



# the engineer

Spring, 1971

# We

We of the Corps of Engineers have long been waiting for the advent of a forum to air our ideas on current Engineering problems—military problems as well as those within the civilian domain.

We are optimistic that we now have such a vehicle, with the initial issue of THE ENGINEER, making its debut on the engineering scene.

Through this medium, we hope to trigger engineer thinking. We hope to stimulate controversial subjects; "cross-generate,"—if you will—engineer viewpoints, with the objective in mind of progress in the profession. Certainly there are among us engineers who can rebut or reply to questions such as:

"Should Engineers be generalists or specialists . . . ."

"Can we attain trade union recognized proficiency for our MOS specialists . . . ."

"What is the best method of reducing response time . . . ."

We would like to see such topics—and countless others, explored and we believe that this can be done effectively through future issues of THE ENGINEER.

Controversy for controversy sake? No—that is not our objective. What we are after is progressive engineering thought, and we feel that we shall be successful in reaching that goal. We see THE ENGINEER as a reflection of contemporary thinking engineering-wise. It will be edited with the aim of provoking the thought processes of the complete span of our personnel, from young enlisted men to career-oriented engineer officers. From them may well emanate new ideas, fresh approaches to existing problem areas—solutions perhaps, to many of the technical barricades facing us.

With that in mind, an epigram occurs to us (and we are speaking in terms of engineering problems):

"PROBLEMS KNOWN BY ALL, ARE PREVENTED FROM GROWING TALL."

In essence, this means that discussion invites solutions, and we want to stimulate discussion in THE ENGINEER.

Remember, THE ENGINEER constitutes an open engineer forum. We hope that those who are in the business, will give us the business !!! Your help is solicited. Input is desired from all engineers who wish to serve the interests of our Army and nation.

Let us hear from you !!!



*Robert R. Ploger*  
**MG Robert R. Ploger**  
Commandant, U.S. Army Engineer School



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Our cover photo was taken by Major Robert W. Whitehead, Liaison Officer to Southeast Asia, Office of the Chief of Engineers. His photo contrasts the old and the new in South Vietnam. Read about it in LOC, page 18.

# the engineer

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# engineer interview:

with  
brigadier general

## IRA A HUNT JR

*A young Corps of Engineers lieutenant supervising the construction of a road in an underdeveloped country in Southeast Asia would appear to have little in*



*We have done away with reveille, cut our details in half, relaxed the dress code . . . and in general enhanced the total environment.*

*common with an atomic demolitions specialist assigned to an engineer unit in Europe. Nor would it seem that either of them would have any mutual interest with a missile equipment repairman running a final check on a piece of vital missile support equipment located on a test atoll in the Pacific. Yet all of these men have a common tie—they are all graduates of the U.S. Army Engineer School at Fort Belvoir, Virginia, the "Home of the Engineers."*

*The U.S. Army Engineer School is the Army's oldest military service school. It is the sixth largest graduating institution of learning in the Washington, D.C. area—until recently averaging about 25,000 graduates each year.*

*Its reason for being? Very simply put—to produce professionally qualified engineer officers, and enlisted personnel extremely proficient in related engineering skills. Their mission? For combat troops—to provide all possible engineering knowledge for progress; be it in the area of the railroad*



*We rely greatly on inputs from the field to tell us how to improve the quality of our students.*

*building of the 1800's (which saw this nation expand from east to west, and in so doing promoted the commercial well-being of untold thousands of its population, increased trade potential, and sped lines of communication to the point of instantaneous response which we enjoy today), or in the area of water resources planning—or the relatively new field of ecology.*

*Brigadier General Ira A. Hunt Jr., is the Engineer School's executive—he's the individual who, on a daily basis, directs the school's operations for the commandant of the school, Major General R. R. Ploger (who also is the commanding general of the Engineer Center and Fort Belvoir), and working closely with the Chief of Engineers,*



*Instruction depends on people and we have the best. Our instructors are enthusiastic and they are knowledgeable.*

*Lieutenant General F. J. Clarke, General Hunt has pushed for quality in the officers assigned to duties with the Engineer School. He has been successful to a great degree.*

*This is understandable.*

*A most personable individual, charming in conversation, and most friendly socially, General Hunt belies a constant underlying concern for problems which "bug" him. Outwardly, it would appear that there is no such thing as a problem without resolution to him. He is a man who believes in a direct approach to solving problems. He is an impatient man—in a great hurry to see that problems are solved, and to his satisfaction.*

*He has an outstanding record of accomplishment. He is not out to make friends, as such. He is governed by an overwhelming desire to accomplish those tasks in which he believes. And he believes also that others should be as "fired up" as is he. In fact, he sees that they are.*

*Most who work for him for the first time are rather shaken.*

*He is much like a high-tension wire, severed—for all within his reach soon become charged with endeavor.*

*He is quite a person—and provides the current which makes the Engineer School today, an electrified organization.*

*He has much going for him: graduated from the US Military Academy in 1945, after two years at Vanderbilt University—MS Degree in civil engineering from MIT at Cambridge—Studied at Delft, the Netherlands, and at Grenoble, France, as a Freeman Scholar, receiving the doctor of university degree in hydrodynamics from the University of Grenoble. He has a masters degree in business administration from the University of Detroit, Michigan, and a doctorate in that field of endeavor from*

*George Washington University in Washington, D.C.*

*General Hunt knows engineering. From both the civil side—and in combat. He has instructed at both the US Naval Academy and the US Military Academy at West Point, in engineering subjects. He has served as a district engineer and with the Office of the Chief of Engineers.*

*In Korea, he served with distinction with the Eighth Army; and in Vietnam, he earned a name for himself as chief of staff and with the First Brigade of the 9th Infantry Division as a "helwa guy" who wanted to get a job done.*

*Pacific Stars & Stripes reported that "... if not all of the 1st Brigade loved Hunt—some clearly did not—they put out for him at a remarkably high level."*

*It would appear to be an academic assessment, then, of this gentleman's profile as:*

*An intellectual with an enviable professional competence; blessed (or damned, as the reader may choose to evaluate) with an unswerving commitment to patriotic duty; brave; determined; resolute; ambitious; impatient to see that orders are fulfilled; faithful; imbued with a deep sense of integrity; and a man in one whale of an inspired hurry.*

*As "the man" charged with applying broad policy to the practicality of daily operations it can be well-understood why THE ENGINEER chose to interview him, for he is the "spark-plug" which ignites engineer effort today at the US Army Engineer School.*

**ENGR: General Hunt, what do you consider the major missions of the Engineer School?**

HUNT: I think that most engineers would be interested in knowing that up to the first of February this year we were the only school

in the CONARC System that had all 26 of the missions which could be assigned. Of these I would consider that we have three major missions: First, to educate and train engineers. Second, to insure that we have up-to-date doctrinal inputs in our teaching and training literature. Third, to foster the idea that Fort Belvoir is the "Home of the Engineers." Of these the last is by far our most important mission.

**ENGR: Why do you say that making Fort Belvoir the "Home of the Engineers" is our most important mission?**

HUNT: The majority of engineer officers who remain on active duty will be assigned to Fort Belvoir twice during their early and therefore formative careers to attend the basic and advanced courses. Now that we have a new CONARC NCO schooling program the majority of NCO's on active duty will probably be stationed at Fort Belvoir three times: for their AIT and for the new Basic and Advanced NCO Classes. Therefore, Fort Belvoir must engender in our officers and NCO's the spirit of the Army and a pride in the Corps.

**ENGR: We have heard that you have a new training philosophy at the Engineer School.**

HUNT: I wouldn't say it was new. We have just formulated it. Instead of focusing on teaching alone we zero in on three major aspects. First, of course, are the core subjects, those tasks that must be learned by all students. Second, we have broadened the scope of training to include electives, outside speakers and a comprehensive reading program. I would say in each of these areas Fort Belvoir has obtained distinguished results. Third, we include physical fitness, social activities and leisure time. Since most of the officers and enlisted men at

tending Fort Belvoir are on their way to Vietnam or have just returned from Vietnam leisure and family life are of paramount importance. Lastly, we blend these three aspects of training into one total bull's eye by adding what I call "The Engineer Spirit"—the desire to get the mission done and done well, taking pride in how we do it. This, of course, ties in very closely with our stressing of the "Whole Man Concept" in all student activities.

**ENGR: Exactly what do you mean by the term "Whole Man Concept"?**

HUNT: That is an expression we coined to describe the aforementioned program of providing leisure and in taking care of people—insuring that Belvoir is a good place to stay. It applies particularly these days to enlisted men. We have done away with reveille, cut our details in half, relaxed the dress code, permitted individual decoration of rooms in barracks, provided much more free time and in general enhanced the total environment. These programs have been directed by the Commandant and are fully supported by the Post staff as well as the School.

**ENGR: Can you describe some changes that have occurred in the past two years?**

HUNT: Yes, certainly. Major changes have occurred in all areas of instruction, so please let me single out only the Basic Course. Previously a basic officer's standing in his class was determined totally by academics. Now his grade is computed 70 percent on academics, 20 percent on leadership (to include peer ratings) and 10 percent on physical fitness. Should the newly commissioned officer fail in any of these areas he must go before the Academic Board. Additionally we have five "Go-No Go" subjects that all offi-

cers must pass. These are areas where every second lieutenant must properly perform his mission: They are Map Reading, Maintenance Management, the Combat Engineer Practical Exam, Roads and Airfields and Combat Engineer Support. We have doubled our hands-on training. The Combat Engineer Practical Exam is an excellent example of this. The young officers are quizzed on the role of a second lieutenant in the field and they must cope with seven realistic problems. In each of our 52 courses we have



expanded the scope and reduced the time in class. All students now attend class only five days a week and have at least four hours off during the week, generally on the same afternoon to take care of personal affairs.

**ENGR: Do you think this new program, for example, in the basic course has paid off?**

HUNT: Handsomely. So far this year over 60 percent of all our

lieutenants on active duty have opted for Voluntary Indefinite Status prior to leaving Fort Belvoir. We have had over 4,000 voluntary indefinite officers in the past two years. As result of this, as well as the drawdown in Vietnam, the turn-around time for company grade officers has stretched to at least four years.

**ENGR: Would you explain to me then about the electives? What are they?**

HUNT: The electives program pertains primarily to the Advanced Course where we have 16 electives divided into two groups of eight each 15 weeks long. These electives include graduate studies, undergraduate degree courses and courses taught by the Engineer School. Each advanced course student elects two 90 hour electives each semester. It is possible, then, for the student to obtain 12 hours of graduate degree credits with The George Washington University with whom we have a degree program or 12 hours of undergraduate degree work with the University of Virginia with whom we have an undergraduate degree program. Students with a master's degree can work on his Professional Engineer License while in the Advanced Course. Primarily our electives are in the field of management and engineering, with military oriented specialist courses for those not interested in degree work.

**ENGR: With all the things that have been done to improve the Advanced Course we note that the engineer officer selection for the C&GSC has decreased. Can you explain this? And what and if anything is being done?**

HUNT: Yes, it is explainable. The decrease in engineer quotas for Leavenworth is a temporary



thing. It stems from the fact that the Corps of Engineers is short of majors and the quotas for Leavenworth are predicated on the number of qualified personnel within each of the three branches: the Signal, Military Intelligence and the Corps of Engineers. To be qualified an officer must have at least eight years of service and be a graduate of his branch advanced course. During the Vietnamese buildup there was a shortage of engineers. So we all served in Vietnam and there was a decrease in the number of advanced course graduates. We have recently established two completely new programs here at the Engineer School. One is for *constructive credit*. All engineer officers on active duty with eight years of service who have a college degree and have served as a company commander are reviewed by a board of officers, headed by myself, and if their record is good they are given constructive credit. We have just completed a Board and have awarded constructive credit to 30 officers. The second program is that of *equivalent credit*. Engineer officers with a baccalaureate degree can be assigned to the Engineer School Staff and Faculty and by monitoring certain courses pass a qualification exam and receive equivalent credit for the Advanced Course. Both of these programs receive the same diploma and same

credit as resident students. We have hopes of qualifying more officers, particularly when the large number of captains that we now have reach their eighth year. Thus, the engineer quotas to Leavenworth should surge upward.

