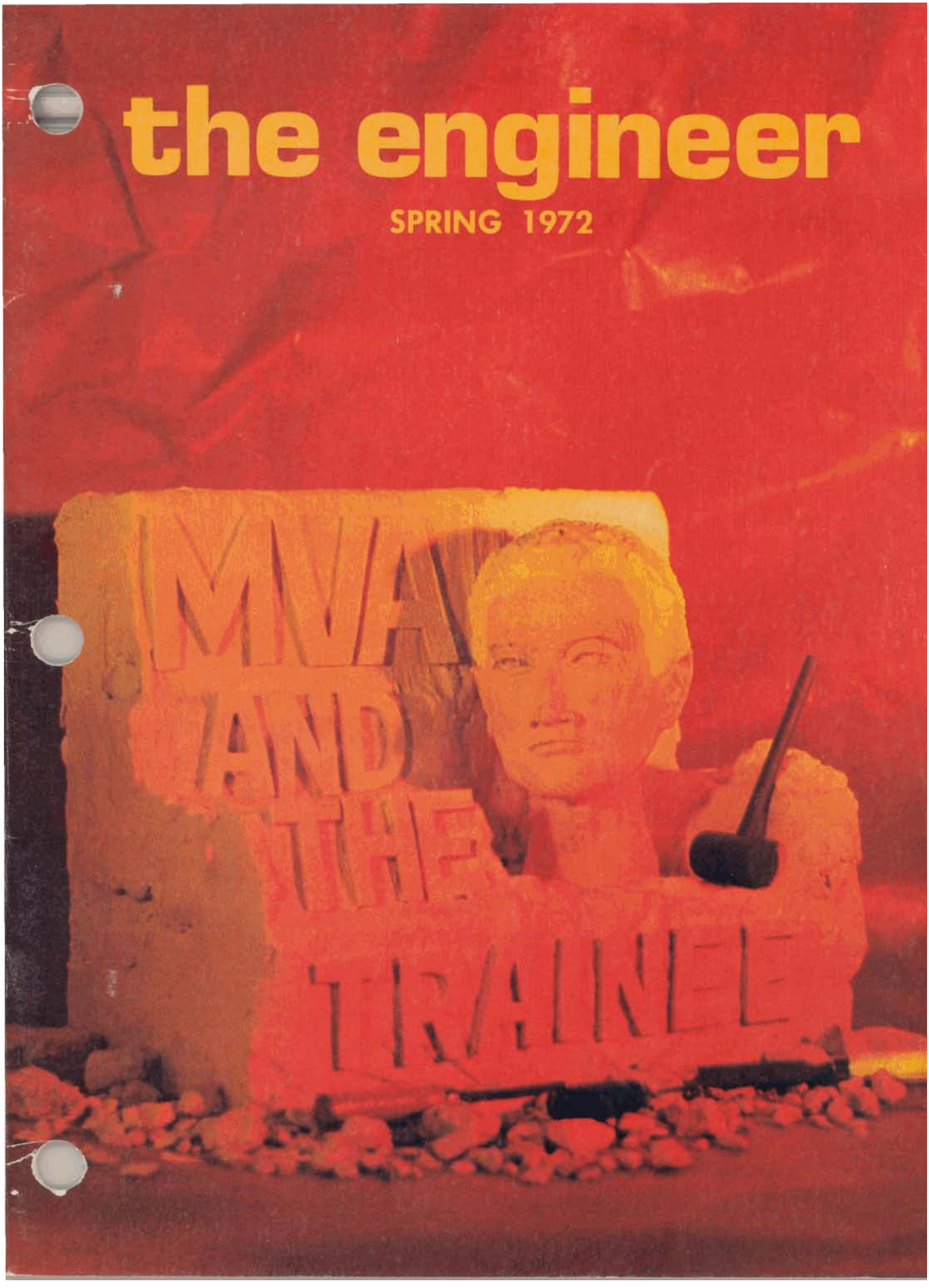
the engineer

SPRING 1972



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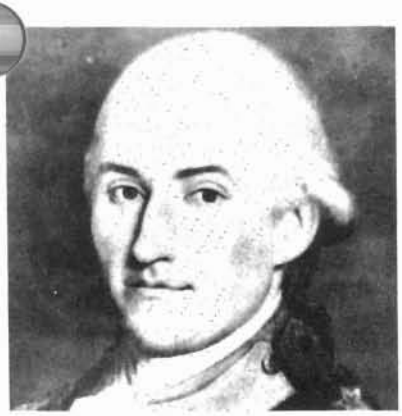

Little is known of the private life of America's third Chief Engineer, Major General Louis Le Beque de Presle DuPortail, except that this distinguished French officer was born in 1743 in Pithiviers en Gatinois, a small town in the neighborhood of Orleans and was educated at the military school of Mezieres, where he qualified as an officer of Engineers at the age of 18.

During the summer of 1776, the Minister of War directed him to prepare a new set of rules for the French Engineer Corps. As a reward for his work and his eager response to the Minister's suggestion that he go to America to fulfill a special request made by the American Congress for four outstanding foreign engineers, DuPortail was admitted to the Royal Corps of French Engineers with the rank of lieutenant colonel and subsequently joined General George Washington's Army. He was promoted to colonel and named Chief of Engineers in the Continental Army by resolution of the American Congress in July 1777.

As Chief Engineer and later as the first Commandant of the "Corps of Engineers" (which the Congress formally established in 1779), he became one of General Washington's most trusted advisors and was responsible for planning and directing the defenses which kept the Army safe during the darkest period of its history—the terrible winter of 1778 at Valley Forge.

DuPortail attained the rank of major general in the Continental Army after his brilliant work in directing the Siege of Yorktown where success in October 1781 meant final victory for the American cause. Before retiring and returning to France in October 1783, he was directed by General Washington to develop plans for a new American Engineer Department. These plans later laid the groundwork for establishment of the present Corps of Engineers and the United States Military Academy at West Point. As a result, the general has often been referred to as the "Father" of the Corps of Engineers.

DuPortail bought a small farm near Valley Forge, the scene of his best-remembered activities in this country. He remained there until 1802 when he decided to return to France. But the general never reached his destination alive. He embarked in Philadelphia, but died on the passage over to his native land.

U.S. Army Engineer Sch
Fort Belvoir, Virginia

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ABOUT THE COVER

Art Director John W. Savage, Jr., envisions the role of the Engineer instructor at Fort Leonard Wood, Missouri, as he takes a raw trainee and molds him into a proud member of the Modern Volunteer Army. He sees a parallel between the instructor and a sculptor who takes a raw piece of material and refines it into a piece of art.

Pipeline

FIBROUS CONCRETE STRENGTHENS AIRFIELD RUNWAY PAVEMENTS

Recent comparative testing of plain and fibrous reinforced concrete has yielded unprecedented results that may well provide an economical means of upgrading every military and civilian airport in the United States.

Composed of cement, fine and medium-grade aggregate, and steel fibers one-inch-long and 16 mils in diameter, fibrous concrete reveals remarkable durability and strength. Tests show that the material has a capacity to reinforce in all directions and at all locations. Fibrous concrete retards deterioration, extends pavement life and should require less maintenance than conventional concrete pavements.

Tests were performed by the U. S. Army Construction Engineering Laboratory (CERL) of Champaign, Illinois, in conjunction with studies being conducted at the U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

During the testing, both fibrous-reinforced and plain concrete pavements were subjected to simulated loadings of the C5A military cargo plane. The fibrous pavement was only half as thick as the regular pavement, but it withstood twice as many load applications and incurred far less damage. When the regular pavement was virtually destroyed, the fibrous pavement still had useful life.

After 700 loadings the plain concrete pavement was reduced to a shattered condition, while very few hairline cracks appeared in the fibrous concrete after 1,400 loadings.

SKYCRANE USED TO EXECUTE UNIQUE FEAT

Can you thread two needles with two threads at the same time? Moreover, would you risk hoisting a 19,750 pound load with a 20,000-pound maximum lifting capacity?

Well, Company "C," 97th Engineer Battalion (Construction), Fort Riley, Kansas, combined with the 263nd Aviation Company, Kansas National Guard from Topeka, to perform this difficult feat.

It was a "first" for both outfits and was accomplished during the tower construction of a water training facility at Fort Riley's Break Neck Lake.

Members of the 97th constructed the tower which was simple enough —two gigantic 90-foot utility poles with bracings, a ladder, and a personnel launching platform.

The real problem was how to get it placed and secured in a vertical position. This is where the 26 came into the act. Slings were tached to the top of the tower to a CH-54 Skycrane (see phot

Then, using 98 percent of its ing capacity, the big "chopp raised the tower into the air t vertical position and moved it t prepared site.

Here, there was a bit of mar vering as the 22-inch-in-dian base ends of the tower poles v jockeyed into two 24-inch-in-meter holes 15 feet deep and feet apart.

The 97th, however, knew the could be done. After all, their m is "No Task Too Great."

ARMY ADOPTS NEW CABLE SET FOR FIXED BRIDGES

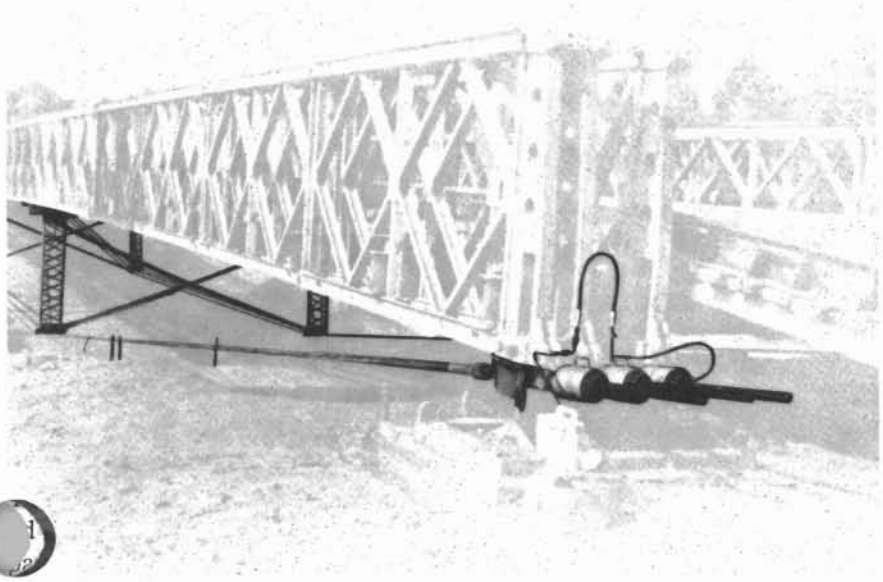
The Army has adopted a Cable Reinforcement Set for the Bailey-type M2 panel bridge that will substantially reduce construction time as well as the number of personnel that are required to erect the military standard fixed bridge.

Developed by the Marine and [illegible]dge Division of the U. S. Army [illegible]bility Equipment Research and Development Center, Fort Belvoir, Virginia, the set has been typed Classified Standard A. This means the set is the most advanced and satisfactory item available to satisfy current requirements.

The set employs cables supported below the bridge trusses to apply a "pre-stress" condition. These cables are connected to the end posts of the trusses by means of a special beam. They are tensioned by hydraulic cylinders that are capable of stressing three cables simultaneously.

As a result, this reinforcement gives a triple-truss, single-story panel bridge the same 60-ton load-carrying capacity for 170-foot spans as the triple-truss, triple-story.

The reinforced single story bridge requires 192 fewer panels with fittings and consequently, bridge construction time is reduced from 20 to 8 hours. The bridge crew is reduced from 155 to 63 men and the manhours, from 2,945 to 504.



USAREUR ENGINEERS CITED FOR 'REHAB' WORK IN GERMANY

The Facilities Engineering Division of U.S. Army, Europe, has been awarded the Presidential Management Improvement Award for its efforts to improve accommodations throughout USAREUR (see **the engineer,** Winter Issue, "Westward Ho!").

The award—signed by President Richard M. Nixon—was based on the division's rehabilitation work on troop barracks in Germany. The program involved work on 120 Army kaserns (posts)—26 of which have been completely renovated or are nearing completion). Other work for which the division has been cited includes heating plant improvement, fire prevention, providing prefabs for isolated sites, reduction of the backlog of essential maintenance and repair from $150-million to less than $100-million, and decentralization of power procurement.

ENGINEERS NAME ITSCHNER WINNER

Company A, 326th Engineer Battalion (Combat), 101st Airborne Div. (Airmobile), will receive the Itschner Award, as the outstanding Army Engineer unit of 1971.

Co. A, which recently returned from the Republic of Vietnam to Ft. Campbell, Ky., was cited for support of Operation Dewey Canyon II, LAMSON 719.

engineer interview

Reaction among professional soldiers to implementation of the Modern Volunteer Army program has been animated, to say the least. The resultant polarization of opposing factions has pitted the more progressive younger soldier who more accurately reflects attitudes within the civilian community, against that hard core of older careerists whose attitudes reflect a life style committed to a highly specialized extension of that same civilian community.

It was with this controversy in mind that the staff of **the engineer** *visited the U. S. Army Training Center and Fort Leonard Wood, Missouri, to get a grass roots impression of "what's happening" to the engineer soldier in training. Based on what* **the engineer** *discovered at Leonard Wood, a series of relevant questions was proposed to, and subsequently entertained by Command Sergeant Major Robert W. Elkey, CSM of the U. S. Army Engineer Center and Fort Belvoir, whose most recent Permanent Change of Station was from assignment as Command Sergeant Major, 1st Engineer Advanced Individual Training (AIT) Brigade, Fort Leonard Wood, Missouri.*

A veteran of 24 years' service, CSM Elkey originally enlisted in the U. S. Marine Corps during WW II and served as a Marine until 1946 when he became a member of the U. S. Army Reserve. With the mobilization of U. S. Army forces for the United Nations commitment to the Korean Conflict, he again volunteered for active duty. He was assigned briefly to Fort Devens, Massachusetts, and then to Germany, where he served as platoon sergeant and intelligence sergeant of various engineer units until his return to the United States and Fort Lewis, Washington, in 1955. In succeeding years, CSM Elkey returned to Germany as Chief Engineer NCO for VII Corps, and subseqently was reassigned to the Continental United States (CONUS) as Sergeant Major and Senior Instructor of the ROTC Detachment at the South Dakota School of Mines and Technology, Rapid City, S. D.

More recent assignments have included tours in Vietnam in 1966 and in 1969, during which he served as Command Sergeant Major of the 937th Engineer Group (C). Bracketing his tours in Vietnam were assignments in CONUS both times as Command Sergeant Major of the 1st Engineer Advanced Individual Training Brigade at Fort Leonard Wood, Missouri.

Selected as Command Sergeant Major for the U. S. Army Engineer Center and Fort Belvoir, he was reassigned from Fort Leonard Wood to "The Home of the Engineers" at Fort Belvoir, Virginia, in August of 1971. Accompanying him on this tour of duty are his wife and of his four sons—another son is in the Army, stationed at Fort Dix, New Jersey.

ENGR: SGM Elkey, while you were Command Sergeant Major of the 1st Engineer Advanced

"I'm an old 'brownshoe' man myself."

"What we want and need most is the professional . . ."

". . . doing your own thing what is important."

dividual Training Brigade, my Chief of Staff William C. Westmoreland outlined guidance for the Modern Volunteer Army concept, citing enhancement of service attractiveness and removal of irritants to the troops. In general terms, what was the impact of implementing MVA at the training brigade level?

CSM: Well, as far as actually implementing it, there was no problem because the Chief of Staff said it was going to be done, so we did it. Our principal problem at the Fort Leonard Wood area I was in was the power load, quite frankly. We were in WW II mobilization-type barracks with the old wiring which had not been increased to handle for example, beer in the mess hall where you had to have additional coolers. The existing wiring would not take the power load so we had to improvise to get beer to the trainees in the mess hall. It meant that somebody simply had to use his imagination. The no sign-in, sign-out provision was no problem, as to its implementation, but we did run into a problem because some of the younger troopers took advantage of the fact that they didn't have to sign in and out on weekends. They would take off and just disappear. We even had one man who flew all the way to Alaska one weekend and got snowed in and couldn't get back.

ENGR: Was there a noticeable increase in the Absent Without Official Leave (AWOL) rate?

CSM: Yes, the AWOL rate did go up at first, but then leveled out.

ENGR: Did initial MVA changes, such as elimination of many seemingly unreasonable troop formations and implementation of a shorter work week enhance or hinder accomplishment of the training mission of your cadre?

CSM: In the long run, I believe it

enhanced the training because we were able to eliminate some of the unnecessary training which had been going on (outdated training such as corduroy roads, chespaling, etc.) and concentrate on types of training which have practical application in Southeast Asia or a more conventional theater of operations.

ENGR: How did your cadre react to MVA changes that liberalized such traditional policies as daily reveille formations and the "white sidewall" haircut?

CSM: Well, as to be expected, there was some resentment of it at first, but the truly professional NCO recognized these things for what they were—particularly the reveille formation which had outlived its usefulness many years ago. Quite frankly, in my own company when I was first sergeant, I never had reveille formation except once a month. There was a work call, of course, but that is quite necessary—especially with the trainee—to keep abreast of the whereabouts of the troops. In fact, it is an effective training vehicle to teach trainees good habits like eating a solid breakfast to start the long 8-, 10- or 12-hour training day the right way. So far as haircut policy is concerned, the change hasn't bothered me or the bulk of my cadre. Grooming, within the guidelines of the regulation, is what I'm concerned about. After all, longer hair isn't going to impair the man's ability to get the job done.

ENGR: How do you characterize the trainee going through AIT at Fort Leonard Wood today? Does his circumstances as "better educated and better informed" than his (post-WW II and Korean War) predecessors make him more difficult to motivate and train?

CSM: Motivation is the job of every NCO, regardless of his assignment —whether it be a TO&E or a training outfit. The properly motivated, professional NCO cadreman in a training brigade such as the 1st AIT Brigade at Fort Leonard Wood can effectively motivate his people because he can and does make them realize the reasons for the type of training they are getting. Today's highly-educated trainee, in fact, seems more easily motivated and "trainable" than his predecessors. Educational level then, it seems, is a significant factor in determining the relative trainability of the new soldier. Recently, through chance, two sister companies in the 1st AIT Brigade at Leonard Wood were filled

"...our basic training tools- cadre and instructors-have had to burn the midnight oil to augment practical experience with the rudiments of theory."

in a distinctly contrasting manner. One became a company of enlistees and draftees with an educational level of 9-plus years, while the other became a unit composed of enlisted Reserve and National Guard trainees whose educational level was 13-plus years. With virtually identical cadre and the same combat engineer type of training, the latter company excelled and was cited by the commanding general, while the former did poorly overall.

