27TH YEAR OF PUBLICATION

THE FIELD ARTILLERY JOURNAL

JANUARY-FEBRUARY, 1937

PUBLISHED BIMONTHLY BY
THE UNITED STATES FIELD ARTILLERY ASSOCIATION

January-February, 1937

CONTENTS

AUTHORS ALONE ARE RESPONSIBLE FOR STATEMENTS CONTAINED IN THEIR ARTICLES

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VOL. 27 No. 1

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Copyright 1937, by
The United States Field Artillery Association

Patron Saint of Artillery

PUBLISHED BIMONTHLY FOR

THE UNITED STATES FIELD ARTILLERY ASSOCIATION

BY MONUMENTAL PRINTING COMPANY

32D STREET AND ELM AVENUE

BALTIMORE, MD.

Editorial Office, 1624 H Street, N. W., Washington, D. C.
Michael V. Gannon, Captain, Field Artillery, Editor

Entered as second-class matter August 20, 1929, at the post office at Baltimore, Md., under the Act of March 3, 1879

Published without expense to the government

The Field Artillery Journal pays for original articles accepted

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

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To the Officers and Soldiers of the Field Artillery

An autogiro is undergoing a tryout in the work of the Field Artillery School at Fort Sill. No one can foresee clearly the full possibilities of this new machine as an auxiliary to the ground troops. For the field artillery particularly, it should facilitate reconnaissance, liaison, battlefield surveillance, and observation of fire. Only time will tell, but our hopes are high. The decision that air photos, rather than fire-control maps, be used in survey operations, has influenced our gunnery practices. The reorganization of the infantry division presents problems pressing for solution. We look ahead to progress.

More realistically we see that the radio, even with its ever-improving devices, can not yet displace the wire-telephone; nor has the runner been outmoded as a means of communication. While motors have come to us in large numbers, we still have the horse and mule doing valiant service. No system of fire control has yet been devised superior to direct observation. The cannoneer still has muscles to exercise, and brains with which to control his mechanical servants, which are not yet his masters, and never can be.

However, it is safe to make one assumption—the field artillery will achieve its mission, the fire support of infantry and cavalry, by mastering and practicing its lessons, rather than by giving these but perfunctory attention while awaiting the improbable moment when battles can be won by pushing buttons. "There is no royal road to national defense," said the late Secretary of War, Honorable George H. Dern. "You cannot purchase it with gadgets,"—nor can battles be won thereby.

I have been pleased to note, from the reports of the various boards which inspected entries in the 1936 Knox Trophy Contest, that our lessons are being well learned.

UPTON BIRNIE, JR.,
Major General, United States Army,
Chief of Field Artillery.

Photo by U. S. Signal Corps

FROM A WARTIME RECRUITING POSTER

THE FIELD ARTILLERY JOURNAL

VOLUME 27 JANUARY-FEBRUARY, 1937 NUMBER 1

And Now the Autogiro

BY BRIGADIER GENERAL LESLEY J. McNAIR, U. S. ARMY

EIGHTEEN years have elapsed since the Armistice. War equipment of today makes that of the World War appear quite outmoded. It is a striking fact, however, that there are few items of modern equipment which were not in use, or at least in being, during that war. Motorization, mechanization, all types of airplanes, and balloons, for example, were in common use at that time. Postwar types embody many improvements and developments, but distinct innovations are rare: progress has been by evolution, rather than revolution.

But today the Army is face to face with something really new—the autogiro—new in its interesting military possibilities, and new in its original and exceedingly clever application of aerodynamic principles. The Air Corps has purchased two Kellett autogiros, one a YG-1 and the other a YG-1A: and, after acceptance tests, has placed the machines, with Air Corps pilots, at the disposal of the ground arms, for service tests.

The autogiro was invented by Senor Juan de la Cierva, a brilliant Spanish engineer, whose first machine was built in 1920. His earlier experiences with airplanes were not altogether happy,

KELLETT AUTOGIRO YG-1A

Note the inclination of the rotor axis. The propeller axis also is inclined, so as to pass through the center of gravity of the giro as a whole

KELLETT AUTOGIRO YG-1A

The rotor blades are folded back for transport by road or for storage. Note the horizontal tail surfaces—opposing airfoils, which set up a couple to counteract the propeller torque

and he was impressed by the inherent faults of the type. He sought greater safety in flying. It is the irony of fate that, at the age of forty-one and after bringing his brain-child through the most trying period of its development, he met death recently in a modern transport airplane.

Our new autogiros have flying characteristics which appeal especially to the artilleryman. The minimum speed in still air is about 16 miles per hour. When flying into a wind of this or a greater velocity, they can hover above a selected point. The maximum speed is 130 miles per hour, and the cruising speed 105 miles per hour. They can land in a small space, since the roll on landing is almost nil—a few feet. Descent, either with or without power, may be varied at will from a long glide to the vertical.

In a take-off in still air, the machines can clear an obstacle 50 feet high at a distance of 300 feet from the starting point. The jump take-off, now under development, permits an initial vertical rise, predicted as great as 200 feet, before beginning normal flight.*

The giro permits rapid and wide changes of speed; it is capable of exceedingly sharp turns; it can dive and loop; and, in general, has no small assortment of acrobatics, with possibilities as yet unexplored.

These characteristics and other features of the giro point to interesting possibilities in its tactical employment. Its landing and take-off capabilities permit the giro to operate in close touch with the supported ground units. In addition, the rotor blades can be folded back parallel to the fuselage, for transport by road, which would permit the giro actually to march with

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*The jump take-off was under development by Cierva in England at the time of his death, and its invention is credited popularly to him. Actually, however, the original conception and elaborate calculations establishing its practicability were the work of an American—Mr. R. H. Prewitt, a young alumnus of Purdue University and now Chief Engineer of the Kellett Autogiro Corporation.

a column if desired. The small minimum flying speed should permit a rapid, detailed reconnaissance by giro more effectively than by any other means, either air or ground. The giro has taken aloft a telephone wire and established communication with the ground from an altitude of two thousand feet. Visual signaling, giro-ground, is readily practicable.

Thus the giro is under consideration for a field of usefulness now filled by the observation airplane and the captive balloon. Some comparison of the three means is appropriate. Statements in this connection are of course purely relative; moreover, they are subject to revision as experience with the giro is accumulated.

The balloon now is the quickest and most accurate means of air observation of fire. It permits the use of a field glass, and has wire communication with the ground. However, it is a large, visible, and vulnerable target. It is sensitive to weather conditions, a wind of 25 miles per hour affecting its usefulness. It requires a large ground establishment, and its mobility is limited.

The airplane has high speed, which diminishes its vulnerability. In addition, it can defend itself by machine-gun fire. It has a large radius of action in observation and reconnaissance; and its view can be vertical, favoring accuracy. Its speed, vibration, and wings handicap vision; a field glass cannot be used.

The giro affords better vision than does the airplane, owing to the absence of wings, and to its lesser speed and vibration. The practicability of using a field glass from it is yet to be determined. The machine itself is less visible in the air than the airplane. Since the present type of giro is unarmed, it is reasonable to assume that

THE AUTOGIRO IN FLIGHT. NOTE THE CONING OF THE ROTOR BLADES.

its operation, except at night, would be confined largely to friendly territory. However, a larger type—and there is no basic reason to doubt its practicability—could be armed readily. Armament, coupled with the giro's inherent maneuverability, would change this aspect completely. Like the airplane, the giro is less subject to the weather than the balloon.

The comparative effectiveness of the three means in observing fire under tactical conditions is yet to be determined, although there is reason to believe that the giro would be superior at night. It appears that, for reconnaissance of targets and hostile terrain, the airplane would be superior to the present giro: but that the giro would be decidedly superior in reconnoitering friendly terrain and for command and courier purposes. The giro is the most easily concealed on the ground.

Merely as a short-range forecast, and assuming that the giro proves serviceable, it is not difficult to visualize the possibility of its replacing the balloon largely, if not entirely, and the observation airplane in a degree as yet indeterminate.

The giro is intriguing to both the layman and the technician, even in these days of ceaseless wonders. Aside from the widespread interest which the machine has aroused, the principles embodied are important in appraising its value and possibilities. There are some misconceptions in this respect. Consequently, a brief explanation—as nontechnical as possible—of the basic features seems in order.

It is seen from the cuts that the giro has a fuselage and undergear of the familiar type; it carries an engine and a propeller. There are no wings in the ordinary sense; but the fuselage carries certain tail surfaces and a rudder, which stabilize the machine and facilitate turns. The distinctive feature is a large rotor, mounted abové the fuselage and consisting of three equally-spaced blades or wings. In flight, the rotor rotates freely with its axis, due to airflow. It is to be noted that the plane of the rotor is not perpendicular to that of the propeller, but is inclined downward to the rear, for reasons which are explained later.

The propeller is connected directly with the motor, and the pilot can connect the rotor also by means of a clutch. In preparing to take off, the brakes of the giro are set, and the motor and propeller started. The pilot engages the rotor, which thus is brought to speed. He then releases the rotor and the brakes, and opens the throttle. The rotor continues to spin for the moment. The propeller moves the giro forward. The airflow thus created maintains the rotation of the rotor; and, as the giro gains speed on the ground, the rotor also gains speed and soon lifts the machine into the air. It may be remarked that the rotor could be started from rest by taxiing the gird around the field, but the method would be slow and hence impracticable. Thus in flight, the motor-driven propeller moves the giro, while the air-driver rotor sustains it.

AUTOROTATION

Among the array of phenomena which are at work constantly during the operation of the giro, perhaps none is quite so difficult to grasp as that of the rotor's rotation without a visible source of power—termed autogiration, or more commonly autorotation. An under standing of autorotation is the key to appreciating the giro's behavior, so that it is necessary to make a special effort to explain the phenomenon.

On seeing the giro in flight, one is apt to jump to the conclusion that the

rotor rotates in the same manner as a windmill. Actually, the rotor and the windmill rotate in opposite directions, so that the windmill is hardly a suitable analogy. If the rotor were a windmill, it would hold the giro on the ground, instead of lifting it.

Before going into the reasons for this condition, it seems best to demonstrate the facts convincingly and practically, in order to clarify the problem.

The cuts show two forms of model rotors — home-made, but satisfactory for the purpose. Each consists of a handle with a pivot at the end, on which is mounted a rotor, free to spin in an airflow. No. 1, with four blades, is essentially a windmill. The blades are pitched at about 15 degrees with respect to the plane of rotation. No. 2 has blades formed as efficient airfoils, like the wings of an airplane. The pitch is zero.

Both forms are pitched in the same direction. It is apparent then, that, if either of the rotors is to lift or sustain, it must rotate so that a blade in its uppermost position or when nearest to the fan moves away from the reader. Rotation in this direction only is autorotation, properly speaking. Rotation in the opposite direction is antiautorotation.

Our interest in such rotors is to subject them to airflow and see what happens. This is accomplished readily by holding them in various positions before an electric fan as a source of airflow equivalent to that obtained in flight. The position of rotor No. 1

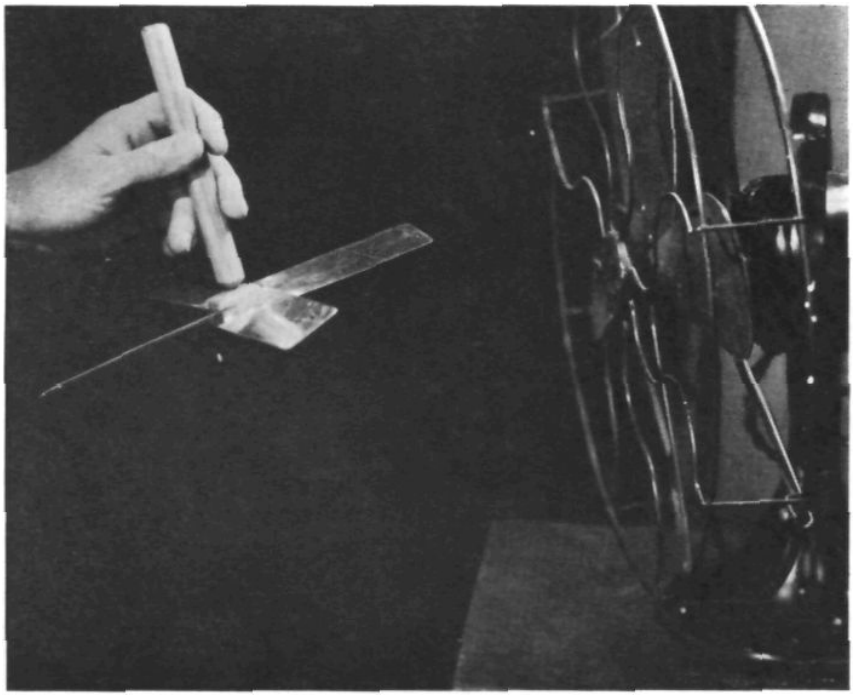


Photo by U. S. Signal Corps

MODEL ROTOR NO. 1
A windmill: capable only of antiautorotation. Pitch of blades about 15 degrees with respect to the plane of rotation
Airflow A: Corresponding with that in flight with power

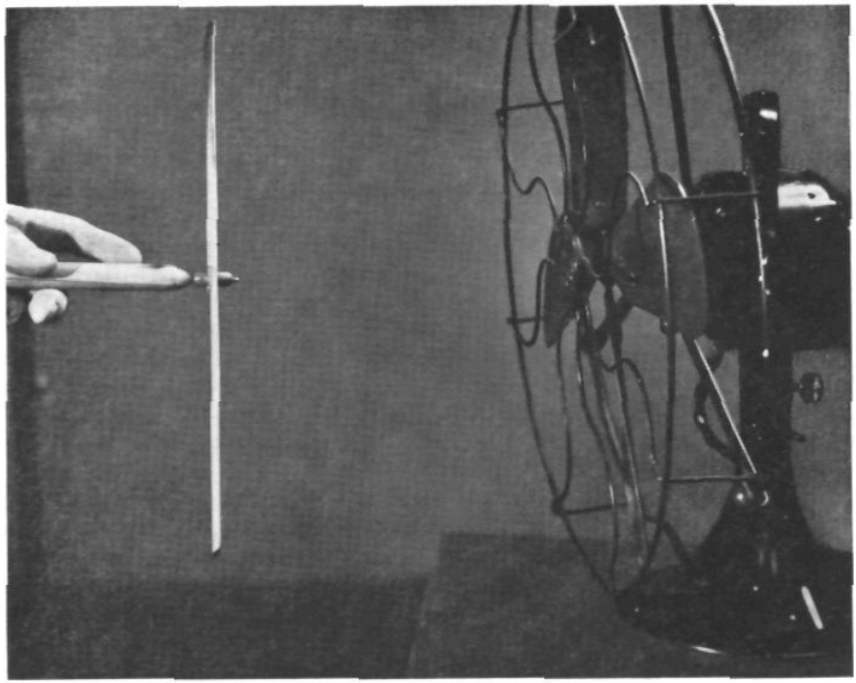


Photo by U. S. Signal Corps

MODEL ROTOR NO. 2
Formed blades of zero pitch; capable of autorotation
Airflow B: Corresponding with that in flight (descent) without power

before the fan gives a direction of airflow designated as airflow A; that of rotor No. 2, as airflow B. Airflow A approximates that obtaining with the giro for all directions of flight *with power*. Airflow B is that obtaining in vertical descent *without power*.

With rotor No. 1, having flat blades pitched at about 15 degrees, autorotation can not be obtained with either airflow A or airflow B, or any intermediate airflow; there is antiautorotation only. Even if the rotor is spun initially by hand in the direction of autorotation, and then is subjected to airflow, it stops quickly and antiautorotation sets in—and, for airflow B especially, at high speed. The reason lies in the excessive pitch of the blades.