**ENGR: Has the Engineer School felt the impact of the drawdown in the Armed Forces?**

HUNT: With respect to students, the Officer Candidate School graduated its last class in December, 1970. This was a distinguished organization which was a source of great pride to all of us here at Fort Belvoir. After three years of operation the Engineer Officer Candidate Regiment graduated 10,380 second lieutenants of which 5,850 were commissioned in the Corps of Engineers. Compare this to only



2,323 graduated during the Korean War. However, for the past two years the officer and enlisted inputs have not decreased at all. Reductions in active Army students have been balanced by increases in the Reserve and National Guard students. Yet, during this period the instructor strength of the school has decreased from over 4,000 to 2,400 personnel, and our monetary inputs have decreased from about \$100 per student to \$50 per student. Yet, I can guarantee there has been no reduction in instruction. In fact, the instruction has improved.

**ENGR: How can you say that?**

HUNT: First of all, instruction depends on people and we have the best. Our instructors are enthusiastic and they are knowledgeable. That is all it takes to run a school. We also have a feedback program where students critique our courses. Thus, we're able to shore up our weaknesses and reinforce our strengths. I am proud that last year three of our lieutenant colonels were selected to go to the senior service colleges. Yes, the quality of our instructors, officer and NCO alike, is great. I am not talking about their degrees or their schooling but about their performance and their capabilities.

**ENGR: Is there anything else you would like to add, General Hunt?**

HUNT: Yes, I would like to bring out just one more point. We are no longer stressing teaching at the Engineer School; our interest is on learning by the student. We are student oriented. We want these students to go out to their jobs in the Army and in engineer units with a feeling of confidence and with the highest of esprit. We rely greatly on inputs from the field to tell us how to improve the quality of our students. The Engineer School doesn't belong just to Fort Belvoir—it belongs to the whole Corps. After all the Engineer Center is the "Home of the Engineers."





# THE GREAT DUNE

Henlopen Point juts into the Atlantic Ocean two miles north of Lewes, Delaware. On this peninsula stands the largest sand dune on the Delaware coast.

A windblown sand formation, the Great Dune is located on Fort Miles, which serves as the First U.S. Army Recreation Center.

Each summer, hundreds of military personnel break away from the Eastern shore megalopolis and take to the beautifully sloping sand of the Army's

This 1969 aerial photograph pictures the Atlantic Ocean shoreline (far right), the Army's housing facilities (top center) and the Great Dune just below the buildings (center).







Cape Henlopen recreational facility. Families fill the 26 housing units to capacity; there are many more requests for reservations than can be filled.

The Army shares the peninsula with Delaware's Cape Henlopen State Park. During the past several years, the U.S. Army has returned 1,200 acres to the State of Delaware leaving approximately 190 acres for Army use.

Charges of Army neglect and damage to Cape Henlopen arose after expansion of housing facilities in the recreation area. Press accounts of preparation of trailer sites, and subsequent statements by public officials, suggested the Army "leveled" a 70-foot dune.

A 20-foot depression was formed by wind eddies. Wind came down over the recreation center's buildings and into the sand. As this swirling wind scooped up the sand, a depression formed.

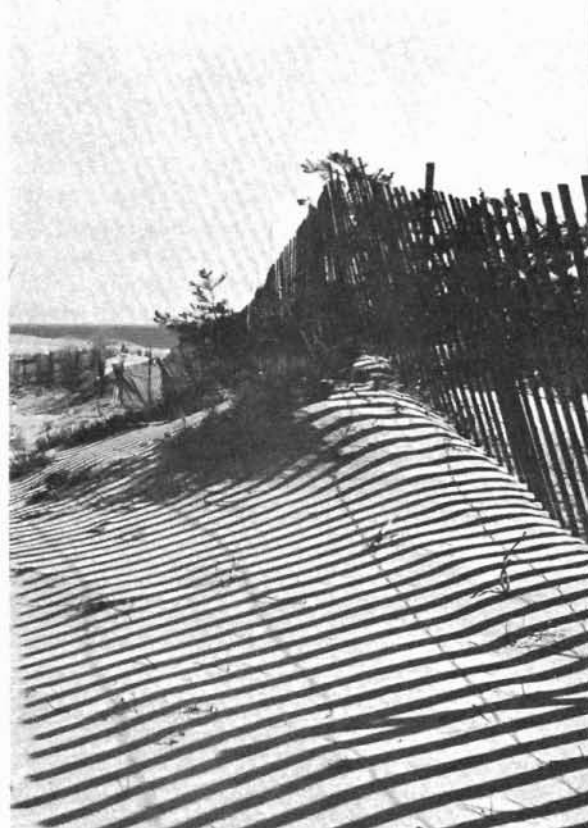
The Army attempted to fill this depression and provide a level contour once more. Plans called for ten house trailers to be placed here so more families could be accommodated during the summer.


Because of the recent national concern with ecology, the Army has taken a long look at the Great Dune.

"We in First Army are completely cognizant of the natural beauty and value of the dune. We are taking all prudent steps possible to insure the proper management of the area," commented retired Lieutenant General Jonathan O. Seaman, former commanding general of the First United States Army.

Steps toward stabilization have included planting vegetation, erecting snow fences and emplacing a bulkhead on the shoreline. Minus these conservation measures, erosion's toll would have been far more detrimental.

Army policy notes the importance of conserving sand dunes and that dunes play a





significant role in preserving seashore environment. At Cape Henlopen, that policy was exercised even before it was made explicit in a 1966 Army regulation.

Aerial photography of the area taken in 1938 shows bare, windblown sand without structures or vegetation. Just prior to World War II, a massive reinforced concrete coast artillery gun emplacement and a row of one story concrete block buildings were constructed. They arose in the area now used by the Army recreation center. Since 1944, two developments have changed the picture.

First, vegetation has grown over the dune area. Beach grass, heather and scrub pine, planted by Army engineers, preserve the dunes and enhance their beauty. Recent data reveals 45 per cent of the ground on the north slope is covered. Significant coverage was also noted in other areas. Vegetation provides a major stabilizing influence on dune movement.

Furthermore, buildings along the northern edge of the dune and shoreward from the artillery emplacement stabilized that area. Acting as a windbreak, the buildings cause an accretion of sand on the crest of the dune. This prevents further southward creep of the sand covered area in the building's vicinity. The joint influence of the artillery emplacement and buildings, when coupled with the ocean breezes, created the 20 foot depression on the crest of the dune.

Sand was taken in a layer, largely from the east and west of the depression along the longitudinal axis of the dune and from the inner surface of the southern crest. This lowered the profile of the dune behind the gun emplacement by about seven feet near the centerline. Profile elevations on the south side, across the dune from the recreation center buildings and trailers, remained about the same.

The Great Dune has by no means been destroyed by Army bulldozers. The depression was filled with sand pushed from the side of the dune. Vegetation in that immediate area was destroyed because of the displaced sand. However, filling the depression helped stabilize the dune. Neither the dune's height nor its profile was significantly altered by the operation; new vegetation has been planted.

Originally, plans called for ten trailers to be emplaced in the area. However, because of adverse publicity, only five of the trailers have been installed to accommodate visitors.

Average rental price is seven dollars per day per family. For the past six years, all units have been reserved to their maximum capacity for the entire summer season. This amounts to thousands of people annually having the opportunity to spend seven days of their leave time at a beach resort within their financial means.

A large number of military personnel and their families also visit the beach on a daily basis.

Although permanent housing facilities are reserved for military personnel, the beach and dunes are open to the public. This allows the general public to enjoy the area's recreational utility and natural beauty.

Recreational activities at Fort Miles are financed by the Command Welfare Fund, which is comprised of non-appropriated funds available to First Army headquarters. Non-appropriated funds are derived from profits made by the post exchange and other Army activities. No tax revenue is used to support these activities.

The Fort Miles Military Reservation serves as an important training site for Army Reserve units. Gently sloping beaches are ideal for training crews of amphibious vehicles used in across-the-beach operations.



Plans are now being made to rehabilitate the 20-position rifle range at Fort Miles so Delaware-based Army Reserve and National Guard units can conduct annual rifle qualifications at Fort Miles. This would save time and expense for transportation; the current site is Fort Meade, Maryland.

First U.S. Army uses 13 acres for recreation; the remainder is used for training. The Army has not only turned over most of the land and buildings to Delaware, but has loaned supplies and equipment to its Parks Department.

Recreational use of seashore land by anyone will create some disruption of the environment; experience of private developers and governmental units in nearby coastal areas proves this. But there is little doubt that the dunes at Cape Henlopen are the largest along the Delaware coast and among the best preserved due to the ecological endeavors of the U.S. Army.

Housed in the former Naval Radio Station facility, the 68th Transportation Platoon is permanently stationed at Fort Miles. Because it is located at Fort Miles, the unit can move its heavy amphibious vehicles to the beach without traveling on state-owned roads or park land.

The unit moved to Fort Miles because of overcrowded conditions in the Lewes Army Reserve Center. That facility was being used to over 200 per cent of normal capacity. Expanding the Lewes facility to accommodate the unit would have cost \$147,000.

Four other Army reserve units use Fort Miles for weekend training. They are the 67th Transportation Platoon of Lewes, Delaware; the 315th Service and Supply Company of Dover, Delaware; Headquarters and Headquarters Company, 275th Service and Supply Battalion of Seaford, Delaware; and the 151st Transportation Platoon of Chincoteague, Virginia.



Walker

This'll Blow Your Mine



Land mines are deadly weapons. Hidden beneath the ground, they attack without warning. Most frustrating of all, after a comrade is killed, there is no way to retaliate. There is no tangible enemy, no sniper to gun down, nothing but the bleak reality that you may be next.

Much like the war itself, Viet Cong and NVA mines have no standard form or power. This means they are difficult to detect and neutralize. U.S. Army personnel have to continually develop new mine detection techniques.

Techniques, which were developed during 1969 by D Company, 1st Engineer Battallion, proved particularly effective on a 20 kilometer stretch of QL 13 north from Lai Khe, Republic of Vietnam. This area had traditionally been a hotbed of mining activity. It was a vital stretch of the military supply route and required daily opening.

Built by the French prior to World War II, the road was in poor shape. Two large trucks could barely pass on the narrow road. The pavement and much of the base had long since disappeared and had been replaced with laterite. Although civilian traffic on the road was heavy, the area of mining activity was not populated.

The initial requirement was for an accurate and





prompt mine reporting and recording system. All sweeps had been instructed to blow mines in place. A standard report format was prepared and distributed to each sweep team. Information included exact grid co-ordinates, location of the mine in meters from road center line, road width, type of firing device, how found and crater size. This aided the pinpointing of all mining activity as to type, size and location for long-range planning.

Keeping the same people on the same stretch of road was preferred. It was necessary to run the detectors on high range, and the regular alternation of sweeper and prober was important. This insured familiarity with a given stretch of road; subtle indications of a mine became more noticeable. This again resulted in a better detection ratio. Detectors run on high range were more effective, but they did not account for more than 20 to 25 per cent of the mines found.