ENGR: Do you think then, that the more sophisticated, worldly trainee is easier to work with?

CSM: In the respect that he is easier to reach—yes. But in that same sense, our basic training tools—cadre and instructors—have had to burn the midnight oil to augment practical experience with the rudiments of theory. As a conseqence, the cadreman oftentimes has to "push himself" to keep up with the trainee! He has had to work at expanding his educational horizons to keep his job.

ENGR: Do you think the new Non-Commissioned Officer Educational System is a sound idea that will program the professional NCO with the education he needs to accommodate today's trainee?

CSM: Definitely. This new approach to career development for NCOs has been needed for a long time. It offers a more effective in-service education for the career NCO and, in addition, provides the impetus for pursuing the very essential civilian education upon which he must base much of his professional expertise. I firmly believe that civilian education is an essential facet of professional development and advancement. In fact, I would predict that someday soon two years of college credit will be a prerequisite for promotion to E-8 or E-9.

ENGR: The MVA program, so its spokesmen say, is designed to "strengthen the Army as an institution." Of the three major categories into which MVA energies are being channeled to that end, the effort to strengthen professionalism seems to be the most critical as it involves building legitimate, positive incentives to attract and retain high-quality people. What positive incentives have been developed to that end since the advent of MVA?

CSM: Again, in the enlisted area NCOES is perhaps the most significant step, providing enlisted career development with a much-needed shot in the arm. The engineer version back here at Fort Belvoir is quite outstanding because of facilities—the Education Center and the U. S. Army Engineer School—and expertise that has been tailored to the needs of commissioned officer career development. The enlisted variation has been patterned along those lines and is easily adapted to this training environment.

ENGR: Do you feel that recent increases in pay have done something to help attract the potential careerist into the ranks, perhaps in the sense that the civilian/service salary differential is shrinking?

CSM: Quite frankly—yes. But I don't think increased pay is the only answer to attracting professionals. Factors such as patriotism and sense of duty to country are significant. Personally, I've been around the Army for quite a few years, and pay has been secondary beyond what I felt was necessary to take proper care of my family. I just haven't worried about it. I feel that the important thing is job satisfaction and doing with my life what I care about. I'm career military and consider myself as much a professional as a doctor or lawyer or businessman on the outside. That factor—doing your own thing—is what's important. If the Army is your thing, you'll buy it without thinking twice about the pay.

ENGR: Do you think, that once the stigma associated with our involvement in Southeast Asia is a thing of the past, the Army will find itself in a better position to negotiate for talent on the market?

CSM: I think so. This Vietnam [illegible]g—as no other in our history—has been unpopular. Recruitment, the accessions system, has been a serious problem area after every major war in which we've been involved—with reductions in strength requirements within the system and the foul taste of death in the mouth of the public. But, in the sense that history repeats itself, the plateau at which we arrive after the dust settles will afford us the opportunity to rebuild our professional force as we did after WW II and the Korean Conflict.

ENGR: The Army Chief of Staff has directed "commanders at every level to take rapid and positive actions which enhance service attractiveness and remove irritants to the troops." Of those actions implemented—not only at Fort Leonard Wood, but also Army-wide—which do [illegible] think are the most significa[illegible]?

CSM: Those initial actions which had the most impact on the troops were elimination of pass distance restrictions and sign-in/sign-out requirements—and they make sense for the most part. If a man has the money and desire to take a trip and feels confident that he has enough time to get there and back without absenting himself from his job, there's just no sound reason to hold him back. If he blows it, it is his own personal problem for which he will have to take his lumps . . . So far as elimination of a sign-in/sign-out requirement is concerned, I feel that it is a fine idea intended to eliminate an institution used by some unscrupulous officers and NCOs as troop harassment. Unfortunately, it also impairs the company-level administrator's ability to keep track of people for the eventuality of emer[illegible]cies such as death in the family [illegible]e like.

ENGR: The 4th Engineer Advanced Individual Training Brigade at Fort Leonard Wood was recently moved into new brick barracks which represent a fantastic improvement over the old frame "mobilization" type of two-story barracks which still house your old unit, the 1st AIT Brigade. It would be logical to assume that this represents a positive step toward making Army life more tolerable and training easier to accomplish because of the effect such a move would have on morale. Is this really the case?

CSM: Oh, yes. Definitely. The old type of barracks is outmoded and sometimes just plain worn out. In the winter, the wind seems to blow right through them and the old oil heating plants just don't do the job. Wiring is inadequate to accommodate today's trainee who has, in many cases, his own radio or phonograph or even television in a partitioned billet. The move to new brick barracks was a real godsend for the 4th Brigade in the sense that it helps provide the basic human needs of the trainee—with a little bit of icing on the cake to boot. We wish we in the 1st Brigade had been the ones to move. But there was a morale equalizer in the 1st Brigade—company mess halls that could cater more easily to the individual soldier than the battalion mess into which the 4th moved.

ENGR: A recent revamping of pay for lower grade enlisted men has made the dollar differential between pay grade E-2 and E-5 far less dramatic than ever before. That fact, along with recently extended time-in-grade requirements for promotion to E-5, has made advancement at that level far less important to the non-careerist. How has this circumstance affected the attitudes of the Vietnam returnee or lower-grade enlisted man close to Estimated Termination of Services and return to civilian life?

CSM: Although in the material sense, the rewards of advancement at that level are less significant than before, I think the average soldier in that situation will do a decent job anyhow. For the man who is really short, however, I don't think there is or ever was an effective way to motivate him to do a good job. In fact, if a man is due to return to the states for less than a year from a

. . . in the sense that history repeats itself, the plateau at which we arrive after the dust settles will afford us the opportunity to rebuild our professional force as we did after WW II and the Korean Conflict."

short tour and has decided to get out, he should be separated at that point rather than reassigned as a short-timer. He wants out now and is a potential headache over an "obligation" status in or out of his Military Occupational Specialty.

ENGR: In that vein, redeployment and deactivation of engineer units formerly committed to Southeast Asia have sent back here to stateside posts a large number of the "instant" variety of sergeants E-5 and E-6 who don't have a great deal of experience under their belts. On the whole, how have these individuals adapted to troop duty and administrative drill to which they were not normally exposed in a combat zone?

CSM: The majority of them are doing an outstanding job. In fact, I'm quite proud of the personal association I have had with many of them. However, there is that element of incompetence that crops up occasionally in any grouping of personnel with which one has to cope. I do think that leadership schools back here in the states are essential for people in this category and can provide a base of training to compensate for that lack of experience characteristic of the "instant" NCO.

"With the advent of the Noncommissioned Officer Education System patterned after the commissioned officer training scheme and somewhat standardized within a branch or Military Occupational Specialty, quality is guaranteed."

ENGR: Fort Leonard Wood is the home of the Engineer Noncommissioned Officer Candidate Course which, because of implementation of the Engineer Noncommissioned Officer Education System here at Fort Belvoir, is being phased out. How much of an improvement does ENCOES represent over "local" and specialized "spit-and-polish" varieties? Do you think this approach to enlisted career development will adequately meet the needs of a "new action Army" in which complexity of equipment and sophistication of leadership problems is increasing?

CSM: Well, the Engineer Noncommissioned Officer Candidate Course at Leonard Wood was activated, along with the Skill Development Base, to meet the needs of the Vietnam buildup. We just had to emphasize quantity rather than quality. So far as the "spit and polish" local NCO academies are concerned, they did serve a useful purpose in building esprit and steeping the candidate in tradition and ceremony as a matter of course. But the training varied so greatly from school to school and with significant turnover in cadre that there was no assurance in fact, that a man had attended, an NCO course, who had been properly trained. With the advent of the Noncommissioned Officer Education System, patterned after the commissioned officer training scheme and somewhat standardized within a branch or military occupational Specialty scheme quality is guaranteed. Yes—it is a great improvement over the old approach and quite logically will meet the needs of a Modern Volunteer Army in providing a highly competent enlisted leader.

ENGR: Both of the Engineer Advanced Individual Training Brigades at Fort Leonard Wood are engaged in training that they refer to as "maximum hands-on." What is the "hands-on" approach and how effective is it compared to the training that it has replaced?

CSM: "Hands-on" training is simply instruction that emphasizes student participation and practical exercise. Classroom instruction, of course, is utilized to orient the trainee but is far less a part of the total block of instruction than it used to be. The "hands-on" approach makes good sense in engineer training. One just can't appreciate the difficulties in, for example, erecting a Bailey bridge until one tries to do something as simple as lift a panel and pin it into place. The right and wrong of it will fall right into place when the bridge is launched across the gap—or perhaps the next morning when a sore back graphically illustrates the use of an improper lifting technique. In a nutshell, I'd say it is a great approach to training. We can't, in my mind, get enough of it.

ENGR: Fort Leonard Wood, quite unlike Fort Benning, is

ot categorized as a VOLAR post and, as a consequence, is not a recipient of funds appropriated for the purpose of implementing changes or testing ideas. Because of this situation, changes such as replacement of "GI" kitchen help with civilians and renovation of inadequate barracks, which are important to the "GI," have not been implemented. How important to the MVA mission are these prospective changes? Do you think the program may have missed its mark by emphasizing beer in the mess hall and longer hair when changes are vitally needed in other areas?

CMS: No, I don't think the program missed the mark. Beer in the mess hall and longer hair were a place to start. The more significant changes that are being considered are still being tested under the provisions of the VOLAR experiment. Once a determination has been made about the relative merits of certain changes, I'm sure monies will be appropriated to have them implemented Army-wide.

ENGR: VOLAR is said to be working in the 197th Infantry Brigade at Fort Benning, Georgia, where MVA-proposed changes are being implemented and tested. What are your opinions about VOLAR? Will it strengthen professionalism as it is intended—or will it attract people other than those high quality individuals at whom the program is aimed?

CSM: Well, VOLAR is strictly a test program, and as such I couldn't do it justice with an evaluation at this point. I will say that the idea behind the program is sound and when the testing is over I'm sure we'll see some changes in the MVA program.

ENGR: Comments from a few old "Brownshoe" Army types,

and adverse publicity in the news media imply that the MVA program has gone too far in "loosening the standards" which have traditionally been associated with Army life and has, as a consequence, undermined discipline.

CSM: I'm an old "Brownshoe" man myself, and I don't think there is a widespread discipline problem. There are, have been and will continue to be occasional local problems, but they are resultant from poor leadership or bad attitudes among incompetent or inflexible officers and NCOs. You see, the standards have not lowered. They've just been modified to suit the times. I've adapted and made adjustment without lowering my personal standards, and I can't see why others who call themselves professionals can't—or won't—adapt. These are the people who cause prob!ems—the kind of so-called leaders who, because a man can now have longer hair, say: "The hell with all of it! If he can have his long hair, I don't care what he does anymore." It's all a matter of professionalism.

ENGR: The discipline question brings us right back to that old intra-system conflict over the relative merits of the hardnosed negative incentive—"do it or else!"—approach to getting the job done, as opposed to the positive incentive or reward type of motivation which the Modern Volunteer Army program is concerned with developing. Do you think MVA will work, or do you think that the Army might have to re-adopt the old "Brownshoe" approach—much like the U. S. Marine Corps has maintained for the past 30 years—to accelerate its development into an efficient, capably led, highly competent fighting force?

CSM: Yes, I think the program will work because it is simply progress called by another name. The growing pains will be less severe if we all work together. It's just unfortunate that we have those few individuals who are dragging their feet and fighting change. This is a point about which I feel strongly—so strongly, in fact, that I will not recommend for promotion a man who demonstrates this attitude, regardless of his technical proficiency or career motivation. What we want and need most is the professional, not the run-of-the-mill careerist.

"...leadership schools back here in the states are essential for people in this category and can provide a base of training to compensate for that lack of experience characteristic of the 'instant' NCO."

The Terrible Tempe

Application of the basic tenets of military engineering in Southeast Asia has not been without a generous serving of expedient and imaginative methodology. An interesting case in point is illustrated by the story of bridging the Ba Bep near Cu Chi in the Republic of Vietnam.

The Cau (Vietnamese for, among other things, bridge) Ba Bep project began as a normal mission requirement for elements of the 554th Engineer Battalion (Construction), 79th Engineer Group, 20th Engineer Brigade, during the peak of enemy activity in the Tet season of 1968. It entailed, very basically, emplacement of a small dry span over the Rach (river) Ba Bep where route TL8A, a main supply route (MSR) to the 25th Infantry Division main base camp at Cu Chi, intersected on its winding way to Phu Cuong.

Actually, the bridging requirement was a part of an elaborate road project in which the 554th upgraded the 16 kilometers of one-lane road between Cu Chi and Phu Cuong. And this project,of course, was just a minor facet of the vast Lines of Communication program of institutionalized engineer support of the pacification effort in the Republic of Vietnam.

What appeared on the surface, however, at the intersection of TL8A and the Rach Ba Bep—and quite literally had to do with "what appeared on the surface" —did grave injustice to the complexity and sophistication of the problems the 554th was to experience before the Ba Bep was to be bridged. In quite the same sense, it hid a mystery story that was about to unfold.

The Rach Ba Bep is a small tributary of the Rach Saigon and amounts to hardly a trickle in the dry season. The monsoon season, however, introduces the TL8A to another face of the Ba Bep with floodwaters from overflowing rice paddies and the agitation of tidal action transmitted up this small tributary by the Rach Saigon.

Approached problematically, the two faces of Rach Ba Bep and its diverse moods necessitated special care by the 554th when they designed and began to construct Cau Ba Bep.

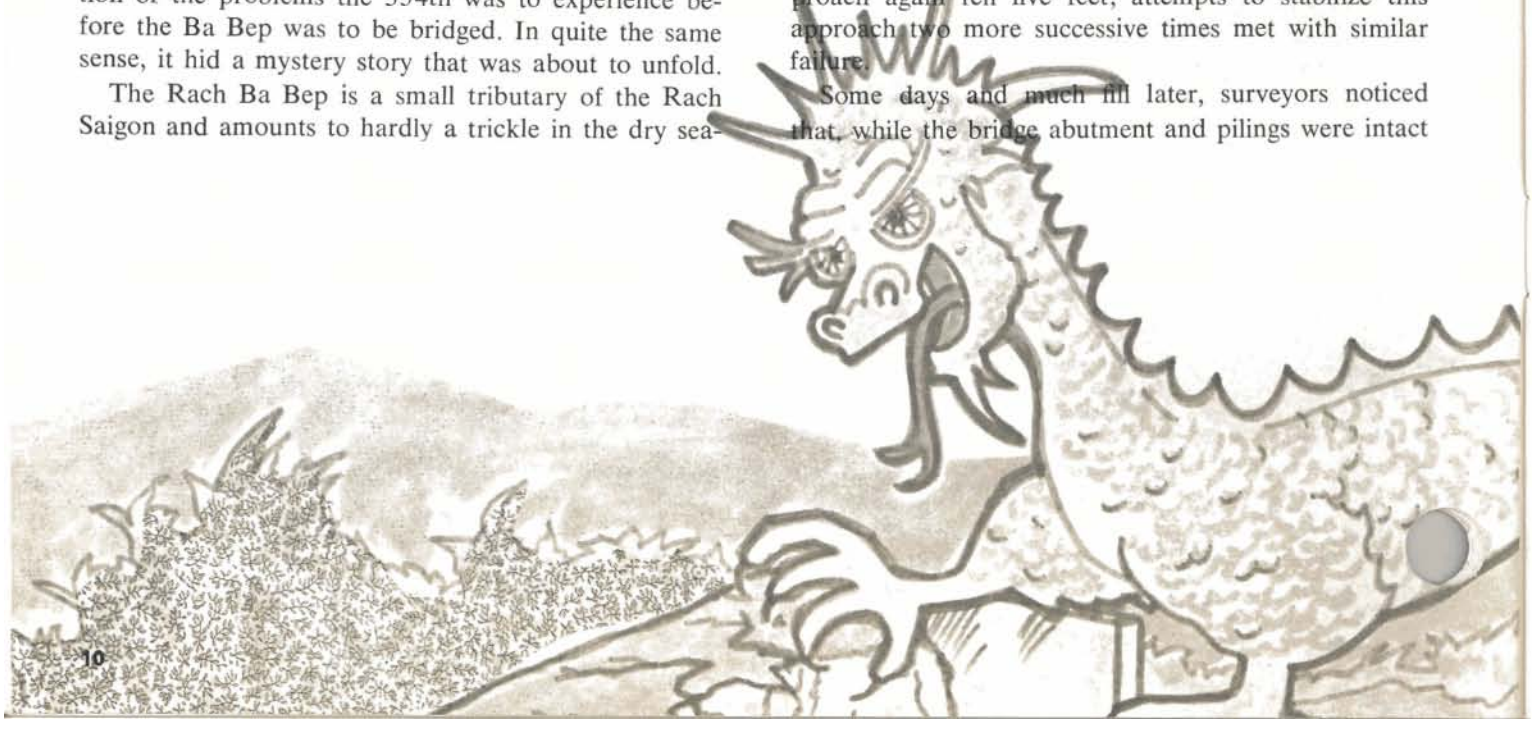
Having spanned the short gap on schedule in early June, the 544th set about the task of stabilizing the approaches to Cau Ba Bep with laterite and coarse rockfill. They took extra care and time to comply with design specifications and despite a monsoon rain that had begun in earnest, completed the project without a hitch—almost!

Seven days after the Cau Ba Bep was opened to traffic, the north lane of the east approach mysteriously dropped a full seven feet.

Engineers quickly surveyed the damage and reacted to official pressure to reopen this "critical" MSR by stabilizing the area of failure by leveling with a D7 dozer. Without having actually identified the problem, they compacted the materials already in place and filled a second time with laterite and rock, reopening TL8A in 36 hours.

The day following, the north lane of the east approach again fell five feet; attempts to stabilize this approach two more successive times met with similar failure.

Some days and much fill later, surveyors noticed that, while the bridge abutment and pilings were intact



# of Rach Ba Bep

THE HENRY LARCOM ABBOTT AWARD

and immobile, the east side of the stream bed was heaving upward and out toward the center of the stream. Upon further examination of the bridge site, they discovered a fault in the surface of the ground just off the north side of the road through which dark, silty paddy clay was oozing.

A call went out to 79th Group Headquarters this time for a higher level assessment of the problem. The decision made to answer that call, based on the necessity to keep this MSR open, specified a more sophisticated variation on the stabilization approach—with emphasis on preparing the subgrade for the subbase fill.