With rotor No. 2, having formed blades of zero pitch, there is autorotation. If the rotor is placed at rest before the fan, with any airflow between A and B, it autorotates invariably. However, if it is spun by hand in the direction of antiautorotation and then is placed before the fan, it continues to rotate in this direction at apparently the same speed as it autorotates.

A third rotor, similar to No. 2 but with blades pitched at slightly less than three degrees, also was tried. It gave only antiautorotation, on account of the pitch.

As a result of these demonstrations, it is concluded that—

First, in order to secure autorotation, the pitch of the blades must be small. The fact that autorotation is not obtained with these small models at a pitch around three degrees by no means

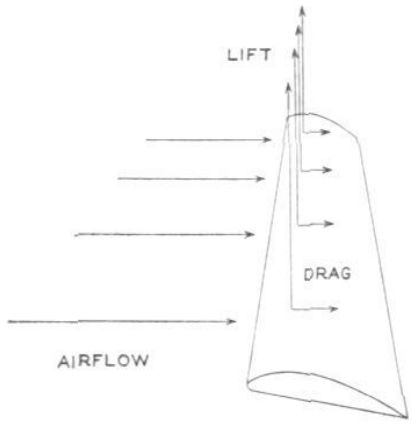
fixes the limit at less than this value. Actually, with the giro, autorotation is obtained with a pitch as great as four degrees or more—theoretically over ten degrees under ideal conditions. In the case of the YG giros, the pitch is about 2½ degrees.

Second, in order to secure autorotation, there must be a component of airflow upward through the rotor; and the greater the component, the faster is the rotation. This fact accounts for the inclination of the plane of the rotor of the giro with respect to the axis of the propeller, noted previously; otherwise, flight would be impossible. It follows that the upward component of airflow through the rotor—and hence the rotor speed—can be increased in two ways: for a given direction of airflow, by increasing the velocity of airflow; and, for a given velocity of airflow, by altering the direction of airflow from A toward B.

In view of the foregoing presentation of the practical aspects of autorotation, it is interesting to examine in a general way the reasons for the demonstrated conditions:

As a preliminary, it is well first to refer to the fundamental principles relating to an airfoil subjected to airflow. The airfoil is inclined to the airflow as indicated. The movement of either the air or the airfoil sets up a force perpendicular to the airflow, known as the *lift:* and a force parallel to the airflow, known as the *drag*. These forces are present in the cases of both the wings of an airplane and the blades of the giro's rotor. In fact, the rotor frequently is referred to as a rotating wing.

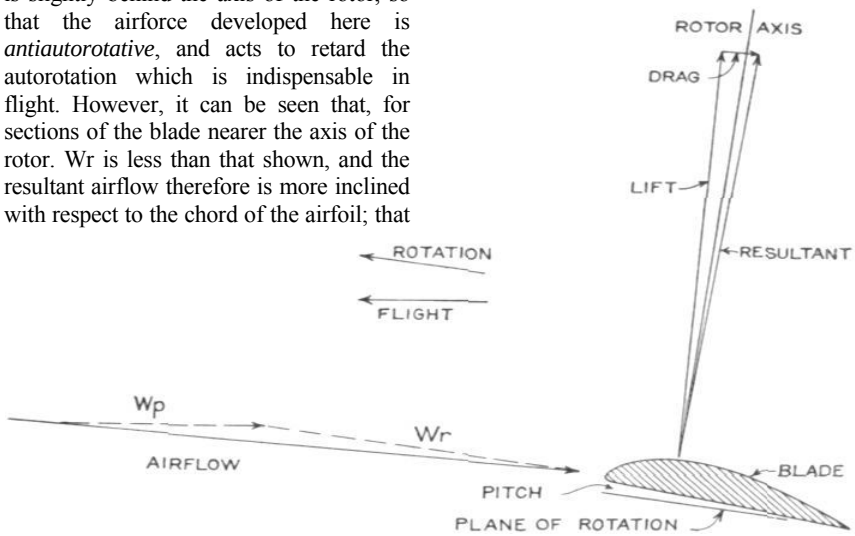
The blades of the rotor pass through a succession of positions with respect to the direction of flight, because of the rotation of the rotor and the inclination of the plane of rotation. It is sufficient to consider two positions: First, the advancing blade, extending directly to the right side and moving forward with the giro; and second, the retreating blade, extending directly to the left side but moving rearward. Other positions of the blades could be studied similarly. The figures show the conditions sufficiently accurately for the purposes of this discussion. Movement under full power is assumed.



AIRFOIL IN AN AIRFLOW

Consider the advancing blade. The cut shows a section of the rotor blade, which is one foot wide and 20 feet long. The plane of rotation is inclined slightly, with the rotor axis perpendicular to it, as indicated. The blade is pitched with respect to the plane of rotation. Wp is the component of airflow due to the forward movement of the giro, in the direction of flight, under the thrust of the propeller. Wr is the component of airflow due to the rotation of the rotor, parallel to the plane of rotation. Wp and Wr give a resultant airflow in the direction indicated, which creates a drag in the same direction and a lift perpendicular to it. The resultant of the lift and drag is the airforce acting on the blade at this point of its length. The resultant airforce

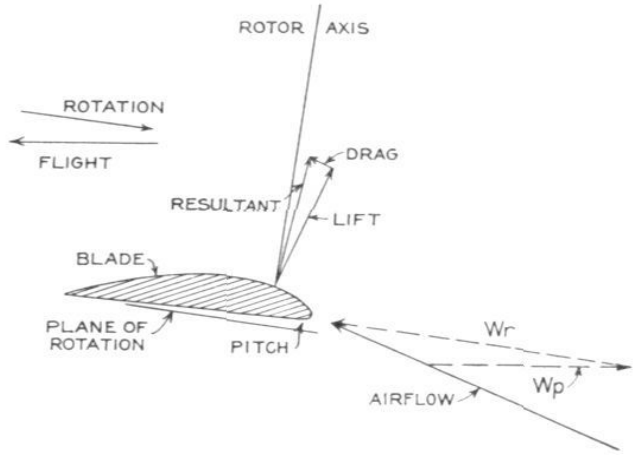
is slightly behind the axis of the rotor, so that the airforce developed here is *antiautorotative*, and acts to retard the autorotation which is indispensable in flight. However, it can be seen that, for sections of the blade nearer the axis of the rotor. Wr is less than that shown, and the resultant airflow therefore is more inclined with respect to the chord of the airfoil; that



THE ADVANCING BLADE OF THE ROTOR
A section of the blade acted upon by antiautorotative airforces

is, the angle of attack is greater than that shown. An increase in the angle of attack moves the resultant airforce forward toward the rotor axis; and, for sections sufficiently near the rotor axis, the resultant airforce is ahead of the rotor axis, so that its action is *autorotative*. Thus, the outer portion of the advancing blade is acted upon by antiautorotative airforces, and the inner portion by autorotative airforces. This condition has been established conclusively by test.

Consider the retreating blade. The section of the blade has its leading edge to the rear, and it moves in a direction opposite to that of flight. The rotor axis is inclined as for the advancing blade, and of course the blade again is pitched above the plane of rotation. Wp has the same direction and intensity as for the advancing blade. Wr, parallel to the plane of rotation, opposes the movement of the



THE RETREATING BLADE OF THE ROTOR
A section of the blade acted upon by autorotative airforces

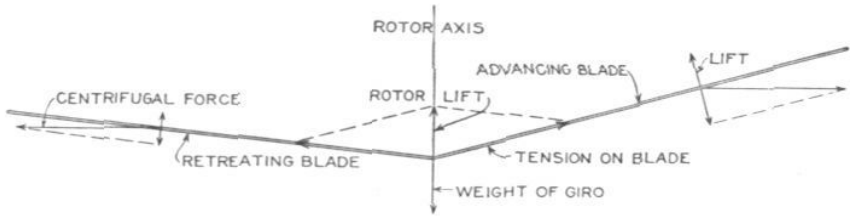
blade, just as for the advancing blade. Thus, Wp and Wr have almost opposing directions, while they are almost in the same direction for the advancing blade. The resultant airflow is as indicated, with a decidedly greater angle of attack, but of lesser intensity, than for the advancing blade. The resultant airforce acting on the blade is much less than for the advancing blade; and, since it is ahead of the rotor axis, it is autorotative. For sections nearer the rotor axis, Wr is less than that shown, and the angle of attack is even greater; so that the airforces acting on the retreating blade are autorotative throughout its length.

The lift is a maximum for positions near the advancing blade, and a minimum for positions near the retreating blade.

For positions of the blades other than advancing and retreating, the airforces are predominantly autorotative. If the autorotative and antiautorotative airforces acting on the blades in their various positions be considered collectively, their resultant—or algebraic sum—must be zero; for otherwise the speed of the rotor would change until a constant speed was established. If, for example, the autorotative airforces predominated, the rotor would speed up, increasing Wr for all positions of the blades. This increase would decrease the angle of attack throughout, decrease the autorotative airforces, and increase the antiautorotative airforces. These changes soon would stop the acceleration of the rotor, which then would rotate at a constant speed under those particular conditions. It is true that the speed of movement and other conditions of flight change the airforces acting on the rotor blades, but the effects are compensating in such a degree that the resulting change in the speed of the rotor is slight. The giro is designed so as surely to give autorotation and adequate lift, and the rotor speed throughout the range of flying conditions undergoes remarkably little change—something of the order of ten percent.

FLEXIBILITY OF THE ROTOR

Thus far the rotor has been considered as though the blades were attached to the axis rigidly. Actually, the blades are free to fold upward like an inverted umbrella, the position of each blade in flight being controlled by the forces acting upon it at each instant. The lift due to the airflow acts to raise the blade, except of course where the lift is negative. The centrifugal force due to rotation tends to held the blade horizontal. The necessity of this arrangement lies in the variations of the lift to which a blade is subjected as it rotates. It has been shown that the lift is greater on the side of the advancing blade (right) than on the side of the retreating blade (left). If the rotor blades were fixed to the axis rigidly, one effect of the



FLEXIBILITY OF THE ROTOR

The forces acting upon the advancing and retreating blades, combined so as to show the lift of the rotor as a whole

differential in lift would be to roll the giro sideward (to the left). Thus the hinges of the rotor blades provide a flexible rotor, and incidentally relieve structural stresses in the blades. The situation is shown generally in the figure. Each blade rises until the lift is balanced by an equal component of the centrifugal force acting on the blade. The other component of the centrifugal force is balanced by tension on the blade. The resultant of the tension on the blades is the lift of the rotor as a whole, and is balanced by the weight of the giro; except, in some positions, when the rotor lift is augmented by a vertical component of the propeller thrust.

The figure is somewhat misleading unavoidably so. Since, as stated previously, the lift is greater on the right than on the left side, it would be natural to expect the right blade to be more "coned" than the left, as shown in the figure. Actually, however, the maximum coning is when the blade is to the left front, and the minimum coning when the blade is to the right rear. The condition is due to the fact that the rotation of the rotor changes the position of a blade before the lift produces its full effect; in other words, coning lags behind lift. It may be added that the resultant lift of the rotor as a whole is not exactly on the axis as shown, although not far from it.

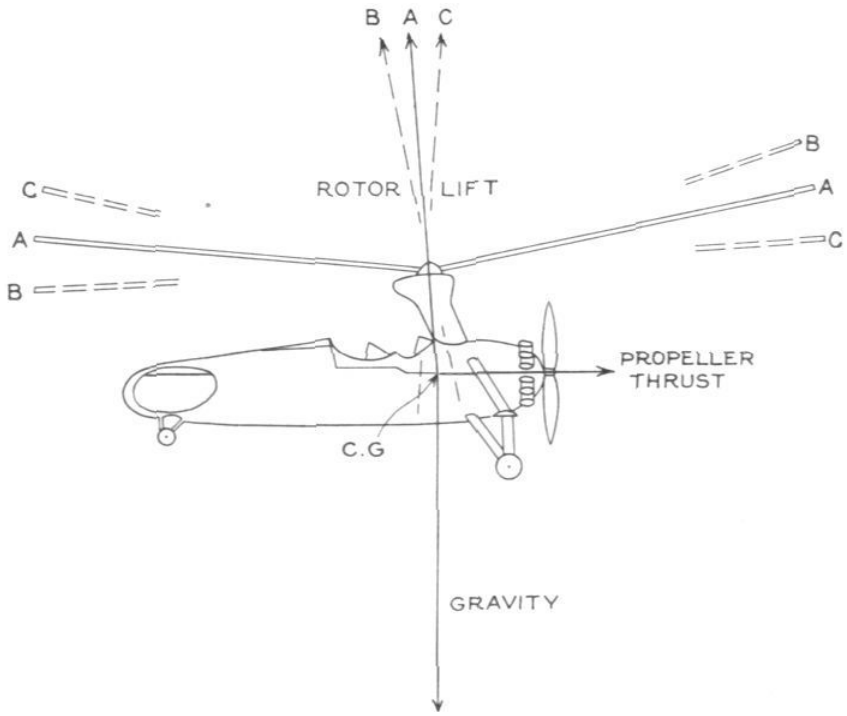
Since the airforces acting on a blade are changing throughout the cycle of rotation, it follows that the coning also is changing constantly. In short, a blade revolves about the axis, rising and falling with the varying lift. This movement of the blade perpendicular to the plane of rotation is called flapping.

CONTROL

The control — it might be called steering—of the giro is remarkably logical, simple, direct, and effective. Control is primarily by tilting the rotor axis. Although the rudder and tail surfaces are valuable aids in control, they are not strictly necessary for this purpose.

Control in the vertical plane with power—diving and climbing—is by tilting the rotor fore and aft through a total of some 11 degrees, in quite the same general fashion as for the automobile in the horizontal plane. The figure shows the giro as for level flight. Its attitude with respect to a horizontal line is a general one for rectilinear flight: for climbing, it is inclined upward along the line of flight; and in diving, it is inclined downward along the line of flight. In this attitude, the giro may be said to be in balance, due to its design. There are three forces acting in the vertical plane, the thrust of the propeller, the lift of the rotor, and gravity. The design is such that, for rotor position A, all three forces act through the center of gravity, as shown, or sufficiently nearly so for the purpose of this discussion. Hence, so far as concerns the vertical plane, the giro is in rotational equilibrium; there is no moment acting to disturb its attitude; and the only movement is that of translation along the line of flight, parallel to the propeller thrust.

If the rotor is elevated to position B. it is seen at once that the rotor lift no longer passes through the center of gravity, but is in front of it; the other two forces are unchanged in this respect. The result is that the rotor lift sets up a moment which turns the nose of the giro upward, and the machine climbs. If the rotor is held elevated, the flight is curved, concave upward; and if continued sufficiently, the result is a loop. Or the rotor may be held in position B only until the desired



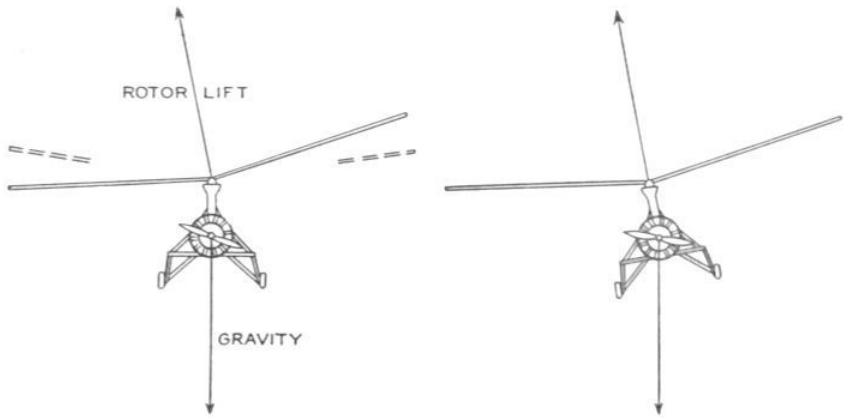
CONTROL OF THE GIRO IN A VERTICAL PLANE
Rotor position A is that for rectilinear flight in whatever direction; rotor position B, that for curvilinear flight in climbing; and rotor position C, that for curvilinear flight in diving

direction is attained, and then returned to position A. The result then would be rectilinear climbing.