With detailed reporting figures, two significant facts appeared. First, nearly 90 per cent of the mines found were detected visually. Second, the majority of the mines were non-metallic with slapstick detonators.

Detailed reporting and analyses, along with better detection ratios, supplied other facts. Mines were inevitably set in pairs, and mine markers were frequently used. When a pattern of three mines was used, it was almost immediately recognized. This information was valuable because after one mine was discovered, knowledge of a high possibility of another mine nearby was very helpful. In some cases the first mine discovered was the second of the pair; this raised the level of alertness considerably.

Mine markers were subtle. The traditional grouping of three sometimes existed. But more often the marker consisted of a pole, board or stalk of cane placed at right angles to the traffic lane opposite the lane in which the mine was located. When someone became suspicious of the marker, his instinct was to change lanes, which brought his vehicle squarely over the mine.

To make such markers more noticeable to sweep personnel, the road was carefully policed each day to clear the road of all trash. This had a double-pronged effect because innocent looking pieces of wood frequently proved to be slapsticks.

The road was also outposted by day, and an occasional ambush patrol was run by night. Although the number of mine casualties and equipment damage had been halved, it did not seem possible that even this number of mines could be missed by the sweeps.

For control purposes, a second sweep began in the middle of the afternoon. On the first mid-afternoon sweep, two mines were located. Teams were positive the mines had not been there in the morning. Conclusion: the mines were being emplaced by day.



Walker

Previously, no military traffic other than the sweep and its security moved on to the road until all sweeps were complete. However, civilian traffic proceeding north from Lai Khe and south from Quan Loi would follow the sweep down the road. This practice was stopped, and civilian traffic was held at these points until all sweeps were completed. Sweep personnel discovered that, with no military traffic on the road, persons following the sweep had emplaced mines behind the sweep with little fear of detection. Holding civilian traffic effectively reduced the number of incidents. However, it required close coordination with the National Police and local authorities. It was also unpopular and difficult to control.

Mining incidents first fell off to a low ebb; then they hit an upswing with the advent of the monsoon season. This had been expected because time and ease of emplacement were aided by the saturated condition of the soil. Mines were frequently found in puddles of water on the road and on the soft road shoulders. Again it was obvious that mines were being planted during the day.

Sweep personnel decided the mines were being emplaced while trucks were stopped, supposedly for repairs. It is commonplace practice to make on-the-road repairs, so the action aroused no suspicion. Signs were set up along the road warning civilian traffic not to stop; military police enforced the rule with good success. Again mining incidents fell off.

There were various other observations. There is a direct link between vegetation control and nighttime emplacement. Low roadside brush and grass encourage mine emplacement because they provide concealment. Cutting or burning this vegetation back about 20 feet greatly reduces the danger.

Periodic road blocks and detailed search of vehicles, coupled with the no stopping rule, were very effective in preventing daytime emplacement.

Examination of the slapstick revealed that the metal contacts used were often coated with heavy asphaltum. This allowed light civilian vehicles and sometimes quarter tons to pass over them without detonating. In some cases, repeated passes were required to rub through the asphaltum.

Ultimately, a detection rate of 95 per cent was achieved. These experiments in mine detection showed that there is much more to counter-mine measures than simply having a sweep team move smartly down the road.

After completing Officer Candidate School, Captain Anson F. Thorp was commissioned into the Corps of Engineers. His first assignment took him to the 538th Engineer Battalion, USARPAC, Vietnam, where he gathered the data for his article. CPT Thorp was later reassigned to the 91st Engineer Battalion, Fort Belvoir. He wrote this article as part of the third Engineer Officer Advanced Course of 1970.

# YES TER DAY



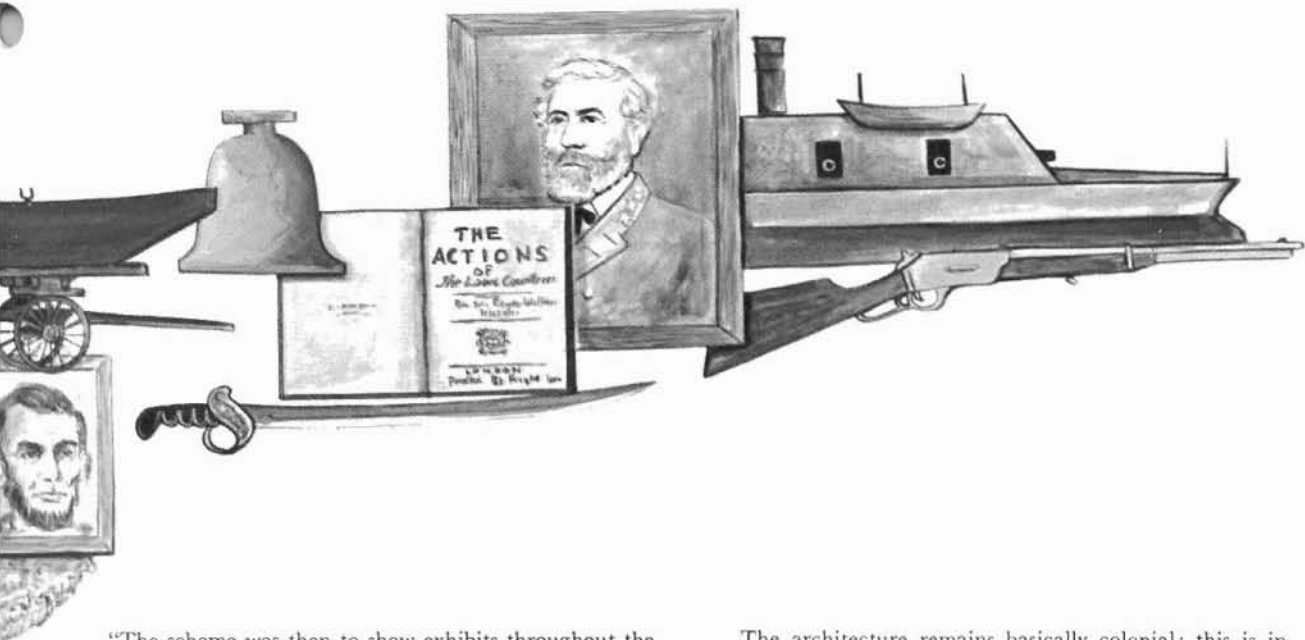
## *a nostalgic journey into the past*

Throughout its 100 year history, the Corps of Engineers Museum has stood backstage as other engineer divisions took their bows. Finally the days of understudy are over. The museum has taken the long-awaited cue and advanced to center stage.

In late April, the museum came into the spotlight it deserves. The museum—and the museum only—is now located in Building 1000 at Fort Belvoir, Virginia, home of the U.S. Army Engineers.

For 18 years, prior to the recent opening, most of the museum's 15,000 items were stuffed in one room on the second floor of the Corps of Engineers Library on Fort Belvoir. Some items were wedged among library volumes.





"The scheme was then to show exhibits throughout the library," explained Edward B. Russell, Director and Curator of the Corps of Engineers Museum. The museum and library were physically sharing a building and were organizationally combined.

Russell began the struggle for a separate museum in 1957.

"I developed plans to consolidate the museum separate from the library," Russell said. In 1970 his plan received the backing of Brigadier General Ira A. Hunt Jr., assistant commandant of the U.S. Army Engineer School.

After campaigning for the change and waiting for an appropriate vacant building, Russell made his request to Major General Robert R. Ploger, Commanding General of the U.S. Army Engineer Center and Fort Belvoir. An hour after Russell submitted his request, he received MG Ploger's affirmative response.

Located on Belvoir Road, the post's main street, it now has plentiful parking space and more floor space. The museum is now expanded and in a strategic position near virtually all of Fort Belvoir's major facilities.

Less than a mile off U.S. Highway 1, the museum is easily accessible to tourists visiting Mount Vernon, home of George Washington. Fort Belvoir is only two miles from the historic home.

"We hope to get a lot of visitor attraction," Russell said. He expects people of all walks of life to see the museum exhibits.

When the museum was part of the library, there were approximately 6,000 guided tours and 10,000 visitors per year.

Now that the museum is in its new location, Russell anticipates 50,000 visitors per year. He expects this figure to increase annually as the museum gains exhibits and renown. As before, the museum is open to the general public and free of charge.

The museum's new home is a one story brick structure which formerly housed Fort Belvoir's Data Processing Center.

The architecture remains basically colonial; this is in keeping with the Fort Belvoir and Northern Virginia style.

Remodeling will be completed in phases with both the interior and exterior of the building undergoing major alterations.

Students in the Engineer Officer Basic Course suggested plans for improving the building. Some of these concepts have been used already; others will be implemented in later phases of museum construction.

The museum decor conveys a strong feeling of the Army engineer through various textural materials. Wood, brick and shingles emphasize a rustic rather than smooth, clinical atmosphere.

"Each window becomes a part of history," Russell said. He was referring to the grill work on museum windows. Each window will be enclosed in grill work once used at West Point.

The museum is organized so there is a chronological progression through history. The first room concentrates on the American Revolution; remaining rooms progress through the Corps of Engineers' history.

The Hall of Fame Room is devoted to engineering personalities. It honors men either for outstanding civil work achievements or military leadership.

Probably the most valuable items in the museum are original maps of the seizure of Yorktown, the 1781 battle ending the American Revolution. Removed from the archives in Paris, the maps were donated by General Pinson, Chief of Engineers of the French Army in 1955.

A collection of Americana was donated by Major Victor V. Martin. It features original advice from an 81 year old Thomas Jefferson written to a youth named after Jefferson. Additional advice was added to the letter nine years later by Andrew Jackson.

The collection also has writings by George Washington, William Henry Harrison, Zachary Taylor, Abraham Lincoln and Francis Scott Key. "And," Russell added, "what collection is complete without writings from John Hancock?"



Walker

"Dear Baldie" begins one original letter from General Douglas A. MacArthur. Written in 1931, the letter related General MacArthur's thoughts upon being appointed Chief of Staff of the Army. The letter was written to Major General Julian L. Schley, Chief of Engineers and a classmate of GEN MacArthur while at the United States Military Academy in 1903. The salutation refers to MG Schley's nickname while at West Point.

The collection of Corps of Engineer castles dates from 1840 to the present. An original drawing of the castle device illustrates its initial use by the military. Numerous engineer battalion distinctions include crests and insignias.

A large variety of engineer officer and enlisted uniforms and accessories is displayed. This includes belts, hats and swords. One rapier dates back to 1840 or 1850; the first use of the engineer castle was on the handle of this rapier.

The same rapier appears in one of the museum's prized portraits. The original portrait of Brigadier General Daniel P. Woodbury, pictured as an engineer lieutenant, shows him with the light rapier. BG Woodbury, who was killed near the end of the Civil War, served as the Chief of Engineers from 1836 to 1864. The portrait was donated by his granddaughter.

Another original portrait is of Major General William M. Black, Chief of Engineers during World War II. The portrait was painted by MG Black's son.

Taken by Brigadier General Henry Larcom Abbot's personal photographer during the Civil War, a number of rare stereopticon photographs picture many of the general's personal friends and comrades in arms.

Other photos spotlight General Robert E. Lee, General Douglas A. MacArthur, a ceremony honoring Major General George W. Goethals, salvage operations of the battleship Maine and construction of the Panama Canal.

The Corps of Engineers conducted the 1910 salvage operations and 1912 final burial at sea of the Maine. For its assistance, the Corps was given the original wheel from the ship. The wheel and numerous photographs note this accomplishment.

