MILITARY REVIEW

U. S. ARMY COMMAND AND GENERAL STAFF COLLEGE
FORT LEAVENWORTH, KANSAS

MARCH 1958 VOLUME XXXVII NUMBER 12

Conclusion

Only if we clearly separate the permanent contents of our moral and spiritual heritage from the appearances they may depend on at the time, can we grasp the meaning of the word "tradition." If we hold on to the appearance that is "convention," we are in danger of losing that which is essential.

There is more than one tradition. In history, different attitudes always have opposed each other, a fact that sometimes leads to different demands in practical life. Tradition, therefore, is not a principle leading to conformed thought and action. "Restorationists" and "reformists" always have fought each other. This fight is an important part of history.

It is impossible to claim tradition for oneself and to deny it to others. It makes no difference if other communities only care for the conventional part of it. A moral and spiritual inheritance may only be carried on by the proper heirs. It depends upon their attitude whether this inheritance seems worthwhile to the following generation.

German military tradition is a tradition of service and not of command. It does not justify pride and arrogance. On the contrary, it demands more of those who live by its standards. The meaning of chivalry is not only a special distinction and characteristic of a knight, today it is also a means of evaluation. We understand it as willingness to serve, consciousness of personal responsibility, and preparedness to render assistance.

If the eye is fixed upon the ideals of the past and upon different social orders, then there will be no room for reality and mission. The soldier is led into opposition against his superior. Isolated tradition is good only for the museum and soon will be satisfied with arrogance and formalities.

The attack of dialectic materialism is directed consciously against the foundations of our tradition as the main pillars of our free society. But this menace gives us, at the same time, a chance for reflection, recognition of ourselves, and decision.

If we want to continue our existence we have to make humanity, the desire for peace, service for the government based upon moral convictions, and willingness to assume responsibility the leading principles of our life. Our power is based upon them.

The Helicopter in the Army

Translated and digested by the MILITARY REVIEW from a copyrighted article by Erich Hampe in "Wehrwissenschaftliche Rundschau" (Germany) February 1957.

THE helicopter is a special type of flying apparatus, and an evaluation of its capabilities and employment cannot be made by a simple comparison with airplanes. It can be achieved only from a knowledge of its special peculiarities. It also would be a mistake, as often happens, to look on the helicopter as a jack-of-all-trades, although its seemingly limitless flexibility appears to lead to this characterization.

Actually, the helicopter as a means of conveyance does take in certain domains which, as a matter of fact, can be covered in no other way. It is in these domains that its peculiar missions lie.

In speed and radius of action the helicopter presently is not the equal of the airplane and, presumably never will be. On the other hand, the regular plane is not capable of vertical takeoffs and landings. The zone from zero to 150 yards in

height is dangerous for the airplane, but is to be regarded as favorable for the helicopter. It is able to take full advantage of terrain rises and forest passages for concealment, and there is no terrain obstacle it cannot easily surmount. With a skid landing gear it is able to land on flat roofs, snow or ice-covered surfaces, and, if provided with floats, can use any kind of landing field, and almost any body of water. It is able to transport loads of every kind, even of a bulky nature, which planes cannot carry.

Finally, it is able to carry out, with precision, subtle missions from the air that would be difficult from the ground and which are beyond the capabilities of other flying devices. The helicopter is a link in the transportation chain that begins where the capabilities of the truck terminate, and ends where the airplane attains superiority with its greater speed and radius of action.

German Prehistory

In the 15th century Leonardo da Vinci drew a number of sketches of helicopter type aircraft. Technicians of the various nations carried the idea forward through the centuries but did not find a practical solution until 20 years ago, when the German professor, Henrich Focke, developed his first helicopter. Essentially, his design fulfilled all the requirements for a flying machine of this type. While this was but a small model, in 1939 he brought out a much larger helicopter, the *Fa-223*, which had a maximum speed of 110 miles an hour and was able to pick up a load of 2½ tons. About the same time, the German inventor, Anton Flettner, built a naval helicopter, the *Fl-282*, for the special mission of submarine defense.

In 1942-43, German submarines used a motorless *Wagtail* autogiro for observation, towing it by means of a cable which also contained telephone wires. This small autogiro could be disassembled, packed in two watertight tubes, and stowed in the bridge superstructure.