The subgrade was attacked with leveling, scarifying, stabilizing and compacting before eight huge 290M scrapers made half a day's worth of passes at it with bellies full of laterite. But when surveyors evaluated the progress of six hours of continuous filling, it was discovered that the approach had actually—and very mysteriously—defied hundreds of cubic yards of fill and dropped a foot.

The 20th Brigade Headquarters, having been kept abreast of the now infamous Cau Ba Bep, dispatched a team of geologists and soils experts to the bridge site. They arrived to be greeted by not only the commanding officer of the 544th, but also the very considerable failure of the west approach to the bridge.

The team of puzzled experts began to closely scrutinize the area and local roads. They shortly discovered the interesting phenomenon to which the problem was to be attributed—50 thousand years of buffalo chips sitting on a huge subsurface stabilized plane.

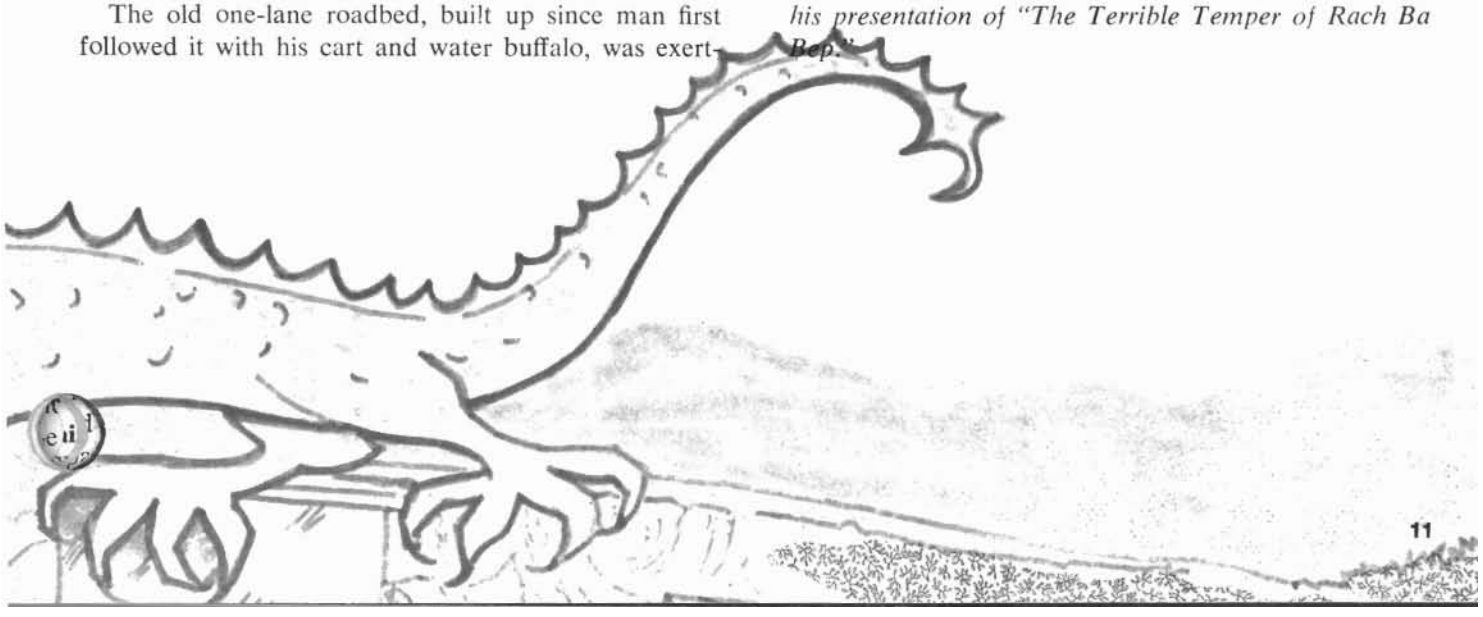
The old one-lane roadbed, built up since man first followed it with his cart and water buffalo, was exerting enough force perpendicular to the plane to stabilize the south side of the new road bed. The new laterite lane, however, was being filled with rock and laterite that began to displace the silty, fluid paddy clay to the area of least resistance—away from the "dam" created by the old roadbed and perpendicular bridge abutments, across what had now become a classic "slip" plane through the surface of the rice paddies to the north.

Having now identified the problem, the experts consulted their cone penetrometers and slide rules and came up with a solution—surcharge. They suggested very simply a blast rock and earth fill on the open north end of the "dam" to create sufficient force perpendicular to the subsurface plane to "contain" the clay in a roughly rectangular perimeter.

The 544th began to implement the plan with care, first stabilizing the banks of the stream to insure that it would not be closed by sliding mud. They then filled an area approximately 100 feet by 200 feet on the north side of each approach with a primary layer of blast rock and a secondary layer of rock and laterite mixture. In only 20 days they had completed the project and TL8A was open into Cu Chi.

The terrible temper of Rach Ba Bep had been curbed!

Captain Gary D. McDonald is a recent graduate of the Engineer Officer Advanced Course at Fort Belvoir, Virginia. A Vietnam veteran and career officer, Captain McDonald was recently presented the Henry Larcom Abbott Award for excellence in writing based on his presentation of "The Terrible Temper of Rach Ba Bep."



CCE-A

The first time most U. S. Army Construction Engineers were able to get a real handle on the relative merits of military and commercial equipment was after the big buildup began in Vietnam back in mid-1965.

In those days of the early going, our Engineer construction units that deployed to Vietnam were equipped with "Army equipment." At the same time, civilian contractors were coming ashore to get the same job done with Commercial Construction Equipment.

It did not take a mastermind to figure out the difference in the equipment. As construction progressed, the military engineer could look about with envy at the contractor's equipment. All he had to do was compare the production potential and efficiency of his machines with that of the contractor's commercial machines. The military equipment came out second best.

Whenever an engineer construction platoon leader, his company commander, or his battalion commander felt the pinch of tight construction schedules or the rigors of heavy and complex construction, that individual could look over his shoulder at the sight of the contractor's equipment and begin dreaming of bigger and better things.

The dreams first became a reality when MCA-LOC (Military Construction Army-Lines of Communication) equipment was introduced to select engineer units that were committed to Vietnam's highway lines of communication construction in 1968. The MCA-LOC equipment consisted of some 28 separate items of commercial construction equipment that the U. S. Army Mobility Equipment Command (MECOM), St. Louis, Missouri, procured with Military Construction funds.

Even though there was a valid need for the items to complete the planned LOC on time, it took a lot of paperwork to get the desired results. Direct Support and General Support maintenance and support of the MCA-LOC equipment was provided by contract to assure maximum availability of the equipment. Then the requirement for the equipment was worked up and instigated in Vietnam and submitted directly to MECOM. It took approximately two months to analyze these requirements and another two months to solicit proposals from manufacturers and finally award a contract for the desired items. Delivery time varied from three to six months—making the total cycle time from receipt of the requirement to fielding of the item between seven and 10 months. Because of the urgency of the requirements, contract awards were based on a manufacturer's ability to deliver an item within the shortest time frame.

There are three basic ways the Army can obtain construction equipment.

- It can develop its own. Under this program, the Army can design its own equipment to meet all requirements—mobility, transportability, use in varied and extreme environments, maintainability, storage, and so on. It also can take maximum advantage of standardization and compatibility with other Army equipment. This system is generally used only when there is a requirement for an item that is not available commercially. The 20-ton rough terrain crane, for instance, is the result of Army research and development efforts.
- It can take a commercially available construction item and modify it to meet the various Army requirements. The popular 830M and 290M Medium Wheeled Tractors found their way into the Army inventory in this manner. Actually the majority of all the construction equipment in the Army inventory falls into this category.
- It can go "straight commercial." This method is indicative of the Engineer Family's current thinking.

There are advantages and disadvantages to all three alternatives. But it is the disadvantages that come to mind first when any piece of equipment is being criti-

Major Gerald M. Tippins

N IMPOSSIBLE DREAM ?

cized. This is especially true when that equipment is associated with poor job performance.

It is a fact, of course, that military-designed construction equipment serves its intended purpose. But this type of equipment usually has some obsolescence built into it relative to the civilian industry since the Army research and development cycle takes time to come up with the finished product.

After a military design item is fielded there is a tendency to keep it as long as possible. On the other hand, civilian contractors are taking advantage of technological advances in their equipment year by year. Repair parts also can be a problem, especially when they are designed characteristically for the military. These parts will be produced only on military demand and, if and when the balloon goes up, there will be a time lag in supplying them to the field. The military-adopted or military-modified commercial item has many of the same problems. The Army investment in development for the modification is usually considerable because of what follows. Basically, for every modification that is made to a commercial item, a military peculiar part is introduced into the system. The extent of the modification of the commercial items varies from item to item. Then too, there are extremes. One such extreme, for example, is the military adopted 20-ton Lattice Boom Crane. This item is reported to have 40 percent of its parts modified to meet military requirements. Yet for construction purposes, this crane does no more than its commercial counterpart. The manufacturer stocks 60 percent of the parts for the crane for all of his customers, while the other 40 percent is provided only on military demand.

The Army's appetite for Commercial Construction Equipment was whetted when it began using MCA-LOC earmarked equipment. There should be a way to get the commercial off-the-shelf equipment into the hands of our construction troops on a routine basis. It is not possible to go the MCA-LOC route because MCA funds can not be used routinely for equipment buys under current regulations. Today, more competition in procurement must be recognized because the urgency for new items is diminishing with the phase-down of the war in Vietnam. Therefore, the possibility of awarding contracts based on the manufacturer's ability to deliver is gone and, in fact, will not be needed. Now the items will have to be supported in a peacetime environment where contract maintenance support may be too costly. This means that the military will have to begin placing more reliance on the Defense Supply System. The Army anticipated this problem four years ago.

In 1968, the Department of the Army (DA) organized an Ad Hoc Working Group to establish policy on the use and procurement of Commercial Construction Equipment. The DA policy was to include implementation procedures for expeditious adoption and assurances that any procured equipment would be of the highest quality.

After the results of the Ad Hoc Group were staffed at DA level, they were published in a policy and guidance letter in August 1969. The Army Materiel Command (AMC) in coordination with Combat Developments Command (CDC) and Continental Army Command, developed a detailed implementation plan for the DA policy. Coordination of this plan at DA level resulted in the program that is generally followed today.

How does it all work? Briefly, the cycle for fielding a commercial item starts with the CDC Engineer Agency at Fort Belvoir, Virginia's, initiation of a requirements document. The document is designed to completely describe the commercial item that is needed. This requires close coordination between CDCEA and the U. S. Army Mobility Equipment Center, which is also located at Fort Belvoir.

The document includes two important pieces of in-

formation—a planned basis of issue (BOI) and a rationale for the type and size of the desired piece of equipment. The BOI is critical at this point since it significantly impacts on the cost effectiveness for the item. This must be shown before DA will approve a "go-ahead" to procure it. The goal of the program is not only to introduce the modern up-to-date commercial equipment but also to reap all the benefits of increased productivity and efficiency that will provide a maximum savings in manpower.

After the requirements document has been coordinated through the major commands, it is forwarded through DA for approval. Once the document has been approved by DA, the Army Materiel Command develops an item description and sponsors a Request for Technical Proposal from industry.

Then a field evaluation of the commercial items proposed by industry is conducted at civilian job sites by the U. S. Army Test and Evaluation Command (TECOM). All evaluated items must have been in general use by the construction industry for at least one year. This requirement has been instituted to take maximum advantage of the R&D work of the civilian industry and to minimize formal Army testing.

There is a statement which is repeated time and time again. "Contractors are using this equipment every day and making money. The Army should just go out and buy it." While this may be true, the field evaluation insures that there is only a minimal risk involved with no formal testing. One should keep in mind that Department of Defense procurement policy is to "Fly Before You Buy."

So after the evaluation is completed, successful candidates are then asked to submit a bid and generally the award will be given to the low responsive bidder. The successful bidder's item of equipment will then be type classified Standard A. The Defense Construction Supply Center will be the contracting activity and will provide for the support of the item once it is fielded. The item will normally receive the same type of support that is given to all other items of equipment in the

Army inventory. The only noted difference that will be felt in the field will be that the using unit will have to make use of cross reference files to convert manufacturers' parts numbers into Federal Stock Numbers (FSNs) before it can requisition repair parts. Under this system, the fast-moving parts will be stocked a issued upon demand. For items that are not stoc because of a low demand or are out of stock, separate open-end contracts with manufacturers may be used to get quick delivery of the repair parts.

Currently, the Army is well underway with a program that is designed to "try out" the latest implementation plan. Three items are being used in this pilot program—a 25-ton Hydraulic Crane, a 1,500-gallon Bituminous Distributor, and a 20-ton On-Off Highway Dump Truck. These items will replace the 20-ton Truck Mounted Crane, the 800-gallon Bituminous Distributor and the 5-ton Dump Truck now being used by construction units.

The program, as presently envisioned, applies only to the construction battalion, construction support company, port construction company, dump truck company, engineer equipment operating teams, engineer utility teams, and in some cases, light equipment companies.

Speculation grows that once the items are introduced into the system, the basis of issue will eventually include more engineer units and even units of other branches when appropriate.

The initial program is moving slowly. Although the procedures do not seem to be grossly different fr those that exist today, many decision points have b reached and a lot of problems have been aired and

explored. Case in point—the 25-ton crane is only about halfway through a planned 31-month-cycle from initiation to actual fielding. The field evaluation is currently underway and fielding is scheduled for July 1973. The other two items are currently scheduled to follow close behind.

To prevent any time lag once the pilot program really begins to roll, CDCEA has already initiated requirements documents for other items. These include requirements documents for high speed embankment compactors, self-propelled vibratory rollers, self-propelled rubber-tired rollers, heavy and extra heavy crawler tractors, equipment transporters, backhoes, and large front loaders. Also under consideration is a full array of equipment that will provide the Army's construction engineers with a modern, efficient fleet of equipment.

This is all very interesting but what are the ways this program can be judged and measured in terms of success? It can be termed a success if the Army can ultimately get the commercial equipment off-the-shelf and into the hands of the construction troops. But what about the support? Obviously if off-the-shelf equipment is fielded and not properly supported, the program will not be a success. Some experts may want to measure the program's success in terms of time. If they compared the predicted, perhaps optimistic,cycle time—from CDCEA's initiation of the requirement to fielding in 31 months—with other Army construction equipment programs, this could be called a success. Programs involving development of construction equipment could be longer than five years to show the end product. Programs involving military adopted or modified commercial equipment also can take as long before an item is type classified.

The CCE program would be termed successful when it is compared to the other programs. However, if the experts would look closely at the seven to ten months it took to field the MCA-LOC equipment, they might feel that the program is still lagging in some respects.

Shortening the cycle time is still a sought-after goal. Aside from what has already been mentioned about shortening the cycle time, there is still another unique aspect of the program. A permanent Ad Hoc Working Group has been established to monitor the program and to recommend and execute changes that will streamline and perfect it.

The Ad Hoc group meets regularly at Fort Belvoir and is currently investigating ways to shorten the time that is required to initiate a requirements document and get it approved by DA. The group has already found a method that, if approved, would cut the present processing time in half. Even more dramatic, of course, would be a way to get relief in the area of type classification. The group claims that if the type of technical evaluation that was used in the MCA-LOC program were used, as much as six months could be chopped off the program. This probably will not work since existing regulations relative to type classification are very specific about the evaluation of an item that must be certified as "suitable for Army use" by TECOM. The Ad Hoc Group also has asked AMC to take another close look at all possible ways that the procurement cycle can be reduced. The group additionally plans to take a hard look at relative cost or effectiveness of the maintenance support of the MCA-LOC equipment as compared to support of standard equipment.

If this intensive care continues on in the program, the first item will certainly be fielded. This is of paramount importance to cast the die. It is expected that a more vigorous program will continue to evolve as it is massaged into the most efficient and practical program the present-day Army can have. This type of forceful procurement program is needed for the Army to obtain the best equipment for the engineers so they can do their job in the challenging years ahead. e

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Major Gerald M. Tippins is currently assigned to the Materiel Requirements Division, Engineer Agency, U. S. Army Combat Developments Command, Fort Belvoir, Virginia. He has held a number of construction engineer assignments that included tours with the 293rd Engineer Battalion in Germany and the Lines of Communication Division, Construction Directorate, Military Assistance Command, Vietnam. The major is a 1961 graduate of The Citadel, Charleston, S. C.

SHADES OF JOHN HENRY

steel driving men

Tying modern America to its colorful past has been a source of many of our nation's finest collective efforts. Indeed, it is a theme that pervades virtually every aspect of the American existence—from blues music and politics to fairy tales and mountain moving.

And when Americans think in terms of achievement against monumental odds, they think collectively of the nation's most celebrated rural folk hero—John Henry—the steel driving man.

It was John Henry, so the stories go, who in the middle 1800's matched his own strength against a steel driving machine on the railroad and lost. But John Henry's tremendous losing effort is what people remember about him today. He fought against the odds and lost but won the hearts of his countrymen.

The theme has been carried along through the centuries by each new generation of Americans and today we consider any difficult effort one of the mainstays of our rich heritage. Giving it the "old college try" is as American as bubblegum and baseball. And it is the motto of the Corps of Engineers—Essayons—"Let Us Try."

One of the Corps' units, for example, gave out with the old try not too long ago. The 562nd Engineer Company from Fort Richardson, Alaska, was given a task that had been attempted without success three times in the past. A crack separate outfit and winner of the Itschner Award in 1961 as the outstanding Engineer Unit in the U. S. Army, the 562nd was asked by State Department of Parks officials to construct a 45-foot steel stringer bridge over the Eklutna River Drainage Basin in Eklutna, Alaska.

The base for the selected site was almost solid granite. What was not rock might as well have been. Permafrost—a permanent fixture in the world's cold regions—had frozen the earth hard enough to make steel picks bounce off like jack balls.

The task of driving timber piles into a surface this hard looked like an enormous job. Indeed, civilian officials at the scene from the Alaskan Bureau of Land Management were convinced that the bridge was an impossible task.

Although it is difficult enough to perform any kind of construction in extreme cold, the 562nd was not about to give up without a try. It was decided that demolitions and steel tips fastened to the ends of the 40-foot-long, 18-inch-wide piles would have to be used to break that surface. The goal was to sink the piles eight feet into the granite mass.

With the help of 100 Engineers, 50,000 pounds of material, and 300 tons of equipment, an attempt was first made to drive a single pile without demolitions. The pile sank two feet and then snapped and shredded. This was not a wasted effort. The 562nd had found a swift way to make large quantities of firewood. Shaped charges of ammonium nitrate were then brought up from the rear to provide "beginner holes" for the massive creosoted piles.