More artifacts commemorating the construction of the Panama Canal refer to the Order of the Striped Tiger for military civil works achievement.

Exhibits spotlight various civil works projects in the nation's capital that were completed by the Corps of Engineers. Among these projects are Washington Monument, the Pentagon and the Library of Congress. Models, dioramas and graphics illustrate the construction.

Used from 1869 through World War II, a complete set of models of the Bridge Equipage of the U.S. Army is on display.

A collection of engineer and Army officer instruction manuals review officer instruction of the American Revolution, the War of 1812, the Civil War and the Mexican War.

A ship's bell is dominantly displayed. Forged in Belfast, Ireland in 1892, the bell tolled for 50 years aboard two United States vessels. It first was used on the transport Grant from 1898 to 1902 and then the dredge Chinook from 1903 until it was decommissioned in 1946.

A cannon that stood in front of the Corps of Engineers Library moved with the museum. The 1841 bronze cannon was originally removed from Willets Point, New York, the first home of the Army Engineers. The bronze six pounder stands in front of the new museum. "We consider it one of our prized possessions," Russell commented.

The collection of American and British firearms includes a derringer like the one used by John Wilkes Booth when he assassinated President Lincoln. There is an 1839 Hall breech-loading rifle in the museum's collection. One rifle was used by Mosby's Raiders in the Civil War defense of Fairfax. Another item in the collection is a Sharps breech-loading percussion carbine used in the 1876 Battle of the Little Big Horn. Russell often tells viewers that this rifle "could be the one" that killed Custer.

The most recent acquisition to the rifle collection is a chrome plated SKS; it is among the collection of basic weapons used by the Viet Cong.

Fort Belvoir's entire history will be traced from its beginning as Belvoir Plantation. As a military installation, Fort Belvoir will be covered as it changed from Camp A. A. Humphreys to Fort Humphreys and finally to Fort Belvoir.

An 1851 Austrian cavalry saber is one of the foreign gifts displayed in the museum. Presented to former Chiefs of the Corps of Engineers, Commandants and Assistant Commandants of the Engineer School, other gifts include statuettes, military dolls, figurines and silver items.

The museum's oldest holding is a gold ring dating back to 300 B.C. The Greek ring bears the likeness of Lysimachus, an engineer general who worked for Alexander the Great.

Asked which museum piece he likes best, the dedicated curator responded, "I like 'em all. You don't stay 18 years with one museum without putting a lot of heart into it," Russell added. A dedicated man who has spent countless hours searching for new items and researching the ones he has obtained, Russell said he is interested in "anything that has to do with military engineering."

He has been seeking early officer uniforms for some time; the museum's collection is weak in pre-Civil War uniforms.

Three-dimensional equipment used by engineers is also rare. Russell would like a larger assortment of items such as early surveying instruments, picks and shovels.

Because engineering projects of the corps are difficult to picture interestingly, Russell is constantly on the lookout for suitable paintings, photographs and drawings.

The museum makes no purchases. All items are gained through contributions. A sundry fund has been established to handle donations. Items are welcomed from organizations as well as individuals. Russell continually seeks additional items to enrich the Corps of Engineers Museum.



Staff writer Rodger A. Streitmatter came to THE ENGINEER from Fort Belvoir's post newspaper, THE CASTLE. He was graduated from Southern Illinois University with a degree in journalism.



Walker



Walker



Walker



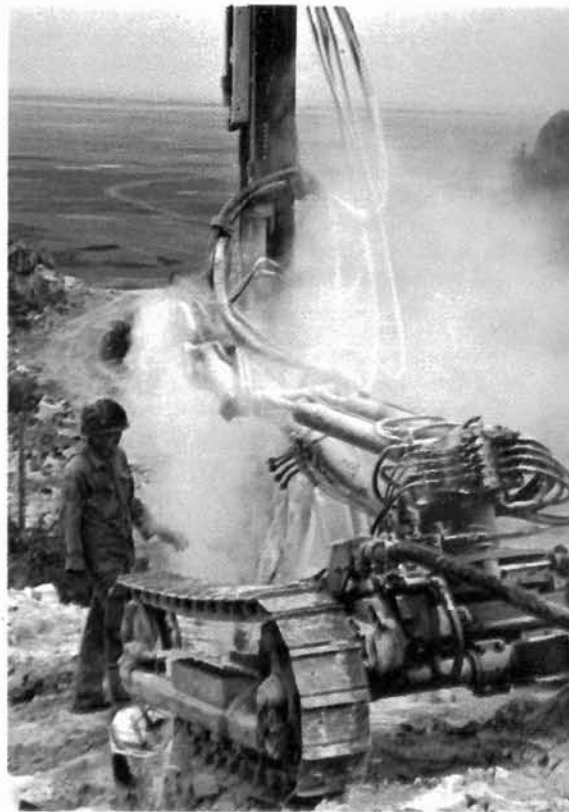
# LOC

Vietnamization. It wasn't even a word a few years ago. But today Vietnamization spells out the top priority mission of U.S. Army Engineers in Vietnam.

The Lines of Communication (LOC) Restoration Program exemplifies the importance of Vietnamization to U.S. Army engineers. This program is the largest military engineering project ever undertaken in a foreign country. It combines the efforts of U.S. Army Engineers, Navy Seabees, civilian contractors and, of course, their Viet-



Whitehead





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namese counterparts. U.S. Engineers have taught their skills to ARVN engineers.

When this half billion dollar program is completed, it will provide the country with over 2,500 miles of modern highways. In addition to the highway network, the project will improve 770 miles of railroad and several airfields. Together these improvements will link the major population centers of the Republic.

An effective and dependable road network will tie together the rural and urban aspects of Vietnam's economy. Improved roads increase the potential for industrial growth of the basically agricultural economy. Raw material can be transported from entry points to industrial sites throughout the country. This insures that the farmer can transport his products to the urban market. The roads mean urban buying power for rural producers' goods.

LOC construction also enables the Vietnamese to re-settle their homes. As each segment of the network is completed, former inhabitants return from exile to resume life at the point where enemy activity disrupted them.

After refugees are resettled, the network of bridges and byways become more important. Quick access to rice mills, markets and storage areas stimulates the farmer's interest in money crop production. The days when the peasant farmer grows only enough crops for his family's needs are over.

As it provides a transportation network, the LOC program adds security to the areas it touches. Villagers no longer have the fear that accompanies a long, seldom-used dirt path.

Another improvement in Vietnam life due to former inhabitants returning on LOC roads is resumption of formal education and medical care. Long An hamlet, near Ninh Phouc, typifies this change. When Long An's schoolmaster returned to his home, he rebuilt his house, reopened the village school and started plans for the community's first medical facility.

In another village, near the Mid-Delta city of Can Tho, a three-mile span of road provided the only link with the outside world. The 1968 Tet offensive destroyed this road and its three bridges. During the next two years, crops were moved to market by a tedious process of alternately rowing and dragging a sampan for miles. The original population of 2,100 had filtered down to a stubborn handful by April, 1970 when the damage was repaired. Traffic over the new road returned residents, trade and a sound future to the village.

Before a single foot of asphalt could be laid on Vietnam

ground, tremendous effort was expended to develop the resources and capabilities necessary for road building. To appreciate the scope of the LOC program, this preliminary work must be noted.

When U.S. Army Engineers arrived in Vietnam in late 1965, only a few rock quarries were in operation, and rock was critically needed for construction of base camps and tactical roads. There are now 13 U.S. Army rock quarries and eight contractor quarries. More than 90,000 tons of rock are produced each month at the Vung Tau Quarry operated by the 94th Engineer Detachment.

In 1967, rock resources were virtually non-existent in the Delta area. So the Delta Rock Program was developed to provide large volumes of rock. During 1970, more than 190,000 tons of rock per month were moved by barge to off-loading sites throughout the Delta from quarries at Vung Tau, Thu Duc, Nui Sam and Nui Sap.

Asphalt plants that prepare surfacing material are located with crusher operations at most of the quarries. Of the 10 Army asphalt plants scattered throughout the Republic, all but three operate in conjunction with quarries. The remaining asphalt plants are located at sites near paving operations. Rock is trucked from quarry sites and stockpiled to be used as needed. In some areas, the recently improved railroad system transports rock. Rail haul decreases wear on vehicles and increases the volume of rock that can be transported.

Other preliminary work arose because of Vietnam's unusual weather conditions and wide variations in terrain and climate. These conditions spurred the development of new highway construction methods.

In the Delta, mud and a shortage of rock threatened to stalemate construction of roads strong enough to support heavy traffic. A process known as clay-lime stabilization was used. Clay is scraped out of rice paddies to form a roadbed several feet above the water level. A predetermined amount of lime is spread over the surface and mixed with the clay to form a concrete-hard road base. Once cured, the surface is paved with a double course of asphaltic concrete. Cement stabilization similar to clay-lime stabilization is used on portions of QL 13 in the Third Military Region.

The LOC program introduced commercial road building equipment into the U.S. Army Engineer units to supplement the TO&E. A total of 669 items were purchased using Military Construction Army funds. The equipment is used on all phases of road construction. Perhaps the two most important purchases were the 250 ton per hour rock crushers and the 12 cubic yard dump trucks; both items are filling vital needs. Other items include compac-



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tion equipment, soil stabilization plants, asphalt distributors and pavers.

Security on the new roads is an integral part of the LOC program. Areas subject to enemy activity—wherever jungle or heavy brush surrounds a highway—is cleared on both sides for a distance varying from 200 to 300 meters. After Rome Plows bulldoze the cover, it is difficult for the enemy to ambush traffic on the road. Opening fertile areas for agricultural development is a significant by-product of the land clearing operations.

A wide assortment of bridges links the gaps between the paved highway. Approximately 250 bridges measuring 11,300 meters will be built as part of the LOC program. ARVN engineers constructed the largest of the bridges; it measures 1,106 meters and is located at Tuy Hoa.

The Engineer Command is responsible for the bulk of the LOC construction. Nearly half of the command's 20,000 men are involved in some facet of the LOC project scheduled for completion in 1972.

The high number of engineer personnel involved with the LOC project is being reduced through extensive Vietnamization of all aspects of the road construction. ARVN engineers have been trained in operating quarries, producing asphalt, building bridges, constructing highways and land clearing. As their training encompasses more areas, the number of ARVN forces involved in engineer projects gradually increases.

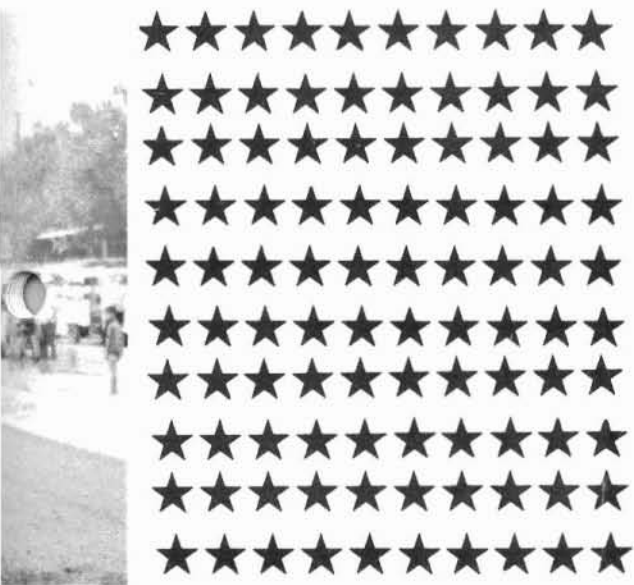
U.S. Army Engineers have trained ARVN Engineers in their skills. In addition to military, Vietnamese civilians have been hired and trained by both U.S. Army and civilian contractors.

