrive in Grafenwoehr, Germany, for Brigade 75 III.

Engaged in day and night field training, the batteries of the 1-3d FA have been paying close attention to the howitzer sections — the lowest echelon of firepower. The culmination of this hard work was a section Army Training and Evaluation Program.

The top section in the battalion, led by Sergeant Lash of B Battery, won a trip to Copenhagen, Denmark, and was feted at a battalion party.



A howitzer section from the 1-3d FA, 2d Armored Division, awaits a fire order deep in German woods after its "deliberate occupation" part of the section ARTEP. In this portion of the test, a section has 30 minutes to set up, camouflage, establish security and prepare to fire.

Redleg I

GRAFENWOEHR — "60, 59, 58, 57, 56 . . . 2, 1, 0." At that instant, a total of 138 rounds impact on one square kilometer of ground. The end result, one of the biggest TOTs ever held at Graf.

That is how the 3d Armored Division Artillery's command post exercise (CPX), Redleg I, ended at the Grafenwoehr

training area.

The time on target (TOT) (a method of bringing maximum firepower against an enemy at a particular time) was the "main event" of the CPX and required a lot of time to organize.

The TOT was organized by LTC William Emacio, assistant fire support coordinator, and included two units from 1st Armored Div Arty, one each from the 2d Armored Div Arty, 3d Infantry Div Arty and 41st Artillery Group (V Corps), plus the four units from the 3d Armored Division.

Div Arty ARTEP

GRAFENWOEHR — Challenging, unpredictable, formidable. One day it was cold — the wind-chill factor lowered temperatures to hardly bearable. The next day there was four feet of mud. Three days later, the mud had turned into a fine, white penetrating dust, coating the trees along the tank trails. By midday, the soldiers had a white film of dust on their hair; their clothes looked battered and well-worn. The vehicles had lost their camouflage to the dust.

Just about everybody in the 3d Armored Division samples Graf life at one time or another. This time it was the division artillery's turn to go there for its annual battalion Army Readiness Training and Evaluation Program (ARTEP).

This ARTEP took on a unique twist, with div arty battalions joined by the German Army's 10th Jaeger Brigade and 105th Field Artillery Battalion.

Each of div arty's four FA battalions — 2-27th, 1-40th, 2-6th and 2-3d — took the test.

In the event of war, Americans would be fighting alongside German troops. Since the language barrier alone could be catastrophic in combat, elements of the German 10th Jaeger Brigade were deployed to operate with the div arty units during the ARTEPs. Both German and US forward observers called in requests to the main fire direction center where all the necessary translations were made, the data calculated and fed to the guns.

Initially, the Germans were the frontline security force, supported by a div arty battalion. Eventually, the Germans would pull out and head north to their normal sector of defense and the div arty battalion would have to change its tactical mission and deploy in support of a simulated American brigade.

Two German decontamination elements from the 10th Jaeger Brigade participated in div arty's nuclear, biological, chemical operation. Men and materiel had to be decontaminated. After removing their field gear, the men went into a tent, stripped down and then moved into the adjoining tent where they showered. The men also trained in scrubbing down their boots, weapons and



A decontamination team from the German 10th Jaeger Brigade hoses down a howitzer. (US Army photo by SP5 Pamela Frederick)

equipment.

When the Germans had evacuated to the north, the div arty battalion moved into its new sector at night under blackout conditions.

At 11 pm on the second day of each ARTEP, the battalion fired a time-on-target mission into the impact area.

Sometimes an inefficient move or decision resulted in embarrassment, a deflated ego or lost confidence. According to LTC William Emacio, chief controller for the ARTEPs, the basic concept of ARTEPs is to evaluate the troops while they are training — to show the strong points and identify those areas that need improvement. He said it was important that a soldier make his mistakes now and learn from them, instead of making mistakes on some future battlefield where he won't get a second chance.

In the course of each exercise the battalions packed and unpacked three times. Personnel were gassed, decontaminated, mined and occasionally embarrassed. They were harrassed by jets, humiliated by capture, slept an average of four hours a day . . . and still maintained their vehicles. They were tested on general military knowledge and everything the testers could come up with on the subject of the enemy.