The helicopters allotted to the German Wehrmacht gave excellent service during World War II, mainly in the framework of the Air Transport Service's Emergency Branch, and also were used in rescue missions.

However, it was not until the end of the war that the importance of the helicopter for military purposes was more clearly recognized. In September 1944 the Mittenwald Mountain Infantry School carried out a series of successful tests with helicopters for carrying loads in mountainous terrain. It was found that loads could be carried into almost inaccessible areas in minutes by this means, whereas ground transportation took hours to accomplish a similar task. Two well-functioning helicopters take the place of an entire pack battalion of 500 men with a large number of pack animals, according to these tests.

Together with this, the possibility of instituting new and unexpected points of attack through the transport of cannon and ammunition by helicopters was presented. For the first time, the helicopter's significance as a direct tactical combat means became apparent. But it was not until the end of the war was approaching and the Alpine region was being considered as the last bulwark that mass production of helicopters was undertaken. It was too late, but the high military value of the helicopter definitely was established.

Korea

In the Korean campaign the helicopter provided further proof of its military significance. It was employed on missions for which it was not originally intended, and it handled them successfully. A comprehensive increase in the number of helicopters in the American Army began. One can appreciate the degree to which the helicopter proved its worth on the basis of the two missions for which it was em-

ployed mainly—for command and liaison, and as an instrument for various troop missions.

The helicopter had become for the higher command staffs—from the division upward—a flying jeep. These commanders could find their units and discuss the situation with them on the basis of their own impressions within a very short time, without delay, and over any obstacles. No unit leader was sure that the roar of the whirling rotor blades would not suddenly be heard behind his combat post and the high commander would be unexpectedly standing before him. These "surprise effects" appear to have been limited to the friendly units which, with the dispersed form of combat, in itself, may have been a great advantage. The helicopter does not appear to have been used for tactical surprise at that time.

The helicopter served in signal communication units, in engineer units, and in the medical service. Every signal communication battalion was supplied organically with a helicopter and used it successfully for the laying of field wire lines, especially over impassable terrain. It was necessary to mark the cable and telephone lines plainly to keep them from constituting obstacles to the low-flying helicopters.

The engineer construction battalions—about the equivalent of the German heavy engineer battalions—had two organic helicopters per battalion and were able to make good use of them in terrain reconnaissance and bridge construction. Determination of the position of lines and the emplacement of bridging equipment can be more rapidly judged and directed from above than from the ground or water. Here again the helicopter increased efficiency from the standpoint of speed and accuracy.

The greatest use of the helicopter appears, however, to be in the transportation of wounded. In this field, astonishing feats were accomplished. About 18,000 wounded were transported from Korean battlefields by means of the helicopter. Most of the cases were injuries such as head and abdominal wounds that had to be dealt with quickly and which could not endure transportation by land. It is stated that the transportation of such wounded, from the time of the injury to the medical center, normally did not exceed 30 minutes. As a result the lives of many wounded men were saved. This fact was reported as of great morale value to the troops. These experiences have been given special consideration in the reconstitution of medical units in the American Army.

Frequently, it is asserted that the helicopter is very vulnerable to enemy ground fire in the combat area. Surprisingly, this view is in no way supported by the experiences in Korea. One supposedly authentic source indicates that not a single helicopter was lost in the air by enemy action. The maneuverability of the helicopter also makes it a very difficult target for interceptor aircraft.

The best proof of the helicopter's successful military employment in Korea is to be seen in the fact that the number of helicopters in the American Armed Forces has been increased considerably. The present number in the Army has been given by the press as several thousand.

Further Development

Technical efficiency increases to the extent that special technical means are developed for each separate task. It is not surprising that a large number of different types of helicopters have been developed, each of which has been created with the view to best meeting certain requirements.

However, military employment can be given only to a limited number of these special types. Too great a variety increases the difficulty of handling the helicopter, decreases its operational efficacy, and multiplies the problem of replacement parts.

It would appear, therefore, as in the case of motor vehicles, that only three main types are required. These are the small three- to four-place helicopter, corresponding to the passenger automobile; the medium helicopter, corresponding to the light truck; and the large helicopter of more than 20 places which could be compared to a bus or cargo truck. Within these groups, there should be no diversity of models. This will prevent such difficulties as occurred with respect to motor vehicles during the Second World War. In the case of the helicopter, limitation of types is still more important since the efficient operation of the helicopter is even more dependent on a steady flow of replacement parts than is the motor vehicle.