Similarly, position C gives a dive, either rectilinear or curvilinear, depending on how long the rotor is held in position.

If the motor fails or is cut out in flight, descent must follow; and autorotation is maintained by the airflow due to descent. The descent may be either vertical or gliding, according to the attitude in which the machine is placed by the control. If a glide, the necessary propulsion is provided by a component of the force of gravity. It has been found by test that the speed of descent—that is, the vertical component of the giro's total speed—varies with the inclination of the descent. If the glide is such as to give a horizontal speed of about 40 miles per hour, the vertical speed is the minimum possible—about 9 miles per hour. If either a greater or a lesser horizontal speed is obtained, the vertical speed is greater than 9 miles per hour. In any case, the vertical speed of landing without power is sufficiently small to obviate danger. The long gliding range permits reaching a suitable place for landing in case of engine failure. The vertical speed of descent of the giro in still air is somewhat too great for a gentle landing, so that some forward speed preferably is introduced just before touching the ground, in order to soften the landing.

Control in turns is quite similar to that in the vertical plane—by tilting



CONTROL OF THE GIRO IN TURNS

Just before a turn. The rotor is tilted laterally to the position shown in full lines, but the machine has not yet responded, and is not in rotational equilibrium

The giro has responded to the lateral tilting of the rotor, and is in the turn. It has banked so as to reestablish rotational equilibrium

the rotor laterally through a total angle of about seven degrees. In the left figure, the giro is in straight-away flight, just before a turn. The rotor is tilted laterally to the position shown in full lines. The resulting change in the direction of the rotor lift has two effects: It sets up a lateral component which draws the giro bodily to one side; and it sets up a moment which rotates the machine laterally until equilibrium is reestablished. The side-slip is resisted by the tail of the fuselage, which turns the machine, aided by the rudder if used. The rotation banks the machine automatically. The attitude after the turn is begun is shown in the right figure.

THE HELICOPTER

In connection with the giro, it is of interest to mention the helicopter, lest the two types of aircraft be confused. The giro decidedly is not a helicopter, although both types have rotors. The giro's rotor is air-driven; that of the helicopter is motor-driven. The airflow in the case of the giro is upward through the rotor; in the case of the helicopter, it is downward.

The inception of the helicopter dates back to the fifteenth century, long before the airplane appeared. Many helicopters have been built, but none has proved practical nor come into use. Mechanical and structural complications have characterized all constructed to date. The perfect helicopter would permit either swift or stationary flight. While the helicopter has not been successful thus far, it is not accepted in all quarters that the type is impracticable. *Only recently Mr. W. Laurence LePage has advocated a helicopter with a flexible rotor and direct control, but without a propeller. Forward movement would be by inclining the rotor forward, it being estimated that a speed of 150 miles per hour could be obtained with an inclination as small as about eight degrees.

THE FUTURE OF THE GIRO

The first successful airplane flight was well over thirty years ago. It was success at least in man's age-long struggle to imitate the flight of birds; it

*Journal of the Franklin Institute, October, 1936.

electrified the world. There began at once a period of feverish activity in developing the new machine. A decade later came the World War, which intensified such efforts as nothing else could have done. It might well be that the elapsed years actually are equivalent to fifty years of normal peace time development in this respect. Thus it is clear that the airplane has reached maturity; untold millions of treasure have been spent on it, including private capital and direct and indirect aid by governments. A host of master minds have concentrated on it, and are still at work, spurred by world-wide competition.

A world full of scientific wonders has found special pride in the airplane. What is this upstart which has come along to challenge the very fundamentals of the airplane? Why bother when the airplane is filling so admirably the needs of air commerce? Can it hope to match—much less excel—the perfection of the modern airplane? The giro indisputably is the creature of a brilliant mind, a mind thoroughly familiar with the airplane. The giro is a reality, not a theoretical dream; it already is past the blueprint stage. It is idle, however, to compare the young giro of today with the sleek, perfected airplane. People once smiled at the horseless carriage. Shall we now do likewise, when a wingless (in the ordinary sense) flying machine appears?

It is apparent that the giro is aerodynamically complex—more so than the airplane—but this complexity does not extend necessarily beyond the realm of engineering and design. The development thus far has required a great amount of costly research and test, and much more still is needed. The effort up to now has been confined to comparatively small groups, and conducted as private enterprises. Recently, however, the National Advisory Council for Aeronautics has interested itself, and is contributing helpfully. While progress has been marked and encouraging, it has been slow.

The problem of the giro should be approached primarily by considering its essential principles, without undue stress on its present design, limitations, and defects. Does the giro offer something worth while which the airplane has not? If the answer is yes—or even possibly yes—then the Federal government should put its might squarely behind this struggling infant, and push its development. The answer should be found in a period of years—not decades.

We of the military now are about to meet this strange, new bird which has come among us. We now have the opportunity of participating in a development which has dramatic possibilities. We must not forget, however, that the giro is only a boy, and we should neither expect nor demand that a boy do a man's work.

Two Views on Transport

Horse vs. Motor—At Night

BY COLONEL EDWARD N. WENTWORTH, *FA-Res*.

THE trend toward motorizing all branches of field artillery is rather alarming when one considers that in future wars the amount of night movement will be even greater than during the World War. Despite the greater speed of motor units for movements over long distances, horses will continue to be more rapid than motors within the division area, because of the better vision in the dark which horses possess as compared to chauffeurs.

Striking evidence of this was presented in a skeletonized field artillery brigade problem which was carried on at Camp McCoy, Wisconsin, by the 161st FA Brigade this past summer. The exercise involved a situation in which a frontal attack on the enemy position indicated too great a sacrifice, and the division commander decided to attack from the flank. This necessitated the movement of the provisional artillery brigade, from their supporting positions for the frontal attack, to a new area where they could cover and support the flank attack.

A reconnaissance by detachments down to and including batteries for the purpose of selecting positions and completing survey operations, was involved. The batteries were to be led into position under cover of darkness, and support the attack at daylight on the morrow. In the reconnaissance, a handicap was experienced in the motorized organizations, because of the absence of motorized vehicles that could give the personnel thorough and quick access to all parts of the terrain. The mounted detachments were able to go through wooded areas, under cover, without disclosing their positions by dust. They therefore could make a thorough study of the positions with considerably more speed than could be made by the motorized units.

The night occupation of position included one regiment equipped with a battery of horse-drawn artillery, one regiment equipped with a battery of tractor-drawn artillery, and a third regiment equipped with a battery of truck-drawn artillery. The firing batteries were left at rear echelons, the horse-drawn being approximately three miles and a quarter from the position to be occupied, the tractor-drawn about two miles and a half from the position to be occupied, and the truck-drawn about two miles and a quarter from its gun position. All movements were without lights.

At nine o'clock it was dark enough so that orders were issued to bring up the guns. Word was sent to the horse-drawn regiment by mounted messenger, and to each of the other two regiments by a messenger in an automobile. The horse-drawn unit, despite the fact that nearly two miles additional, going and coming, had to be traveled, was in position ten minutes before the truck-drawn units arrived, and about eighteen minutes before the tractor-drawn units arrived.

A number of variable factors entered into the situation, such as the fact that the horse-drawn units were manned by ROTC candidates who showed high enthusiasm, but who were as unfamiliar with the horses as the horses were unfamiliar with their drivers. This lack of acquaintance between horses

and drivers undoubtedly served to slow up the operations somewhat more than would have been the case had the ROTC been using the horses regularly. On the other hand the ROTC students were on their mettle and full of enthusiasm to equal the regular soldiers in a tactical exercise.

One is impressed with the knowledge, as a result of this experience, that horses see better in the dark than men, and that in the distances involved in division artillery movements, horses will give quicker support after dark than motorized vehicles. In this exercise, the trucks and tractors were able to move over bad roads while, for part of the distance, the horse equipment had to move over secondary sand roads. This made the relative speed of the horses even more striking.

Another factor involved in the situation is the amount of noise. An officer, not of the brigade, who went ahead to an outlying OP some two thousand yards in advance, reported that he could hear the tractors moving into position very clearly and well in advance of the time they got into position, whereas he was unable to hear either the horses or the trucks. Secrecy of movement is better obtained with animal than with tractor equipment, unless the latter are improved greatly before another war.

It is difficult to visualize any area where combat will be encountered, in which a motor vehicle could be invented to take a reconnaissance party or individual over any and all terrain in the satisfactory manner that a horse does. We have many vehicles that can take personnel and materiel up to the area, but none that can make a thorough reconnaissance expeditiously. In future wars decisions will have to be made more quickly, for movements will be much more rapid than in the past, owing to the mechanized units. Reconnaissance will have to be far more hasty, and a poor reconnaissance, which does not enable the party to select the best OP's and positions, will be sacrificing an advantage which is rightfully theirs, whether the situation be offensive, defensive, or a mere security measure. It is just as important as ever that the artillery of the infantry division, supporting the troops that meet the first shock of combat, have facilities for the most efficient and rapid reconnaissance, the greatest degree of mobility by night, and the best facilities for secret movement.

Horse vs. Motor—Recruits

BY CAPTAIN CRESWELL G. BLAKENEY, FA

IF we could take two groups of recruits and assign one to a horse-drawn and one to a motorized battery; then, at the end of a given time, it should be possible to answer the question of whether, in this motor-conscious age, it is easier to train truck drivers or pair drivers. To all intents and purposes such an experiment has been worked out during recent ROTC camps attended by the advance-course students of Princeton University.

Before their arrival in camp these students had received a certain amount of instruction with both horses and motors. As sophomores and juniors they had an average of two hours "drill" each week in equitation or driving. They had studied motors from the theoretical side for one term. All could drive passenger cars. In other

words, these "recruits" certainly knew more about horses, but probably no more about motors, than the average increment one might expect on mobilization.

In the years prior to the summer of 1936 about one-fourth of the instruction time was given over to animal transport. This, in general, included the management of the pair and team, maneuvers limbered, short marches, practical harness adjustment, stable management, and care of animals. The animals and materiel of a regular battery were used in this instruction. At the end of the first three weeks of camp, by daily rotation of duties among the students, they were able to perform the duties of the various mounted individuals of a battery.

At the beginning of the fourth week the unit marched from Madison Barracks to Pine Plains, a distance of twenty-two miles, with some difficulty, but withal, it could make the trip. The next step in the instruction was a hike of about seven miles, the pitching of a shelter-tent camp, and return to camp. This was accomplished with considerable fatigue to all—horses, students, and instructors alike.

The camp finale was an overnight problem involving a six-mile march, an occupation of a position, a movement forward under cover of darkness to a new position, and return to camp after supporting a simulated attack at dawn. The six-mile march was made with some discomfort, because of dust; the selection and occupation of the position was done in good style. The horses were taken to water twice during the day, a matter of half a mile each day. The cannoneers performed their duties in firing while the drivers were looking after the animals. The displacement forward was to be made at nine o'clock. In order to insure proper harnessing, the drivers began to harness well before darkness had fallen. So that by the time the movement had been made, the picket line stretched, unharnessing done, and the animals fed, it was late before anyone was able to get any sleep at all. When the battery had returned to camp the next morning everyone was thoroughly tuckered out.

As for the summer of 1936, it was the first year the unit was equipped with a completely motorized unit of light field artillery with high-speed adapters for the guns. During the first three weeks in camp, again about one-quarter of the instruction was given in motor transport, but much time was saved because the motors did not have to be harnessed and unharnessed, so that more stress could be laid on the duties of motor officers. During this time each student was given an opportunity to drive all types of vehicles and also to drive a truck with a gun towed behind it. Instruction was given, too, in maneuvers limbered, in convoy rules, in maintenance and shop work, and in the actual care which a truck driver must give his vehicle.

At the end of this three weeks' period instead of the command moving to Pine Plains, it remained at Madison Barracks and a daily march was made for service practice and ROP's. Student officers conducted the marches, and they and the drivers were rotated daily. This routine was interrupted for a 150-mile march to Lake Placid, where camp was made for the night and the vehicles cared for. The fatigue of the day was so slight that everyone was able to attend a dance. The return trip was made the following day. During the entire march each student drove about fifty miles. Whereas the driving was generally good, there was a noticeable improvement toward the end of

each stint in the equal spacing between vehicles and the consequent uniform travel of the tail of the column.

For the final overnight exercise the situation required a thirty-mile march, followed by the same tactical situation and movement forward as for the previous year's horse exercise. As this was the culmination of the training, it gave an excellent idea, to those who had seen both problems operate, of the relative efficiency of the two types of transport, as far as the ability of the student drivers to function was concerned. The drivers performed their duties nearly to perfection. The guns were dropped in their proper positions with despatch; the vehicles were taken to the truck park and hidden most satisfactorily; fifteen minutes before darkness fell and the battery was to move forward, the drivers were alerted and the motors turned over; all was quiet and orderly in coupling the guns, in moving out, and in establishing the battery in its forward position; and everyone was bivouacked at the guns or truck park in short order. All of this in decided contrast to the days of horses. In the morning, the daylight firing was done and the battery returned the twenty-five miles to Madison Barracks, where the vehicles were thoroughly cleaned before the men were released at nine-thirty. No one was tired and there were no frayed tempers.

During the course of the second three weeks' instruction the battery marched a total of 910 miles. There were no lost vehicles; there was no accident (not even a fender lost its paint); at no time was anyone excessively fatigued. The opinion of those charged with the instruction was that, as far as the transport was concerned, the drivers were able to handle the motor equipment one hundred percent more efficiently than they could horses. More was expected of the unit and more was accomplished, with less fatigue. As an experiment as to how prospective drivers will react to motors or horses it would seem well proven that a body of men can be trained more quickly to handle a motorized battery in all its ramifications than a horse-drawn one. Further, it shows that a motor driver, although not permanently assigned to a truck, can be trained to operate and care for it over good roads and bad in a relatively short time.

But from the standpoint of training reserve officers it would seem that a certain amount of training with horses is still necessary. About half of the regular army division artillery is organized as horse-drawn; there is the horse artillery with the cavalry division; pack artillery has been proven very much worthwhile; and there is no better way to make a reconnaissance than on horseback. In consequence, as a matter of all-around training, instruction in both types of transportation must be given to a certain percentage of the students studying to be reserve officers. As yet we can not afford to put all of our eggs in one basket and neglect either horses or motors. This dual type of training can be given best at ROTC institutions where, at the college or university, the students have an opportunity to work with horses and at the summer camp they can use motors as the means of transportation. Thus our prospective reserve officer will be able to step into any type organization to which he may be assigned.

Who In The Driver's Seat?

BY CAPTAIN JOSEPH I. GREENE, INFANTRY

IF our army should suddenly be expanded to meet an emergency, its motor vehicles would be numbered in hundreds of thousands. For every one of these vehicles there must be a driver, and preferably, an assistant driver also. It is thus worth our while to consider what our sources of drivers will be, what degree of driving ability our potential drivers may already possess, and what further training they will need.

At first thought the problem may seem slight. There are 26,000,000 registered vehicles in the United States, every one of which *somebody* drives. As some hasty statistician has calculated, there are six vehicles apiece in our country for an army of 4,000,000 men.

On the other hand, the statement is often made, and sincerely, by those who have supervision over the training of peacetime military drivers, that a young man who has never driven a car makes a better driver than one who has had previous experience. This, as we shall soon see, is a broad statement, and is based on grounds that fit neither our ideas of emergency training nor the motor civilization of our nation.

It is not difficult, however, to ascertain what our situation would be as regards military drivers if war should come at any time in the near future. There are plenty of data available; we have only to examine them. We can gain the clearest picture, perhaps, by making several comparisons—not only a comparison between wartime and peacetime military drivers, but also between both of these and civilian drivers in general. In addition, we should consider in brief the probable differences between military vehicles in war and in peace, and between these and the general run of vehicles on our highways, since this is a pertinent factor affecting drivers.