Three of the battalions faced one more hassle when they rolled in from the field — the Maintenance Evaluation Team. The other battalion had been inspected just before its departure to the field. ☒

The Infantry -



An American 75-mm gun crew in action.

In the half century since World War I, warfare has made quantum jumps in selected areas. For example, we have gone from crudely powered flights to manned and unmanned satellites orbiting the earth in hours or remaining stationary over desired locations. We can even control the weather. We have laser-guided and rocket-assisted projectiles. Technology has indeed made marvelous strides. The human aspect has not changed much.

*These stories from the battle of WWI illustrate only too well our lack of meaningful advance in fire support. How many of these same 50-year-old problems have you seen repeated in recent training? How many of these problems are our doctrine and training experts still wrestling with? Are men really smarter than the machines they create? Excerpts from Chapter XVIII, "Infantry-Artillery Team," **Infantry In Battle**, published in 1939 by **The Infantry Journal, Inc.** —Ed.*

Artillery Team

The effective functioning of the infantry-artillery team depends upon the intelligent and unremitting efforts of both members to solve the difficult problem of liaison.

When infantry has room to maneuver or is not faced by strong continuous resistance, it may be able to advance with little or no assistance from tanks and artillery. This situation may arise when the enemy is not determined to hold, or after the rupture of his position. On the other hand, when confronted by determined resistance from a strong enemy who is well equipped with machineguns, infantry requires all possible assistance from the auxiliary arms, particularly the powerful help of the artillery, in order to have any chance of success.

In our problems and exercises we have adopted a liaison technique which permits infantry-artillery teamwork, but does not insure it. Mere physical and intellectual liaison between these two arms is not enough; there must be moral liaison as well. The infantry must know and trust the artillery; the artillery must know and trust the infantry.

Let us examine some of the many difficulties the infantry-artillery team meets in the attack. Let us assume that a battalion has an artillery liaison officer with it, that communications are working and that in the initial stages of the attack the artillery can fire its concentrations either on a time schedule or by direct observation of the infantry's advance.

So far, so good; or, at any rate, not so bad. But now what happens if the infantry goes too fast, or not fast enough, for a time schedule of concentrations? What happens if it goes through terrain where it and the enemy are both lost to view of artillery observers?

Usually it will not be long before our battalion strikes a snag. The problem of infantry-artillery liaison then becomes acute. Pinned to the ground, platoon leaders have only a vague impression of the sources of hostile fire, and that impression may be in error.

Although it will seldom be true, let us assume that all officers are provided with adequate maps. Let us further assume that some of the enemy can actually be seen. Subordinate leaders must now transmit this information to the rear, together with the locations of their own units. Just how accurately will these platoon leaders be able to locate this hostile resistance on the map? How precisely will they indicate the positions of their own troops? Remember, this will not be done in the academic quiet of the map-problem room, but in the confusion and stress of battle; not on new, unfolded maps, but on maps that are muddy, wet and wrinkled from a hundred folds.

The message goes back by runner and eventually reaches the battalion commander. This officer still has to formulate his request and, through his liaison officer, transmit it to the artillery. Even if we assume that this message is clear and accurate and contains all that the artilleryman must know, there are still other factors to be considered. The message may be long and involved. The artillery has to receive it, may have to compute data and then has to get on the target. Even if everything is accomplished with 100 percent efficiency and good luck, how long will it all take? In exercises we do these things in a few minutes; in war they often take hours. The artillery may lack ground observation. The infantry's request may be incomplete or inaccurate. Communications may break down. These and a thousand and one similar obstacles may arise that must be overcome before the artillery can come to the aid of its partner.

Here are the things that artillerymen must know: accurate location of the target; nature of the target, whether it is an enemy machinegun, a line of foxholes or a counterattack; the location of the frontline of friendly troops; when the fire is to start; and, finally, when it is to stop. Unless it has this information, the artillery cannot respond effectively to the calls made upon it by the infantry it supports. But how often and how fast can the infantry furnish this? Artillery observers seldom know all of it unless they are told. They can see something, but not everything.

As a result of the lessons of the World War, we shall probably avoid some of the more common errors we made then. For instance, the artillery liaison officer will certainly not be chosen for his uselessness to the artillery, as seems to have been done in some cases.