Because the Republic of Vietnam will be responsible for the roads, skilled personnel must be available to care and maintain them after U.S. Army personnel leave Southeast Asia. This is an important aspect of the training.

Vietnamization, as practiced by the engineers, is a continuous process. The increased emphasis on withdrawal of American troops from Vietnam has focused attention on Vietnamization of the LOC program.

The extent of Vietnamization can be seen on a 40-mile section of QL 1, east of Long Binh. This is the first all ARVN paving project. ARVN engineers comprise the paving crew, drive and maintain dump trucks carrying asphalt to the paving site and operate the asphalt plant at Gia Ray that supplies asphalt.

Implications of this first ARVN paving project are far reaching: Vietnamization is becoming more than just a term, it is becoming a practical reality.



Whitehead





# MOVE BY

Lieutenant Junior Grade Kevin P. Gallen said "thanks" as the mail clerk handed him the manila envelope. Lt. Gallen tucked the packet under his arm as he pulled the fur-trimmed hood around his head and slipped on his gloves before he left the warm post office and faced the frigid cold around the South Pole Station.

Army Staff Sergeant Kenneth J. Woods tossed his manila envelope through the car window and on to the front seat. He then climbed into the car and headed for his barracks at Palmerston, New Zealand.

Alvin E. Pierce yanked his manila envelope from the narrow mailbox and slapped the tiny door shut. Car keys still in hand, he bounded up the stairs to his fourth floor apartment—one of the few in Vietnam.

Though strung across three continents, these three men are getting ready to "hit the books" in the same classroom.

The classroom: the world

The textbook: a progressive study packet

The school: US Army Engineer School  
(USAES)

Each week, men located around the world pick up 5,000 manila envelopes and prepare to increase their knowledge of engineering through the USAES Correspondence Course Program.

Through the courses developed at the USAES, military and civilian personnel around the world increase their knowledge and improve their skills in military engineering. Courses help mold well trained, mentally alert soldiers needed in today's technological Army. As far as practical, correspondence courses



# UP MAIL!



offer instruction identical to that in USAES classrooms.

The subcourse is the actual study package the student receives. It consists of an introduction, a series of lessons with attached memorandum or textbook, lesson and examination exercises and necessary training and supplementary materials.

A correspondence course consists of related subcourses; each subcourse teaches a particular topic or phase of a subject. Individuals who do not want to enroll for an entire course may design their own study program from over 200 subcourses in the program.

Officer, non-commissioned officer and enlisted MOS career development courses, plus special functional courses, are offered.

There are four officer career development courses.

The Engineer Officer Basic Correspondence Course (E-1) is designed to increase the proficiency of engineer lieutenants in company level duties, particularly those in engineer combat units. It also provides reserve component officers the means for meeting branch qualification and educational requirements for promotion through captain. The 34 subcourses total 228 hours of instruction; they must be completed in two years or less.

Identical in subject content to the E-1 course, the Engineer Officer Basic (Nonresident/Resident) Course (4-5-C1) offers residential instruction. Students complete one or more phases of instruction by spending two weeks on active duty for training at Ft. Belvoir, Va. The course consists of a nonresident phase of 22 common subject subcourses totaling 65 hours of instruction and three phases that may be completed through nonresident or

resident instruction. This course must be completed within two years.

The third officer course is the Engineer Officer Advanced Correspondence Course (E-23). It is designed to offer engineer officers a working knowledge of approved command and staff techniques and doctrinal concepts for the training and operational employment of engineer units. Completion of this course satisfies military educational requirements for promotion of reserve component officers through the grade of lieutenant colonel. Completion of 50 per cent of the course meets educational requirements for promotion from captain to major. The 71 subcourses totaling 473 credit hours of instruction must be completed within four years.

In subject content, the Engineer Officer Advanced (Nonresident/Resident) Course (4-5-C23) is identical to the E-23 course. A combination of seven phases of nonresident and resident instruction comprise the course. Three nonresident phases consist of 47 common subject subcourses and add up to 151 hours of instruction. Students complete one or more of the four nonresident/resident phases by attending two week active duty for training periods at Ft. Belvoir. The C-23 course permits students to transfer to the E-24 or USAR School Engineer Officer Advanced Course without loss of time or credit.

Two courses are designed specifically for non-commissioned officers.

The Engineer Non-Commissioned Officer Basic Career Development Correspondence Course instructs selected engineer enlisted personnel in engineer tactics and techniques for duty assignments in

managerial or advisory positions. Consisting of four phases, the course totals 239 hours.

Enhancing managerial abilities is the goal of the Engineer Non-Commissioned Officer Advanced Career Development Correspondence Course. It prepares senior engineer non-commissioned officers for the US Army Command and General Staff College Special Correspondence Course for sergeant majors and operations sergeants. The course's two phases total 164 hours of instruction.

At present there are six enlisted/NCO MOS career development courses. They are used to supplement on-the-job-training, prepare for MOS tests, increase MOS proficiency or prepare for promotion. These courses also meet the needs of federal employees assigned to engineering organizations. Also, servicemen who see their future in the booming construction industry can acquire requisite job knowledge and skills that enable him to compete in the skilled labor market. Courses currently available are Combat Engineering (12B20), Combat Construction Foreman (12B40), Carpentry (51B), Plumbing (51K), Masonry (51D) and Electricity (51R).

Additional courses now in planning stages are Refrigeration and Air Conditioning, Construction Surveying, Topographic Surveying, Illustrating, Engineer Equipment Repair, Crawler Tractor Operating, Crane and Shovel Operating, Fire Fighting, Working with Sheet Metal and other skill areas.

In addition to these career development courses, the USAES offers six functional correspondence courses. They involve both military requirements and professional advancement. These courses are Engineer Officer Advanced Management, Engineer Construction, Engineer Combat Support, Engineer Technical Orientation, Engineer-in-Training and Professional Engineer Preparatory Courses.

Participation in the correspondence course is voluntary. To ensure that no interested person is denied the chance for self-development, eligible applicants receive course materials free of charge.

USAES correspondence courses are open to members of all the Armed Services—Navy, Marine Corps, Air Force, Coast Guard and Army. Civilian employees of the federal government are also eligible if the instruction is job-related. Army ROTC students, certain US citizens living in foreign countries and others authorized by the Commanding General of the US Continental Army Command may also enroll.

Information on eligibility and prerequisites for all courses may be obtained by writing the Commandant, USAES, Attention: Department of Non-resident Instruction, Ft. Belvoir, Va. 22060.

Prospective students should fill out and submit DA Form 145, Army Correspondence Course Enrollment Application. For military personnel, the proper channel is their commanding officer; civilian personnel should apply through their immediate supervisor.

Students set the pace of study commensurate with their ability to learn. After all lessons and the examination have been submitted, a certificate is issued for each subcourse completed successfully. A diploma is awarded upon completion of a career development or special course.

The USAES does not offer purely academic courses. Uniformed members of the Armed Services who desire to study a language, history or philosophy, for example, will be assisted by the U.S. Armed Forces Institute.



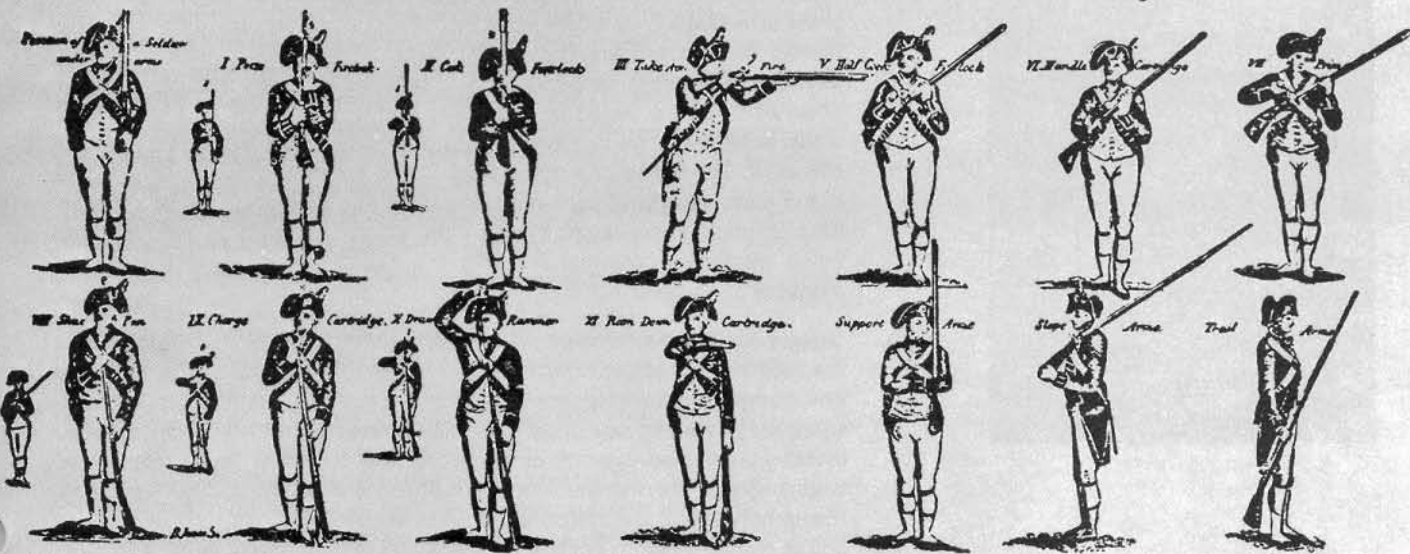
Students formerly enrolled in the Professional Engineer Preparatory Correspondence Course have lauded it as "exceptionally well prepared and the necessary review needed to pass my professional engineering examination ten years after my college training," "a good review for one 30 years out of school" and "well engineered, smoothly administered and have excellent coverage of subject."

This is what the USAES Correspondence Course Program meant to many who have taken advantage of it and will mean to some 14,000 students now enrolled. Make that total 14,091.

Director of Nonresident Instruction at the U.S. Army Engineer School, Lieutenant Colonel Arthur Daoulas is from Dracut, Massachusetts. He received a civil engineering degree from the Missouri School of Mines, Rolla, Missouri and a Masters of Business Administration from the University of Maryland. LTC Daoulas commanded the 864th Construction Battalion, the Peacemaker Battalion, in Vietnam. He was also Director of Facilities, Engineering, at Fort Leavenworth, Kansas.

TO ALL BRAVE, HEALTHY, ABLE BODIED, AND WELL  
 DISPOSED YOUNG MEN,  
 IN THIS NEIGHBOURHOOD, WHO HAVE ANY INCLINATION TO JOIN THE TROOPS,

# TAKE NOTICE,



WE SHALL ENDEAVOR TO ANSWER THE QUESTION:

## WHY ME?

In every officer's career there arrives a day of decision concerning his future in the Army. A decision to remain in the Army or to get out and sample the greener pastures seen on the civilian side of the fence is not one to be taken lightly or to be made in haste. The Army is not the right career for every man any more than every man would be a career asset to the Army. A decision to stay in the Army or get out is one that ultimately will affect every facet of the remainder of your life and that of your family. With that profound thought, let's look at some of the reasons that influence officers in their decision concerning a career in the Corps of Engineers.

The military career in general provides officers with a deep-rooted sense of satisfaction in the knowledge that they are devoting their career to the service of their nation and fellow man. Although patriotism may not be sung out as the primary reason most officers stay in the service, it is, without a doubt, one of the important intangibles that influence officers toward a military career.