First, we may dispose of the possibility of making military drivers from men who have never driven a motor vehicle. The points in favor of doing this are simply that drivers thus trained learn the right way of doing things from the beginning, and have nothing to unlearn. This may well be true. But here we immediately run counter to the fact that in many parts of the nation today it would be hard to find men of military age who have never driven a car of some kind. Even in the poorer districts, where the per-capita ownership of automobiles is low, there was no dearth of boys at the beginning of the C.C.C., who had driven enough to believe they could qualify for a truck driver's rating. In few camps were less than 25 percent willing at least to try out for the jobs, and in many camps some three-quarters thought they had a chance. Except for a small number of veterans, C.C.C. personnel consisted of youths of 21 or younger. Any war army would consist of men above 21, hence all the more likely to have had driving experience of some kind. The possibility, therefore, of selecting and training all wartime military drivers from

among only those without driving experience of any kind is difficult to imagine as practicable.

But there are much better reasons for dismissing this idea entirely. A table of motor vehicle registration for 1935, published in the U. S. Government monthly magazine, *Public Roads*,* for August, 1936, shows 3,655,705 registered trucks and tractors. (The tractors form a very small part of the whole. Well over half of the total is made up of trucks of 1½-ton capacity or larger.) According to the *World Almanac*, there are more than a million men gainfully employed as drivers and chauffeurs. These we may look upon in a measure as professionals. But there are still more than 2,500,000 persons whom we may call amateur truck drivers. Certainly there is a driver for every registered truck.

How great a part of all these drivers, professional and amateur, really know their business well enough to become capable military drivers in short order, it is impossible to say. Of the million drivers listed as gainfully employed, probably one in three works for a company or corporation that operates a fleet of vehicles. To hold such jobs a high order of driving ability is required. Commercial firms of the present day realize fully that motor vehicles form a big item in dollars and cents. They not only require efficient and reasonably careful driving but also expert maintenance. They are fully awake to the necessity for thoroughly trained driving and maintenance personnel. That their standards are high in both regards is borne out by a reading of any automotive industrial journal, and by the fact that the ratio of accidents to taxicabs, busses, and commercial trucks is lower than it is for privately owned passenger cars. Many commercial firms require, for example, a rigid physical examination for all drivers, and many are putting into effect the most modern methods of testing driving ability.

Of the 2,500,000 who drive trucks but are not primarily engaged in driving to earn a living, it is surely reasonable to estimate that one in ten is a fair driver. This group contains many farmers who own and run their own trucks, and all those such as plumbers, electricians, and repairmen, with businesses too small to include a hired driver as such.

Thus, of what we have termed the professional type of driver, we have roughly 350,000, and of the amateur truck drivers, some 250,000, whom we can reasonably expect to drive with some degree of experience. This total of 600,000, it is worth noting, comprises only one driver in 43, when all the registered motor vehicles in the United States are taken into consideration.

This great body of trained drivers is a potential source of military drivers in any emergency. It is true that our policy is to avoid disrupting civilian commercial affairs any more than we can help, in time of war. But it is not to be supposed that the mere fact that a man is a capable, highly trained, bus, truck, or taxi driver will be a bar to enlistment or grounds for draft exemption. Moreover, if an army needs such men, it will work no great hardship if the commercial world in general must replace them by less qualified drivers, capable, however, of training to a similar degree of efficiency. If an emergency army took 300,000 drivers from their civil pursuits that would be only 9 percent of all the truck drivers in the nation, and a little more than 1 percent of the drivers of all kinds. And even if we assume that all members of an army of

*Publication of the Bureau of Public Roads, Department of Agriculture.

4,000,000 were drivers of registered vehicles, 85 percent of all drivers would still be left in civil life. Women, men below and above military age, and unemployed drivers would soon make up the difference to the business of the nation.

It seems likely, therefore, that there would be no lack of drivers if war should come. In fact, obtaining experienced drivers in an emergency period will be easier than in time of peace. In time of peace few good drivers with steady jobs enter the enlisted ranks. Even in years of business depression, an experienced motor vehicle driver seeks, and often obtains, work upon Government projects at somewhat higher scale of pay than he would be certain of getting as a soldier. The C.C.C. truck-driver grades are only one example. Hence it is that there are not many young men among peacetime recruits who already know reasonably well how to drive and take care of a truck.

All in all, then, we are likely to be much better off as to trained driving personnel for a wartime army than, for example, as to trained machine gunners. Whatever their experience, of course, drivers brought into the army will need further training in military ways of driving. It is not to be expected that wartime drivers will jump into trucks and away to battle. But even if an emergency were so great as all that, it would be well within possibility to find enough drivers to operate the vehicles with fair efficiency from the start. In the summer of 1935, when, in maneuvers, the army began to use modern trucks in large numbers, remarkable results were achieved with drivers inexperienced in military movements.

But are the conditions of military driving actually so much more difficult than those of civil traffic as it runs upon our highway by day and by night? It is doubtful. Indeed, except for the one factor of enemy activity, military driving will be done under conditions that are generally much better than those of daily traffic.

In the first place, the condition of vehicles will be much better. During an extensive traffic survey in New Jersey in 1933*, the ages of 239,000 trucks were noted. The table shows what was found.

Age	*Percent of Total*
Less than 1 year	3.9
1 year	14.1
2 years	18.2
3 years	16.9
4 years	18.0
5 years	9.6
6 years	6.5
7 years	5.0
8 years	2.9
9 years	1.7
10 years	1.1
10 to 20 years	2.1

There were 35 trucks more than 20 years old. The average age of trucks was almost 4 years. These figures, from a populous industrial State, can be taken as fairly representative of the country at large—if anything, a little above the average. They speak only generally, of course, of the average condition of the 239,000 trucks, or of the condition of any age group. But that can be guessed by any one who drives his own car, and takes even a little pride in keeping it in shape.

If war came, the army might have a number of four-year-old vehicles. They would be in good condition, however, because they would have had the excellent

*The report was made by Mr. L. E. Peabody, Senior Highway Economist, Division of Highway Transport, Bureau of Public Roads. Department of Agriculture. The data in the table appeared in *Public Roads* for April, 1935.

maintenance that obtains in the army in time of peace.

But by far the greater part of our vehicles would be new. Indeed it is probable that in the event of war we could get new vehicles as fast as we could organize units to use them. The existing stocks alone of suitable commercial vehicles would give us an excellent start.

There is other plain evidence, too, to show that military vehicles under almost any conditions are kept up better than the average car. Of more than a million cars inspected in Pennsylvania, a year or two ago, 40 per cent needed brake repair work. In another State, four cars out of five had glaring or insufficient headlights.

These figures are typical of the cars that we pass daily on the road, but not of military vehicles—in peace or in war. Maintenance may slump during an extended campaign, but in our motor civilization, and in a military organization, drivers' maintenance, higher maintenance and inspection, unit replacement, or even vehicle replacement, will prevent military motor vehicles ever reaching the state of neglect that is all too common in nonmilitary automobiles. In general, the drivers of an emergency army will have much better vehicles to drive than they drove before they put on uniforms.

And vet the performance of the great mass of vehicles comprising daily traffic is truly remarkable. The 26,000,000 vehicles of the United States each average 8,000 miles of travel per year.

In time of war, the military driver may drive farther than that in a year's time. But much of his driving will be under better conditions, not only as regards condition of vehicle, but also as regards risk from his own or his fellow drivers' carelessness. In spite of the great numbers of automobile accident fatalities that occur each year in the United States, only one recorded accident of any kind occurs in each 200,000 miles of vehicle travel. And only one fatal accident occurs in each 5,000,000 miles of vehicle travel. (The vehicles of the country travel about 650,000,000 miles per day. The surprising thing, when the figures are carefully studied, is that more accidents do not occur.)*

These things are true in spite of the fact that requirements in the different States as to driver's examinations vary widely, and that States with thorough laws thoroughly enforced are few indeed. Taking the United States in general, with these few exceptions, the half-blind, the deaf, the aged, the youthful, the decrepit, the drunken, the reckless, the careless, the inexperienced, and even the half-witted, have small trouble obtaining drivers' licenses where one is even required.

In any conceivable military force, however, drivers will, like all soldiers, pass a physical examination before acceptance into the service. They will come from a limited age group, which for the most part will eliminate drivers of less than 21. (The accident rate among youthful drivers is far higher than in any other age group.) Furthermore, soldiers selected as drivers will have to pass special drivers' tests based on modern, scientific methods of driver selection.

The wartime military driver, then, will drive a better vehicle, with less chance of accident in the ordinary sense, than the man behind the wheel on any busy highway.

Moreover, he is also subject to uniform

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*Editorial Note: Yet it has been said that automobile accidents, from 1920 to 1935, cost this country more casualties than all four of its major wars.

training, discipline, and control. A thousand vehicles moving down a highway, all driven by men who have had at least a brief training in doing the same things in the same way, have a far better chance of arriving at destination intact, or with a minimum of difficulty, than a thousand civilian vehicles whose drivers may have almost as many different notions of the way to drive. Standard safe driving distances, and standard rules of the road are two of the most important factors in this regard.

We must bear in mind, however, that much wartime driving will be off the main highways on country roads and cross-country routes. Furthermore, the best of highways may become torn by shells and bombing. Driving under these conditions must be learned by experience, and it is here that men who have been used to driving over similar ground in civil life will show to best advantage. The country truck driver, the lumber haulers, the contractors' employees who have learned how to maneuver their loaded vehicles over rough detours—these will have the best groundwork of experience for the most difficult army driving. Those who have been more used to highway and city driving will have to learn by training and by experience.

From experience also must come proficiency in driving under conditions of battle itself. But here, surely, long civil experience tempered by brief army training should be of greater value than a brief period of military training without any previous experience.

We may conclude that in case of war the following will be true:

(1) There will be great numbers of experienced drivers from which to select our military drivers.

(2) Many of them will have had experience in driving over poor roads and rough terrain.

(3) All drivers from civil life will need at least a brief training in military methods, but enough will be capable of handling vehicles with a minimum of practice and training—or even with none at all—if that should be necessary in a great emergency.

(4) It will not be practicable to train military drivers from men who have never driven before. It will take too long even if it should be possible to find such men in adequate numbers.

(5) In general, military driving is done under better conditions than in civil life. The one important exception is on and near the battlefield or under hostile air attack. But vehicles will be in better condition, and standard methods of maintenance and driving will obtain.

The gist of all we have said may be summed up about as follows: What we shall need as emergency driver training is not an elementary course in driving and drivers' maintenance, but intensive training in correcting the bad driving habits of experienced drivers and in adapting the experience of such men to the special conditions of military driving. Since we shall need many drivers at once, there must be a rapid process of elimination, which will put the best men in drivers' seats as soon as possible, and keep a supply of good drivers continuously ready to take the wheels of new vehicles as they are procured. This process must also drop out the "in-and-out Sunday drivers" and all others whose ability does not come up to the mark. Instead of having too few, we are sure to have more drivers than we need. We must be prepared to use modern methods of testing and selecting in order to pick the best.

The Italian Artillery in Ethiopia

(DIGESTS BY LIEUTENANT COLONEL JOHN S. WOOD, FA)

AS time goes on the magnitude of the Italian effort in Ethiopia becomes more apparent. An idea of the difficulties encountered and of the efforts required to overcome them may be gained by a study of artillery employment on the Eritrea and Somalia fronts. These fronts will be considered in turn, for they present marked differences in terrain, forces involved, and tactics employed.

ERITREA EXPEDITION*

1. TERRAIN

The terrain confronting the northern Italian columns consisted of a high plateau extending parallel to the coast at a mean height of 2,000 meters and cut by deep and rugged valleys. The few roads and trails followed the main ridge along the center. They were wide enough for fairly easy going along the levels but became only mule or foot paths in the valleys. The principal one, the so-called imperial highway, was no more than a mediocre dirt road with no maintenance.

Nevertheless, in dry weather on the flats, travel was generally simple, even for motor vehicles, owing to the ease of moving across country and of improvising trails. In the valleys and on the slopes, however, movement was almost always difficult and required special measures or the construction of roads.

Both truck and tractor columns were able to move and maneuver closely in rear of the troops, particularly when furnished with the assistance of an escort of foot troops, as was normal. Pack artillery was always able to move where needed and even the truck units nearly always found some way to advance.

Observation was excellent from the many high points and isolated hills overlooking the plain, air observation rarely being needed.

There was no lack of both surface and ground water. The latter is found at shallow depth, sometimes even constituting an obstacle to motor movement.

From an artillery standpoint, the generally favorable conditions of maneuver, the absence of natural limitations to fire, and the excellent possibilities for observation and signalling favored a large-scale employment of every type of field piece, except the heaviest calibers. Naturally, the exceptional conditions and the grave difficulties of supply required special measures in the organization of troops and trains and in manner of their employment.

2. ORGANIZATION.

The artillery plans and preparations for the expedition were based on the foregoing considerations, the need for light, fast units, and the absence of enemy artillery. A reorganization of units included motorization to the greatest possible degree with a considerable reduction of battery personnel and materiel. The number of guns was cut down to conform to the possibilities of ammunition supply; the trains of pack batteries were motorized; truck-drawn batteries were reduced to three pieces; and the reserve artillery was given the fastest trucks available.

The peacetime artillery of three native batteries (65/17 guns*) and three

*L'artiglieria nella guerra Italo-Etiopica, by Gen. Gavarelli—Rivista Di Artiglieria E Genio, September, 1936.

*The usual Italian system of describing artillery. In general, the top figure represents the caliber in millimeters and the lower figure the length in calibers.

companies of foot artillery for manning the frontier forts was finally augmented and so organized as to provide:

Four native pack mule battalions of three batteries (65/17 or 75/13), one for each native brigade.

Three native tractor and truck battalions of three batteries (77/28).

Two truck-drawn battalions of three batteries (105/28) manned by Italian nationals.

Four native fortress artillery groups of twenty-four batteries, together with a like number of national groups. These groups disposed of 400 pieces of various calibers (120, 105, 77, 75, 76) intended for the forts in being and those to be constructed.

From Italy were received the motorized battalions of the general reserve artillery and the organic artillery of the divisions constituting the expeditionary force, together with the necessary cadres to complete the colonial units.

In order to provide a solid defensive organization for the colony, three lines of fortified posts were constructed along 300 kilometers of front on the southwest frontier. These were capable of all-around defense, and were provided with fifteen to thirty days' supply of ammunition, food, and water. They were manned chiefly by artillery (82 batteries of 320 pieces) and a truck transport pool was created to facilitate the movement and reinforcement of these units. This system of posts was pushed forward during the advance into Ethiopia to provide protection for the occupied areas—an extremely difficult and laborious task.

As an experiment, two especially mobile motorized battalions of 77/28 were organized for close-support missions in any terrain. The guns were knocked down into suitable loads and transported on light trucks, supplemented by small mountain tractors and trailers for supply and for movement in and around the battery positions. The battalion combat and field trains were truck units. Owing to the impossibility of securing all the required motor equipment, the utility of these motor pack units could not be fully determined.

A groupment of battalions (100/17 and 149/13), motorized, arrived from Italy to constitute the general reserve artillery.

3. TRAINING.

By means of schools, tactical exercises, and firing practice, the whole expeditionary artillery was rapidly made familiar with the following principles of employment:

a. The necessity and possibility of pushing immediately in rear of the infantry ready for prompt action in order to utilize the artillery superiority to the utmost degree. Hence: Careful selection and reconnaissance of routes; provision of special means to overcome terrain difficulties; assignment of engineer and infantry detachments as escorts to facilitate artillery movement.

b. Fire action in close support of the infantry. Hence: Liaison detachments with each infantry battalion at least; observation well forward; sure means of target identification and preparation of fire (charts and maps); simple but sure communication (maximum use of visual signalling).

c. Decentralization of command and of firing units, but with the possibility of centralization by even the highest commander when necessary. Hence: Each battalion in direct support of a designated infantry unit with priority of fire missions in its zone of action, but in communication with the higher artillery commander for other missions: continuous forward reconnaissance by both battery and higher commanders, to insure prompt displacement behind the advancing infantry.