We have a good mechanism, we prepare and number the concentrations that are likely to be needed and we are well-schooled in theory. But how many infantry units frequently participate in exercises in which artillery is represented and infantry-artillery liaison emphasized and when there is anything beyond the transmission of a routine message or so? Has the infantry been practiced, under battle conditions, in transmitting requests to the artillery quickly — requests that the artillery finds adequate for fire on unexpected targets?

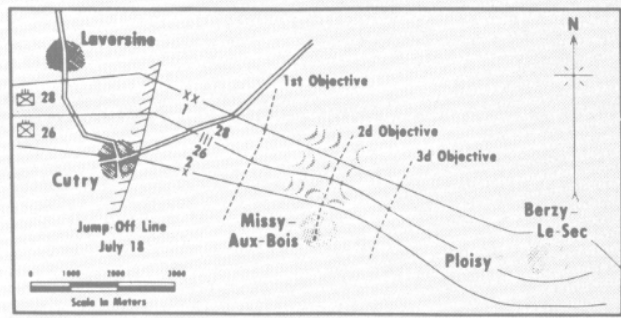
Unless infantry considers the artillery in all its actions, it is headed straight for trouble!

In many instances in the World War, artillery gave extremely effective support to the infantry. If we expect this to be normal we must make it normal. We must be prepared to deal with the difficult situation as well as the situation that solves itself. The infantry-artillery team is not a fair-weather partnership. For this reason the first historical example that follows deals with a situation in which infantry-artillery teamwork was not attained.

July 1918

On July 18, 1918, Battery A of the US 7th Field Artillery formed part of the artillery supporting the 28th Infantry (1st Division). The initial artillery support was to take the form of a rolling barrage. Telephone wires had been installed, liaison detachments had gone to their respective headquarters and H-hour (4:35 am) found the battery in position, prepared to take its proper part in the attack.

In this operation the artillery battalion commander had been ordered to accompany the infantry commander whom he was supporting; this was in addition to the usual liaison officer furnished the infantry. Since there was no executive officer provided at that time in the artillery organization, the senior battery commander was detailed to act in this capacity in the absence of the battalion commander. The commander of Battery A took over this duty. The procedure had certain disadvantages. To quote CPT Solomon F. Clark: "Messages from the infantry came through the battalion commander. Messages, orders, fire charts, etc., from the artillery brigade invariably came direct to the battalion CP near the batteries. This procedure practically deprived the artillery battalion commander of the ability to control his unit, and resulted, in those cases where it was followed to the letter, in command being assumed by junior officers for considerable periods of time."



At 4:35 am the batteries opened. No caterpillar rockets were seen, so the artillery concluded that it was not firing short. Liaison officers soon reported that the barrage was satisfactory. The attack progressed and Battery A displaced forward.

The liaison officer with his detail of a half-dozen men had gone over the top with one of the assault companies of the 28th Infantry. In the fighting near the Missy-aux-Bois Ravine, the platoon to which he had attached himself became separated from the others. Soon the platoon commander found himself out of contact on left and right. The lieutenant, who had never fired a rifle, became engaged in a duel with a German sniper and was wounded in the arm. To quote Captain Clark, "It may be easily imagined that liaison under these conditions practically ceased to exist."

Late on the morning of the 18th the commander of the artillery brigade visited Battery A. He stated that the infantry had far outrun the artillery fire, that they were at that time near Berzy-le-Sec and that their frontline was beyond the artillery's maximum range. Reconnaissance parties were sent out and, after some time, determined the location of the frontline. It was by no means as far advanced as Berzy-le-Sec. In fact, the infantry did not take that town until several days later.

(From the personal experience monograph of Captain Clark, Field Artillery.)

Discussion

The 1st Division had been in training in France for more than a year and had had six month's experience in the frontline. It has participated in a limited objective attack at Cantigny. It was accustomed to the idea of liaison officers and was determined to solve the problem of tying in its artillery with the infantry. Is it reasonable to expect that the average division will be better prepared?

At the start of the attack liaison was perfect. The form of support — a rolling barrage — facilitated this at first. The rolling barrage, which lifts on a time schedule and moves forward, starts with the infantry but thereafter it may be either too slow or too fast. In one case it retards the infantry; in the other it outruns them, failing to give support where and when support is needed. However, "lifts" on a time schedule can solve the early part of the problem if the infantry and artillery have coordinated beforehand.