The cornerstone to any personally satisfying career is the job satisfaction to be gained from the work. A glamorous, well-paying job is not necessarily a good job unless it provides the challenges, responsibility and rewards essential to the personal satisfaction of the worker.



By the very nature of our mission, the Corps of Engineers has a great advantage over other branches of the Army in providing job satisfaction for our officers. In our engineering efforts we have a lasting, physical monument to our efforts and skills after we complete a job. Whether this be a penneprime chopper pad, a section of asphalt road or a civil works dam, we can look back with pride and see a tangible result of our work. The sense of achievement in the creation of worthwhile works is the most satisfying part of engineering. The responsibility of successfully meeting a challenge through the effort and skill of yourself and those whom you command marks the Corps officer as a leader and manager of no small ability.

Responsible, challenging jobs are abundant in the Corps. Think about the men and equipment that are the responsibility of our platoon leaders and company commanders. The construction and combat support missions performed by our units will task the keenest and most imaginative of minds and make great demands on the technical and professional engineering skills of our officers. Our jobs are characteristically constructive in nature and not of the repetitive or make work type.

The varied responsibilities of the Corps of Engineers provide opportunities to work and develop skills in a field interesting and challenging to the individual preference of nearly every officer. An officer who wants to be a gung-ho combat leader of men can find the job he wants in the Corps just as can the officer whose interests are in the scientific research and development areas. The Corps has officers participating in all of the Army specialist programs from aviation to foreign area specialist. For the officer who doesn't want to specialize, the diversity of our work means that there needn't be a stereotyped career in one narrow field unless, of course, an officer truly desires to specialize within the Corps.

Only after an officer has assured himself that he can obtain personal job satisfaction from a career in the Corps should he consider the long list of other benefits of a military career. Certainly one of the most attractive prospects is the opportunity for advanced schooling. Recent experience indicates that about 60% of all Corps career officers can expect to obtain an advanced civil schooling degree. There are four programs available for civil schooling. They are the Degree Completion Program (Bootstrap), the officer Undergraduate Degree Program, the Advanced Civil Schooling Program and the new Advanced Degree Program for ROTC Duty. These are flexible programs that combined can satisfy a schooling desire for almost any officer that is demonstrating good performance in his duties.

The Army way of life with attendant feeling of camaraderie with your peers, the social life and family involvement, the variety of duty stations both stateside and overseas and the traditions and customs of the service gives a sense of belonging and identity that is difficult or impossible to find outside military life. Retirement, PX, commissary, insurance and medical care benefits are well publicized, recognized incentives of mili-

tary service. There are other benefits not so apparent. Find out how much insurance you would need to have in order to provide the same protection that the Army survivor benefits give your dependents or to provide the income protection that you enjoy in the Army should you become sick or disabled. It is very substantial.

The most frequently mentioned reasons that Corps officers give for leaving the service are:

1. The desire for more authority
2. More opportunities for independent action
3. Freedom from red tape
4. The desire for less supervision over their work
5. Opportunities for more money
6. The belief that the officer was under utilized by the Army in relation to his abilities.

Any decision that will affect a person as profoundly as deciding whether or not to make the Army a career should not be an emotional decision made in a fit of pique or a euphoria of well-being based on a single incident. Rather, all aspects of the entire spectrum of considerations relating to your career, both pro and con, should be explored.

When all the pros and cons of Army life have been considered, a young officer should then sit back and try to view his personal situation with as much objectivity as possible. This is also the time to decide on the type of civilian work on the outside that looks most attractive and then whether or not your personal goals can be better achieved in that civilian job. A second look at the list of reasons officers give for leaving the Corps will show that these are the very same problems that your civilian contemporaries are experiencing in their work in private industry. In fact, many Engineer officers who have resigned from the Army state that the amount of responsibility and opportunity for independent action that they were allowed in the Corps was far greater than that they were afforded as civilians. This is really not unexpected because showing a profit must be the primary objective of private industry whereas that of the Corps is the training of engineer leaders and managers. The civilian world also has its bureaucratic inefficiencies and its share of poor leaders just as the Army does.

Many people work a lifetime and never are able to find a job that satisfies them personally. I feel that Corps of Engineers officers have an unequalled opportunity to find that job satisfaction in their work and in their service to our nation. This is the key to a future in the Corps and in finding a true sense of accomplishment and meaning in your career.

A graduate of the U.S. Military Academy, Major Gary D. Beech was commissioned into the Corps of Engineers. His first assignment took Major Beech to the 307th Engineer Battalion, Fort Bragg, North Carolina; he served as a company platoon leader and executive officer. After attending Flight School, he became a fixed wing aviator and flight commander for the 39th Engineer Group, Europe. Joining the 4th Cavalry, USARPAC, Vietnam, Major Beech served as rotary wing aviator and aerolift platoon leader. He then became Aviation Staff Officer of the Engineer Division, Mediterranean. Major Beech is now Assistant for Military Affairs, Public Affairs Office, Office of Chief of Engineers.



# ITSCHNER

The Itschner Award is named for the former Chief of Engineers and past president of The Society of American Military Engineers, Lieutenant General Emerson C. Itschner.

Given annually by the Society, the award is presented to the unit of the Army Corps of Engineers selected as the most outstanding during the year.

This year's winner is Company C, 8th Engineer Battalion, 1st Cavalry Division (Airmobile).

Combat support of the Infantry has always been at the heart of military engineering. In that role, the Army engineer fully realizes the purpose of his efforts. Airmobile engineering, probably more than other forms, exemplifies the close bond existing between infantryman and engineer.

Mission-orientation, aggressiveness and response reach a zenith in the airmobile engineer. With the Vietnam conflict drawing to a close, it is fitting that we seize this opportunity to acknowledge the unique infantryman/engineer relationship characteristic in airmobile units.

Throughout the six years that the First Team has been in Vietnam, the Skybeavers of the 8th Engineer Battalion have provided engineering acumen and backbreaking labor imperative to support of highly fluid warfare. The assault into

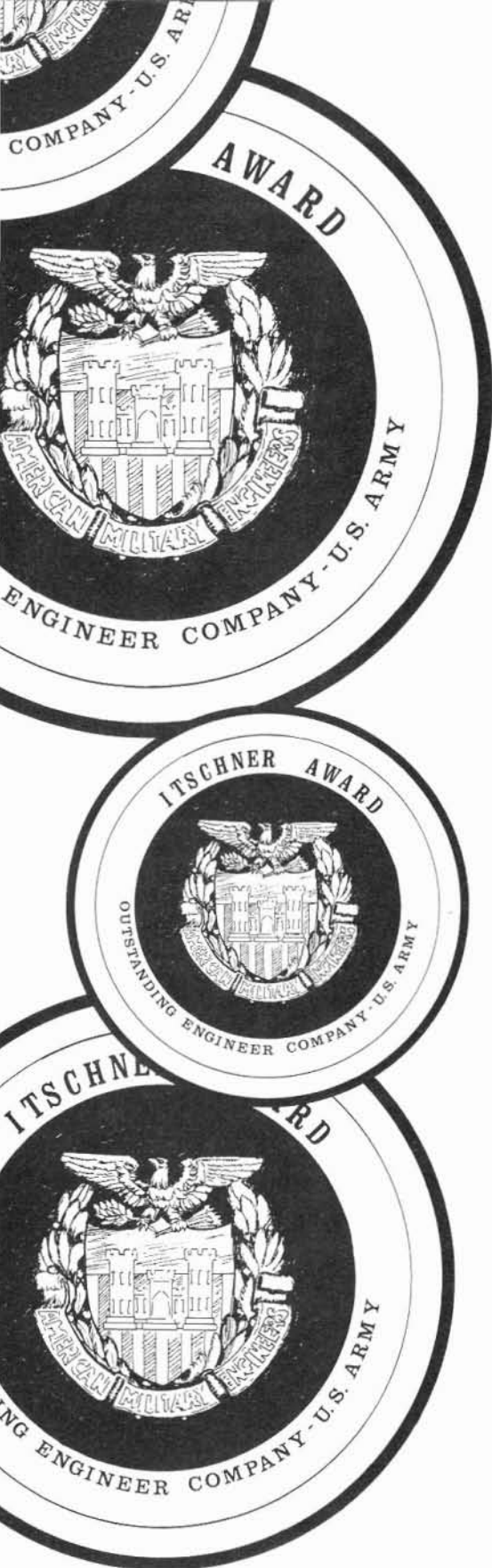
Cambodia may well have been the most dramatic and successful operation of the war, and, of all the engineers, the Skybeavers of Company C, 8th Engineer Battalion, led the way. This company epitomizes an outstanding airmobile combat engineer unit. The company's performance during the Cambodian Campaign, as well as for the entire year, was superb. Company C contributed immeasurably to the successful completion of the 1st Cavalry's mission.

During 1970, the unit amassed an impressive record in all aspects of direct combat engineer support to the 3rd Brigade of the division. The Cambodian Campaign, during May and June, was the high point of this exciting year.

Before, during and after this operation, the company never failed to accomplish all missions superbly.

The months before the Cambodian Campaign were filled with extensive combat support. The company was primarily involved in the construction of battalion-sized fire support bases, airfield upgradings and minesweep operations.

During late spring and early summer, the pace became hectic as the Cambodian Campaign grew in intensity. Combat engineer effort that initiated, sustained and later withdrew the



# AWARD

massive onslaught was of a scale never before experienced in the Vietnam War. Company C, 8th Engineer Battalion led the way.

Performing in a superb manner during the campaign, the unit contributed significantly to the history of airmobile engineer operations in the Vietnam War. No other engineer company in the III Military Region has equaled Company C's outstanding performance during this period. For every seemingly impossible obstacle placed in the unit's path, some method was always contrived to overcome it and accomplish the objective. Company C stands alone above the other support of the 1st Cavalry Division during the Cambodian Campaign.

The success of the Cambodian operation, and resultant drawdown of enemy forces, permitted greater dispersion among the tactical units in the following months. Combat engineers were able to devote more engineer effort to the improvement and construction of fire support bases. Missions included minesweeps, carpentry, sling-outs, revetment construction, demolitions and every aspect of important firebase construction. Each mission was met with enthusiasm and aggressiveness.

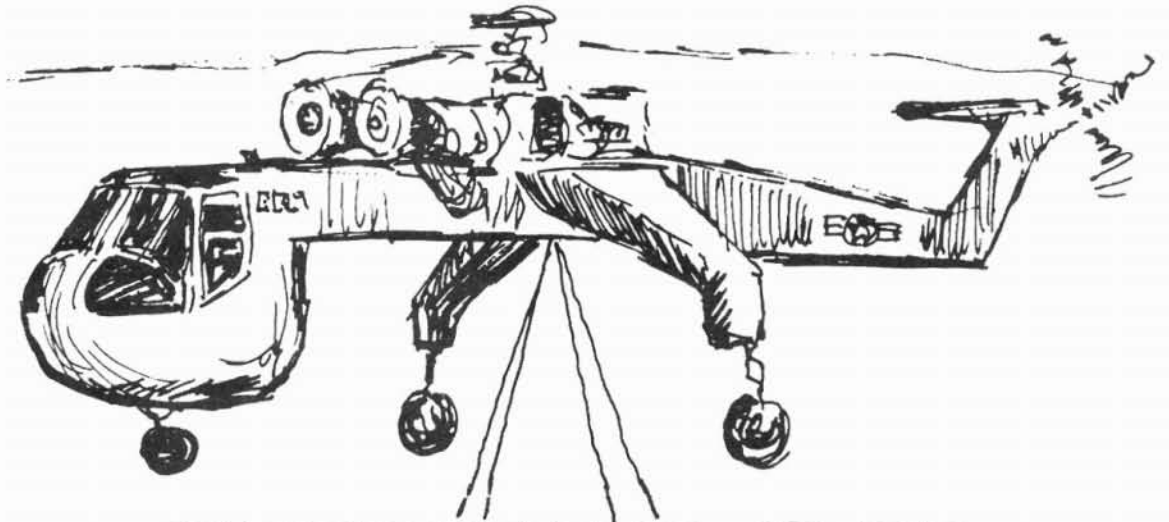
To cap an impressive year's activities, and on top of all the combat and combat support missions, the men of Company C prepared for and successfully passed the Division Annual General Inspection during December.