Owing to the special conditions of

terrain and the enemy weakness in artillery and air forces, battery positions were selected further forward near their observation posts, and were closely grouped to simplify the organization of command, communication, and fire. In these forward areas each battalion and isolated battery had to provide strong all-around machine-gun defense of its positions.

Air observation was planned and provided but was not much employed in the actual operations. It was rarely needed, except for the indication of targets and a limited amount of surveillance.

The corps topographic sections and the army map section, together with a colonial topographic section organized prior to their arrival, were practiced in rapid preparation and distribution of charts and maps. The work of these sections, in conjunction with the airphoto sections, was particularly effective and valuable during the entire advance.

4. OPERATIONS

a. First phase.

The information of the enemy at the beginning of active conflict in October gave no indication for any particular apportionment of the reserve artillery. It was finally assigned to columns according to the roads available.

Hardly a round was fired during the initial advance, which was made in three columns:

The west column (2d Corps) to Adua (Adowa);

The center column (Eritrean Corps) to Enticcio;

The east column (1st Corps) to Adigrat.

The difficult marches, however, furnished a large-scale test of the maneuverability of the new artillery units, both pack and truck. The truck-drawn units were able to follow closely, except those of the center column, which were held up by impassable mountain terrain about thirty kilometers north of Enticcio. Had infantry and engineer detachments been furnished during this period it is certain that no delay would have occurred in the artillery advance. The light trucks and the tractors, particularly, demonstrated exceptional maneuvering power over difficult ground.

As soon as the first objectives were attained, the fortress artillery was brought forward to man the second and third defensive lines of the newly occupied territory. Within a few days twenty batteries had arrived as a nucleus of this defense.

b. Second phase.

The long advance to the Macalle-Tembien-Tacazze line, over increasingly difficult and little-known country, gave additional evidence of the maneuverability of the truck-drawn artillery. The native battalions of 77/28 and 105/28 followed immediately behind the infantry and were soon joined by the battalions of 149/13.

As before, the defensive batteries were moved forward promptly, fifteen of them being used along the line of communications in the Macalle sector alone.

c. Third phase.

After the relief of General di Bono and the assumption of command by Marshal Badoglio, the operations took on a new character and a new tempo. The enemy had concentrated two strong forces, one under Ras Mulugueta south of Amba Aradam, the other under Ras Cassa south of Tembien.

In this situation, almost all of the truck-drawn artillery was concentrated in the vicinity of Macalle as a general reserve under the army commander. Two groupments, a total of eleven battalions and thirty-four batteries, were formed. Some of these were brought forward by forced marches of 500 kilometers in four or five days, over the few

trails, or across country under extremely difficult conditions.

The artillery action in the ensuing battle of Enderta in February was intense, continuous, and often decisive. In the double envelopment of the strong and extensive Amba Aradam position, the gap betwen the two corps was particularly dangerous. Two or three battalions of the motorized reserve artillery were attached to each corps for protection of the outer flanks, the remaining five battalions being disposed centrally in front of Amba so as to cover the front of both corps and with neutralization and interdiction missions along the entire strong enemy front together with the particular mission of protecting the corps' inner flanks.

Battalions were massed close to their observation posts and the infantry lines, prepared for close defense, and joined by a very complete communication net to infantry and higher artillery commanders. A gridded map, 1/50,000, was widely distributed to both infantry and artillery for location of targets and preparation of fire.

The fire throughout was prompt, sure, and effective. After a rapid but intense preparation by all the artillery, the infantry began its long advance, constantly supported and protected by the batteries, which were particularly active in breaking up counterattacks. Frequent displacements were required, many of them of six or seven kilometers. In the five days of this battle which routed the Ethiopian forces, the artillery fired 26,000 rounds, half being expended by the reserve artillery.

About half of the reserve artillery was now sent to Scire and Tembien for action against the remaining enemy forces. The movements were made by forced marches and with great rapidity. One battalion of 149/13 moved 550 kilometers in three days over practically trackless country.

d. Fourth phase.

In the latter part of March, the Ethiopians were reported concentrating their best troops around Ascianghi for a last stand. These forces were believed to possess artillery in considerable amounts which were later found to be

From Revista Di Artiglleria E Genio

ITALIAN NATIVE TROOPS IN ETHIOPIA WITH 65-mm. ACCOMPANYING GUN

much exaggerated. For this reason, every effort was bent toward providing for the advance of particularly mobile units of reserve artillery to supplement the organic division pack artillery whose effectiveness was now much reduced by the loss of a disturbingly large number of its animals.

The zone of advance was more difficult than any yet encountered. On one stretch of 50 kilometers there were three mountain passes at least 3,000 meters high traversed only by mule or foot paths. All available troops, including the greater part of the artillery personnel, were set at work constructing a road. Fifteen days were allowed for its completion but the task was abandoned as too long after a week or so of labor.

The approach of the rainy season and the increasing enemy activity called for a speedy advance. A route was selected over which the artillery was to be dragged or carried. A groupment of reduced battalions of six to nine pieces, according to the number of light trucks available, was formed. Pieces were disassembled into transportable loads. The whole effort of this groupment was directed toward moving the guns of four battalions. Another groupment was formed by the personnel of the other five battalions of the reserve artillery with the mission of assisting the movement of the guns and carrying out the necessary reconnaissance and preparations for their immediate employment in the new zone. In spite of the rains, by the end of March, a week ahead of the time expected, two battalions of 100/13 were in position, and rendered invaluable assistance in breaking up the enemy attack which began on April 1st. Similarly, in the subsequent advance on Addis Ababa, the artillery was present, ready to support the infantry on every occasion.

* * * *

The northern operations presented many features of special interest to the artilleryman. Particularly noteworthy were the maneuverability of truck-drawn units, the appearance of motorized pack artillery, the utilization of fortress artillery to protect the zone of communications, the determination to keep the guns in immediate touch with the infantry in all situations, and the insistence on having a highly mobile artillery mass of maneuver in hand under the immediate control of the commander-in-chief.

SOMALIA EXPEDITION*

1. TERRAIN.

The lower Somala plain extends from the coast for hundreds of miles into Ethiopia, wooded and flat, covered with thorny bush—a "spiny fog of green" during the wet season; parched, dusty, and yellow during the dry months. Traversed only by native trails and by a few sluggish streams, this vast territory offers a formidable obstacle to any advance.

In such a country, the impossibility of local supply, even of water, necessitated long lines of communications and strict subordination of operations to the maintenance of these lines. Tactically, the limited possibilities of orientation, communication, observation, and maneuver, together with the necessity for constant security measures on all sides, constituted a peculiarly difficult problem.

On the higher plateau, four or five hundred miles inland, the terrain becomes similar to that of the great central highland described in the account of the northern operations. Rather open in character, broken by rugged hills and

*Le nostre operazioni nell' Africa Orientale-Rivista di Fanteria, January, 1936. L'impiego dell'-artiglieria nella Somalia, by Major Petroni and Capt. Barengo—Rivista di Artiglieria e Genio, July-August, 1936. Impressioni di guerra sul fronte Somalo, by Major Petroni—Rivista di Artiglieria e Genio, April-May 1936.

deep valleys, with few roads or trails, it presented only the usual difficulties encountered in mountain country.

2. TRANSPORT.

The few dirt trails existing at the beginning of hostilities were soon churned up into clouds of dust in dry weather, and seas of mud in the wet season, by the constant stream of trucks floundering along them. Nevertheless, both troops and supplies were brought up, in spite of the fact that four or five hours were often required to move a single kilometer ahead. Naturally, the roads were improved as time went on, but it must be remembered that the distances were great and road material extremely limited. The distances from the port of Mogadiscio to the various advanced bases were from 300 to 1,000 kilometers.

Truck transport was used from the coast to the combat zone, camels and pack mules from there forward. Of these, the mule was considered superior.

3. TROOPS.

Prior to the border incident at Ual Ual in 1934 the troops in Somalia consisted of a few Arab-Somali battalions and camel pack batteries, one company of tanks with a section of armored cars, together with air, engineer, and service detachments. Prompt measures were taken to build up an effective establishment and by the end of March, 1935, the Somali Expeditionary Force, comprising both Italian and native contingents, under General Graziani, was formed and ready.

Of the native troops, the Arabs made the best soldiers, although the Somalis were excellent. The latter were particularly tireless and rapid marchers, moving regularly 20 to 25 miles a day without fatigue.

The native divisions were organized in the same manner as those of the metropolitan force (3 infantry regiments of 9 battalions, 1 artillery regiment of 3 or 4 battalions). The artillery (65/17 and 77/28) was packed by camels. Combat and field trains employed both camel and mules as pack animals.

4. ENEMY.

The enemy was known to have large forces, under the command of Wehib Pasha, a Turkish soldier of fortune in Ethiopian employ. The Abyssinians possessed good rifles, many machine guns, a few armored cars, and some artillery. The artillery comprised mostly pieces of small caliber (37-67 mm.) of various models, with many kinds of ammunition, good, bad, and mediocre. A considerable number of modern weapons like the Oerlikon gun were on hand, together with ancient types such as the model 1861 iron cannon (120-150 mm.) using black powder. There were eighty-nine of the latter, purchased as a great bargain from a European power in 1914.

In the wooded lower plain, the enemy employed small mobile bands, moving rapidly, striking quickly from any direction, and disappearing promptly into the jungle. These bands were sometimes detached from larger units organized for defense in holes, caves, and scattered trenches, with riflemen and machine guns well concealed under trees and bushes.

On the high ground, the enemy resistance became more compact and his defenses and troops more readily located by ground and air observation. The town of Gorrahei, for example, one of the main objectives was an organized locality, covered by a double system of trenches, and armed with machine guns, trench mortars, and artillery.

5. COMBAT.

From the start the advancing columns were compelled to move slowly with reduced distances, reconnaissance pushed far forward, and with strong security

detachments on all sides. The long approach marches, with all elements ready for action in any direction, were characterized by sudden contact, followed by rapid and close combat against an aggressive and mobile enemy who might appear anywhere at any moment. Surprise was the dominating factor; carelessness was unpardonable.

Under such conditions, sudden and rapid fire action was required from the supporting artillery. With little or no time available for coordinated plans of fire, with the difficulty of identifying and designating targets, and with very limited means of communication, the infantry had to rely mainly on its own weapons. The employment of the 65/17 as accompanying artillery in the infantry front lines was indicated and attempted. However, as this was a camel pack weapon, it was hardly adapted to such a mission. Trucks were improvised to haul a few pieces; but, in general, it was considered better to keep the batteries together out of immediate contact with the infantry, particularly in the long approach marches.

Against the few organized positions, the usual missions of preparation, support, and protection were assigned to the artillery. Even here, however, a considerable portion had to be held ready to repulse flank and rear attacks from the enemy. The lack of positions giving good observation, the absence of well-defined reference points, the difficulty of range estimation, the impossibility of visual signalling, the reduced effect of fire in the thick vegetation—all combined greatly to limit the artillery possibilities in this close country.

The artillery had much more freedom of action on the upper plateau. Batteries could be posted with observation close at hand and the mass action of battalions could be utilized against enemy concentrations and for counterbattery. Such action was rare, however. The targets were usually fleeting, requiring rapid surprise fire from individual batteries.

Adjustments were as rapid and as simple as possible. Percussion bursts were very difficult to observe in the heavy vegetation, and time fire adjustments were preferred in the wooded regions. Large brackets were sought and fire for effect delivered promptly by rapid, searching volleys at irregular intervals. The safety limits for firing ahead of friendly troops had to be increased considerably over the regulation limits.

* * * *

The operations in Somalia began in October, 1935, and ended in the advance of General Graziani's forces to Harrar and their junction with the northern army at Diredawa early in May, 1936. They are interesting mainly because of the significant and extensive use of native contingents and the tremendous natural obstacles overcome by widely separated forces completely dependent on long and precarious lines of communication. The enemy does not appear to have offered any serious resistance after the occupation of Gorrahei, in the first week of November.

The artillery seems to have followed the usual line of procedure for the movement and employment of pack batteries. It is interesting to find that the mule was considered "the sturdiest, most courageous, most dependable means of transport for artillery in colonial warfare." Also of interest is the fact that the accompanying batteries which have recently been attached to each infantry regiment of the Italian army are armed with a 65/17 gun of the same model as that used in Somalia.

United States Field Artillery Association

IN accordance with the call of the Executive Council the twenty-seventh annual meeting of the U. S. Field Artillery Association was held at the Army and Navy Club in Washington, D. C., on December 11, 1936. Major General Upton Birnie, Jr., U. S. Army, presided.

A quorum was present in person or by written proxy for the transaction of business.

The Secretary-Treasurer presented and read his annual report and financial statements, which are appended hereto, and made a part of these minutes.

The President had previously appointed Lieutenant Colonel A. C. McBride, FA, and Captain Josef R. Sheetz, FA, to audit the financial statement of the treasurer. At the direction of the chair, the secretary read the report of the committee, which stated that the auditing had been performed and the financial statement had been found to be correct. A motion was made, seconded, and adopted, approving the report of the committee.

The chair stated that there were three vacancies in the Executive Council to be filled. These vacancies were caused by the expiration of the terms of office of Major General Upton Birnie, Jr., U. S. Army, of Lieutenant Colonel T. J. J. Christian, U. S. Army, and of Lieutenant Colonel Ralph C. Bishop, ORC.

The chair had previously appointed Colonel Rene E. DeR. Hoyle, FA, and Captain Josef R. Sheetz, FA, as a nominating committee. Colonel Hoyle, its chairman, read his report, which submitted the names of General Birnie (for reelection to the Council), of Colonel William Bryden, FA (GSC), and of Lieutenant Colonel Ralph C. Bishop, ORC (for reelection). It was moved, seconded, and adopted that the polls be closed, and that the secretary be directed to cast the unanimous ballot for the nominees.

The names of the new members, to serve for a period of two years, then were announced.

It was moved, seconded, and adopted that the matter of continuation of the Prize Essay Contest be left to the discretion of the Executive Council when the current competition had been completed.

Following adjournment of the regular meeting, the chair summoned a meeting of the Executive Council, at which the following were present: General Birnie, Colonel Lesley J. McNair, U. S. Army, Colonel William Bryden, U. S. Army, Colonel Rene E. DeR. Hoyle, U. S. Army, Colonel Leroy W. Herron, ORC, and Lieutenant Ralph C. Bishop, ORC. In accordance with the provisions of the Constitution, the Council elected Major General Birnie to succeed himself as President, and Colonel Augustine McIntyre, U. S. Army, Commandant of the Field Artillery School, as Vice President, to succeed Major General W. H. Butner, U. S. Army, whose term had expired.

To General Butner and Lieutenant Colonel Christian, its outgoing officers, the Association wishes to express its sincere appreciation of their services.

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Captain Willis S. Bryant, FA, addresses annual Directors' Meeting, American Federation of Women's Clubs, Washington, D. C., January 14. . . .