When the first 40-pound charge was set off at the proposed bridge site, there was little evidence of any depression when the debris had settled—only a puddle of water 18 inches deep and 2 feet wide.

The Engineers kept up the barrage and the piles slowly began to sink into the unwilling surface.

After three weeks of concentrated effort, 562nd personnel were able to drive the eight main piles eight feet into the frozen surface, construct end dams, and place four 7,000-pound steel stringers in position over the 20-foot-wide glacial stream.

Long working hours were the order of the day as the structure began to take shape. The 90-foot-long, 16-foot-wide frame was dressed with eight-inch-thick treadway, two and one-half inch decking, four-foot-high handrails, and six by six inch curbing. The finished bridge weighed some 42,000 pounds. The construction price was about $50,000.

The bridge represented not only a fine achievement but also a first for the Engineers in Alaska. This was the first time they had ever constructed this particular kind of bridge in that state. Completed on June 24, 1971, some five weeks after the 562nd "broke granite," the bridge has opened a new permanent route for campers to the southeast corner of Eklutna National Park.

RATED "P" FOR PROFESSIONALS

Captain Dennis F. Pierman

On a damp Winter morning in central Missouri, fog creeps from the Ozarks, as Carl Sandberg reflected, "on little cat feet." It tumbles and boils its bone-chilling shroud over the fingers of leaf-less trees, carrying the odor of mulch and sod with it. Into Fort Leonard Wood it quietly slips at first light, turning off-white clapboard barracks into ochre sentinels end on end.

The ghost of ten thousand reveilles clears a brassy throat as dawn makes its feint at the fog. But the fog "sits looking on silent haunches", waiting for the bugler's first staccato note to assault the sounds of silence.

This morning, "Reveille" introduces nothing more than the time of day to those interested enough to be listening at 6 a.m. To the disappointment of a lurking fog, row upon row of lapstrake hulks, neatly dressed and covered, stand the only reveille formation on Fort Leonard Wood.

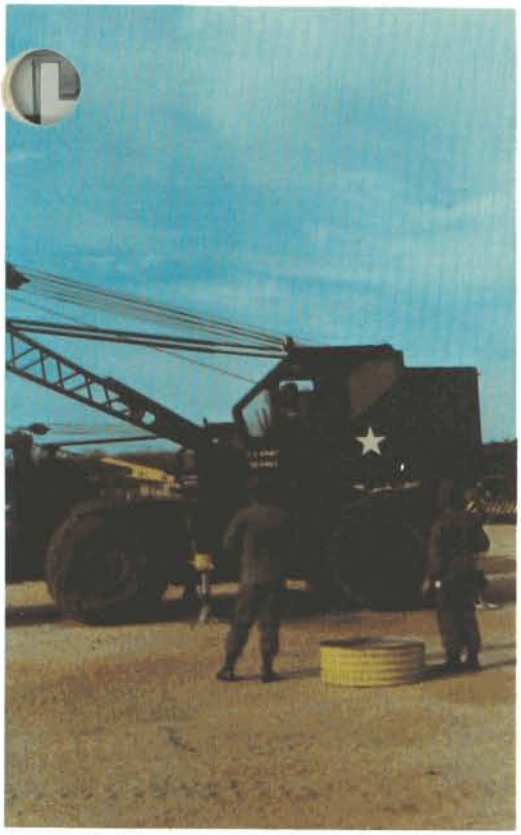
Reveille, to the chagrin of old "First Shirts" everywhere, has died the same death, it seems, that white side-walls and spit shining died with the "snicker-snack" of the Modern Volunteer Army Program's broadsword. That invincible giant, tradition, is being carefully dismembered to make way for a streamlined, contemporized Army whose new mainspring is synchronized with a changing America.

The Army is changing in the wake of progress, addressing problem areas with programs such as the Modern Volunteer Army Program (MVA) and VOLAR, a controlled testing program designed to expand the volunteer, professional base upon which the structure of the Army is based. Because MVA has a wider, more universal application to the mechanics of the Army system, it warrants close examination by organizations Army-wide.

The Modern Volunteer Army program, designed basically to develop the Vietnam-era Army into an

The 4th Engineer Advanced Individual Training Brigade maintains this huge open-earth training area in the heart of Fort Leonard Wood. Pictured on these two pages is a sampling of the diverse, equipment-oriented training that one will encounter on an average training day in the "Million Dollar Hole."

THE MILLION DOLLAR HOLE



efficient, capably led, highly competent fighting force, necessarily plays an important role in the training environment and is easily dissected in units such as the 1st and 4th Engineer Advanced Individual Training Brigades at Fort Leonard Wood, Missouri.

It is this level, the second 8-week increment of a soldier's first 16 weeks of introduction to the Army in living color and stereophonic sound, that the promotional effects of the accessions system and that initial introduction to the MVA are put to a critical test.

It is during this period of indoctrination and rudimentary introduction to a military occupational specialty that the prospective careerist tries on the Army's multi-media, multi-million dollar advertising campaign for size—does today's Army really care more about what he thinks than how he wears his hair?—does that Army really want to join *Him?* This is the period during which that unique consumer tries it all firsthand, developing impressions that are sometimes an indelible influence on his vulnerability to the professional mystique. If the MVA succeeds in the development of a salable product to market at this level, that prospective professional will have been effectively exposed to attractive career prospects. If it does not, the young soldier who is a "high quality individual" will have been lost to civilian enterprise before the contest for his energies has even begun.

MVA, of course, has come to Fort Leonard Wood as surely as it has to installations throughout the world. It was recently examined in the 1st and 4th Engineer Advanced Individual Training (AIT) Brigades at that post to provide **the engineer** with insight into controversy about the program.

Initially, it was discovered in interviews with a cross section of permanent party personnel that inconsistency in the application of changes for one unit to the next is most aggravating. This failure to establish a "universal" application of needed reform—a failure based on non-availability of funds Army-wide—coupled with a politically uncomfortable "institutionalization" of a long awaited program of reform, has become a subject of concern and a basis for heated argument.

Examination of MVA in Fort Leonard Wood's two engineer training brigades was preceded by an introduction to the local application of the program— a la post MVA project officer. He simply reiterated a by-the-numbers presentation in pamphlet form "The Fort Leonard Wood Scoreboard for the Modern Volunteer Army"—indorsed by the post commander, Major General W. T. Bradley. It contained, in the first few pages, excerpts from Army Chief of Staff General W. C. Westmoreland's address to the Army Commanders' Conference of November, 1970, in which he established guidance for the Modern Volunteer Army concept.

"I expect commanders at every level," he directed, "to take rapid and positive actions which will enhance service attractiveness and remove irritants to the troops —We are willing to part from past practices where such practices no longer serve a productive and useful end—Nothing is considered sacrosanct except where military order and discipline . . . are jeopardized—"

The remainder of the "Scoreboard" for Fort Leonard Wood illustrates examples of recently implemented changes common to most post activities Army-wide as a result of the Westmoreland edict.

Eliminated—

- Revielle formations except for ceremonial training or other special occasions.
- Local requirements for the pass form (DA Form 345.)
- Bed checks except for control and personnel undergoing punishment.
- Unnecessary troop formations and curtailed "hurry up and wait" activities as much as practical.

Established—

- A five-day work schedule, with modification for BCT units.
- Short order meals in the messhalls for weekends.

Proposed—

- Civilian kitchen attendants to replace soldiers on KP duties (contingent on funding.)

Leonard Wood's MVA action officer added, "What hurts so badly is that old stickler—lack of money. Fort Leonard Wood has the unhappy circumstance of not being VOLAR funded (i.e., recipient of specially appropriated monies for promoting an All-Volunteer Army.) As a consequence, we can't put our effort into critical areas such as barracks renovation and the like which are necessarily expensive. We could, of course, put our backs into it and do that kind of thing ourselves, but we would run into trouble with the civilian community to which this sort of thing is normally contracted. A small town such as Waynesville (Missouri) is like Fayette, North Carolina or Columbus, Georgia, in that it is dependent on the military installation in its locale for the livelihood of many towns people. No one wants to violate an existing policy of sound community relations and return Fort Leonard Wood to its place as a self contained 'little Korea' as some old-timers had once labeled it."

Close examination of MVA within Leonard Wood's two Engineer training brigades necessitates an evaluation of each brigade, its special mission, the type of student or trainee with which it deals, and its cadre.

The 1st Engineer Advanced Individual Training

Brigade, once known as the U.S. Army Training Center, Engineer, 1st Training Regiment, is the only unit in the Army which offers combat engineer training. Functional areas with which its training deals include construction, combat arms and combat support, each of which is a facet of the complicated role of the Table of Organization and Equipment (TO&E) combat engineer. Specific engineer instruction, accomplished through a committee system, includes map reading, engineer tools, panel and timber bridging, river crossing operations, and expedient construction of roads and culvert systems. "Combat" training covers land mine warfare, field fortifications, explosives and demolitions tactics and weaponry. In addition, under provisions of the Skill Development Base Program, the 1st Brigade has operated the Combat Engineer Noncommissioned Officer Candidate Course which is being phased out to accommodate Fort Belvoir, Virginia's new Engineer Noncommissioned Officer Education System (see **the engineer,** Winter 1972, Vol. 1, No. 4.)

The 4th Engineer Advanced Individual Training Brigade, on the other hand, represents a departure from the combat engineer theme in providing the Corps of Engineers with its heavy equipment operators and engineer soldiers with construction-oriented skills such as blasting (Powderman Course), utilities and plumbing, carpentry and the like. But its most spectacular enterprise is its Heavy Equipment Operators Course and Training Area 256; part of the "Million Dollar Hole" where, on an expanse of open earth work resembling a huge quarry operation, row upon gargantuan row of cranes, shovels, scoop loaders, drilling machines, tractors and the like rumble and crunch through the training day.

Because the training mission of each brigade differs so significantly from that of the other, it is not at all unusual that one finds two generally diverse groups of trainees in the enlisted and drafted (RA and US components) categories. The combat engineer in the 1st Brigade, because he is by definition of its military occupational "specialty" a generalist, seems less sophisticated and less highly motivated than the prospective specialist who is undergoing more specialized training in the 4th Brigade as an equipment operator or tradesman.

The great equalizer, however, appears to be the large percentage (sometimes 90 percent) of enlisted Reserve and National Guard (ER&NG) trainees in both brigades. Their attitudes, because they are only on temporary active duty and generally have a higher formal education base, have a universally positive and stabilizing effect on their RA and US contemporaries whose perspective is strongly influenced by active duty service obligations of two or three years and a significantly lower average formal education base and average age.

A basic flaw in the program is apparent at Fort Wood as it must be elsewhere; one unit, the 4th Brigade, grabbed the brass ring and found itself in new modern brick barracks while its sister element, the 1st Brigade, maintains the old frame "T" variety and its characteristic headaches. The resultant contrast, because it is in an area so elementary, establishes an argument for uniformity.

An articulate and concerned officer from the operations shop (S-3) of the 1st Brigade put it this way, "The 4th Brigade people are the lucky ones. We here have not only the complicated administrative and training problems common to both brigades but also the sometimes impossible task of motivating a trainee whose barracks is not fit for human habitation. For example some of the heaters don't work. So in subzero weather, I would guess, indoor temperatures are far below the 70 or 72 degrees they should be. The wiring is old and inadequate and the plumbing is in the same sorry state. And there isn't a lot we can do about it with no money and regulations that prohibit extensive renovation of the "T" buildings. We are violating a basic pyramid of human needs principle by not providing these men, who as combat engineers spend a great deal of their training time out in the weather, with adequate shelter and simple creature comforts.

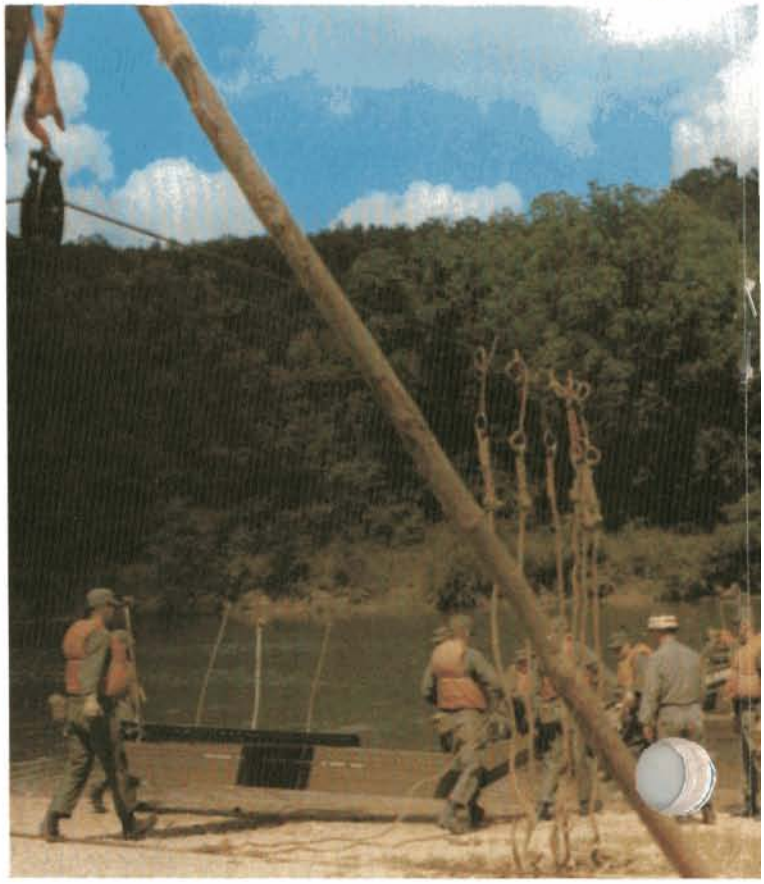
A staff officer in the 4th Brigade commented to that end saying, "Yes, it is too bad there wasn't enough money to get all of our engineers into these new buildings. I can understand the kind of a problem those old billets constitute for the 1st Brigade—especially when some of their trainees have had the new accommodations a few weeks earlier as basic trainees right here at Fort Leonard Wood."

Trainee perspective about MVA is limited in scope, but one of casual interest permeates both brigades. The difference in billeting is mildly controversial, but actually of little consequence as they are too busy training to get into philosophical arguments about it. And having had no exposure to the 'old' Army, their expertise is rather valueless based on an ability to compare a change to a point of order discarded sometime before they were inducted."

Cadre, however, had some rather strongly worded comments about the changes introduced by the MVA program.

"Institutionalizing this program of changes and giving it an official, high level 'handle'," said one 1st Brigade Drill Instructor veteran of 18 years in the Army, "has turned many people off. I'm of the opinion that things are getting too centralized back at Department of the Army level. Things that should and have been

The 1st Engineer Advanced Individual Training Brigade trains engineers. Pictured here from "high noon" counter-clockwise to seven o'clock are combat engineers assembling an aluminum floating foot bridge, trainees crossing the finished footbridge in combat gear, and a combat assault from fiberglass assault boats on the Big Piney River. The 4th Brigade conducts training of a more specialized application as exemplified by the Carpenter Course. Pictured at the right, a 4th Brigade instructor shows trainees the correct way of nailing, sheathing, and bridging on exterior walls. In the bottom center photograph, an instructor assists trainees in installing hip jacks and valley jacks on a "hip and valley roof."



VINTAGE 1972: A GOOD YEAR FOR TRAINING AT FORT WOOD

company-level determinations—like sign-in/sign-out policies and haircut regulations—have been taken away. This hurts us here in the training company and impairs our ability to accomplish our mission because our authority has been usurped by the Pentagon.

"But for the most part, I think the MVA approach is basically a sound one and the resultant standardized changes are awkward but essential while the Army is in a state of flux as Vietnam 'winds down.' It just makes the job of the training cadre a little more demanding. But, then, that is what I'm being paid for in the first place—to accomplish the mission as directed."

Comments about the caliber of the engineer trainee at Fort Wood, how he differs from the trainee of the post Korean War period and his "trainability" were consistent from one brigade to the other. Cadre personnel saw him as more highly sophisticated, better educated, and easier to work with than his predecessor. Black and white overkill in the lecture phase of instruction, because even "average" trainees can be used as "assistant instructors," is no longer an evil necessary to accommodate the occasional slower learning trainee. This has given rise to "hands on" training, the training brigade jargon for practical exercise employed to the maximum. This is a more practicable kind of teaching vehicle and much more satisfying to the trainee who is, in many cases, working overtime simply to adapt to Army life.

Other recent changes in training emphasis have, as part of the MVA effort, had significant impact on the trainee, his cadre, and the Army. As exemplified by a conservation project involving engineer trainees of the Skill Development Base in the 4th AIT Brigade, training has a new practical slant that generates that rare commodity known as job satisfaction for trainees and cadre alike.

Working in conjunction with the Fort Leonard Wood Post Engineer activity, the 4th Brigade launched wildlife habitat improvement project for rabbit, quail, and other species of local small game about 17 months ago. The project, which involved improvement of land belonging to the Army and a National Forest, was completed in late Spring 1971 after extensive work by 4th Brigade trainees operating tractors, dozers, and Rome plows. The trainees incidentally rotated into the work schedule on a daily basis to give as many individuals as possible a chance to get involved.

The 1st and 4th Engineer Advanced Individual Training Brigades at Fort Leonard Wood, Missouri, have been tempered by nearly two years of MVA-propelled changes since General Westmoreland outlined his initial proposal for a Modern Volunteer Army. The challenges associated with implementing these changes during this critical period in a trainee's developme have been demanding, but met with the kind of str professionalism which MVA hopes to engender Army wide.

"The new trainee may have long hair and classroom episodes low key compared to the trainee of 10 years ago," commented a Drill Instructor typical of the cadre from both brigades, "but he is much easier to work with and to motivate. It's sometimes tough on me now that a man is encouraged to ask 'why' and to risk a barrage of 'sharp shooting,' but it's really good for me because it motivates me to keep abreast of things which I might otherwise have let slide by. I just have to keep sharp, know my job thoroughly, and use my head. Those old-timers who've been 'ghosting' for years and getting by with it by intimidating the young enlistee or trainee with a couple of stripes are going to be slow to adapt and will just fall under the ax as the post-Vietnam Army gets peacetime 'svelte'."

And that is the honest truth of it. A change has been directed and change the Army will. The engineers, alive and well at Fort Leonard Wood, have "gotten with the program," as have true professionals throughout the Army, and have risen to meet the challenge of creating a Modern Volunteer Army. Training has become more effective, the trainee more trainable now that his dignity as a human being is his to maintain as a ma of universal policy while the Army itself has beco more acceptable as a prospective career for today's youth. But there is still a long way to go before all the problems are identified and resolved. The 1st and 4th AIT Brigades are into the fray and helping the Corps of Engineers maintain its reputation as a highly progressive, professional component of the U. S. Army.