The year was a brief, but monumental, period in the history of a proud combat unit. From the push to BuDop, with subsequent build-up, to the historic thrust into the heart of the North Vietnam sanctuaries in Cambodia, and further, to the brigade relocations and concomitant problems in a new area of operations, the year 1970 saw an unsurpassed chronicle of success for the Skybeavers of Charlie Company, 8th Engineer Battalion.

The ability to get the job done in the intense, fluid combat environment, combined with unsurpassed esprit de corps, made the unit truly without peer and deserving of the highest recognition.

The Itschner Award Selection Committee also named two companies to receive honorable mention for their outstanding performances during calendar year 1970. These commendations went to Company A, 11th Engineer Battalion, Combat, Korea, and Company D, 79th Engineer Battalion, Construction, Europe.





# SKYHOOK

## the role of the helicopter in engineering

Today's technological Army is constantly on the lookout for advancements to streamline its military operations. Adequate equipment is continually being replaced as more efficient equipment is discovered. Air mobility, one of the Army's top research programs, now offers a solution to the many restrictions of surface transportation in the support of construction.

The replacement: the helicopter.

There are, for example, numerous potentials for the helicopter as a resource for bridge building, or in more generalized terms, as a resource for gap crossings. Although many characteristics peculiar to the helicopter provide advantages, there are also associated disadvantages. There is, however, evidence of a clear plus in the area of potential benefits to the construction industry.

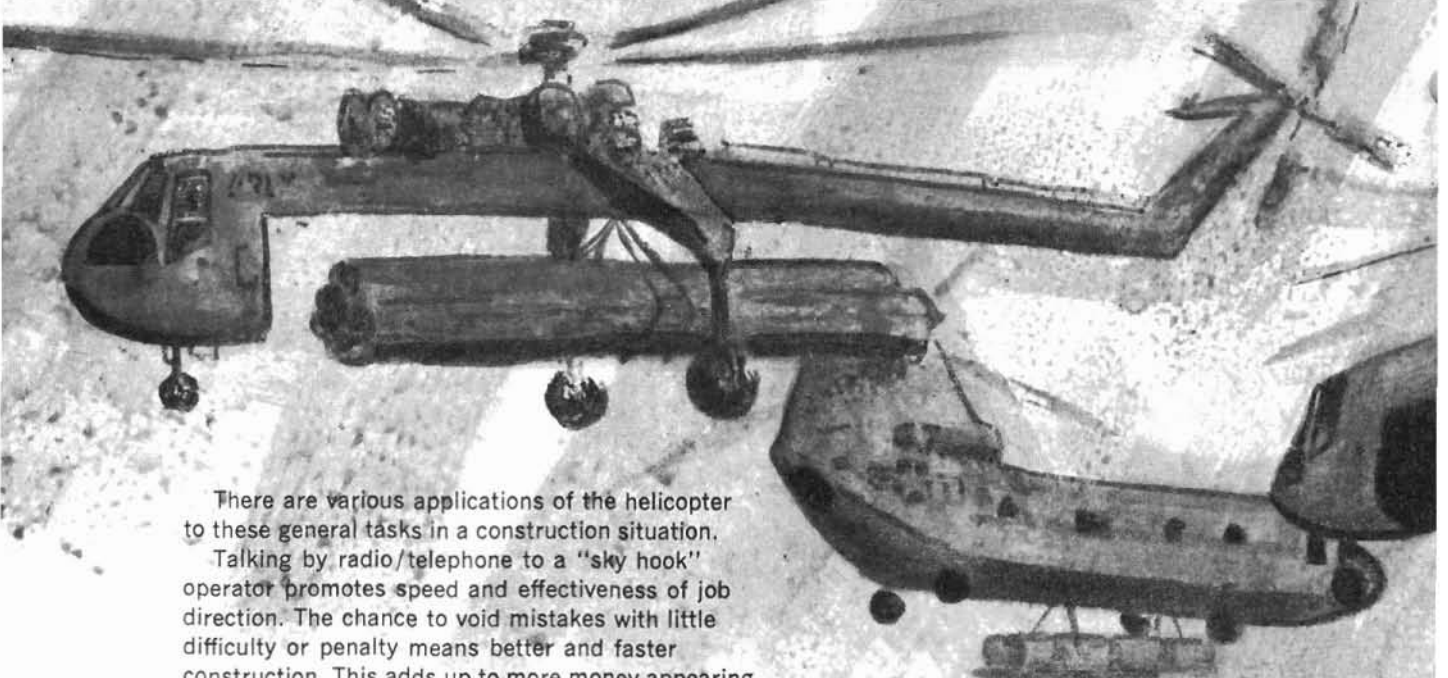
What engineer has not been faced with a problem which could have been easily solved with a "sky hook?" But, how many have ever employed the one item available to them that can be literally described as a "sky hook," the helicopter?

In the broadest construction sense, there are three basic tasks the helicopter can accomplish.

- 1.) The helicopter, of course, can transit areas of steepest grades, swamps, water, snow or heavy timber stands.
- 2.) It can comfortably cruise at speeds over 100 miles per hour without regard to the state or presence of road net or waterway.
- 3.) It can operate from hastily prepared locations to receive cargo in an area only slightly larger than that required for the cargo itself. Compare that to the area needed for turn around of grounded transport and for off-loading and storage. And, of course, if materials can be provided on a short-term delivery schedule, the need for large storage on-site is gone. This fact offers savings in manpower and equipment.







There are various applications of the helicopter to these general tasks in a construction situation.

Talking by radio/telephone to a "sky hook" operator promotes speed and effectiveness of job direction. The chance to void mistakes with little difficulty or penalty means better and faster construction. This adds up to more money appearing on the plus side of the contractor's balance sheet or what is even more important, time in a combat environment.

With regard to construction loads, a sky hook can handle between two and ten tons. Obviously, no one today seriously considers building a sizable bridge using a single vehicle to haul materials. When we get up in the range of ten to twenty tons of transport per helicopter load, the prospect of substantial deliveries becomes more attractive. Certainly the rate of initial progress in construction could be increased, even today, and lead to economics.

Another advantage of the helicopter is its separation from surface traffic patterns or congestion. In addition, the helicopter does not add to ground vehicle congestion at the work site. The mobility and flexibility of the helicopter in working has already been mentioned.

The helicopter also has disadvantages. It is not a "fail-safe" mode. There is always the threat of total loss of vehicle and cargo in case of a catastrophic failure of the vehicle. On the other hand, a helicopter can equal or better safety records of the cranes currently employed in the trade and is free from the hazards of lines of communication interdiction.

There is one new and significant factor the builder must consider when using the helicopter—air disturbance potential. This involves the problems of rotor-wash on personnel and materials at the job site, and the wind loading on the cargo being carried.

Most engineers readily concede that an airborne vehicle is more sensitive to weather than ground based vehicles. Helicopter operation is influenced by air density or violent air turbulence. There are

also the traditional foes of flight, and construction too—rain, fog and smog. And we are unable to control these factors.

The helicopter, along with its suspension cable and load, form a vertical obstacle which must compete for air space with other aircraft, high buildings, transmission lines and radio towers.

Our sky hook also has a limit in single-mission endurance because of fuel consumption. Fuel and payload capacity offer certain tradeoffs, but continuous airborne operations must today be held below two hours.

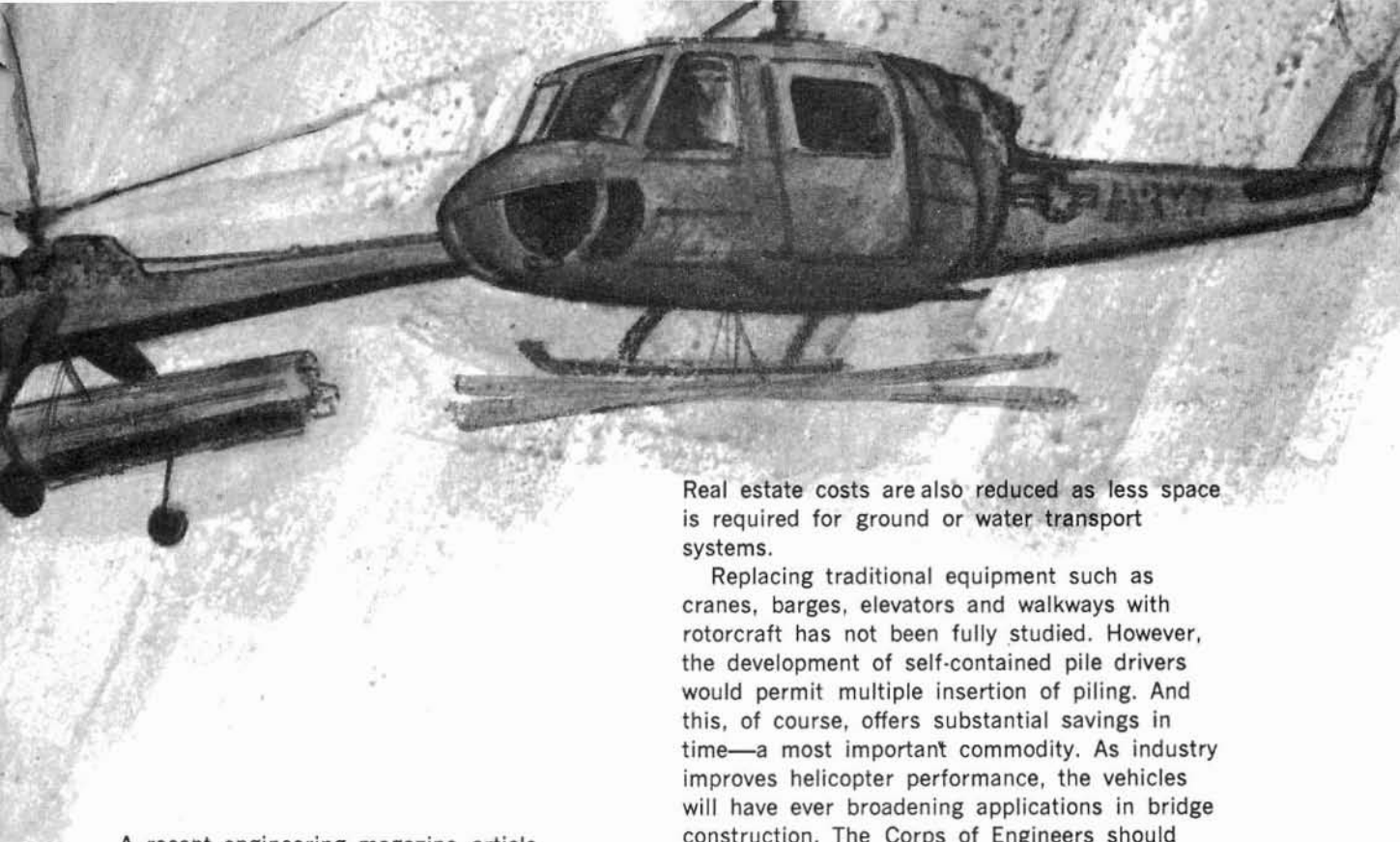
And finally, when it comes to precise placement of materials, the airborne vehicle does not provide a standing point of reference in space.