The real trouble develops later. For instance, in the foregoing example, the artillery brigade commander was completely in error as to the location of the frontline infantry. It is obvious that unless the artillery knows the infantry's location it is going to hesitate to fire. Yet, despite this natural reluctance, it is only necessary to read the personal experiences of frontline infantry leaders to realize that all too frequently artillery does fire on its own troops. In fact, General Percin of the French Army estimates that 75,000 French casualties were caused by French artillery during the last war. American artillery frequently faced the same indictment.

It is infantry-artillery liaison that seeks to remedy such conditions and that strives to promote a more smoothly functioning partnership. This should be borne in mind when the artillery liaison officer reports to the infantry commander; an immediate conference should follow, and not a perfunctory one either. The infantry commander should thoroughly acquaint the liaison officer with the situation and, in turn, be thoroughly acquainted with the artillery plan, the location of the artillery's OPs, the plan for displacement of observation and the terrain the artillery commands with its observation and fires. Infantry should

also have a clear understanding of the work of the liaison detail itself. During the World War an infantry commander often told his liaison officer, "You stay here," and then promptly forgot all about him.

The artillery believes today that a liaison officer, unless definitely needed at the front to check or observe fire, should stay with the infantry battalion commander. The artillery liaison sergeant remains at the command post in the absence of the battalion commander and the liaison officer. He keeps abreast of the situation and is authorized to transmit requests for fire. If the liaison officer is at the command post, the sergeant goes to the observation post.

In the example we have just examined, the artillery liaison detail displayed great gallantry. They rivalled their infantry comrades in pushing forward against the Germans, but they did not do the job they were sent forward to do.

The infantry-artillery liaison mechanism existed then in much the same form it does today. The troops were better than the average that can be expected in the opening stages of any future war, and yet late in the morning of this attack liaison "practically ceased to exist."

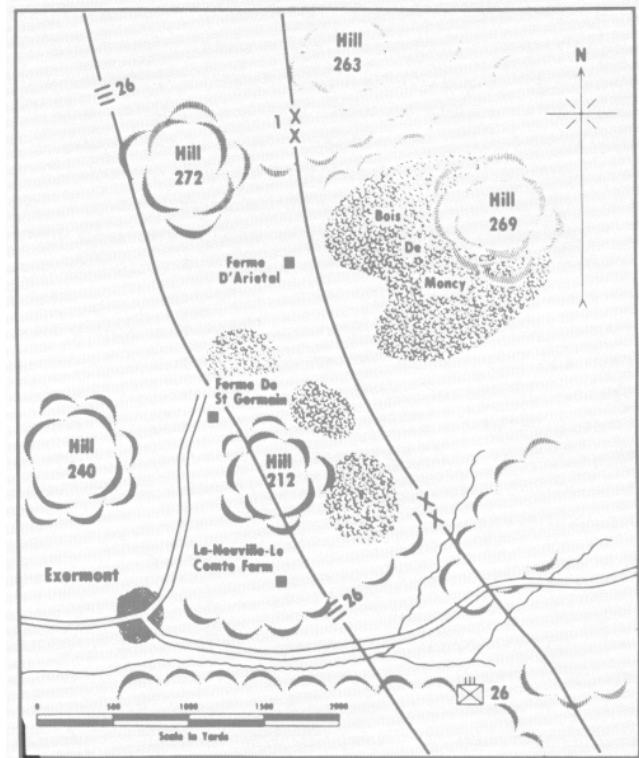
Prearranged fires, assignment of specific artillery units to support specific infantry units and the dispatch of liaison officers from artillery to infantry will not by themselves insure infantry-artillery teamwork.

October 1918

On October 4, 1918, the US 1st Division launched its attack in the great Meuse-Argonne offensive. By noon the following day the 1st Battalion of the 26th Infantry had captured Hill 122 and the woods east of that hill. At this time the 3d Battalion, which had been in reserve, was ordered to advance, pass through the 1st Battalion and continue the attack. At 1:15 pm the relieving battalion reached the forward lines of the assault units.