As a kind of postscript to our examination of MVA and training at Fort Leonard Wood, it must be added that lessons learned in the last year and a half have caused people such as Brigadier General Ira A. Hunt, Jr., Director of Training for the Continental Army Command, to take a second look at changes implemented in training centers. Emphasis has now been placed—effective mid-February—on an "austerity" common to the pre-MVA training environment and a more vigorous training (PT) oriented curriculum.

It is anticipated that this old variation on an older theme will revitalize training and make it more "palatable" in the long run to both the Army and the trainee. Perhaps the trainer and trainee alike have discovered that beer and mashed potatoes, mixed well with psychedelic music and posters, garnished with plenty of sl and week-end passes, make GI Joe a dull boy. In a event, time and the Army march on. **The Editor**

VERSATILITY IS THEIR THING

ENGINEER STAFF

A U. S. Army combat engineer battalion is geared to perform many tasks that augment the mission of friendly forces in an unfriendly environment.

According to the Army's definition, combat engineer battalions are highly efficient outfits that are capable of aiding the operations of "friendlies" in a variety of ways. They can erect tactical bridges, build tactical roads and airfields, clear mines, and perform reconnaissance. These outfits also know how to use demolitions to impede the enemy—by blowing up his bridges, roads, and airfields.

So what, then, is the mission of the combat engineer battalion stationed in the Continental United States? Is it solely to maintain a training program to intensify the engineer skills of the individual engineers assigned to that unit?

No! In reality, the role of a stateside combat engineer unit is far more diversified than one might think. Even though military occupational specialty training is essential, the skills of the engineer lend themselves too readily to peacetime necessities to go unused.

But what might a specialist in bridging demolitions, reconnaissance, excavation, or rigging do to benefit a civilized and highly technical world at peace? The answer is—many things. With imaginative planning, combat engineers can accomplish many worthwhile projects such as improving recreational and educational facilities, helping civilian organizations or municipalities, providing training facilities for other units, or contributing to the upkeep of a military reservation.

A prime example of what a combat engineer unit can do when its capabilities are channeled in a positive direction is the "track record" of the 18th Engineer Battalion (Combat), stationed at Fort Devens, Massachusetts.

During the past several years the battalion has undertaken numerous on-post and off-post projects. Many of these projects have been in direct support of Fort Devens, both to assist other units and to aid the general operation of the base. For instance, the 18th labored to enlarge the Turner Drop Zone for almost two years in order to improve the training capabilities of the Fort Devens-based 10th Special Forces Group (Airborne). This project, which entailed the clearing of 278 acres of land, was a massive exercise in all phases of combat engineering. The project called for the utilization of every engineer skill because it involved the felling and disposal of almost 200 acres of trees, filling a large marsh, levelling steep inclines, and the installation of proper drainage.

The battalion also has supported in the general operation of Camps Drum in New York and Edwards on Cape Cod, Massachusetts, by initiating intense range rehabilitation programs. In addition, the 18th has upgraded roads and provided field construction to improve the training facilities at both camps.

In other projects such as the construction of the Fort Devens sanitary landfill, the 18th Engineers reflect the Army's sensitivity to the pollution concerns of the country. The sanitary landfill, which consists of four, 17-foot-high, collapsible berms, affords the post with a means of disposing of its refuse without resorting to the traditional incineration method.

In fact, ecological consideration has been given top priority treatment in the planning and execution of all of the battalion's projects. The Turner Drop Zone project is a good example. The ground there was reseeded and drainage ditches were strategically located to insure proper drainage.

Members of the 18th help landscape and extend the Fort Devens Golf Course.

Building demolition techniques also have been altered in the interest of the environment. The old practice of tearing outmoded buildings down to the base and leaving concrete foundation eyesores is a thing of the past. Now the buildings are completely razed, the foundation is removed, and the area is graded and seeded. This leaves an attractive plot of grass until that space is again put to use.

These considerations for ecology on the part of the 18th Engineers have paid handsome dividends for Fort Devens. The battalion's efforts have been instrumental in the post's selection as the winner of the Army Chief of Staff's Conservation Award for 1971. Fort Devens also was named runner-up for the Secretary of Defense's Conservation Award for 1971.

During 1971 alone, the battalion completed 68 projects designed to make the lot of the individual soldier happier during his leisure time. Members of the 18th extended and improved the Fort Devens golf course, built a horse training corral at the Fort Devens Saddle Club, improved the baseball, track, football and beach facilities, and constructed a patio for the Noncommissioned Officers Club.

The Army's contribution to the civilian community has recently been questioned by its critics. Many have asked, "Shouldn't the Army become more involved in the problems of the community they live in?" These critics should check the 18th Engineer Battalion's record. Its very mission charges the unit with providing general engineer support for the entire First Army area.

Civic action assistance is more than just a byword with the 18th. It assisted in the rebuilding of war-torn West Germany after World War II. And the battalion has lived up to its legacy during the past several years

Personnel from the 18th improved this beach area at Mirror Lake.

Engineers from the 18th raze some old buildings to make the post look beautiful.

by aiding local civilian municipalities and organizations. When emergency conditions exist, it is a common sight to see members of the battalion on the scene providing assistance.

Engineers of the 18th have rolled out the heavy equipment on many emergency occasions to plow out a snowbound community during the harsh winter months in New England. Not long ago, the battalion provided engineers and heavy equipment for the dredging operation that was needed to clean up Spicket River near Fort Devens. After 130 tons of refuse was hauled away, this action provided recreational facilities for the surrounding area.

Like any good neighbor, the 18th has maintained a keen interest in youth organizations in the area and has helped them in many ways. The battalion provided a major portion of the support for the Fort Devens-conducted Project Summertime, a program that gave underpriviledged children from Eastern Massachusetts a vacation equivalent to any summer camp. Members of the 18th also constructed a youth center in Athol, Massachusetts, in support of Project VISTA, and cleaned up a playground in Lawrence, Massachusetts, for the Neighborhood Youth Corps.

All these achievements add up to proof beyond doubt that a combat engineer unit can and does function as an integral part of a society at peace. Every combat veteran knows the necessity for the type of support the combat engineer can provide in a hostile fire zone. The value of the combat engineer, however, is not depreciated by a Continental United States assignment. His skills are just as applicable to peacetime as they are to combat. The proper employment of those abilities can and have benefited both the Army and the country it serves.

PIER PROTECTOR

Captain Robert J. Oldmixon

Now you see it—now you don't!

In the blink of an eye, a high-explosive charge blasts away the supports from underneath a vital bridge. Downstream, dark figures move toward the shadows of the riverbank. After observing the effects of their carefully placed explosives, enemy sappers are quietly leaving the area . . .

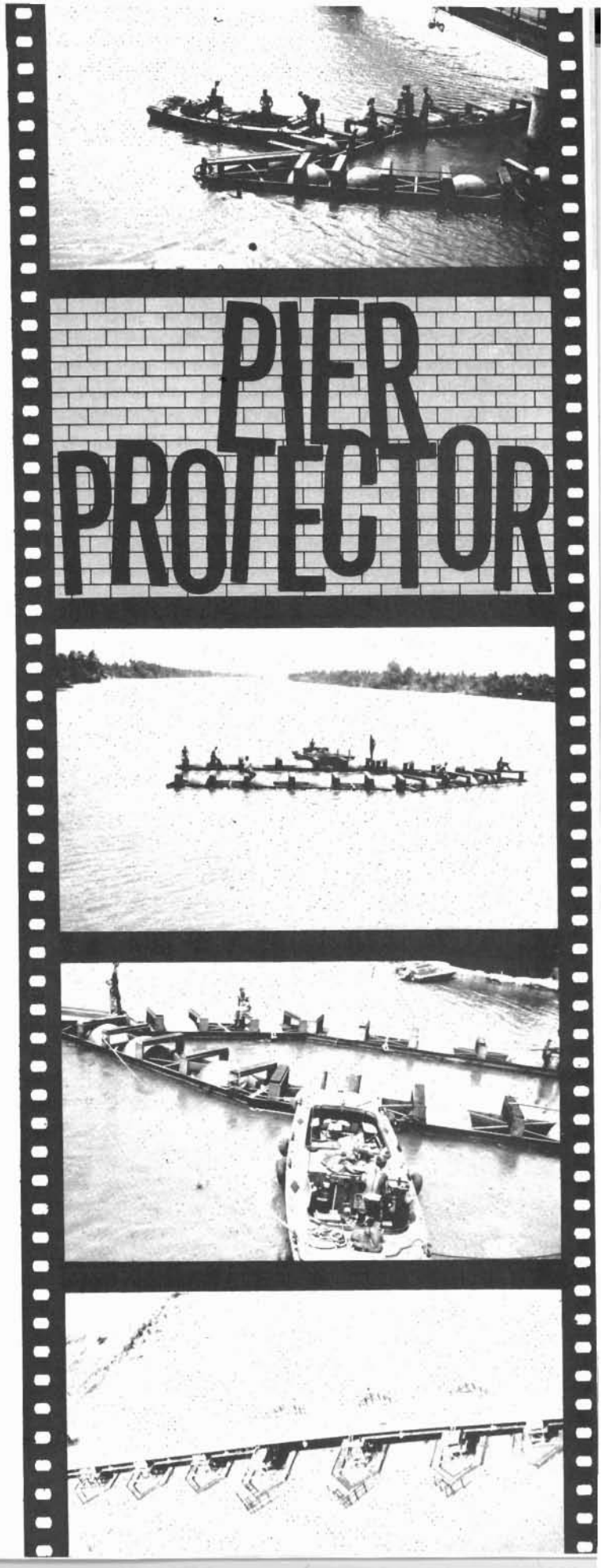
The capability of the enemy in Vietnam to destroy bridges causes great problems for US and Republic-of-Vietnam forces, just as General Robert E. Lee's Confederate saboteurs a hundred years ago created problems for General Ulysses S. Grant's advancing Union troops.

With all the air capabilities of our present-day forces in a technological age, bridges remain about as critical to military communication as they were to army commanders a century ago. Unconventional (guerrilla-type) war tactics used by the enemy in South Vietnam—compounded by the large number of bridges required to support the country's transportation routes—have made protection of bridge structures a primary mission for Engineer units.

Two construction companies of the 92nd Engineer Battalion and the 41st Engineer Port Construction Company attached to the 92nd, began work on the 1002-foot Phu Cuong Bridge in October 1967. The bridge was opened to traffic nine months later. On November 6, 1968, North Vietnamese Army sappers, swimming undetected to the bridge, attached explosive charges to a pier. Minutes later the critical link of Main Supply Route (MSR) 25 between Long Binh Depot, Di An, Phu Loi, Cu Chi, and Lai Khe was crippled—after only five months of use.

A young North Vietnamese lieutenant named Nguyen Diem switched allegiance, rallying to the side of the South Vietnamese government only a few weeks after the sapper attack on the Phu Cuong Bridge. The new "Hoi Chanh" (defector), Lieutenant Diem had been executive officer of a highly-trained North Vietnamese Army underwater demolition company. He had been leader of the sapper team that hit the Phu Cuong Bridge.

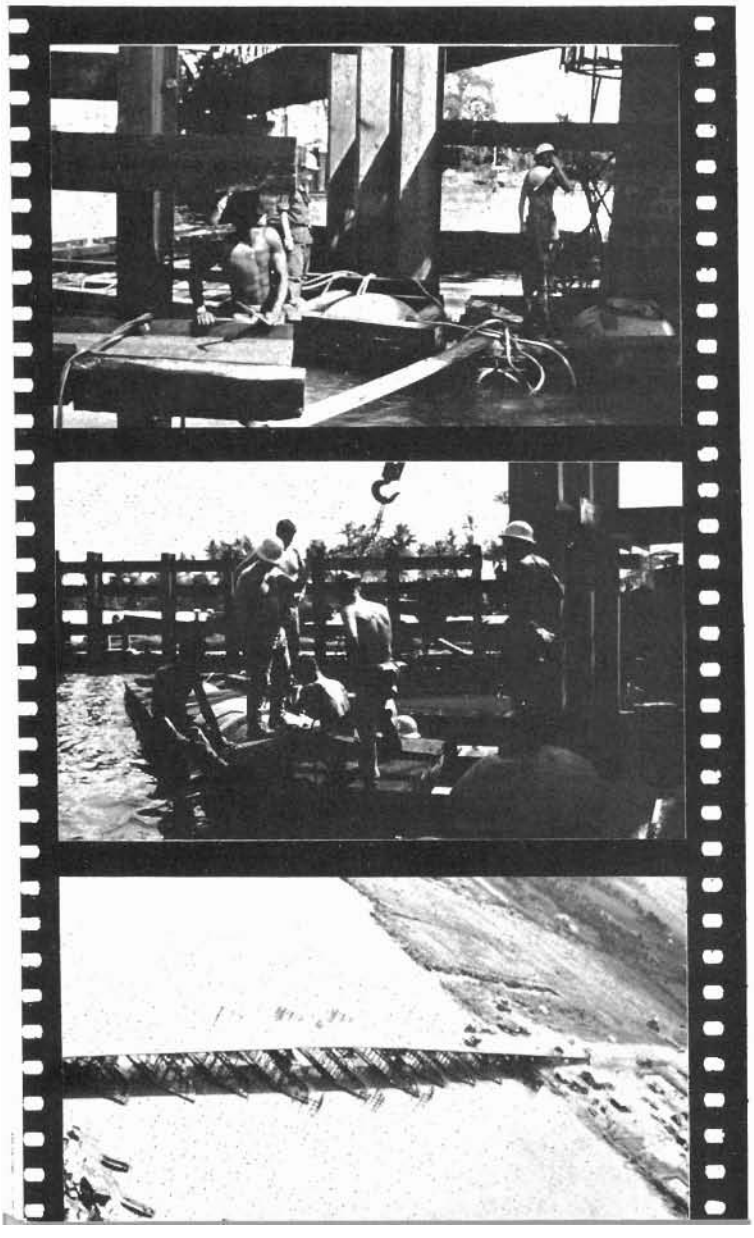
Before the North Vietnamese Army would make him a lieutenant, Nguyen Diem had to complete two years of extensive training in swimming and underwater demolition in the port of Haiphong, North Vietnam. Although use of SCUBA equipment was among the things Lieutenant Diem was taught, he admitted that such sophisticated equipment was rarely available. He explained that sappers commonly used snorkels which



they made from sections of garden hose about seven inches long.

Lieutenant Diem used the snorkel while swimming in a sitting position, with his head tilted back beneath the surface of the water. He was taught to navigate in this position by kicking with a bicycle-pedalling motion, moving in the direction of the current while towing up to 500 pounds of explosive charges. The charges are often suspended with rubber floats at a neutral buoyancy approximately one meter below the surface of the water. Ordinarily a swimmer enters the water upstream of his objective through an unsuspected inlet. With the snorkel in his mouth, he makes his way to the bridge, ties off the charge and exits the river downstream in much the same manner as he entered. Meanwhile a chemical delay fuse, timed to allow the swimmer to reach safety, detonates the charge.

Two methods are used in disabling a bridge. A critical pier may be demolished by exploding a charge placed directly on it. If a large amount of explosive is available, it may be anchored on the floor of the river or to a pier protection system to create a blast capable of dropping a span.



The explosive required to drop a span is calculated by a field expedient formula used by the North Vietnamese Army, $C=30Kdr^2$. C is explosive required. K is a factor for specific resistance characteristics of construction of the span—wood, concrete or steel. D represents thickness of the bridge, or breaching distance in meters. R is the distance from the center of the explosive mass to the top of the bridge.

Kilograms of explosive required by the formula is based on deterioration of the strength of the blast taking place when it passes above the surface of the water. Since submersion of the explosive reduces the quantity needed to drop a span, that quantity may be reduced (by up to one-half) by scheduling detonation at high tide, when the water level is closest to the bridge span. (At a depth equal to or less than ½ r, the charge may be reduced by as much as one-half. Tests indicate this formula has some validity.)

Early in 1969 the 20th Engineer Brigade began a survey of bridge security in the III Corps Combat Tactical Zone. Key bridges in this region were visited by a team accompanied by a Hoi Chanh who had been trained in bridge demolition by North Vietnamese forces. Each bridge was analyzed to find weaknesses in existing protective systems. The object was to find ways to eliminate weaknesses that made bridges susceptible to sapper techniques. The bridges had six common weaknesses.

- River inlets within 100 meters of bridges seldom yielded to good observation.
- Mine booms (cables stretched across a river's upstream side, at water level) which did NOT have chain link or concertina wire fencing suspended below water level, would stop floating mines but would not deny swimmers access to bridge piers.
- Sampans capable of transporting large quantities of explosives were generally allowed to pass unchecked under bridges.
- Due to improper placement, lights did not eliminate shadows and dark areas on the water surface.
- Catwalks, suspended beneath the superstructure on piers, were often too far above the water to allow effective observation.
- Guards unconsciously established habit patterns on their watches. An observant enemy could pick the best time for an effective attack. This weakness, present at the site of the Phu Cuong Bridge, was capitalized on by Lieutenant Diem's sapper team.

As a result of experiences in Vietnam, U.S. Army engineers have developed improved bridge defenses.

mine boom strung across the river can help keep the enemy away from a bridge structure, if chain link and concertina wire is suspended deep into the water from the boom. Such an obstacle is difficult for a swimmer (with no underwater breathing device) to breech, especially if he is towing explosives. This defensive network should be supplemented by guards, posted to allow complete observation of the mine boom. After passing under such a barrier, a swimmer must surface to clear his breathing tube. At this time, he would likely be spotted by alert guards.

Barriers around piers also can be an important defensive measure. The fixed pier-protection system was designed to protect piers of permanent bridges. Steel H-piles driven into the riverbed provide a frame for rebars welded into a six-by-six-inch mesh cage, or a frame for a (less desirable) chainlink cage including the pier. The cages are then filled with "Shariffs" (three U-shaped pickets centrally welded together to form a six-pointed frame which is wrapped with barbed wire), concertina or other wire to make penetration of the cages difficult for a sapper. A critical part of this system, the catwalk around the top of the cage, allows a guard visual access to the water surface on all four sides of each pier.