Moreover, these three types should meet all military requirements. By far the greatest variety of employments would fall to the small helicopter. This type ought to be especially dependable in the field where technical showpieces are not needed as much as reliability under all circumstances in the fulfillment of assigned missions. Such dependability is, above all, the result of the exploitation of years of experience. This should be considered when innovations, seductive as they may be, are suggested.

The other two large classes are not to be considered as normal troop equipment, but as special transport means for troops or supplies. That helicopters for up to 400 passengers are being planned is an indication of the magnitude to which developments are leading. It should be mentioned, however, that every increase in size means greater difficulties to be overcome, hence any development in this direction must proceed a step at a time.

Command and Communication

The conduct of combat operations—no longer in a combat line but in separated combat groups—as well as the necessary wide dispersion of the units in the employment of atomic weapons and guided missiles, requires that the higher troop commander leave his place in the armored car and take to the air. It is only thus that the commander can directly ascertain the combat situation and influence the troops by his presence at the points of greatest danger. Telephone lines and radio do not satisfy this need.

In addition, by the installation of television cameras in the command machine, the higher commander would be able to obtain a direct optical picture of the situation in certain objective sectors while he was still on the ground. The "field marshal's hill" is thereby not only replaced by other means, but is freed from enemy action. This possibility also offers invaluable advantages to the higher artillery commander.

The use of the helicopter is equally advantageous to the staff members for supervision of march columns and to transmit to the units the necessary orders by means of radio or loudspeaker. They can be used to search for rest and bivouac areas which provide the necessary cover and camouflage. The units can be led to these areas by flying ahead of them or by giving directions from the air when there is a scarcity of time.

The condition of highways, roads, and terrain can be reconnoitered in the same way. Trafficability of highways can be determined and traffic bottlenecks detected. Assembly and stream crossing areas can be sought out. If necessary, the helicopter can take over the security of the unit in such an assembly because it is able to catch sight of any possible enemy movements in the surrounding area.

It will be particularly valuable for moving liaison officers over terrain that is no longer passable; for example, terrain which has been torn up so badly or radioactively contaminated by atomic explosions that the ordinary personal car can no longer pass over it. Radio communication is possible, it is true, but only an emer-

gency means as compared with direct conversation.

For atomic, biological, and chemical warfare troops the employment of the helicopter offers the following possibilities: If the probability exists that the terrain is contaminated by the use of war chemicals, samples of it for subsequent determination can be taken quickly without risk to personnel. The same is true when contamination by the scattering of radioactive substances is suspected, or after an atomic explosion. By means of radiation-measuring devices this may quickly, definitely, and safely be ascertained—a dangerous and time-consuming task for which special details would otherwise have to be assigned.

At the same time, the helicopter could warn any troops who chanced to be approaching the area and also mark off the contaminated terrain with warning signs. It will prove an advantageous means of removing detachments from a dangerous zone such as this, since the longer the time spent in contaminated terrain, the greater the danger to the individual. Finally, the helicopter will show itself to be a practical, indeed a well-suited, means for spraying decontaminating substances on terrain areas such as narrow passes and bridges which must be traversed. The helicopter literally could be designated as a jack-of-all-trades for these specific missions.

For the artillery, the helicopter is a well-suited means for close terrain reconnaissance in search of suitable and covered firing positions, and for the rapid transfer forward and the stationing of advanced observers in suitable locations. Its value for fire direction in larger units already has been mentioned. Thus the helicopter takes the place of the obsolete captive balloon. Equipped with radio or a television camera, and, if need be, remotely controlled, the helicopter will be an excellent means of observation. During the necessary regroupments for the formation of new strong points, the helicopter is a liaison, reconnaissance, and command means at the same time.

It is hard to say whether wire signal communication lines will play the same role in the future as they did in Korea or whether they will be replaced by radio. But even if they are, the possibility of a rapid landing of radio troops for setting up radio stations renders this task far easier. In extremely hilly terrain, the helicopter is able to perform the duties of a relay station temporarily.

For the mission of ordnance troops, the helicopter finds still another field of employment. Reconnaissance from the air facilitates the rapid location of suitable dump and storage sites with the necessary approach and departure routes. In major combat action it can be used for the control of arriving and departing traffic in order to avoid traffic jams and blocking.