Here the battalion commander was informed that a barrage would be laid on the southwestern part of the Bois de Moncy, which dominated the valley from Hill 122 to Hill 272. This valley had to be crossed in the advance. The barrage was scheduled to come down at 1:45 pm, stand for 15 minutes and then roll forward. To quote the battalion commander: "This necessitated a nerve-racking wait of 45 minutes under heavy artillery and machinegun fire delivered at short-range from across the valley and enfilade fire of all arms from the Bois de Moncy. But it was too late to do anything about it."

The battalion advanced behind the barrage and, against strong opposition, fought its way forward to a point south of Hill 272. To quote the battalion commander again: "During all this time the artillery liaison officer, who had accompanied the 3d Battalion commander, did excellent



work. He controlled the fire of two guns that were located southwest of la-Nouvelle-le-Comte Farm. He had direct telephonic communication with these pieces. Instead of giving targets to his guns, this unusually competent officer issued fire orders from wherever he happened to be. He thus destroyed many machineguns and two pieces of artillery. His fire could not only be directed on all targets to the front, but on targets located along the Bois de Moncy as well."

Later, while the battalion was attacking Hill 272 from the east, the Germans counterattacked toward its flank and rear. The battalion commander, through the liaison officer, asked the artillery to fire a numbered concentration which had been previously prepared to cover the area over which the Germans were advancing. The fire came down promptly and was effective.

(From the personal experience monograph of MAJ Lyman S. Frasier, Commander, 3d Battalion, 26th Infantry.)

Discussion

We see here an example of good infantry-artillery liaison. The bulk of the supporting artillery was used to fire a rolling barrage in accordance with the general artillery plan. In the future we shall probably make little use of the rolling barrage. The form of support will be different. Nevertheless, at the start of an attack artillery will fire according to some general plan.

By October 1918, the 1st Division was a veteran organization. It had learned much about infantry-artillery liaison. The effectiveness of the artillery support is all the more notable when we learn that the 1st Division in this operation did not have as much artillery supporting it as was usual in 1918 Western Front attacks. The remarks of the battalion commander speak for themselves.

Some enemy machineguns, as well as two field pieces located well forward, were not neutralized by the barrage. Prearranged fires will never put out all hostile machineguns. Sometimes machineguns will remain silent until the infantry has gotten close. In this example the artillery liaison officer was with the infantry battalion commander and in direct communication with the artillery. He personally conducted the fire on these machineguns. His method was a shortcut which will probably be resorted to frequently.

Conclusion

. . . where severe reverses were suffered the loser had invariably failed to coordinate his artillery with his infantry. It would be an exaggeration to say that . . . all a commander had to do to win was to achieve infantry-artillery teamwork, but nevertheless such a statement would not be very far from the truth.

The phrase, "The artillery conquers; the infantry occupies," was coined when trench warfare began. It was not true, as the officer who originated it undoubtedly realized. But it did represent the reaction to numerous reverses that were attributed to the artillery's failure to support their attacking infantry properly. It focused attention on what might be called ARTILLERY-infantry teamwork. When this was changed to the infantry-artillery team, decisive results began to be achieved.

The importance of infantry-artillery liaison is undeniable; the real question is: "How can the action of these two arms be tied together on the battlefield?"


Any intervention of direct-support artillery, which has not been foreseen and prepared for, usually requires much time. And once infantry has asked for this fire, it must wait until it materializes or run the risk of being fired on by its own artillery. Although artillery will try to comply with all requests for fire, it is important to remember the supply of ammunition is by no means unlimited. For these reasons, infantry should try to settle local incidents with its own weapons, leaving the artillery to fire on larger targets in accordance with the previously arranged scheme. On the other hand, when a real need exists for artillery fire on some particular place, infantry should not hesitate to ask for it.

Infantry that is accustomed to working with a definite artillery unit has the opportunity to arrange certain conventions. Conventional signals might be arranged to insure the immediate execution or renewal of certain fires.