Although a fixed system is a positive deterrent to attack, it has several disadvantages. 1) A tremendous effort construction effort is required for each pier—in water from 20 to 70 feet deep. 2) Bridges remain substantially unprotected for a period of time since work progresses slowly. 3) Costs are enormous. It would have cost about $630,000 to place fixed protective systems on piers of the Phu Cuong Bridge, a bridge whose total construction cost was just twice that amount—$1,250,000. 4) Furthermore, abnormal tidal fluctuations on major rivers coupled with fixed-level catwalks limit a sentinel's ability to closely observe the water surface for signs of underwater activity—like air bubbles breaking the surface.

Such elaborate defensive systems clearly require great engineer effort to construct. However, as the Phu Cuong incident showed, when a bridge is suddenly destroyed by enemy sappers, the psychological impact on defending troops can be heavy.

An alternative to the fixed pier-protective system is the floating collar. Initially collars were made of wooden rafts, with styrofoam-filled containers adding buoyancy. From the sides of these floating collars, chain link fabric is dropped to the river bottom. The chain link fabric is woven together by divers to yield a closed cage, which is filled with materials in the same way as the fixed system. Time proved styrofoam undesirable adding buoyancy because highly-organic river pollution tended to dissolve it. Also, the supply was limited. Styrofoam was replaced by Navy mine buoys ("ping-pong" balls) capable of supporting weight in excess of 5,000 pounds.

The simple rectangular frame of this wooden collar was replaced with 10-inch channel iron, cut and welded into a reinforced frame, supported by "ping-pong" balls and topped by a catwalk. Concertina wire both inside the cage and surrounding the collar discouraged enemy thoughts of climbing onto the collar platform to assault guards.

Among advantages of floating pier protection is the reduced construction effort. A platoon can complete a floating system in about two weeks, meaning that more bridges could receive defenses in a given amount of time than would be possible with fixed systems. Cost of construction also is proportionately reduced. The floating collar can be penetrated with less effort than a fixed rebar cage, but it is an effective hindrance to underwater sappers and protects piers from mines floated downstream. Floating construction can absorb considerably more shock than fixed systems, and is less easily damaged by floating debris. Repairs are more easily accomplished than on a fixed-cage. Finally, the collar deck forms an excellent catwalk for guards which by it is always at water-level.

River traffic presents a hazard to both fixed and floating pier-protection systems. Heavy currents and unskilled pilots cause boats or barges to strike the pier-guards. Damage from such mishaps can be limited by effective fenders. Best fenders to date are built of nine heavy steel I-piles, driven in a pattern so that the center pile acts as an axis of rotation when a craft collides with the bumpers. Five horizontal bumpers ordinarily are used to make the fender effective at any tide level. To avoid the destructive force of a direct impact, fenders are constructed to establish channels at a 45-degree angle to the shipping stream. While fenders protect a system against river traffic, they add little resistance to an underwater sapper.

With either a fixed or floating pier-defense system, it is essential that guardposts be established at probable entry points on upstream riverbanks.

These defensive techniques all help limit access to a bridge for underwater aggressors. The key to a secure bridge, of course, is always the effectiveness of its guards. e

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Captain Robert J. Oldmixon is a former platoon leader with the 41st Engineer Port Construction Company in the Republic of South Vietnam. Currently assigned as Chief, Services Division, Directorate of Industrial Operations, Fort Belvoir, Virginia, he holds a Bachelor of Science degree from Michigan Technological University.

CIVIC ACTION U. S. STYLE

The cry for help came from a small agricultural town nestled in the heart of Colorado's San Luis Valley. The request was triggered by residents of Center, Colorado, who banded together last June to ask the U. S. Army for an assist in combating an enemy as deadly as one armed with the latest weapons.

That enemy—poverty, disease, and ignorance—is hard to beat. But the U. S. Army has faced adversity before and has always been equal to the challenge.

After a quick study of the situation by a group of officers from nearby Fort Carson, it was determined that Center had one of the lowest per capita incomes in the Nation and that problems existed between the two largest ethnic groups of residents—the "Chicanos" and the "Anglos."

To fight these imposing problems, the group recommended that a city planning commission composed of "Chicanos and Anglos" be formed to determine specific needs, set priorities for projects, and to establish the extent of community participation in the projects.

Then the Army brought in some domestic action experts—members of Fort Carson's 52nd Engineer Battalion (Construction)—to work on the four ma projects. The projects consisted of a city cleanup ca paign, city park improvement, preparation of city streets for paving, and closure of the city dump. All of the clean-up workload was coordinated through a central office occupied by military and civilian operating personnel.

It was a community relations publicity chairman's dream come true to see Army engineer dump trucks, front loaders, wreckers and civilian pickups and trucks

removing old car bodies from streets and yards and hauling them, along with other accumulations of junk, away to a new city sanitary fill.

Army engineers and local civilians also prepared more than five miles of city streets for paving, rehabilitated the city jail and improved the Healthstart mobile clinic.

Secretary of the Army Robert F. Froehlke liked what he saw at Center during a visit to Fort Carson and indicated that the Army's domestic action program could see increased emphasis in the future.

Mr. Froehlke said, "As long as we limit it to something that will help the soldier in his training mission; as long as we can accomplish our other goals without adding more men or dollars, I see no limitation. I don't see people objecting because we don't take over the leadership. As we get closer to that time when domestic action programs become all-important in winning-over uncommitted peoples , domestic action has to become more and more important."

With support coming from the Secretary of the Army, it is expected that the Army engineer will become more and more involved in domestic action projects like the one that was so successful at Center in the months just ahead as the U. S. Army moves into a peacetime status.

How well this type of program will be adopted by engineer troops is, perhaps, best summed up by the 52nd Engineers' commander, Lieutenant Colonel Edgar J. Mixan, who said, "Projects of this nature tend to enhance community relations, raise morale of our troops, and provide excellent training." e

The photos on these pages show civic action at its best. Members of Fort Carson's 52nd Engineer Battalion got right to the heart of the matter at Center, Colorado. They worked side by side with the civilian populace to clean up the town. In the photo on the opposite page an abandoned auto is being delivered to the city dump. The three photos on this page tell some more of the story. Beginning at top left and continuing clockwise—a dozer operator takes a break with children at the city dump; a grader operator explains Army equipment to the local children; and another operator participates in cleanup operations following the demolition of a building.

ENGINEER STAFF

ACCENT ON QUALITY

THE FACT that the U.S. Army currently is directing increased effort toward achieving its goal of being an all volunteer outfit does not imply that anything short of a highly professional, quality Army will be acceptable.

There may be some confusion among engineer enlisted personnel since new policies are inconsistent. Why, for example, is the Army seeking higher enlistment rates while, at the same time, it is involuntarily releasing other personnel?

The answer, of course, lies in the need to place decreased reliance on the draft as the primary source for the recruitment of younger soldiers while concurrently attempting to phase the overall Army strength down to lower authorized levels.

The Qualitative Management Program which was announced in Change 41, AR 600-200, is a major feature of the new program. The first phase of this program extended to June 30, 1971 and the second began July 1, 1971. The total impact of this program will have a far-reaching effect on the enlisted force of the Army.

With career tenure governed by a combination of time-in-grade and time-in-service while qualitative screening of the enlisted force continues, personnel with a history of mediocre performance will no longer be retained in the Army.

Complement this information with the recent announcements raising promotion and reenlistment criteria and one soon gets the message that professionalism and discipline would not be compromised. All of these new policies point to the fact that the "automatic reenlistment environment" is a thing of the past.

Since, under the new programs, an individual must establish and maintain his military and technical performance and qualifications at a level which will insure his tenure as a career soldier, the logical question uppermost in the minds of most career soldiers is "How am I rated among my contemporaries and how can I stay on top?"

The answer to the first part of the question lies partly with the Enlisted Evaluation System set forth in Chapter 5 of AR 600-200 and the Enlisted Efficiency Report and Rating System set forth in Chapter 8, of the same regulation.

The EM Evaluation System provides an objective measure of the technical knowledge of an individual in his Military Occupational Specialty Code while the Efficiency Report and Rating System is a subjective evaluation by the individual's supervisor of his job performance and potential. Both systems are given appropriate weight and together serve to determine if minimum qualifications have been met. The two systems also rank the individual among his contemporaries by grade and MOS. Placing consistently low can hurt an individual's opportunity to compete for promotion, reenlistment, and other career opportunities.

Commanders, personnel managers, and enlisted personnel also should be aware of another important point. In order for an individual to be in the best possible position to compete in this highly competitive

environment he must be placed, within Army requirements, in a career field and MOS best suited to his prior experience, aptitudes, and potential. He must then be allowed to develop this potential to the maximum. Only then do both the Army and the individual benefit.

Now more than ever before, commanders and personnel managers must assess the potential impact on the careers of their personnel prior to any reclassification action between career fields or MOS.

Misutilization of personnel, whether through malassignment or mismanagement, may seriously jeopardize an enlisted man's career in that personnel not actively engaged in the application of their primary skills tend to lose them. This places these individuals at a disadvantage with their contemporaries during annual MOS testing. Some EM may even fail to achieve the minimum score necessary to verify in their MOS.

Failure of an individual to verify twice consecutively in his MOS triggers mandatory reclassification action. Three consecutive failures to verify in an MOS, of course, can result in elimination from the service. These rules are set forth in Chapter 2, AR 600-200.

A low MOS score can have a tremendous impact on the individual soldier in many other areas—

- A score below 70 in the final 12 months of service bars reenlistment. (To reenlist a soldier must have been tested in the preceding 12 months unless specifically exempted by Headquarters, Department of the Army.)
- A score below 100 is a bar to promotion qualification.
- A score below 70 is a bar to the award of Specialty Pay.
- A score below 130 (Combat Support MOS) or below 120 (Combat MOS) is a bar to the award of Superior Performance Pay.

Since MOS evaluations have such impact on soldiers careers, it is the responsibility of commanders and personnel managers to ensure that EM are tested and given an Enlisted Efficiency Report during the prescribed time-frame.

Individuals should review those areas in which deficiencies were apparent in the last evaluation. The old test guide can be used in early study until the new publication is received. Care should be taken to insure that new current references are substituted.

Major General Robert R. Ploger, Commanding General of the U. S. Army Engineer Center and Fort Belvoir, and Commandant of the U. S. Army Engineer School, is encouraging all Engineer unit commanders through individual letters to exercise their responsibilities to assist personnel in improving technical proficiency.

Group seminars are ideal for refresher training when a number of individuals have the same MOS. Concurrently unit proficiency is increased.

Potential individual enrollees should complete DA Form 145, Army Correspondence Course Enrollment Application. For study groups, the unit commanders should transmit applications (DA Form 145) with the name and rank/grade of the designated group leader.

Enrollment for individual and group study can be accomplished by writing to—Commandant, U. S. Army Engineer School, Attn: DNRI, Fort Belvoir, Virginia 22060. MOS evaluation tests are scheduled for August and November 1972.

A total of 35 MOS Evaluation Tests affecting engineer personnel will be given this August. Here they are by MOS and title, respectively—12A10, Pioneer; 12B20, 12B30, 12B40, Combat Engineer; 12C20, 12C30, 12C40, Bridge Specialist; 12D20, 12D40, Powered Bridge Specialist; 12E20, 12E40, Atomic Demolition Munitions Specialist; 12F20, 12F40, Combat Engineer Track Vehicle Crewman; 12Z50, Combat Engineer Senior Sergeant; 41K20, Reproduction Equipment Repairman.

Also 51N20, 51N40, 51N50, Water Supply Specialist; 62B10, Engineer Equipment Maintenance Apprentice; 62B20, 62B30, 62B40, 62B50; Engineer Equipment Repairman; 62D20, 62D40, Asphalt Equipment Operator; 62G20, 62G-30, 62G40, Quarryman; 62H20, 62H40, Concrete Equipment Operator; 82E20, 82E30, 82E40, Topographic Computer, and 83F20, 83F40, Offset Pressman.

MOS Evaluation Tests will be given in 26 engineer specialties in November. Here they are by MOS and title, respectively—51E20, 51E40, 51E50, Camouflage Specialist; 51F20, 51F40, 51F50, Pipeline Specialist; 51M20, 51M40, Firefighter; 52B20, 52B30, Power Generation Equipment Operator/Mechanic; 52C20, Power Pack Specialist; 52D20, 52D40, Power Generation Equipment Repairman; 52E20, 52E40, Power Station Operator; 53B20, 53B40, Oxygen-Acetylene Production Specialist; 62C20, 62C30, 62C40, Engineer Missile Equipment Specialist; 62F20, 62F-30, Crane Operator; and 82D20, 82D30, 82D40, 82D50, Topographic Surveyor.

Absence of current evaluation data can also have an adverse impact on many personnel actions and will result in loss of Proficiency Pay unless testing has expressly been excused by the Department of the Army.

Today's Army is moving rapidly toward a highly qualified, competitive profession where commanders and personnel managers must apply sound personnel management principles and individuals must work hard to maintain their skills and a high level of performance.

Captain Julian E. Pylant

THE CORPS BUILDS FOR SAFEGUARD

The Corps of Engineers is managing one of the most complicated construction programs ever undertaken by this country!

On March 1969, President Nixon announced the following objectives for SAFEGUARD.

". . . Protection of our land-based retaliatory force against a direct attack by the Soviet Union.

". . . Defense of the American people against the kind of nuclear attack which the People's Republic of China is likely to be able to mount from any source.

". . . Provide for local defense of selected MINUTEMAN missile sites and an area defense designed to protect our bomber bases and our command and control authorities.

". . . By approving this system, it is possible to reduce U. S. fatalities to the minimal level in the event of a Chinese nuclear attack in the 1970's, or in an accidental attack from any source."

Thus, rather than focusing on a single purpose, SAFEGUARD has been and continues to be designed to achieve several objectives against a combination of Soviet and Chinese threats.

Extensive progress has been made in the two years since construction was started on the nation's first SAFEGUARD Ballistic Missile Defense System site. The huge concrete and steel structures at the Grand Forks SAFEGUARD complex now dominate the surrounding North Dakota wheatlands.

The second site presently authorized for deployment is in early stages of construction near Malmstrom Air Force Base in Montana. Two additional sites in Missouri and in Wyoming are currently authorized for advanced preparation which includes site survey, selection, and advanced acquisitions.

Comprised of five principal components, the North Dakota and Montana sites will consist of two types of radars, two types of missiles, and the complex data proccessing equipment that is necessary for operation and control of the SAFEGUARD program.

In operation, the system's long-range Perimeter Acquisition Radar (PAR) will detect targets as they appear above the horizon. It will track and relay target information to the Missile Site Radar (MSR) which picks up the targets in the later phases of their trajectories. The MSR will refine tracking data, calculate intercept points, and launch and control the defensive Spartan and Sprint missiles.

Normally, the long-range Spartan missile, capable of intercepts well outside the atmosphere, would be employed first. If the Spartan defense is penetrated or if the targets are allowed to enter the atmosphere to distinguish between warheads and decoys, the short-range high acceleration Sprint missile would be employed.

The data processing equipment which integrates the other components and actually makes employment possible is capable of handling millions of calculations per second. All these tactical components are housed in hardened facilities designed to withstand the shock, dust, debris, pressure and electromagnetic pulse caused by a nuclear detonation.

SAFEGUARD development and deployment is the responsibility of the System Manager, Lieutenant General Walter P. Leber. He is responsible directly to the Chief of Staff of the Army, General William C. Westmoreland.

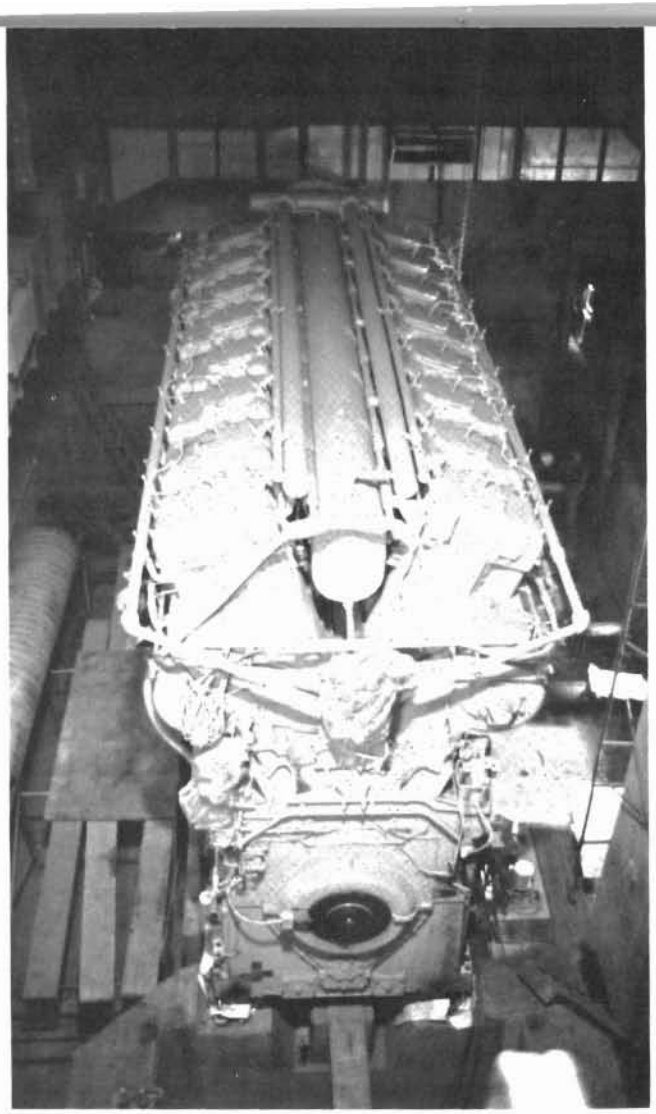
The Army's Chief of Engineers, Lieutenant General Frederick J. Clarke, has the responsibility of designing and constructing the SAFEGUARD facilities. To accomplish this mission, the Huntsville Division in Alabama was formed on October 15, 1967. The Huntsville Division, while assigned to the Chief of Engineers, carries out its functions under the operational control of the SAFEGUARD System Manager. Unlike conventional Engineer Divisions, the Huntsville Division has neither civil works functions nor territorial boundaries

based on watershed basins. Its military construction ...on can be carried out anywhere in the 50 states. ...he Division has conventional responsibilities for designing and construction of facilities, and site selection and validation. Additionally, its mission includes responsibility for operation of facilities during the installation and test period; assisting Army Air Defense Command, the ultimate user in on-site training; providing engineering support to the Weapon System Contractor at the deployment sites; assisting in development of manning tables and equipment lists; and developing operation and maintenance procedures.