These disadvantages may seem imposing if viewed in isolation. However, they differ from conventional construction systems mainly in degree of disadvantage.

For example, there are currently various ways a bridge builder might find it advantageous to use rotorcraft. Over time these uses will expand to keep pace with the added capabilities of helicopters.

Delivery of men, materials and equipment to relatively inaccessible locations may make the chopper the only reasonable method of transport where time is an important factor in the bridge construction.

Obviously, if equipment is required on each side of a substantial gap, the use of a helicopter to move the equipment from side to side means efficient use of the machinery with associated savings.



A recent engineering magazine article explained how a builder used choppers to pour concrete for pile caps. Application of this approach may soon increase.

The full potential of eliminating scaffolding and other false work has only been touched to date. The press abounds with examples of helicopters used to emplace church steeples and towers.

A few words now about the most dreaded of details—cost of operation. A helicopter with a speed of about 100 miles per hour, an endurance rate of 2½ hours and a load capacity of 4,000 pounds can be rented for between \$300 and \$350. The flying crane, at a speed of 50 nautical miles per hour, can deliver 16,000 pounds for \$1,500 to \$2,000 per hour. When compared to the normal price for a 20 ton truck mounted crane at \$20 per hour, the price tag seems large. However, when you consider the cost of auxiliary transport and crane rental at both ends, the price falls within range.

Now, let's take a look at where some of the savings to a builder would appear. The fast transport permits economic hauling over long distances; this reduces the need for multiple bases of operation. Less transportation time for highly-skilled, and therefore highly-paid, technicians results in significant payroll cuts.

Real estate costs are also reduced as less space is required for ground or water transport systems.

Replacing traditional equipment such as cranes, barges, elevators and walkways with rotorcraft has not been fully studied. However, the development of self-contained pile drivers would permit multiple insertion of piling. And this, of course, offers substantial savings in time—a most important commodity. As industry improves helicopter performance, the vehicles will have ever broadening applications in bridge construction. The Corps of Engineers should lead the way.

Military engineers with foresight are looking forward with anticipation to the day when a 25 ton lift capability becomes routinely available. A civilian chopper with such capability, when coupled with greater reliance on factory fabrication of bridge components, will promote changes in methods and techniques of design, manufacture and erection of bridges.

Along with all other Army engineers, I am looking to a future of air mobility in the Engineer Corps.

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It is difficult to capsulize a career as distinguished as that of Major General Robert R. Ploger. Upon graduation from the U.S. Military Academy, MG Ploger received his commission into the Corps of Engineers. He commanded the 121st Engineer Combat Battalion through the Normandy, Northern France and German campaigns. As Division Engineer he advised the commanding general for the D-Day assault on Omaha Beach, for which his unit received the Distinguished Unit Citation. For three years he was assigned to the Supreme Headquarters Allied Powers, Europe. While in Vietnam, MG Ploger commanded the 18th Engineer Battalion and the U.S. Army Engineer Command and acted as Senior Advisor to the Chief of Engineers of the Republic of Vietnam. He was then assigned to the Office of the Chief of Engineers and appointed the Director of Topography and Military Engineering. After organizing the Army Topographic Command, he served concurrently as its initial commander and Topographer of the Army. He then became Director of Military Engineering in the Office of the Chief of Engineers. In July, 1970 MG Ploger accepted his present position as Commanding General of the U.S. Army Engineer Center and Fort Belvoir. He has received master's degrees in engineering and business administration.



On behalf of the Officer Personnel Directorate, may I congratulate you on the first issue of The Engineer Magazine. I am particularly pleased that space will be made available in each issue to the Colonels Division and the Engineer Branch to assist them in keeping you informed—for an informed officer is by nature more dedicated and maintains higher professional standards.

I invite you to visit the Officer Personnel Directorate when you are in the Washington area. For those of you who cannot, write the Colonels Division or the Engineer Branch, keeping them advised as to your preferences. Let me assure you our major aim for you is a successful and satisfying career.

Sincerely,

A handwritten signature in cursive script, reading "Richard A. Edwards, Jr."

**RICHARD A. EDWARDS, JR.**  
Brigadier General, USA  
Director of Officer Personnel



We in the Branch welcome this additional opportunity to get the word to you. Your success in your career and your overall ability to meet any requirements are the reasons for our being here. And keeping you advised is a major task in that effort.

In each issue we plan to cover those subjects we feel of greatest interest to the majority. You can help us by letting us know your thoughts, reactions, and desires. As in our newsletter, we will be brief, and direct you to source documents where necessary. If any questions remain, please write.

The opportunity to serve you is a satisfying assignment for all of us in Engineer Branch. We share pride in your individual success.

A handwritten signature in cursive script, reading "Joseph A. Jansen"

**JOSEPH A. JANSEN**  
Colonel, Corps of Engineers  
Chief, Engineer Branch, OPD



We in Colonels Division join in welcoming this opportunity to get in touch with you. Through this publication, we hope to provide timely information pertaining to colonels assignments around the world.

As information must flow in both directions, we urge you to pass on your desires and future plans. This will help in our providing the best possible assignment to you.

Best wishes and continued success.

A handwritten signature in cursive script, reading "Charles J. Fiala"

**CHARLES J. FIALA**  
LTC, CE Assignment Officer  
Colonels Division, OPD



# BRIDGING THE GAP

## *Personnel Notes*

### **Sound Advice**

Basically your biggest help to a successful career remains good efficiency reports. Do your job well—do your best—and the efficiency report will take care of itself—and you. It helps you be selected for better assignments, schools and promotions. Visit the Engineer Branch at OPO when in Washington and review your files. There you can receive advice on how well you are doing, and map out potential career opportunities. If you can't visit, make sure you submit your preferences in writing. Not everyone may get his first choice, but we make every effort to come as close as we can.

### **Like Stability?**

Increased emphasis is being placed on achieving greater stability for all officers as well as their families. The Army recently reaffirmed the policy stabilizing field grade command assignments a minimum of 18 months and company command assignments a minimum of 12 months. With short tour requirements decreasing, our goal is a minimum of two years between any PCS move with an objective of three.

### **Promotion Outlook Optimistic**

Current average service for promotion to Colonel is 20.5 years, Lieutenant Colonel, 14.2; Major, 8.1; Captain, 2; and 1st Lieutenant, 1. The forecast for the future remains somewhat the same except that the time to make Captain will gradually increase between now and 1 July 1973 to 3.5 years. These times compare very favorably with the 1965 figures which were 22.3 years to Colonel; 17.0 years to Lieutenant Colonel; 10.8 years to Major; and 4.0 years to Captain.

### **Overseas Tours**

The overseas tour situation is changing gradually in accordance with the decrease in short tour requirements. A considerable number of our officers still have to be separated from their families; approximately 41% of Engineer officers are currently overseas, with 26% in short tour areas. Majors and aviators of all grades have been most affected, with many having gone back to Vietnam for a second tour after 20 months, and some on a third tour. Current turnaround time to second tours is about 28 months for majors and about 48 months for captains.

### **Civil Education Opportunities**

The Undergraduate Degree Program, the Degree Completion Program, the regular Graduate Degree Program, and the Advanced Degree Program for ROTC Instructor Duty afford a young officer a number of means to advance his engineering skills and background. In addition to the DA sponsored programs, the Engineer School has a program where an officer in the Advanced Course or on the faculty has the opportunity to work towards either his undergraduate degree or an advanced degree. Some 78% of our Engineer officers have basic degrees while 22% have advanced degrees.

# essayons

- Scene 1.* Office of Major General R. R. Ploger, Commanding General, United States Army Engineer Center and Fort Belvoir, on 1 December 1970. General Hunt and Major Tom King, Information Officer, are seated. General Ploger speaks: "Jim, I think that it would be wonderful if you could get the first copy of The Engineer out for our Annual Dinner on 30 April. What do you think?" General Hunt: "Say, that's a great idea. We will get on it right away."
- Scene 2.* General Hunt's office on 1 February 1971. Major King is speaking: "Boy, we are running into a rocky road getting permission to use color for the engineer magazine. I sure wish you could do something. If you don't, we're dead." General Hunt: "Tom, let's check with my good friends in the Adjutant General's office and see if we can get a sympathetic hearing."
- Scene 3.* General Hunt's office on 10 March 1971. Major King is talking: "It was a lifesaver that the Adjutant General approved the use of color but we don't have a contract yet and it will take 45 days to print the magazine after we get a contract. The earliest we can get the magazine published is mid-June. On top of that we have no art supplies and we haven't rounded out our staff. I think you had better tell General Ploger that we just can't make it!" General Hunt replies: "You can tell the CG, but I am going to see if we can't get a contract."
- Scene 4.* General Hunt's office on 13 March 1971. Major King is present. General Hunt speaks: "Well, the Government Printing Office promises that if they can't get us a contract right away they will print the magazine themselves. They state they will do everything possible to meet General Ploger's deadline. The only thing is they need final copy by 22 March." Major King turns a silly green and says: "If the Adjutant General and the Government Printing Office can come through so can we. The art director will use his own supplies and we will work everybody until the copy is ready."
- P.S.* This first edition of The Engineer may not be its best but never has an engineer magazine been published by so few, with so little time and so little material and with so much moral support from nonengineers—Major General Verne Bowers, the Deputy Adjutant General; the Honorable A. N. Spence, the Public Printer of the United States; Major Tommy King, Infantry, the Editor; Lieutenant Joe Walker, Infantry, the Executive Editor; and Mr. John Savage, the Art Director. I want you all to know that The Engineer has been baptized in the true spirit of "Essayons".

BG Ira A. Hunt, Jr.

# a word

In this modern, fast paced, mod world we are all concerned with "how best to communicate or establish a meaningful dialogue with our church, organization, business, or school?"

Word of mouth, printed media, radio, TV all are extremely effective, if used to full advantage.

The Engineer School is using the medium of this magazine. Realizing that this is not a new approach and not wanting to create just another military publication, we envisioned a modern, innovative and profession-related magazine as an effective, responsive communication medium for the School. It is designed to communicate current military engineering information about new technology and developing concepts for use by the Corps worldwide.

The Engineer will serve as a forum for the exchange of ideas and points of view whether they represent the conservative, the controversial or the forward thinking. We hope that it will stimulate new ideas, the remodeling of existing practices and the enhancement of new professional awareness, skills, esprit and accomplishments. Controversial areas of concern and new "free-thinking" ideas will be published, if well presented and well documented.

The Engineer is establishing the Henry Larcom Abbot Award for excellence in writing. The award will be presented to the author of the best paper written by an advanced course student. The student will receive a plaque, a letter of commendation and a monetary award. The first of such articles will appear in the Summer issue.

A prime ingredient in communications is feedback. Without this reaction the effectiveness of the magazine cannot be evaluated, or its progress charted. We seek your comments and your contributions so that we may provide you with the best possible medium of communication. Without feedback we will operate in a vacuum. A thriving, responsive publication cannot be productive under such conditions.

The Engineer is a non-technical, readable, informative publication. We are seeking articles from you—the Engineer professional, whether you be a student, a member of the staff or faculty, or with troops in the field. Rank is of no concern to us—we desire articles from enlisted and officers alike. We want items of concern, lessons learned and just good solid stories with supporting photographs.

Our goal is simple—to stimulate the thinking of the Corps! The Corps can ask no more or no less of the Engineer, except technical proficiency and professional competence. We hope The Engineer will enhance both.

*MAJ Tommy B. King*