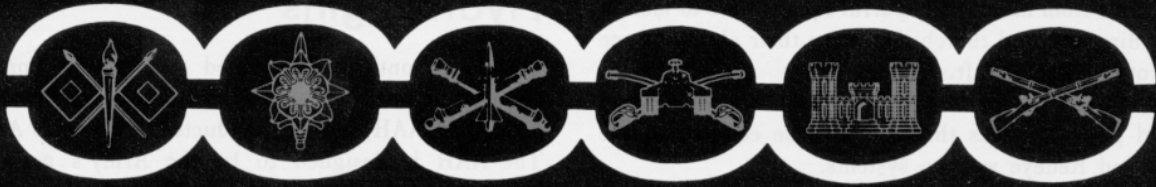
The duration of any particular fire asked for by the infantry might habitually last for a definite period of time — three minutes, for example — unless otherwise requested. The artillery might signal to the infantry that it is about to cease certain fires by some peculiarity in its fire at the end — greater rapidity the last minute, a long salvo, a smoke salvo or a high-bursting salvo. Individual infantrymen, lying down, need some such warning — something they can see or hear. These are but a few conventions that might be used; the number is limited only by the ingenuity and familiarity of the units involved.

Infantry requests for fire might include a statement limiting the *duration of the request*. If at the end of a request for fire made, say, at 9 am, the message added, "Request good until 10 am," that would mean that the artillery would not comply with the request at all if it had not been able to do so by 10 am. Then at 10 am the infantry would be free to go ahead, if the situation had changed, without being exposed to the fire of its artillery, or it could make a new request.

If the physical distance, and sometimes greater mental distance, that separates the infantry and the artillery on the battlefield is to be spanned, the following considerations should be observed:

- Habitual designation of definite artillery units to support definite infantry units.
- Intellectual liaison and mutual familiarity between the arms, so that infantry will not call on artillery to do the impossible, the unnecessary or the unsuitable; while the artillery, for its part, will be capable of appreciating the infantry's problems.
- Determination by the artillery to support the infantry when support is needed, even at some cost, and to seek OPs that will enable artillery observers to follow the combat by direct observation.
- Use by the infantry of its own weapons against small targets that are difficult to describe to the artillery, thereby freeing the artillery to fire on larger targets.
- Recognition by the infantry that prompt advantage must be taken of opportunities afforded by artillery fire.
- Proximity of infantry and artillery leaders in combat, with command posts as close together as practicable.
- Particular attention to communications.
- A moral liaison, reciprocal esteem, confidence and friendship, preferably personal friendship between the two elements of the particular infantry-artillery team.
- Previous joint training of the two specific units of the team.
- Careful selection and actual training with infantry units of the team.
- Maximum use of prearranged fires. 

with our comrades in arms



Army

Ammunition Request

A total of \$910.8 million has been requested by the Army for conventional ammunition items and ammunition production base support in fiscal year 1977.

Ammunition items account for \$655.1 million of the request. This amount provides for worldwide training consumption and inventory losses, selected procurement of modern hardware, buildup of war reserves to meet acquisition objectives and maintenance of an active ammunition production base for key ammunition items. Artillery ammunition, totaling \$297.3 million, accounts for 45 percent of the ammunition hardware request.

The \$255.7 million requested for the ammunition production base will provide for production support and replacement of government-owned facilities, layaway facilities and continuation of a multiyear effort to rehabilitate and improve the Army's ammunition production base.

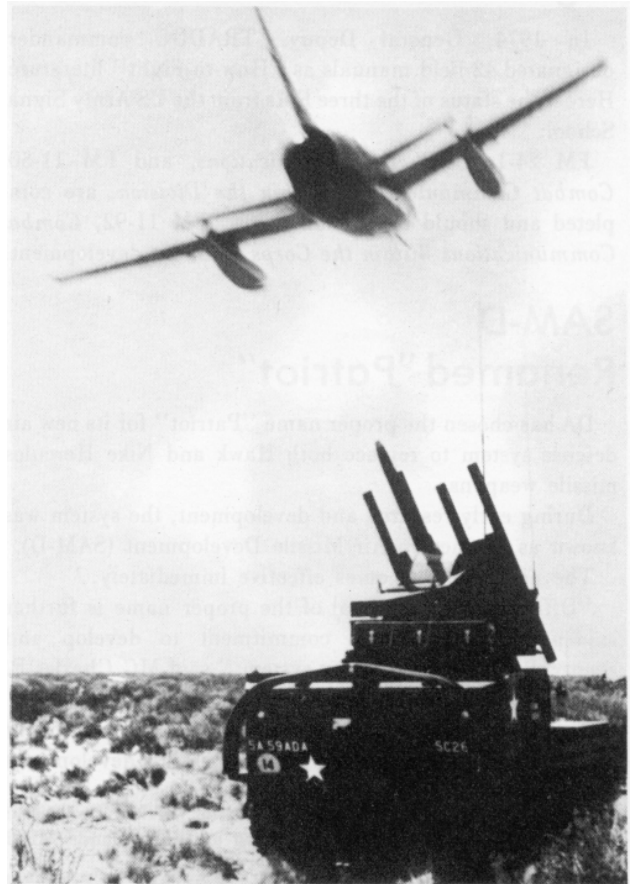
The fiscal year 1977 request is \$35.2 million less than the combined fiscal year 1976 and 7T programs.