The organization of the Division reflects the scope and diversity of its SAFEGUARD role. There are three Assistant Division Engineers, two of whom function as Contracting Officers for multimillion dollar programs. One serves as Contracting Officer for the Construction Program, the other as Contracting Officer for Architect-Engineer services. In addition, the Chief of the Procurement and Supply Division is the Contracting Officer for the tremendous amount of government-furnished equipment incorporated into each site. The Division's Area Offices, located at the respective deployment sites, manage the actual construction.

In creating the Division, care was taken not to staff for functions which could be performed by existing ...sions and Districts in whose area SAFEGUARD ...k might be located. Examples of such functions include acquisition of real estate and contracting for family housing. While the Huntsville Division performs a major role in site selection, actual land acquisition is conventionally carried out by the Office of the Chief of Engineers through respective Districts. Family housing is acquired in a similar manner.

Work at Grand Forks started April 3, 1970, three days after the award of the $137,858,850 contract. The fixed-price contract was at that time the largest ever awarded by the Corps of Engineers (a larger contract has since been signed on February 24, 1972, for Malmstrom Phase II SAFEGUARD work valued at $160,927,932). The 500-pound bid package contained 4,100 drawings and more than 5,000 pages of specifications for the four major structures (the MSR and the PAR and their power plants) and missile field. Five other construction contracts totaling more than $28 million have since been awarded at Grand Forks for the remote Sprint launch sites, nontechnical support facilities, water line construction, and family housing site work. Since construction started, the Huntsville Division has issued over 100,000 contract drawings with changes, construction shop drawings, and government-furnished equipment shop drawings.



It takes a 100-ton diesel engine like this one in above photo to drive the 3,000 kilowatt generators that provide the precise power at both the MSR and PAR sites. Left photo shows the North Dakota MSR site as it appeared in May 1971.

Work on the North Dakota technical facilities was scheduled so that each radar and its associated power plant was enclosed prior to the onset of the first winter. This was of such importance in meeting the ultimate Bid Opening Date that an item for rapid mobilization was part of the bid schedule. With closure and other winterization measures such as temporary shel-

ters and heating, effective work on mechanical and electrical systems proceeded throughout a winter that frequently had temperatures that dropped to 30 degrees below zero.

As weather improved, the contractor increased his work force in the spring of 1971 and reached a manning level of more than 2,500 men at the two radar sites. By the end of October 1971, major concrete placement was completed on both radars and power plants.

At the control center for the Grand Forks complex, structural work on the MSR building is virtually complete. Now backfilled, only a 76-foot-high pyramid shaped turret, containing blockouts for the four radar faces, appears above ground. Beneath, there is a 232-foot by 232-foot two-story hardened building. Hardening includes electromagnetic shielding which is provided by integral one-eighth inch steel liner plate. Individual rooms in the MSR building are lined to protect components from both nuclear blast produced pulses and from mutual interference by system equipment. Another unique feature is the extensive utilization of shock isolation platforms for sensitive equipment. They are used where it is more economic to isolate the equipment than to design it to standards to withstand a nuclear shock environment.

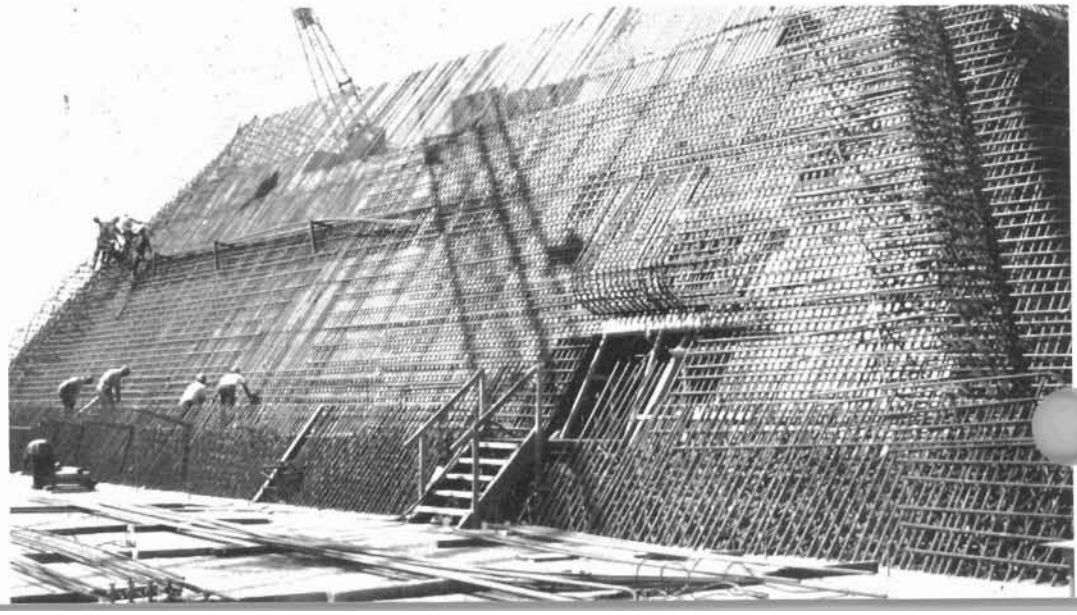
Adjacent to the MSR building is the site's hardened 17.3 megawatt power plant and an eight-million-gallon underground heat sink. Both are structurally complete and were backfilled late in 1971. Other primary tactical facilities include the Spartan and Sprint missile fields, warhead handling building, and missile assembly building. Conventional administrative, industrial, and recreational buildings and family housing comprise the balance of the construction at the MSR site.

The PAR site and its self-contained community are located some 20 miles to the east of the MSR. When structural concrete was completed on October 27, 1971, the 125-foot-high PAR became the tallest building in North Dakota. Measuring 204 feet by 213 feet at the base, it rests on a 10-foot-thick slab and has eight-foot-thick walls—all of heavily reinforced concrete. The north wall slopes back at 25 degrees and contains 6,888 penetrations for the phased array radar elements. As in the MSR, protection from electromagnetic radiation is provided by steel liner plate. The protection scheme is different, however, in that the inside of the exterior walls, floor, and roof are lined instead of lining individual rooms. As in all the tactical facilities, shock isolation platforms are used where necessary. The buried PAR power plant has a 14.4 megawatt capacity.

Four Remote Sprint Launch (RSL) sites are spaced several miles from the CSR in the surrounding Minuteman field. These are being constructed under two contracts totaling approximately $14.5 million. Though much smaller than the two radar facilities, the RSLs are of the same hardened type structures.

In all the SAFEGUARD facilities, standardization of equipment is a key factor. Over $30 million in government-furnished equipment is being integrated into the Grand Forks complex. Types of equipment include such items as 3,000 kilowatt motor generator units, pumps, chillers, electrical switchgear, shock isolators, valves, and the heavy steel cans which house the Sprint missiles. Approximately 10,000 items of 1,700 different makes and models are provided by over 50 supply contracts. At the first two deployment sites alone, standardization is expected to yield savings exceeding $32-million in reduced training requirements, maintenance, and repair parts stockage. e

Captain Julian E. Pylant has been the Assistant Executive Officer of the Huntsville Division since April 1971. He is a 1965 graduate of the U. S. Military Academy, completed the Engineer Officers Advanced Course in 1968 and holds a Master's Degree in Civil Engineering from Stanford University. Previous assignments include two tours in Vietnam—one with the 169th Engineer Battalion (Construction) and one with the 326th Engineer Battalion (Airmobile).



This is a July 1971 view of the four-foot-thick turret of the North Dakota Missile Site Control Building. The workers are starting to tie resteel. The resteel used at each SAFEGUARD site totals more than 25,000 tons. This means that on an average there is almost 300 pounds of resteel per cubic yard for the some 170,000 cubic yards of concrete at each site.

THE CORPS CARES

The following excerpts were taken from U. S. Army Chief of Engineers, Lieutenant General F. J. Clarke's, address during the 105th annual Engineer dinner, May 5, 1972.

". . . . Each of us knows that 'The Corps Cares' about many things, has always cared, and will continue to care. There are some considerations, however, that I would like to reflect on for a few minutes, about the things we do care about, and some things about which we do not have concern.

". . . . The Corps has always been an action agency, and has made its reputation by doing things. It has lived by its motto—Essayons—which we translate alternately as "we try" and "we do". We live by accomplishments, and for 197 years have demonstrated time and time again that we can produce.

". . . . The work of the engineer continues to be the same basic job—of taking what nature provides, and our knowledge of the laws of nature which increases but rarely changes and applying our skills to the benefit of people, in the Army or in the country at large. And our job becomes a twofold job in the future—first of increasing our knowledge of the laws of nature, so that we can be more confident of our abilities, and secondly, of determining better what our users want, so that we can apply ourselves to what is important.

". . . . The first of the two tasks can best be described by the term of professionalism. General Westmoreland has set goals for the Army of becoming an army of professionals—soldiers who know their business and know how to practice it. We in the Corps have the identical responsibility of being professional soldier engineers. This is a responsibility which extends from the engineer soldier or specialist to the highest officers. It requires each of us to know what we should do, why we should do it, how we should do it, and to have developed proficiency in practice, so that we have confidence in our ability to do it.

". . . . This is one of our principal cares—that the Corps continue to be a professional outfit—throughout. The requirements of the Army for Engineer support go up exponentially as the Army gains new levels of mobility, and particularly as the Army sets its sights for increased mobility in the future, as the Army sets new standards of sophistication in its weaponry, and makes use of the new marvels of communication. The Army is talking about and planning on an Army that will move, shoot, and communicate better—and the job of the Engineers is to make it possible—while using the same media of water, earth (or in combination as mud) and air.

". . . . Engineer support of the Modern Volunteer Army is giving us some additional opportunities to employ troops on meaningful projects. With encouragement from General Haines at CONARC, and careful selection of stations where the limited number of engineer troops are stationed, we find them well employed on projects to improve the livability of the old barracks, on construction of ranges and rugged training facilities, in support of the tests of new techniques at Fort Hood.

". . . . The second task that I set for the engineer is to determine better what the Army needs and wants. If these needs and wants are not foreseen, planned for, and provided for, we stand a better than even chance that opportunities will be lost or delayed to our detriment. The determination of what is needed comes through many channels—but the primary one is a mutual exchange of ideas at all levels between the Engineer and the forces he supports, so that concepts are clearly understood as plans are formulated.

". . . . I see for the future that as long as we care for, and consider important, those matters which are important to the Army and the Nation, so long as we develop the professionalism of our people, and so long as we continue to act objectively and honestly, we need have no concern that the need for our services will diminish. So long as the Corps cares about others, they will care for us. e

TIPS FROM THE FIELD

Lieutenant Colonel Robert L. Crosby
Secretary, USAES

In the Winter Issue of **the engineer** we announced the introduction of a new department on Dynamic Training as a regular feature. This is it. In this and succeeding issues we will present Dynamic Training ideas which have been submitted by our readers. We also will keep you informed about the activities of the Engineer Dynamic Training Council that has been established here at the Engineer School at Fort Belvoir, Virginia. In large measure, however, we are depending on you (our readers) to send your experiences and ideas to this department if it is to be successful as a primary source of Dynamic Training ideas. With perhaps a bit of innovative thinking and a dash of ingenuity, these ideas should help make your respective training programs more interesting and motivating.

In case Dynamc Training is a new term to you, maybe you will want to take a look at "DYNAMIC TRAINING, A New Approach to an Old Problem," an article that was published in the Winter Issue of this magazine. Basically, the idea is to inject new life into unit training—to do away with the monotony and boredom that is brought about by mechanically conducting training to comply with relatively rigid requirements that are established by various higher headquarters.

Army Chief of Staff General William C. Westmoreland provided the opportunity for a more dynamic approach to unit training in a message to the field in June 1971 in which he gave full responsibility for unit training to the battalion and separate company commanders of the Army. Who, after all, is in a better position to know what kind of training a unit needs? In developing a training program, who is better qualified to consider the basic mission of the unit, the contingency plans it may have to support, the readiness of that unit's equipment, the local climate, range and training facilities limitations and all of the other factors which directly affect the training program?

Perhaps more to the point, who is directly responsible for the success or failure of that unit to perform any assigned mission when the chips are down? This is why the battalion and separate company commanders have been given the opportunity and the responsibility to take a more flexible—and dynamic—approach to training.

So, it was a combination of things that led to the establishment of the Dynamic Training Board at Fort Benning, Georgia, and the Engineer Dynamic Training Council at Fort Belvoir, to help provide useful information and ideas for those individuals who are responsible for this new approach to training. The role of **the engineer** and this new department is to give visibility to these ideas.

"So, what else is new?" could be the reaction of many when they are exposed to the ideas individuals in the field submitted in response to the Engineer Dynamic Training Survey Questionnaire. It should be no surprise to anyone that new and unique ideas are few and far between. Obviously, this is as true of engineer unit training as it is of all other areas of human experience. What is important to us, though, is how we can take a successful training experience and, by injecting some of that engineer ingenuity and innovative thought, come up with a new application to fit another situation.

Here is an example of a dynamic approach to unit rifle qualification. This is not a "new problem" to the Army and the successful solution is not a "new" one in the sense that it was done within the last few months. But it was new to Lieutenant Bruce C. Clarke when he was assigned to Company C of the 3rd Engineers in 1932, and, without doubt, there are many engineer lieutenants today who are facing similar "new" situations. The first in the series of Dynamic Training experiences is submitted by that lieutenant of the "old Army" who climbed to the top of the ladder during that 40 year span of time. General Bruce C. Clarke (USA-Ret)

makes a point on how to motivate soldiers and tells it like this—

"The officer who can come up with a program of awards or other means of motivating his men which is effective is well on the way to being what is now called a Dynamic Trainer.

"In 1932, I was assigned as a lieutenant to Company C, 3rd Engineers, under a captain who had been a company commander for several years. The annual qualification rifle range season was approaching.

"The Company Commander put the instruction for the range season under me with the admonition that he wanted the company to win the Regimental Commander's Trophy which was given to the company with the highest average score on Record Day each year.

"I carried out what I felt was good preliminary rifle marksmanship instruction and we had good practice firing on the range.

"Before the record firing, I consulted with the First Sergeant as to what awards were given last year for record firing. He told me that about $85 was taken out of the Company Fund and prize money was awarded for the following rifle qualification positions: high offhand score at 200 yards; high kneeling score at 300 yards; high sitting score at 300 yards; high total rapid fire score at 200, 300 and 500 yards; high 500 yards score at slow fire, and high 600 yards score at slow fire. The top award was given for the high aggregate score (officers did not compete as they were motivated in other ways).

"I asked the First Sergeant who won the high aggregate the year before and he said he did.

"I wondered how such a system motivated the 'Bolos.' We had had several last year and this brought our average down. I asked for last year's record score cards.

"After much research, and being mindful of the fact that the Company Commander allowed me $85 from the Company Fund in prizes for the current year, I came up with this program which I carefully explained to the men—On Record Day you will receive five cents for each bull's eye you fire. But 4s are par—no prize. It will cost you five cents for 3s; ten cents for 2s, and twenty-five cents for misses.

"The men were skeptical. They felt that it was a device to make money for the Company Fund. I assured them that it would have cost the Company Fund about $80 last year. They reluctantly went along with my program.

"On Record Day the men won $125 from the Company Fund. Only a few had to pay in any money—none over $1.50. We won the Regimental Commander's Trophy with points to spare.

"What produced these results? Each man was competing against the Company Fund in a way that meant something to him. He tried to "hold and squeeze" each shot—even after he had enough points for sharpshooter or marksman and could not reach the next higher qualification.

"The First Sergeant was still the high winner because he was an experienced competitive shot but the men were not competing with him. His known ability did not dampen the motivation of the troops. Of course, my Company Commander was pleased. The Division Inspector General heard about it and came around to see if such a program was according to the Regulations governing the use of the Company Fund. He gave it a clean bill of health.

"We can draw several lessons in motivating men from this example (five cents was money to a soldier in 1932)."

General Clarke's method of motivating his men would be just as good today as it was those many years ago. His unit also must have participated in some form of Adventure Training in those days without knowing it by that name. Here is an example—1972 style.

Platoon Sergeant Vernon L. Allen of the 814th Engineer Float Bridge Company, 559th Engineer Battalion, Hanau, Germany, submitted the following description of a platoon-level Adventure Training experience that was conducted by his unit—

"My platoon was selected by higher headquarters to run a course setup in Adventure Training. We were to test how much weight a man could carry travelling in hilly terrain with the use of maps and compass. This included water, food, clothing for three days, ammunition, protective mask, and the weapon.

"The course started first with a helicopter ride to the drop point. Then, from the drop point we had to walk 30 kilometers in hilly terrain to a location on the main river. Between these two locations we were told to reconnoiter three demolition targets and to suggest types

of targets, tools, and equipment that would be needed to do the job.

"At the river, we boarded 15-man assault boats that were provided by our company for a run down the river for 29 kilometers. The allotted time was from 8 a.m., Thursday until 5 p.m., Saturday. The platoon arrived at our home station at 6 p.m., Friday; 23 hours ahead of schedule. The test was a success and the course is now being used by the units of the 130th Engineer Brigade."

There is much more to the Dynamic Training program than just Adventure Training. Dynamic Training embraces the entire unit training picture. For example, Captain Thomas F. Ramos submitted this description of some squad-level training that was conducted while he was with the 237th Engineer Battalion, Heilbronn, Germany—

"To increase the confidence and proficiency of my squad leaders, and to help them get to know their men better, I sent my squads on three-day missions. A squad was subject to be called on to move out on these missions at any time without previous warning.

"If a squad leader was alerted after duty hours, he had two hours to round up his squad and leave the kaserne (post) in his vehicle with all equipment aboard. Missions included preparation and execution of target folders, route reconnaissance, erecting rope bridges across small rivers, mine detection, and anything else that was pertinent to our squad missions.

"The exercise was usually concluded with a 10 mile map reading course across wood countryside. Rations were picked up by giving the squad leader only the map coordinates as to their location on the radio.

"As the program developed, I was able to send one squad out each week on a mission. We even broadened the exercise by requesting aviation support. Competition among the squads on who performed the best missions added a great deal of enthusiasm to the program."

These are the types of ideas and experiences we are looking for from you. What you submit does not have to be "new." Sergeant Allen's experience was just as new as General Clarke's experience as a lieutenant. What is essential is that the Dynamic Training idea in some way presents some form of stimulation or challenge. The reward is that the unit, individually and collectively, realizes that it has successfully performed a task or mission—while exercising and perfecting the missions' essential skills. This is where it's at!

How about you? Have you led or been involved in any particularly interesting and effective training exercises? The Engineer Dynamic Training Council is interested in hearing about what you have done. This department of *"the engineer"* will regularly feature ideas that have been submitted. We need your support. So please send a brief write up of your training experiences and ideas to: The Engineer Dynamic Training Council, U.S. Army Engineer School, Fort Belvoir, Virginia 22060.