UNITED STATES FIELD ARTILLERY ASSOCIATION

ANNUAL REPORT OF THE SECRETARY-TREASURER FOR YEAR ENDING NOVEMBER 30, 1936

Assets—November 30, 1935:		
Balance checking account	$5,986,26	
Savings account	3,425.52	
Securities on hand (face value)	23,000.00	$32,411.78
Assets—November 30, 1936:		
Balance checking account	4,873.12	
Savings account	3,511.56	
Securities on hand (face value)	24,250.00	32,634.68
Gain		222.90

A detailed statement of the receipts and expenditures during the last fiscal year is as follows:

RECEIPTS		
Membership dues and subscriptions	7,385.79	
Interest on securities	494.20	
Interest on savings account	98.54	
Books and Magazines	1,137.36	
Miscellaneous ($1,000 Reed note matured)	1,001.08	
	10,116.97	
Cash on hand November 30, 1935	9,411.78	19,528.75
EXPENDITURES		
Printing and mailing FIELD ARTILLERY JOURNAL	3,218.69	
Office supplies	432.85	
Postage, express, telegrams	204.13	
Rent and telephone	400.14	
Services	1,858.00	
Authors, engravers, photographers	1,310.58	
Books and Magazines	865.81	
Insurance, tax	27.56	
Trophies	25.00	
Donations	7.00	
Miscellaneous: copyright, refunds, etc.	244.31	
Government bond	2,250.00	
Prize essay	300.00	
	11,144.07	
Cash on hand November 30, 1936	8,384.68	19,528.75
Total receipts for year ending November 30, 1936		10,116.97
Total expenditures for year ending November 30, 1936		11,144.07
Excess of expenditures over receipts		1,027.10

The excess of expenditure over receipt is due to the purchase of three United States Savings Bonds for $2,250.00, whereas the corresponding item of receipt was for $1,000.00 when a note matured for that sum during the fiscal year. If both were deducted from the statement it would be found that the excess of receipt over expenditure equalled the net gain for the year, $222.90. This is low compared to the profit shown in previous years, and is accounted for by the expenditure of $300.00 for the prize essay, $128.00 for a fireproof safe, $70.00 for an additional typewriter, and increased expense for postage, mail advertising, reimbursement to authors, additional illustrations, and the like, all authorized by the Executive Council, but constituting marked increase.

The sum of $252.00, which was the surplus over collection for a pair of artillery horses for Master Leroy Johnson, was carried in the statement last year in a separate account, while its

disposition was awaited. The Council has authorized its assimilation into the general fund, from which payment will be made annually for the award of the U. S. Field Artillery Association Medal to the outstanding Field Artillery student in each summer training camp of the ROTC.

The Association gained a net of 97 members during the past year, and now has 2,509 paid subscribers, the highest mark, so far as is known, since the war. The assets of the Association are also at the highest face-value mark shown in any annual statement.

The Association has no outstanding bills of importance save the one to the printer, for the November-December issue, which was also outstanding at the time of last annual statement.

In order to determine the fiscal operation of the Association with more clarity, its securities are customarily shown on the annual statement at their par, or face, value. Many of these were purchased years ago below par, and some of them sank considerably during the depression. Of the $24,250.00 face value of securities now listed, $10,750.00 are worth that much or more, but $13,500.00 face value of the remainder are worth approximately $2,075.00. The total marketable value of the securities thus is approximately $12,825.00, which, added to checking and savings accounts, makes our liquid assets $21,209.68, or $8.45 per paid subscriber.

Under the careful management of previous treasurers, the reserve now has reached a point where the Executive Council considers it ample for any emergency that may arise, and the treasurer has been instructed by them to spend the income on the JOURNAL, and to maintain the reserve approximately at its present worth.

During the fiscal year, the JOURNAL was sent gratis to 52 of the latest FA graduates of the Military Academy, and 1,043 single copies were sent gratis to newly commissioned FA graduates of the ROTC.

The Secretary-Treasurer will be glad to receive the suggestions of members for the betterment of the Association and of the JOURNAL

Respectfully submitted,
MICHAEL V. GANNON,
Captain, FA,
Secretary-Treasurer.

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At the instance of Colonel Douglas P. Walker, 106th FA, acting president, New York National Guard Association, and of Brigadier General William F. Schohl, 52d FA Brig, an invitation to be the guest of the Association at its annual convention in Buffalo, January 15 and 16, was extended to the secretary of the Field Artillery Association. . . . Field Artillery Polo Team, Major Harry Watson, Capt. C. N. McFarland, Capt. Homer Kiefer, and Capt. John A. Smith, sweeps 12-goal and open events in Southwestern Circuit tournament at Shreveport, Major Watson dribbling deciding goal in extra period to defeat Houston Huisaches, 6-5. . . .

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War Department Chess Club includes following members of Chief of Field Artillery's staff: Technical Sergeant Earle W. Kunkel, president and secretary; Master Sergeant Guy K. Camden, vice-president; Master Sergeant E. J. Bennett; Master Sergeant Fred Lind. Its five-man team defeated Agriculture contestants in Metropolitan Tournament, Washington. . . .

Five Decisive Days

The Germans in the Reims Offensive

BY COLONEL CONRAD H. LANZA, FA

Author's Note: Where hours are given in this article, Allied Daylight Saving Time is used, which was one hour faster than German Daylight Saving Time. For example, 1:10 AM, means 1:10 AM Allied DST, or 12:10 German DST.

Up to now—The July-August issue of the FIELD ARTILLERY JOURNAL, *in "The Turn of the Worm—the Allies in the Second Marne Campaign," by the same author, brought the reader up to the eve of the events described herein. It told of the gradual accumulation of information by the Allies as to the impending German offensive toward Reims. It related the steps taken to "mouse-trap" the charging Germans by withdrawing to a second position, from which counterattacks should be launched after the jury of the assault had been expended on a thinly held outpost line. (The general map, and the maps which showed the hostile lines and the German intentions for the attack, as of July 14, are reprinted herein from that issue to reorient the reader as to the situation.) The last instalment ended with the line. "The worm was ready to turn!"*

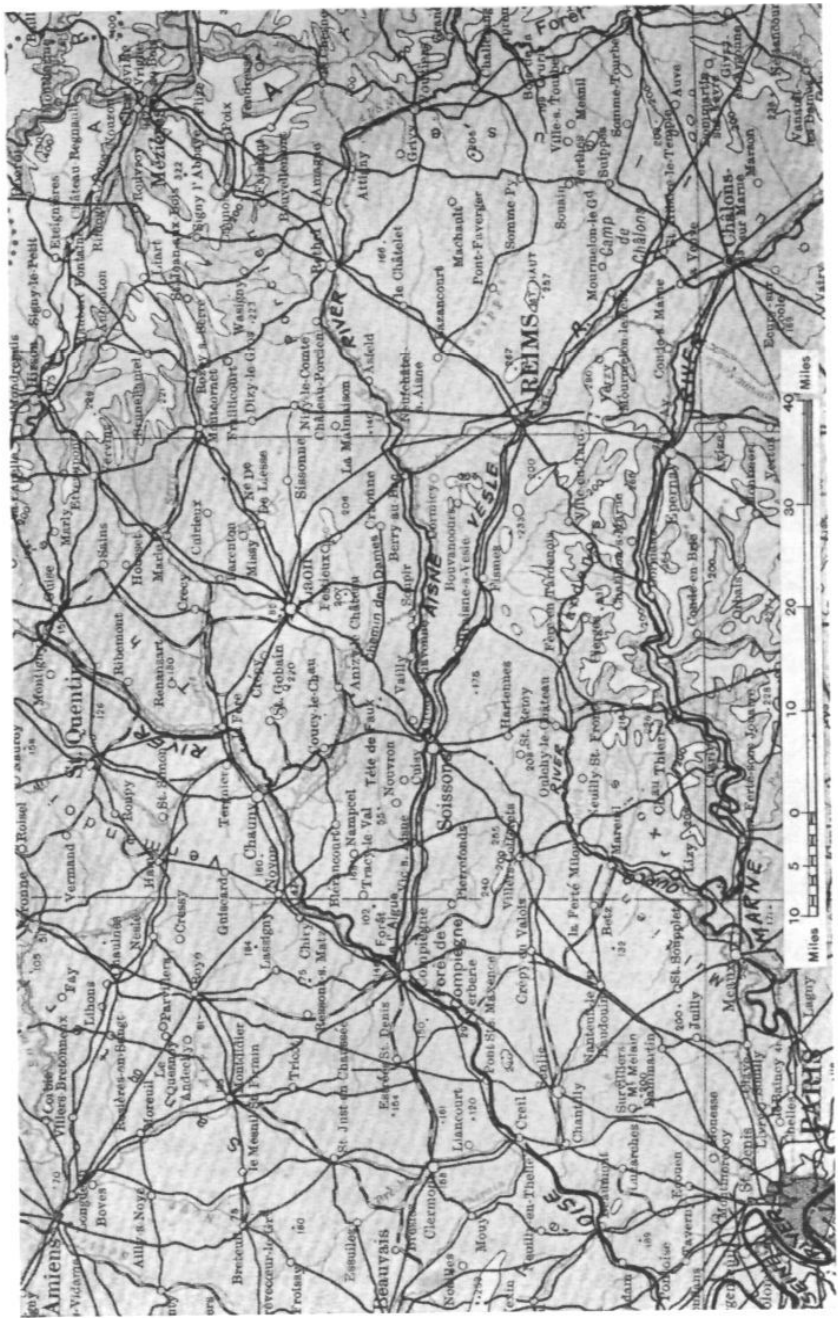
This article treats of the operations that ensued—from the German side. Now go on with the story.

———

THE German plan to reduce Reims was tactically based on having an overpowering artillery preparation, to neutralize the hostile artillery and crush infantry front lines. A rapid penetration by an infantry assault following along lines of least expected resistance, which temporarily passed around enemy strongpoints, and covered by a strong rolling barrage, fired by heavy artillery, using a maximum amount of gas, was counted upon to overwhelm what was expected would be a demoralized and exhausted opponent.

East of Chateau Thierry the Marne River was a formidable obstacle. It was to be crossed by the infantry during the artillery preparation, which preparation was to smash the opposition on the far bank. The artillery on this part of the front was strengthened. East of Reims there was no natural obstacle near the line of departure, and the infantry could stay under cover until near the end of the preparation. In this sector the Marne was also to be crossed, but it was over 20 kilometers away. The infantry assault was to be closely accompanied by heavy artillery, and numerous artillery reconnaissance parties, in order that when the Marne was reached artillery support would not be lacking. The attack front west of Reims was about 37 kilometers; east of Reims it was about 23 kilometers.

This operation—the Reims offensive—had been prepared for a considerable time, and on 14 July, 1918, all was in readiness to start at 12:10 AM. The artillery preparation was to begin at that hour and continue in undiminished vigor until 3:50 AM, at which time the infantry, everywhere, were to jump off, preceded by the rolling barrage. It was hoped that the enemy would be surprised, overwhelmed, and thrown back, and that the Seventh Army, along the Marne, and the First Army, in Champagne, east of Reims, would advance as rapidly as in the earlier offensive on 31 May. On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St. Quentin
Beauvais
Soissons
REIMS
Chalons-sur-Marne
Compiègne
Forêt de Compiègne
Villers-Cotterets
Château-Thierry
Epernay
Meaux
PARIS
AISNE
VESLE
MARNE
OISE
Miles
0 5 10 20 30 40

that occasion they had captured Chateau Thierry. With experience behind them, and stronger and better forces, it did not seem unreasonable to expect to advance the first day with both armies to Epernay, there to unite with Reims surrounded. The Army Group of the German Crown Prince, to which the engaging armies belonged, sincerely hoped so. Initially there were to be 11 divisions in line, with 3 more in close support, in the western attack; 7 divisions in line, and 3 in close support, in the eastern attack. About 1,300 batteries, or nearly 22 batteries per kilometer, had been provided. The Third Army covered the left (east) flank, while the Ninth Army with part of the Seventh Army covered the right (west) flank, along the Soissons-Chateau Thierry front. Everything seemed promising: a great and glorious victory was in prospect.

15 JULY

The night of 14-15 July had at first a light fog or mist, with a small amount of rain. This facilitated the bringing up of troops, especially along the Marne, but by 11:30 PM the weather was clear. Quiet prevailed along the front; the attack divisions were silently taking over the line, while the relieved troops withdrew to become the corps reserves. Communication and OP's were in, manned and working. In the Seventh Army, engineer and labor troops were well forward, cautiously preparing materiel, in order to be ready to start bridges and ferries, as soon as zero hour arrived. The mighty German armies were ready.

Unexpectedly, at 11:40 PM, a half-hour before the battle was scheduled to commence, the enemy suddenly opened a terrific artillery fire, both along the Marne, and in Champagne. Barrages dropped all along the front. East of Reims, the infantry had not occupied their line of departure, and no great damage resulted. But along the Marne the line of departure was to be on the south side of the river, which was to be crossed during the artillery preparation. The leading battalions of infantry were close by. The hostile fire fell like a bolt on the troops in the forward zones. Some infantry battalions were caught fairly by the barrage, and this brought losses, in some cases heavy, and in others, light. The men fled. There had been no provision for this event, and the men went in all directions. In the night, their officers were unable to locate and assemble them until long afterwards. Many returned without their weapons, and these battalions lost their places in the attack. Some of the pontoon trains lost personnel, and some material was damaged, and this caused the completion of certain bridges to be delayed to a time when the infantry using them could not catch the rolling barrage. The river crossing was materially delayed and thrown out of schedule.

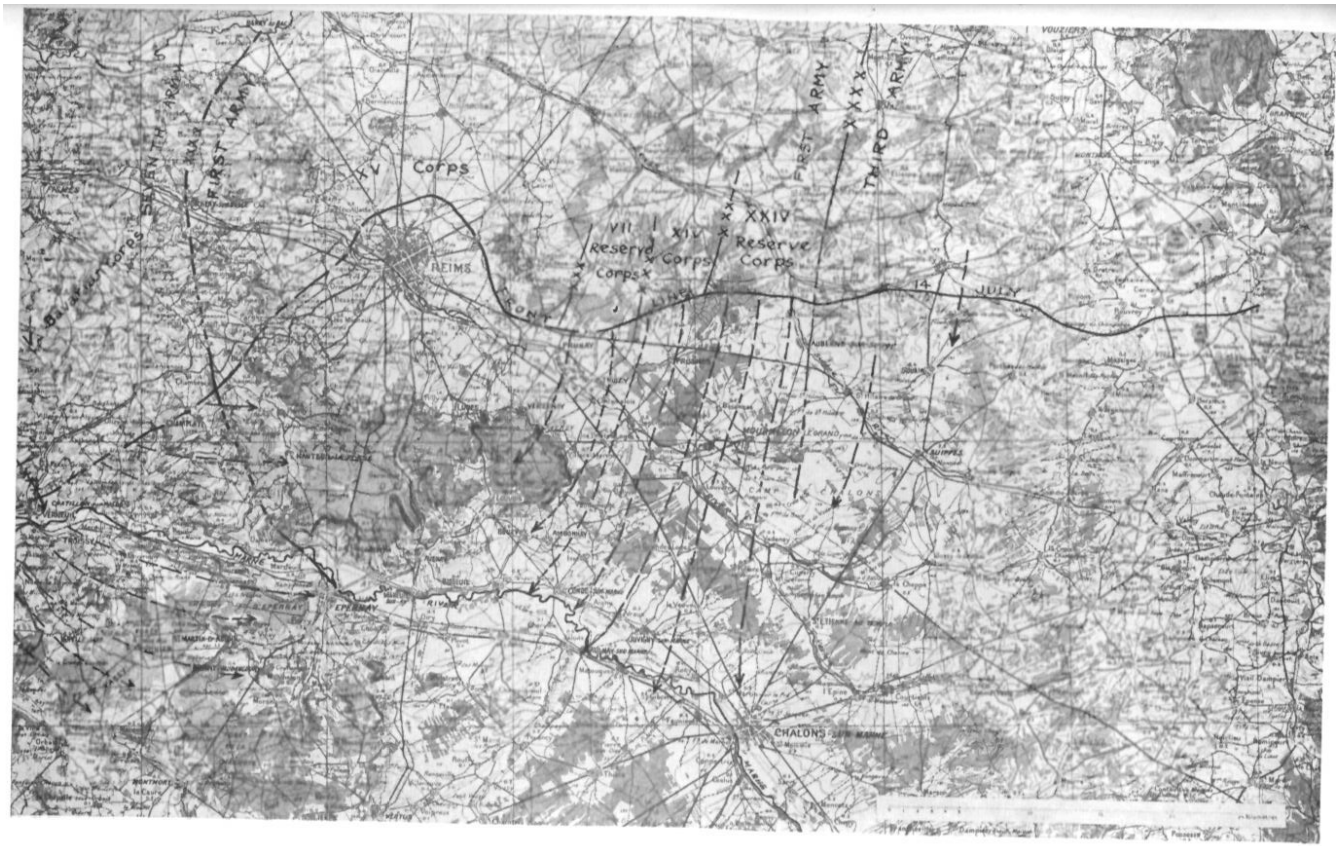
Ten minutes after midnight, the artillery preparation started. Thirteen hundred batteries, firing simultaneously, at a rapid rate of fire, was a formidable effort. The infantry took heart. They could see the shells striking within the enemy lines; they knew the fire was to continue for nearly four hours. It looked as if nothing would withstand such a storm of projectiles. The strong trench-mortar fire appeared to cover the hostile front lines with tremendous explosions. Apparently the enemy was driven out—or maybe killed. It seemed impossible for anything to live under that shelling. The OP's reported that everything seemed to be working according to plan. The batteries shifted from target to target, according to their programs. Only a few batteries suffered


VII Corps
XXVIII Corps
Reserve Corps
COMPIEGNE
SOISSON
VERBERIE
MORIENVAL
CREIL
SENLIS
XIII Corps
NINTH ARMY
XXX
SEVENTH ARMY
XXVII Corps
XXIII Corps
XII Corps
Aisne
Vesle
Marne

Aisne

Vesle

Marne



from enemy counterbattery; the temporary withdrawal of these from action was not noticed. But the infantry along the Marne, who had to be early at the front, did notice the hostile artillery fire, which appeared to be specially directed against them. Elsewhere the infantry remained under cover, and had few losses from hostile artillery reaction.