Chaparral

Air Defense Tests

Air defense units from Fort Bliss, TX, working in conjunction with the US Air Force, have concluded a test called "Innovative Test of Chaparral Air Defense Systems." The test's purpose was to evaluate current doctrine and tactics of Chaparral in a special targeting environment. As a result of the test, some interesting observations were made and some valuable lessons learned.

Prior to the test, the Air Force pilots were briefed by a representative of the Tactics Department of the US Army Air Defense School on the capabilities of the Chaparral



The Chaparral is buzzed by an Air Force F-100, Super Sabre.

missile system. The pilots who were to fly the missions were requested to provide realistic attack profiles; i.e., what they would actually use in a combat situation when attempting to destroy a critical asset. Combat maneuvers were flown against four Chaparrals protecting a simulated division main command post.

Among the test results were:

- On a two-aircraft, high/low attack, the attack from 3,000 feet was detected, tracked and engaged. The trail

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aircraft, maintaining a 200-foot altitude, was not detected until it was too late.

- When three aircraft attacked the target from three different directions at an altitude of 200 feet, it was observed that when the lead aircraft was detected, crew reactions from all four Chaparral squads were to look in that direction and thereby decrease their ability to see the other two aircraft.

The innovative test of the Chaparral weapon system surfaced problem areas that can also be equated to the Vulcan and Redeye weapon systems.

Signal Doctrine

In 1974, General Depuy, TRADOC commander, designated 42 field manuals as "How-to-Fight" literature. Here is the status of the three FMs from the US Army Signal School:

FM 24-1, *Combat Communications*, and FM 11-50, *Combat Communications Within the Division*, are completed and should be available now. FM 11-92, *Combat Communications Within the Corps*, is under development.

SAM-D Renamed "Patriot"

DA has chosen the proper name "Patriot" for its new air defense system to replace both Hawk and Nike Hercules missile weapons.

During early research and development, the system was known as Surface to Air Missile Development (SAM-D).

The new name becomes effective immediately.

"Official Army approval of the proper name is further evidence of the Army's commitment to develop and eventually deploy the Patriot system," said MG Charles F. Means, Patriot project manager.

A Patriot (SAM-D) missile clears the launching rig during a test firing at White Sands Missile Range, NM.



The Army assigns popular names to major equipment and weapons once approved for engineering development or deployment. Patriot has been authorized to resume full-scale engineering development.

AAH Flyoff Begins

A four-month flyoff (called government competitive testing) between two versions of the advanced attack helicopter (AAH) is being conducted at Edwards AFB, CA. The AAH is designed to be the Army's main armed helicopter of the future with special emphasis on its "tank killing" features.

The competing helicopters are built by Bell Helicopter and Hughes Helicopters. The winning manufacturer, to be named late in 1976, will build three more aircraft for continued development and testing of armament, avionics and other aircraft subsystems. Limited production is targeted to begin in late 1980. The Army expects eventually to buy about 500 AAHs.

The AAH will carry a two-man crew, pilot and copilot/gunner, and is designed to fly in marginal weather. It is a 24-hour combat vehicle with improved survivability, safety, reliability and maintainability over the current attack helicopter, the AH-1 Cobra. Armament can include either the HELLFIRE laser-guided missile or 2.75-inch rockets along with a 30-mm gun. The AAH is powered by twin 1,500-horsepower gas-turbine engines. It will perform its mission effectively in all climates, particularly in a hot weather environment.

It will be able to carry up to 16 HELLFIRE missiles and 1,200 rounds of 30-mm ammunition, cruise between 145 and 175 knots (167-210 miles per hour) and have 1.9 hours of mission time.