Maintenance of communications with the fighting forces and the supply columns from the depots and railway and naval unloading points is important. It will be especially important to get critical supply items such as special ammunition, special equipment, and replacement parts where they are needed without delay. At the same time repair troops also may be transported directly to vehicles in need of repair.

Mountain Warfare

It was in the domain of the missions of mountain troops that the first clear recognition of the military value of the helicopter was shown. They show, particularly, that the replacement of pack animal columns by the helicopter was possible to a large degree and that by this means a considerable number of men and animals were saved for other purposes. One especial advantage in this connection is that a larger individual load—such as a mountain gun or some piece of engineer equipment—can be carried at one time. In conducting mountain warfare, the matter of

transportation and supply plays a much more decisive role than in combat in level terrain, since it often presents almost insurmountable obstacles.

In the movement of special details in high mountains, whether it be for the fulfillment of tactical missions or the performance of heavy labor missions such as the construction of cableways or gun emplacements, the transportation of the crews by helicopter to the places of their activity not only has the advantage of greater rapidity but the forces reach the place of their activity in a fresh physical condition instead of exhausted by their long journey in the mountainous terrain. The transportation of warm food to the crews, made possible by the use of the helicopter, is of great importance to forces that cannot prepare their own food.

It is characteristic of mountain warfare that the mobility of the forces is limited. Heavy weapons when once emplaced cannot be moved without the loss of a great deal of time. Since the helicopter overcomes this difficulty quickly, it gives an unusual freedom of action to the conduct of operations in mountains. Therefore, it is able to intervene with strong forces at the time and place needed. In this, the helicopter is a unique and extremely important means of action.

Reconnaissance for the construction of field positions, ferries, bridge sites, and barriers and obstacles can be done more easily and rapidly from the air than from the ground.

Special Missions

Watch of the river above a bridge for mines and floating tree trunks as well as the regulation of traffic at the crossing points can be more efficiently done from the air. Also, reconnaissance for routes for field railway tracks and the construction of roads and pipelines can be accomplished better from a helicopter.

An especially valuable and important field of activity for the helicopter is offered by ice jams and floating ice. The most effective way for determining the magnitude and reach of ice jams and floating ice is from a helicopter. And certainly the helicopter greatly aids the placing of demolition charges and the effecting of demolitions.

The ensuring of a water and electrical supply for the troops, staffs, shops, depots, and hospitals can be achieved much more readily when specialists are brought as rapidly as possible to the central plants or distributing installations. Demolitions that have been carried out, especially in the distribution systems, can be discovered and eliminated more quickly. In the case of attacks on posts, railway installations, important bridges, and tunnels, especially when atomic weapons have been employed, it will hardly be possible to get to them over the ground to determine the damage done and initiate vitally needed repair activities. From the helicopter, however, a clear picture of the situation cannot only be immediately obtained, but individual points of an important nature can be noted immediately and steps undertaken against secondary dangers where necessary.

For the medical service there exists, in addition to transportation of wounded, another equally comprehensive and important domain of activity. Employment of atomic weapons imposes requirements for greater mobility and dispersion on the medical service. Such great losses can occur at focal points by the use of atomic weapons that an immediate assembly and engagement of all available medical forces and units will be required. The areas for the assembly of the wounded and for field hospitals must be reconnoitered. In the meantime, doctors and other medical personnel must be transported to these casualty assembly areas. There will be medications, instruments, and dressing materials to be brought up from the rear. All these are tasks for whose simple and

rapid accomplishment the helicopter is best suited.

Assault Operations

Apparently there was scarcely any movement of units by helicopters in Korea, or at most, only to a small extent. In war games, however, tests are reported to have been made in which the helicopters were given the name of "sky cavalry." By use of night flights, positions back of the enemy's front were occupied and, at dawn, again evacuated.

Theoretically, situations are unquestionably conceivable in which the engagement of a helicopter unit for tactical assault operations could be of great or even decisive value. One is led to this view by the fact that modern combat no longer knows any continuous front and, therefore, leaves open space and freedom of movement on every side. Also, a numerically small but modern unit with select personnel and high-efficiency weapons is able to develop surprising firepower. Both of these developments favor the employment of the helicopter by units.