Crossing the Marne turned out to be a tough problem. Difficulties arose from the beginning. The enemy artillery had not been silenced, and he kept up his barrage along the river at places where they could not be always avoided. The barrages interfered with the building of bridges, not because they fell on the bridges themselves, but because the materiel for the bridges had to pass through areas swept by the barrage. Some materiel was destroyed; some was damaged; some delayed; and some arrived at the bridge site in the wrong order, and blocked the way. Some of the personnel—key men—became casualties. All communication went out early, and it was impossible to transmit orders with any dispatch. Bridge construction was slow, and way behind the time tables. The ferries had better luck. Boats could move, and they went to places where the barrages could be avoided. But this involved detouring troops, and caused more delays; and again the troops were landed on the south bank at the wrong place. Some detachments tried to find their correct positions, and some did not try. Only segments of the south bank became occupied; the line was not contiuous; liaison was lacking across gaps; and no one knew under the circumstances just what to do. They hesitated.

The hour for the infantry assault drew near. From Charteves on the Marne, to Vrigny, southwest of Reims, about 37 kilometers; and from Prunay to Tahure, in Champagne, east of Reims, about 23 kilometers, the infantry were to jump off at 3:50 AM. Daylight was commencing. It promised to be a clear and perfect day. The artillery without a pause was hurling around 7,600 shells a minute into the enemy's lines, and after four hours of this, it seemed certainly as if the infantry way forward must be open. And early reports from the front, except along the Marne, indicated that this was true, and that the chances of success were very favorable to winning the longed-for victory.

In Champagne, the assault troops of the First and Third Armies followed the barrage closely. They broke through the hostile front on time, and pushing forward advanced several kilometers right on schedule. The barrage of heavy artillery, firing gas and shell, seemed to have cleared out the enemy, for there was little opposition. Losses were slight, and the battle progressed according to plan. About 7:00 AM the rolling barrage was approaching its end, being near the limits of effective fire, and beyond the zone of expected resistance. The latter zone had been crossed. The infantry prepared for an advance towards the Marne, a long ways ahead, under open-warfare conditions. The artillery was displacing forward rapidly to support the infantry. Much of this consisted of heavy batteries, the need for which had been foreseen, in order to have plenty of artillery fire ready when the Marne came into view. Ammunition trains followed the batteries to avoid any possibility of a shortage of ammunition later in the day. Unit liaison officers with the infantry had in their last reports stated that the artillery preparation had accomplished its mission, and that from now on opposition should be

much less; where it would be they did not know. Artillery area liaison officers, well provided with motor transportation, pushed ahead to locate targets and report the position of friendly infantry. The plan was working. Only the OP's did not see anything; the country was so flat they could not follow the battle.

About 7:30 AM the advance came to a sudden halt. The infantry found a new enemy position, beyond the zone of expected resistance. It was full of machine guns and trench mortars; there was lots of wire in front. Nobody seemed to have known about this; for the artillery hadn't cut the wire, and if the enemy trenches had been shelled, the enemy showed no effects from it, for he was putting up a very hot fire. It was necessary to send word back to the artillery, for the infantry simply couldn't advance through this fortified defensive position without the help of its sister arm. Liaison officers rushed messages to the rear. They had a hard time; the ground was so cut up by shell holes that transportation was next to useless, and a long time elapsed before messages were delivered. The batteries received them while moving forward. Their progress had been slow because of the bad terrain, and the fact that isolated machine-gun nests had been passed by the infantry without being subdued. These nests covered the roads leading toward the front, and caused traffic congestions until they could be separately reduced. This took time, and when the batteries began to understand that the infantry was in trouble, and that need for help was urgent, they had to unlimber wherever they happened to be, often under very unfavorable circumstances. Besides, the batteries had found it impossible to continue the advance in broad daylight in difficult terrain while under close fire of machine guns. From these positions, occupied haphazard, the artillerymen were severely handicapped. Naturally they were poorly oriented; they could not see the targets, and they were so far from the front that they were unable to maintain liaison with either the area or unit liaison officers. And the latter did not know where the artillery CP's had moved. The batteries which had not displaced were available, but they were farther from the front, and messages received by them arrived so late that there was no certainty but that an important change of conditions might have occurred in the meantime. So they were afraid to fire, fearing that the infantry might have advanced while the message was in transit. The staffs of the divisions were in part well forward, but because of the fire along roads, and the devastated condition of the country, they were unable to direct operations. The artillery more and more lost contact with the front, and failed to support the infantry, which just waited in front of the enemy.

Information as to what had occurred was, for reasons explained, slow in reaching the higher headquarters. It was about noon when it became clear that the infantry was not advancing—had not been for some hours—and that the attack had come to a standstill before what was recognized to be the enemy's second position. It had been hoped that the enemy would be run out of his first position so quickly, and with such great losses, that a subsequent halt on a rear position would either not occur, or would be quickly overcome. Visibility was excellent, but there was the greatest difficulty in determining where the infantry was; where the batteries which had displaced had gone to; and in general just what had happened.

As the day progressed, information came in slowly. It wasn't very good;

not at all what had been hoped for. Starting on the right of the First Army, the VII Reserve Corps, with its 203d Division, had captured Prunay in the morning, and had then been stopped, for a long time, until it established liaison with its artillery. Then it was able to force a crossing of the Vesle, a small stream, which here was generally fordable, and had reached the canal just beyond. The 15th Bavarian Division had reached the vicinity of Wez and Thuisy on time, but was held up before these two utterly demolished villages. During the afternoon it received considerable help from the artillery, and before dark had occupied the ruins in both of these places. Attempts to take Courmelois were unsuccessful; it was impossible to coordinate the infantry attack with the artillery. The infantry were trying to push ahead without any well-formulated plan, and the OP's could not follow the action, which was very irregular. The infantry suffered severely from hostile artillery fire, and called constantly for counterbattery. The enemy's batteries were in the wooded hills in rear of Verzenay and Varzy, about 5,000 meters from where the battle was. The hills were 400 to 500 feet higher than the plain in front, and from such commanding ground, the enemy OP's, with visibility excellent, probably might follow the action. But these batteries were completely hidden and were mostly out of range of a large part of the German artillery, which was in general at least 3,000 meters in rear of its infantry. These hills had been the objective for this corps, but when day ended the total advance had been only about 2 kilometers, and with the enemy's artillery still unsilenced the situation was not promising.

Next in line to the east was the XIV Corps. The 3d Guard Division reached the main road from Reims to St. Hilaire-le-Grand about on time. A sanguinary fight broke out here, and the barrage and artillery liaison was lost. Without artillery support, only minor elements were able to cross the road. This left a gap on the right, as the left of the VII Reserve Corps (15th Bavarian Division) had advanced beyond. When the First Army, around noon, heard of this situation, the army commander ordered the 8th Bavarian Division, which was in corps reserve, to fill this gap, and in addition to attack southeast that same day. It was to do this jointly with the held-up 3d Guard Division, and the 26th Division next to the east, at 6:00 PM, on the front Prosnes (excl.) to Moscou Fme (incl.). The 26th Division had been stopped before it came to the main road to St. Hilaire, had lost liaison with its artillery, and was unable to advance afterwards. The 6:00 PM attack could not be coordinated in time, and only isolated detachments advanced. There was artillery support, but not to the extent needed. Some slight advances were made, which netted a number of prisoners. In this corps, the territory gained averaged 3 kilometers in depth, or about 1-7 of the distance to the Marne.

The last corps in line was the XXIV Reserve Corps. The Guard Ersatz Division was on the right, and advanced up to nearly 9:00 AM, by which time it was about 1 kilometer north of the main road from Reims to St. Hilaire. Strong opposition developed from insufficiently shelled enemy positions, and the infantry was stopped. Artillery liaison ended right here, and no further progress was made. The 199th Division had its right stopped about 8:00 AM on hill 181, but the left made good progress, and reached the main road to St. Hilaire, which it succeeded in crossing at spots, but without being able to proceed further. The 239th Division

also reached this road, but could not cross it. During the afternoon the artillery gave some assistance, but hostile machine-gun nests holding out on the scuth slopes of Hill 116 greatly interfered with liaison. Late in the afternoon, the 199th Division effected coordination between its infantry and artillery, and partially cleared out nests remaining on Hill 181. By the time this was done it was impracticable to arrange for a general advance beyond the line arrived at in the morning. The total advance of this corps was only 2 to 3 kilometers, or about 10 percent of the distance to the Marne. On its left the Third Army advanced its right, and kept in line with the corps, but did not go beyond it.

Over on the west, the Seventh Army had two fronts; along the Marne, and opposite the west flank of the Reims salient. Notwithstanding the difficulties and delays due to enemy artillery placing barrages continuously along the Marne valley, the attack on this front had greater success than elsewhere. But it was not all successful, and it soon became apparent that when the rolling barrage started, it was being followed only in places. There were gaps, some large and some small; in some of these the infantry attacked from one to two hours after the prescribed hour. They consequently had little artillery support. There were hills along both banks of the Marne, and the OP's on the north bank had good positions, and visibility couldn't have been better. But it was impossible for the OP's to locate their own infantry. At this season, the cultivated fields were full of crops, mostly wheat. Infantry moved through these fields under cover. The country was rolling, and much terrain was defiladed from view. Then there were extensive woods. To add to observation troubles, both sides were firing a considerable quantity of smoke. The OP's saw little.

Owing to the long time taken to cross the river, only infantry elements were over by daylight. Soon after, hostile planes discovered the location of bridges and ferries. In a very short while artillery fire began to fall on all points of crossing, while the hostile air forces bombed them at frequent intervals. Direct hits were obtained on bridges, and the casualties among the engineer troops working to keep the bridges open constantly increased. It was quite impracticable to displace forward across the Marne, with batteries scheduled to follow the infantry closely. Even the artillery area-liaison parties, with motor transportation, which had been counted on to keep the artillery informed as to location of targets and of friendly infantry, were unable to get forward. The artillery received little in the way of reports as to the front-line situation. They fired the schedule fires on time, and the rolling barrage moved forward relentlessly as it was intended to, but where the infantry were not behind the barrage, they received little artillery support. The infantry had varying experiences.

On the right, in the XXIII Reserve Corps, the 10th Division, with two regiments in line, attacked west of the Surmelin. The westerly regiment was on schedule, followed the barrage, and captured Fossoy, from the 7th U. S. Infantry, nearly on time, and then stopped as it was almost on its objective. The easterly regiment was badly shelled at the Marne and only part crossed the river. They did not cover their entire front, and had no connection with troops on either flank. Their morale had been shattered by the losses from the enemy artillery, and those that were over moved forward

only a long time after the barrage had left them. They reached Mezy, but were stopped by 6:00 AM near there, by severe machine-gun and artillery fire. They were able to locate some of the machine guns firing at them, and sent messages to their artillery, by runner to the north side of the Marne and thence by telephone, asking for fire on these places. Roughly, it took about an hour to get these messages to the artillery. Some battery was then detailed to fire at the machine guns, and proceeded to do this by a rapid adjustment, on a 200-meter bracket. The fire was absolutely useless. The hostile machine guns, as soon as they saw anything that looked like a battery trying to adjust on them, immediately disappeared, to appear a few minutes later at a new location. If these had been the only machine guns, the infantry might have advanced while the guns were changing position, but there were so many of them that the occasional stoppage of fire from one or two failed to enable an advance to be made. This "hide and seek" business, of trying to locate enemy machine guns, and then notifying the artillery of where they were, and waiting for the artillery to annihilate the machine guns, continued uninterruptedly until about 11:00 AM, during which time the machine guns were never silenced, and the infantry made no advance. By this time losses were so great that the regimental commander found his men breaking to the rear, and he withdrew his command to the north bank. The remainder of the division stayed until night, and then, finding themselves isolated, abandoned their gains and evacuated the south bank. The attack west of the Surmelin, a sector defended by the American 3d Division, was a complete failure.

East of the Surmelin, the 36th Division had a fair start. They early met considerable opposition from a mixture of American and French troops. They passed around Moulins, isolating it, and, nearly on time, advanced 5 to 7 kilometers. By 9:00 AM, with the 23d Division on their left, they were occupying the high ground on the north slopes of the St. Aignan valley. Here they observed what was obviously a strong hostile defensive position, on the other side of the valley. They had known about this position, but they were surprised to find it heavily occupied. This they had not expected. Because of the precarious condition of the Marne crossings there was no supporting artillery near the front. The infantry leaders thought that an attack against a prepared position, protected by wire, and heavily manned, could not succeed unless the attack had been previously prepared by artillery fire. They asked far a new artillery preparation, and fixed 1:30 PM as the hour of starting to allow ample time for the artillery to receive the request and prepare the fire. During the interval, the infantry reorganized and rested. The artillery received this request and complied with it. The only batteries able to reach the new target were the heavy batteries, and these were 9,000 or more meters away. At this range, the dispersion was considerable, and more ammunition was necessary to produce a desired effect. But most of the ammunition had already been fired, as no provision had been made for attacking two positions on the same day. Nevertheless, the artillery started on time, and commenced to shell the enemy second line, far to the front, and completely out of sight of the OP's. The infantry leaders watched the shelling. They had no criticisms to make as to the accuracy of the fire; but they did criticize its insufficiency. After consideration it was decided that the prospects of carrying the position by assault

were not good. The infantry stayed where they were.

Further east, in the VIII Reserve Corps, the 200th Division started way behind schedule. But it made progress, and about noon arrived close to the low ground at La Chapelle Monthodon, and seized Hill 240 near Chezy. Its companion, the 1st Guard Division, succeeded in crossing the Marne nearly on time, but was then considerably delayed by a large number of French nests, scattered irregularly throughout the country. By midday the division had reached Champaillet, and was stopped, liaison with the artillery being lost. During the afternoon, this excellent division displaced part of its artillery forward to south of the Marne. With this assistance a new attack was made, and French troops were driven out of Clos Milon Fme; the advance then kept on, and by dark the division had in its possession the high ground north of Comblizy. The objective of the corps had been Ft. de Lassy and Brugny-Vaudancourt. On the right, about half of the distance had been covered, and on the left, about one-third.