Designed to withstand .50-caliber fire, the AAH also will have an infrared suppression system, a radar warning system, forward looking infrared for limited visibility flights, system redundancy and crashworthy design.

Long Distance Training

While a section from the 359th Signal Group (Reserve) is being seated in a Liverpool, NY, classroom, an instructor at Fort Gordon, GA, steps behind his podium. A class is being conducted over ETN — the Army's Educational Telephone Network. This telephone convener concept was pioneered almost 10 years ago by the University of Wisconsin and now is being adopted by the Army.

The system permits the presentation of current Army doctrinal and technical instruction for the Reserve components or any element remote from its parent unit or major training base.

The device allows two-way communications between an instructor (at a central location) and students where ETN hook-ups are available. Units from Liverpool and Fort Dix, NJ, participated in a recent practical exercise while monitors and evaluators at Fort Devens, MA, and Fort Eustis, VA, listened in.

Instruction came directly from Fort Gordon and was transmitted to several groups of students. Each group is seated around a microphone that comes with the convener unit. At any point during the lecture, when the instructor pauses momentarily, a student may capture the system and ask questions. A special signal coming through the convener keys a slide projector so that visual aids can be coordinated with the presentation.

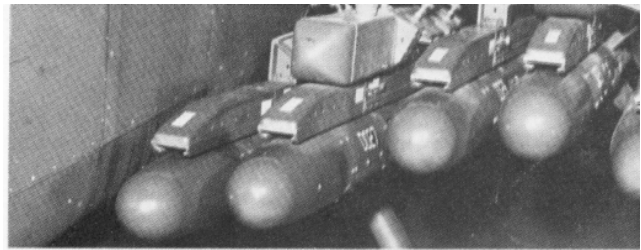
According to members of the 359th, the results were excellent. Other units will soon follow in exploiting this newly available method of allowing Active Army and Reserve units the benefit of person-to-person dialogue.

HELLFIRE Chosen For Attack Helicopter

HELLFIRE, a completely modular, terminal-homing system, has been designated by Department of the Army as the point target, antitank weapons system for the advanced attack helicopter.

Designed for helicopter launch against hard-point targets, missile capabilities include direct, indirect and pseudo-direct modes of fire with sequential or multiple fires. HELLFIRE's combined ability to acquire, identify and accurately engage targets at ranges in excess of existing systems and to engage targets in an indirect fire mode, enhances aircraft survivability by minimizing exposure and signature. The modular concept provides an inherent capability to accept and interface with a family of seekers.

As the primary point target weapon system on the



The modular HELLFIRE system selected by DA for the advanced attack helicopter.

helicopter, the missile will be used to engage threat armor at maximum ranges commensurate with acquisition and designation capabilities. Through trisection laser coding, the missile will respond to a scout helicopter, forward air controller, another attack helicopter or a forward observer or ground scout equipped with a ground laser locator designator.

The missile system demonstrates potential for use in a ground-mounted mode — ideal for mounting on many standard tactical vehicles currently in the inventory.

HELLFIRE's advanced development contract effort has been completed and it is now going into engineering development.

Signal School's New Training Aids

The US Army Signal School is busy cranking out audiovisual training material for field unit use. The films and videotapes (3/4-inch) are available in stock or can be created for selected signal related subjects.

Four recent products are:

AN/VRM-1 Radio Test Set. This 12-minute videotape shows the organizational radio mechanic how to detect defective modules in FM radio sets of the AN/VRC-12 series using the AN/VRM-1.

TS-352 B/U Multimeter. This 13-minute videotape shows the vehicle mechanic how to use the TS-352 multimeter to troubleshoot the electrical systems of an M151 1/4-ton utility truck.

AN/URM-120 Wattmeter. This 11-minute videotape shows the direct support radio mechanic how to check the RF power output of radio transmitters. It provides an indication of the condition of the vehicular antenna system when used with the AN/VRC-12 series of FM radios.

Introduction to the AN/GRC-142. This 15-minute videotape gives the operator an introduction to the AN/GRC-142. It is the first in a seven-part series.

For further information, contact CPT Leslie K. Scofield, AUTOVON 780-6694 or USASIGS, ATTN: ATSN-DTD-TL, Fort Gordon, GA 30905. ☒