It is, therefore, entirely possible to conceive a helicopter squadron consisting of 20 to 30 helicopters with a three-man crew each in addition to the pilot, in which each man is a select individual fighter and equipped with a weapon of high firepower. The unit will be engaged against an enemy sector which, due to terrain obstacles, is weakly occupied, but important in the development of the combat operations. By taking advantage of weather conditions, camouflage, and cover, this type of unit could have a major effect on combat operations.

Another use might be in a situation where a bridgehead that has been occupied by an advanced enemy detachment is attacked by a helicopter squadron. Also, a bridge might be defended to the last minute by a helicopter squadron in order to give the main body of forces maximum time to establish a defensive position.

Such a unit would be able to lay down quickly a smokescreen over a terrain area to conceal it from enemy observation. Opinions also have been expressed to the effect that such a unit would be able to create broad passages through minefields by the dropping of explosives, but this would hardly be practicable except in the case of areas no longer dominated by enemy fire.

Only the most maneuverable of the small helicopters which are easily concealed could be used for the unit activities described above. A mission for medium or large helicopters in unit operations would be the transportation of a major troop unit to another location for regular combat engagement. Here, of course, we are less concerned with a *coup de main* operation than with a new type transport problem. This operation would, of course, have to be conducted under convoy protection since these heavy machines cannot be brought up secretly, as can the light ones.

That the United States intends to exploit these possibilities is shown by the successful experiments with the helicopter assault carrier, *Thetis Bay*, a remodeled aircraft carrier capable of carrying 20 large helicopters with 1,000 assault troops.

Conclusions

This theoretical study has shown some of the manifold possibilities of the employment of the helicopter in the army. It has demonstrated that three major classes of these aircraft, established on the basis of their missions, are justified.

It should be clear that the helicopter does not belong in the framework of the tactical air force, but represents an auxiliary means to be allotted to all three elements of the armed forces. The center of gravity should be on the land—with the army. Since it is to be expected that helicopters will be assigned to all three branches of the armed forces, the central army organization must maintain the closest connection with other portions of

the armed forces, and in its organization and further development of aviation, seek constant counsel from the air arm.

In equipping the army units with helicopters, the necessity for their use by the higher staffs must be remembered. In all higher staffs down to the combat team, a flight of at least three helicopters should be provided.

To what degree independent helicopter units should be constituted for tactical assault operations or major transportation tasks, and to which tactical units they should be assigned either permanently or temporarily, is a question which cannot be answered today. The results of experiments with respect to these matters would have to be known first.

In ordinary march movements the small helicopter can be taken along—loaded on a truck or a two-wheel trailer—and can be made ready for flight in a very short time. A shop truck with several mechanics is required for each flight of helicopters because they need constant and careful servicing to assure safe operations. In addition to care and servicing by specially trained mechanics, a regular overhauling platoon must be provided for constant checking and necessary overhaul. Equally important is the organization of a rapid and frictionless parts replacement system, since many of the parts of a helicopter, after a certain number of hours of use, cannot be repaired and must be replaced.

For the missions mentioned in connection with the various types of forces, the necessary number could be about as follows:

Type of Units		Helicopters
Atomic, biological, and chemical warfare	Staff	2
	per company	1
Artillery	Staff	1
	per battery	1
Signal	Staff	1
	per company	1
Ordnance	Staff	3
Mountain	Staff	2
	per company	1
	per platoon	4
Engineers	Staff	2
	per company	1
	per platoon	2
Technical	Staff	2
	per company	1
	per platoon	2
Medical	Staff	2
	per company	1
	per platoon	6

If possible, pilots for the helicopters of the various types of forces should come from the category of forces with which they are engaged. They must possess the technical knowledge and skill of this arm and the tactical knowledge necessary, since under these conditions they will be best able to fulfill their missions.

The Evolution of Methods of Warfare

Translated and digested by the MILITARY REVIEW from an article by General J. Revol in "Revue Militaire Suisse" (Switzerland) March 1957.

WAR is the continuation of a diplomacy that is unable to gain its desired results by other methods. It is one of the strongest manifestations of human activity, and applies principles which are recognized universally although limited in number and uncertain as to definition.

Imaginative and constructive ideas, superiority of material and means applied at the time and place most suitable to the attainment of an objective, dogged perseverance, and an aggressive mind are useful in every type of peaceful activity. Transformed to the military domain, these