Lieutenant Coloniel Robert L. Crosby currently is Secretary of The Engineer School and Deputy Chairman of the Engineer Dynamic Training Council. His assignments have included duty with the 271st and 9th Engineer Combat Battalions; Commanding Officer the 92nd Engineer Construction Battalion, and later IV Corps Engineer Advisor in the Republic of Vietnam. He is a graduate of the Air War College, holds a master's degree in Civil Engineering from Iowa State University, and is a registered professional engineer in the "Hawkeye" state.

Engineer OCS- Another Perspective!

CAPTAIN JOHN J. CONNOR

"Grossing Out Delta Company," a story on Engineer Officer Candidate School (OCS) by Sergeant (then Specialist 5) Hugh M. Gildea, appeared in the last issue of **the engineer,** *Winter 1972. In a response to that story Captain John J. Connor, who attended EOCS at an earlier time, presents an opposing point of view. After a year's duty as a tactical officer Captain Connor departed the Officer Candidate Regiment in May, 1969, about the time Sergeant Gildea's class began "the Program."*

Could a rookie baseball player who was cut from his team in spring training be an authority on the playing of major league baseball? How well then could a 23-week course be judged by a student who experienced only eight weeks of it?

To understand the perspective from which Specialist Gildea viewed the Engineer OCS program, I did some homework, checking official records and interviewing several people to get an appreciation for the people and events that shaped his experiences during those two months. I concluded that his analysis was based on a very limited, restricted experience. But a point-by-point rebuttal would leave much unsaid. A positive approach would try to show what OCS *was* rather than dispute what it was not.

Most of Specialist Gildea's misconceptions can be attributed to the fact that his judgments are based on the first eight weeks of the program. The junior and senior phases (which he did not experience) were far different from that underclass program, as I hope to make clear. In his nearsighted perspective, Specialist Gildea fails to see the differences between "means" and "ends." Certain elements of the program which seemed bothersome and pointless at the time had purposes which later became clear.

To judge whether the officer candidate school accomplished its mission, we must first look at that mission. Then we should examine the way it went about executing its mission with what was called "the Program." Third, we need to judge the OCS graduates.

DA Pamphlet 601-1 (*The OCS Story*) states: "The mission of Officer Candidate Schools is to develop competent leaders for the nation's Army. These schools emphasize the development of practical leadership, with special emphasis for male candidates on building physical stamina, and the mastery of tactics and weapons. The rigorous program of training and discipline furnishes the means of confirming whether a candidate possesses the potential ability to become a competent leader. The schools' further function is to develop this ability once it is recognized, by teaching the professional knowledge needed for successful leadership."

This statement informs us that OCS has a dual mission, first to confirm a candidate's potential and then to develop it.

The initial part of this mission, which included [redacted] plebe and underclass phases, took up the first one-thi[rd] of the 23-week program. During these two memorable months the candidate's mettle was tested. To the plebe it was a period marked by endless missions with never enough time to complete them. In these hectic weeks he learned how to "function," that is to plan, organize and efficiently use his time, manpower and resources—a very important lesson indeed!

It was during this period that most of the candidates who would fail to complete the program were eliminated—victims of poor physical condition, lack of desire and motivation, or less frequently, lack of ability. At this point very few candidates, especially those who dropped out, realized what was really happening. It wasn't until much later in the program that "lessons learned" became clear. But toward the end of this phase there did appear to be hope for the bewildered candidates, some light at the end of the tunnel in the form of "white tabs" which signified the junior phase.

In this middle stage a class was at its peak when it began to supervise an underclass of its own. This was a unique experience for most candidates, entirely different from sharing command positions among one's own peers. This was the first taste of leadership, th[e] first real feeling for what the program was all ab[out] It was, however, a time to make mistakes. The can[di]dates made many mistakes, and paid the consequences for them. . . . And a few more candidates were dropped from the program.

Then came "Operation Red Tab," the tactical exercise which led to senior status. It was now time to polish rough edges and assume greater responsibilities—company, battalion and regimental command positions. It was a time to assess one's progress through the many weeks of training.

Only now did some of the obscure events of the early weeks make sense. The "switch-around-switch" for example, which at the time seemed nothing but harassment, served several purposes. This exercise tested a class's ability to organize and work as a team, and at the same time gave everyone a better chance to get to know all those men they were helping to evaluate. From the perspective of a senior, the candidate could see that this exercise and other training tactics were only "means" designed to achieve a specific "end," development of competent platoon leaders. By learning how to "function" early in the program, senior candidates were able to routinely accomplish tasks that a few weeks earlier seemed impossible.

How many times did a senior stare in disbelie[f] members of a new class stumbled all over themsel[ves]

attempting a simple mission and ask himself, "Did my ...s really look like that?" Newly developed skills, ...cipline, stamina and organizational abilities helped mold a candidate throughout the program to graduation, and on to his initial assignment as a second lieutenant. It becomes evident that even OCS itself was only a means designed to train a man to be a leader. It was not the OCS goal to mold a man to be a good *candidate,* as an end in itself.

One candidate's thoughts as he looked back on the program are revealed in an excerpt from a speech given the eve of his graduation in November, 1968. "Officer Candidate School *has* done something for us because it was a . . . succession of constant challenges that made us look closely at ourselves and others (and it) has given us a confidence in ourselves and the growing ability to 'keep our heads while all (those) about us are losing theirs.' The program has taught us to roll with the punches, to handle crises, to control men, to command respect—all necessary abilities of a platoon leader which we are now more qualified to be. Of course we're not perfectly qualified, no Program can profess to accomplish that mission. But at least we're the product(s) of a system designed to eliminate the totally unqualified and, more importantly, to develop the potential of the qualified. We have succeeded here ...d success will stay with us, promoting greater suc...s(es) in the future. OCS has done something . . . different for each one of us, but basically it has prepared us to do a better job as platoon leaders."

Any article that attempts to convey the meaning of OCS but contains no mention of the black-capped, ever-present, never-satisfied group of men known as "tacs" would be anything but complete. Again the words of a candidate best describe the tactical officer and the role he played in OCS life. This description is taken from a presentation to Class 14-69, "These are the men who pushed us, men who drew from us the stuff necessary to make a good leader. There were times we inwardly cursed and briefly hated them (when) they did what they knew was necessary. The *why* of it is clear now. We admire them and what they have given us, and again we know pride. Pride that we have measured up to their standards, pride that we shall be treated as their equals even though they will always seem a bit taller, their expectations a little out of reach."

But their expectations *were* reached! Whether at the rocky training sites of Fort Leonard Wood, Missouri, or in the lush jungles of Vietnam, Engineer OCS graduates forged a distinguished record of accomplishment ...which they can be justly proud. To their credit are ...ally hundreds of bridges of all descriptions, mile after mile of roads, plus countless other combat, military and civic-action construction projects that bear solid testimony to both their spirit and their skill. This prized record was won by the sweat, the blood, and in many cases the very lives of these young men.

On December 10, 1967, the Distinguished Service Cross, the nation's second highest award for valor, was posthumously awarded to Second Lieutenant Robert E. Knadle (Clearing The Way, Fall Issue, **the engineer**) for gallantry in action near Phu Li Bridge, Republic of Vietnam, where on October 9, 1967, just 10 days before his 22nd birthday, "he was mortally wounded while gallantly leading his men in the face of grave danger." A special exhibit honoring Lieutenant Knadle, December, 1966, graduate of Engineer OCS Class 2-67, is part of the OCS Hall of Fame in the Engineer Museum at Fort Belvoir, Virginia. The Hall of Fame honors all Engineer OCS graduates through recognition of achievements of its most distinguished graduates from the three eras marking the existence of Engineer OCS—World War II, Korea and Vietnam.

In all three programs the "end" was the same, but the "means" were varied. During the Vietnam era (1966-70) the program was constantly being refined. In 1968 graduates were first commissioned in branches other than the Corps of Engineers. Graduates of the "Old Program" (that was everyone before your underclass) would hardly recognize the program of late 1970 that saw underclass candidates without the traditional "beanhead" haircuts, when weekend passes were standard for all candidates after the second week. But all exterior trappings were secondary to the goal—training a competent second lieutenant.

In the early days of the Vietnam buildup, OCS depended heavily on career-type enlisted men with prior service to fill its ranks, but after mid-1968 the typical candidate was a fresh-to-the-ranks college graduate. New means were required to achieve the same goal. Occasionally a "means" lingered after its usefulness had passed, but this should not be cause for forsaking the entire system. In the final analysis it can be judged that the Engineer Officer Candidate Program successfully completed its mission.

Should a future conflict require for a fourth time that Engineer OCS be called into the service of its country, I would be proud to be a part of it again! e

A May 1968 EOCS graduate, Captain Connor was a Tactical Officer in the Engineer Officer Candidate Regiment from June 1968 to May 1969 and again in June and July of 1970. Between OCR assignments, he served in Vietnam as a terrain intelligence officer with the Assistant Chief of Staff for Intelligence (J-2), Military Assistance Command. Since July 1970 he has been a geology instructor, Dept. of Engineering Science, US Army Engineer School, Ft. Belvoir, Va.

Bridging

LIMITED QUOTA EXISTS FOR OFFICERS TO TRAIN AS ROTARY WING AVIATORS

APPLICATIONS ARE being accepted for officers to train as rotary wing aviators, but selections are being made on a best qualified basis. A decrease in warrant officer candidate flight training created a very limited need for commissioned officers to train in this field. To be eligible, officers must have less than 48 months commissioned service at time of entry and should have an above average performance record. Interested officers should consult AR 611-110 for information or contact the Engineer Branch.

SPECIAL PROGRAMS CAN ENHANCE OFFICERS CAREERS

THE ARMY wants officers to become more aware of the opportunities special career programs afford qualified individuals. These programs are designed to develop and assign officers who are particularly well-qualified in certain functional areas. Such areas are of special Army-wide importance, but do not fall within the development pattern of a single career branch. Specialist programs have been established for careers in Atomic Energy, Automatic Data Processing, Comptroller, Foreign Area Specialty, Information, Logistics, Military Assistance, Operations Research/Systems Analysis (OR/SA), Procurement, and Research and Development. Army Regulations in the 614 series describe the prerequisites, procedures for enrollment, education and training, career development, and specific positions associated with each program. Officers should consider the possibility of developing a specialty in addition to maintaining their branch competence. Interested individuals should review the AR's and contact their assignment officers to discuss how membership in a special career program could enhance their careers. Right now the Engineer Branch is primarily interested in having new members participate in the Logistics, Military Assistance, OR/SA, and Research and Development programs.

THERE IS NO SECRET OR MAGIC OML

MANY OFFICERS think there is something secret or magic about the OML (Order of Merit List). To set the record straight an OML is a merit ranking of officers of the same branch for a limited specific purpose. OML's establish the relative standing of an individual officer among his branch contemporaries to insure equal consideration in the identification of the best qualified officers when making career management decisions. OML's are prepared for specific purposes at specific times—such as recommendations for CGSC, graduate school, and so on. Therefore, any given OML will contain only the names of those officers who are eligible for the personnel action that is being considered. All career branches in OPD use the same general procedures to prepare OML's but no attempt is made to compare officers with their contemporaries in other branches. Major factors considered in the preparation of OML's include manner of performance as indicated on the officer's efficiency report, awards and decorations, combat experience, and military and civilian education. An officer's relative standing can change from one OML to another depending upon the particular group of officers with whom he is compared and the purpose for which the comparison is made. Assignment officers can inform an individual during a normal counseling session whether he was recently considered for some opportunity and where he stood in that consideration.

the Gap

ARMY ENDEAVORS TO STABILIZE TOUR LENGTHS

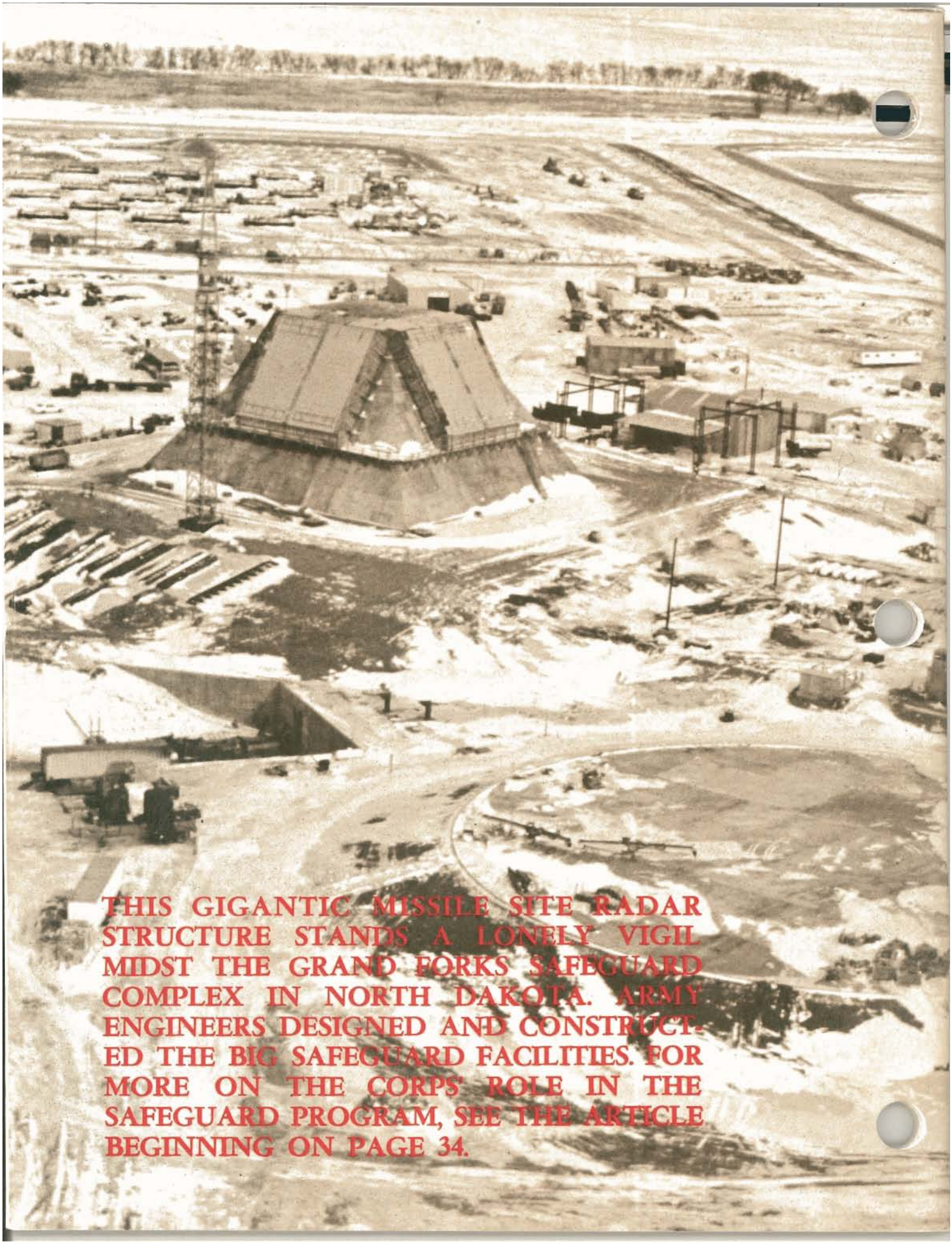
SHORT TOUR requirements have begun to drop for Engineer Officers and warrants. Greater stabilization has arrived now that the Army is cutting back its strength. Today, the Engineer Branch says that dependent tours in Europe should be three years and all Continental U. S. tours at least two years. Also tours with major commands and agencies are being stabilized to three years. It is interesting to note that only a year ago almost 25 percent of the officers in the Corps were serving in short tour areas. And as the drawdown in Vietnam continues, it is expected that many officers will not be permitted to complete their full tour there. Many will be pulled out without being able to complete five-sixths (10 months) of the tour. Even so, the Engineer Branch points out that any officer in this category will receive credit for a short tour regardless of the time he has spent in Vietnam provided the curtailment is for the convenience of the government.

CERTAIN PERSONNEL INELIGIBLE FOR ASSIGNMENT TO HOSTILE FIRE ZONES

INDIVIDUALS BEING ASSIGNED to a hostile fire zone should check their status in regard to the following additional requirements for the area. If they have not had a dental check, they should insure that dental examinations are accomplished and appropriate dental care is completed in accordance with Chapter XIII, AR 40-3. If they are under 18 years of age at the time they are scheduled to report to the oversea replacement station, they are ineligible for assignment in accordance with Paragraph 8-1, AR 614-30. If they are assigned to a country in which they were previously in a prisoner of war status, they are ineligible and should be deleted from the alert orders in accordance with Paragraph 8-1, AR 614-30. If they are credited with a tour in the Republic of Vietnam, they will not be involuntarily assigned to that country unless expressly affirmed by the Chief of Personnel Operations in accordance with AR 614-30 and AR 614-200. If they are sole surviving sons, they must sign a waiver indicating that no objection is interposed for the assignment in accordance with AR 614-75. If they have another family member in a Hostile Fire Zone, they may be eligible for a deferment. There also are other conditions involving immediate family members that may qualify them for deferment or exemption from assignment to a Hostile Fire Zone, in accordance with AR 614-30.

UPDATED ARMY FILM GIVES BETTER SLANT TO GROWING ROLE OF EES

THE FILM "EES, Key To Your Future" has been updated to more clearly portray the ever-growing role the Enlisted Evaluation System is serving under the Modern Volunteer Army concept. The film (MF12-5663) is now available at all field audiovisual centers. The importance of the Enlisted Evaluation System as a personnel management tool in the development of the soldier's career is dramatically portrayed. The film focuses attention on the responsibilities of the individual soldier, commanders, test control officers, personnel officers, and the U. S. Army Enlisted Evaluation Center toward the successful operation of the system. It explains how the system affects the individual soldier's future regarding such important personnel actions as promotions, award of proficiency pay, assignments, retention in service, and eligibility for reenlistment.



THIS GIGANTIC MISSILE SITE RADAR STRUCTURE STANDS A LONELY VIGIL MIDST THE GRAND FORKS SAFEGUARD COMPLEX IN NORTH DAKOTA. ARMY ENGINEERS DESIGNED AND CONSTRUCTED THE BIG SAFEGUARD FACILITIES. FOR MORE ON THE CORPS' ROLE IN THE SAFEGUARD PROGRAM, SEE THE ARTICLE BEGINNING ON PAGE 34.