In the IV Reserve Corps, the 37th Division, next in line, had great difficulty in starting. It was late, and it met a rough and wooded terrain, which afforded excellent and numerous opportunities to the enemy to fight delaying actions. It was hard to keep the artillery oriented as to the constantly changing targets. Each wood had to be attacked separately after proper artillery shelling. The French used isolated 75-mm guns, trench mortars, and machine guns; they caused great losses and much delay. Fighting was continuous, and the advance became better in the afternoon, by which time part of the artillery had joined the front and had liaison with the infantry. By evening, Hill 254, 1 kilometer northwest of Nesle-le-Reponse, had been captured. The 113th Division was able to advance faster. Less one regiment, it crossed the Marne about on time, and pushing forward seized Mareuil-le-Pont. It later reached the line: Cerseuil to Leuvrigny. One regiment attacked north of the Marne, and by a bold advance occupied Reuil-sur-Marne, with the assistance of the 2d Guard Division, on its left. The latter division had seized Chatillon-sur-Marne, without much opposition. It then met severe resistance, and strong artillery fire. The hostile batteries were hidden in woods, and it was impossible to locate them. Their constant fire retarded the advance. After an all-day fight, the line was at Montigny. This corps (IV Reserve), which was astride the Marne, and should have taken Epernay according to the plan, made only about half the expected distance. Still it had gone forward, from 3 to as much as 9 kilometers, in various parts of its zone of action.

North of the Marne and the IV Reserve Corps, was the V Bavarian Corps, whose mission was to drive in the west flank of the Reims salient. At the start, resistance was small, it being found that the artillery preparation had cleared out the foreground, and the troops followed the barrage closely for some distance. On the south, the 195th Division, on a narrow sector, kept up with the 2d Guard Division on its right. The 22d Division seized and occupied the high ground west and north of Belval; while the 123d Division captured Espilly and part of Marfaux. A gain of nearly 7 kilometers was made, but this was less than had been hoped for. Failure to subdue the hostile artillery was the principal factor in holding back the advance. North of this corps, only one division—the 86th—was engaged. It met Italian troops, and drove them back to Courmas.

By 6:00 PM the information from the front was fairly well known at the CP of the Army Group. The Crown Prince and his staff discussed the situation. It was clear that the battle had not resulted in pinching off Reims, nor even approached this conclusion. It had to be decided why the carefully prepared plans had failed and what was now to be done. The views of the army commanders were requested.

The Seventh Army stated that the enemy was apparently prepared strongly to defend his second line of resistance, which had been penetrated in isolated spots only. It was thought to be impracticable to overrun this line, but it could be broken, possibly by a succession of attacks, properly supported by the artillery. As soon as selected parts of the front had been broken through, it was believed that rapid progress would be made. It was realized that the battle of this day had not progressed according to plan, but it was now evident that the plan had been based upon an assumption that the enemy would defend his front in force, especially along the Marne. From statements of prisoners, and from our own troops, the assumption was found to have been erroneous; the enemy had not strongly defended his front, but had withdrawn a large part of his infantry, and most of his artillery, to behind his second line, where they had escaped the artillery preparation. The abandonment of forward areas, and concentration of the defending forces beyond the zone of the artillery preparation had not been foreseen. Consequently the artillery preparation, while destroying, or neutralizing, enemy forces in the forward areas, caused relatively small losses, as the bulk of the enemy artillery and infantry were in rear of the shelled zone, and were found practically unhurt in line, completely ready to defend themselves on the selected position. The Army reported that they had taken a great many prisoners, guns and other materiel, but did not have any figures. The lines were not sufficiently far south of the Marne to prevent the hostile artillery from shelling bridges; all of which undoubtedly had been located by air reconnaissance. The chief engineer of the army had been killed by a shell while inspecting one of the bridges. It was plain that the enemy artillery would have to be pushed away if the ground taken today south of the Marne was to be held. Air reconnaissance had failed to locate any unusual movements in enemy territory south of the Marne, and it seemed possible to continue the advance.

The general impression of the First Army was that the enemy must have expected the attack, and that he had created a deep foreground, and had withdrawn the mass of his troops to south of the road from Reims to St. Hilaire-le-Grand. Numerous statements of prisoners confirmed this view. This enemy position had not been included for severe shelling, as the artillery preparation had been planned on the assumption that the enemy would be farther north. Consequently, the infantry was stopped in front of an only slightly damaged position. Also, there had been a strong wind all day, and this had interfered with the artillery gas shelling. Reconnaissance showed that the enemy's present position was strongly constructed, with elaborate and deep obstacles in front. This position was in range of part of the artillery, but attempts to push the infantry through brought out the fact that, at ranges of from 7,000 to 10,000 meters, the dispersion of fire was too great, and that the artillery fire was no longer sufficiently concentrated to open a road for the infantry, with the ammunition available. It was considered impossible to continue the advance without a new artillery preparation.

This would involve moving forward about 600 batteries, and accumulating a new stock of ammunition. The Third Army concurred in the views of the First Army. On the Champagne front these two armies had taken 2,500 prisoners, and considerable materiel.

The west front from Soissons to Chateau Thierry had next to be considered. The news from here was that throughout the day there had been severe fighting just east of the Villers Cotterets forest. Ground had been lost initially, but by counterattacks it had been recaptured, except for two French nests which were surrounded. There had been considerable enemy artillery activity north of the Aisne, and very severe artillery fire south of the Aisne, in the zone of the Ninth Army. After dark, this army reported that a hostile attack, preceded by a powerful artillery preparation, had been launched by the enemy near St. Pierre-Aigle; obviously a limited attack, which had netted the enemy some ground. A similar attack farther north broke down under the defensive barrage which had been laid down at just the right time. Farther south, in the zone of the Seventh Army, the latter reported that they had gained ground at Hill 204, west of Chateau Thierry, and northwest thereof, principally as the result of an excellent artillery preparation. This success had brought in prisoners from the American 28th Division, thus established as in line, in place of the American 2d Division, apparently withdrawn. Groups of men of the American 4th Division were found to be in the front line, apparently for training, and the presence of this division as in reserve was assumed probable. What particularly attracted attention on the west front was that the enemy had here established an air blockade; as a result there was no information received from the Air Service.

These views were studied by the Crown Prince and his staff. G-2 and G-3 were called on for estimates. They agreed that the relative forces were as follows:

On the Soissons—Chateau Thierry front, no change had occurred. The enemy had in line, or in reserve, 13 divisions, against which the Ninth Army had 14 divisions, and that part of the Seventh Army on this front, 6 divisions. This front seemed to be well guarded.

South of the Marne, the Seventh Army had 6 divisions across the river, and 8 others in reserve. Substantial gains had been made, but the front was too close to the Marne, and it was advisable either to give up the gains made, or else push the enemy back. One and one-half American divisions and 4 French divisions constituted the enemy front, and he had in reserve 1 French division, and 3 French cavalry divisions.

North of the Marne, considerable gains had also been made. There were 5 divisions in line, and 6 in reserve. Against these the enemy had 2 French and 2 Italian divisions in line, and was known to have 1 more French division in reserve.

Around Reims, 2 divisions, on the defensive, faced 3 French divisions. This sector was comparatively quiet.

In Champagne, the First Army had 9 divisions in line, and 5 in reserve. The enemy opposed this force with 7 or 8 French divisions; while 3 French and 1 American (42d) divisions had been located in reserve. The Third Army had no important part in the operation, but they reported 3 French and 1 American divisions in enemy reserve, any or all of which might be brought into line in Champagne by next day. This gave a total of 14 French and 2 American divisions in this sector. The First Army was outnumbered, and was out of ammunition for a new artillery preparation, and success in this area was not to be expected.

Army Group Headquarters gave

credit to the enemy for adopting German tactics, in using a withdrawn position to meet a serious attack. This had been standard German practice since the battle of the Somme, in 1916. It was clear that cutting off the enemy within the Reims salient by junction of the Seventh and First Armies at Epernay could not now be attained. Minor successes were yet possible. North of the Marne, seizure of the ridge from Coulommes - la - Montagne to Sermiérs might cause the enemy to evacuate the Reims basin, and open up the important roads and railroads through the Aisne valley now in hostile possession. To obtain this result, it would first be necessary to seize the high ground from Sermiérs, through Nanteuil-la-Fosse to Fleury-la-Riviere. The First Army, and the right of the Third Army, ought to make some kind of attack to hold the enemy, and prevent him from sending reserves to opposite the front of the Seventh Army.

The decision as to what was to be done was delayed to as late an hour as possible. The decision was to abandon the attempt to capture the hostile forces within the Reims salient by a double envelopment, and in lieu thereof to force an evacuation of Reims, by pressure southwest of that city. At 12:30 AM, orders issued, directing the Seventh Army to continue its attack on both banks of the Marne, but with main effort north of that river directed to seizing the Reims—Epernay road. To hold the enemy in Champagne, the First Army was ordered to attack at 11:00 AM, 16 July, following an artillery preparation, the length of which was to depend upon the amount of ammunition on hand. They were also to assist the Seventh Army southwest of Reims by strong artillery support directed against the wooded hills in that direction. The Third Army was to prepare for a new attack after a regular artillery preparation, and report when they would be ready. In the meantime only their right division would attack, maintaining liaison with the First Army.

At 12:40 AM, General Ludendorff wired from GHQ, directing that the Seventh and First Armies continue their attacks, the Seventh to be reinforced by 1 or 2 divisions, and to make its main effort along and north of the Marne. The First Army was to make its main effort towards Mourmelon-le-Grand and Mourmelon-le-Petit. The two attacks were to force the evacuation of the Reims salient. The Third Army was to attack later, but on a narrow sector. Preparations were to be made at once, and without regard to the foregoing attacks, to release divisions for the main offensive, to be launched shortly against Paris and/or Amiens from the Chateau Thierry—Soissons front and north thereof. The Army Group did not change the orders it had already issued, but did later instruct the First Army to prepare an offensive against the two Mourmelons, and ordered both the First and Third Armies to assemble in rear areas reserve divisions, ready to be transported to other sectors.

16 JULY

The Seventh Army ordered the attack to continue with unchanged objectives. The XXIII Reserve Corps, west of the Surmelin valley, was to remain north of the Marne, on the defensive. It was to support the VIII Reserve Corps on its left, by vigorous artillery fire, including plenty of mustard gas, to prevent hostile movements against the right flank of troops south of the Marne.

The VIII Reserve Corps was to remain on the defensive on its right, but to advance its left between La Chapelle Montadon and Igny-le-Jard. The 6th Bavarian Division was authorized to be used, to increase the divisions in line

to 4, while the 33d Division was held fresh in reserve. As artillery was necessary for an advance, as much artillery ammunition as could be provided for was to be moved to south of the Marne. The IV Reserve Corps also had its divisions in line increased from 3 to 4, with 1 more in reserve. The two right divisions were to attack between Igny-le-Jard (exc) to the road from Mareuil-le-Port to St. Martin-d'Ablois; the two left divisions were to attack astride the Marne, straight towards Epernay.

The V Bavarian Corps was to seize the Reims—Epernay road, the hill west of Fleury-la-Riviere to be taken by envelopment. Their divisions in line were increased to 5, with 2 still in reserve. The VI Reserve Corps to the north was to protect the left of the V Bavarian Corps, by advancing in conformity with its movements.

The First Army ordered its artillery during early hours to silence as many machine-gun nests and batteries as possible, and then to start an artillery preparation for 20 minutes, commencing at 10:40 AM. There was not enough ammunition for a longer preparation. The VII Reserve Corps was to withdraw the 8th Bavarian Division and assemble it in army reserve, and with its 3 remaining divisions was to complete the seizure of Wez and Thuisy. The XIV and XXIV Reserve Corps, to the left, with 2 and 3 divisions respectively in line, were to attack in their zones of action, with no special objectives. Each of these two corps was to assemble 2 divisions in rear in reserve. The Third Army ordered its right division to protect the left of the First Army, by advancing as necessary.

South of the Marne severe fighting started at 4:00 AM. There was no coordination between the operations of the various divisions; each attempted to carry out its orders as seemed best. In the VIII Reserve Corps, the two right divisions had a passive role. They had had time to intrench, and to arrange good liaison with their artillery; some of it from north of the Marne. Without special difficulty they repulsed several counterattacks against their front. The artillery appeared to inflict severe punishment on the hostile infantry. The 1st Guard Division, on the left of the corps sector, met attacks also. These they repulsed, but when they in turn sought to advance in compliance with their orders, they met such severe artillery and machine-gun fire that they made no progress at all.

In the IV Reserve Corps, the two right divisions (37th and 113th), worked forward, fighting desperately, through close country. They succeeded in bringing additional artillery over from the north side of the Marne, and eventually arranged for good liaison. The advance was slow, but by night they had gained about 3 kilometers, reaching a line through Chene-la-Reine. The 2d Guard Division, which was north of the Marne, met strong opposition during the day, but gained about 2 kilometers, seizing Tincourt. The advance of this corps was largely due to good teamwork between the infantry and artillery.

The V Bavarian Corps extended the attack to the north. There was no detailed program, each division attacking independently. Most of the fighting was in woods, and the artillery found it impossible to see any targets; they limited their fire largely to back areas, as they could not determine where the front lines were. After confused and bitter fighting, through a forest cut up by numerous ravines, at the end of the day the 195th Division had taken the Bois du Roi; the 12th Bavarian and 22d Divisions had reached, in the Bois de Courton, the road from Fleury-la-Riviere north to Marfaux; and the 123d Division had crossed the Ardre

brook at Marfaux. The VI Reserve Corps, to the north, drove the Italians out of Onrezy and Courmas. The advance on this front was from 2 to 6 kilometers, but the most advanced troops were still 6 kilometers from the Reims—Epernay road.

The Seventh Army experienced much trouble through the constant shelling and bombing of the Marne crossings. The location of bridges had been changed during the night, but the enemy located the new bridges early in the morning, and thereafter kept up a constant barrage fire on the bridges and their approaches, making it almost impossible to forward supplies and reenforcements. Losses about the bridges were heavy, and it was necessary to start using improvised materiel to keep the bridges open at all. It was evident that if the enemy artillery couldn't be stopped it would be impracticable to maintain the lines of communications across the Marne.

The First and Third Armies attacked at 11:00 AM, as had been ordered. The short artillery preparation accomplished nothing better than to attract the enemy's attention, for as soon as the infantry started off, they were met by an absolutely overwhelming artillery barrage. Only trifling gains had been obtained.

The First Army reported, at the end of the day, that so far they had taken 3,716 prisoners, including 82 officers, and that the wounded passing through amounted to 5,658. The Seventh Army reported over 9,000 prisoners to date, but had no figures as to their casualties. The latter army had identified two new enemy divisions in its front. Otherwise, neither army had noted any change in enemy strengths.

Information came in a little faster this day. The west front, from Soissons to Chateau Thierry, reported new enemy attacks, east of the Villers-Cotterets forest, which netted the enemy some ground. There was considerable artillery activity along the entire front. The Air Service found opposition to their reconnaissances in this direction, and were unable to secure any information. But the situation here seemed also to be unchanged.

The Crown Prince, and Army Group Headquarters, studied the situation very carefully. They early came to the conclusion that the enemy must have had information of the German offensive, and was prepared for it. South of the Marne it was judged that the sacrifice of men and materiel to continue the attack would not correspond to probable gains. Southwest of Reims, there was some hope that an attack here might progress, maybe by a step-by-step advance, which would ultimately result in the occupation of the ridge from Sermiers northwest to Vrigny, which, if taken and held, would compel the enemy to evacuate Reims. In Champagne, the enemy had so organized his defences, and was so superior in strength, that nothing could be done here without new and elaborate preparations.

In view of this situation, the Army Group, at 7:45 PM, directed that the Reims offensive cease, except the advance north of the Marne, which was to continue. The right of the First Army was to support this attack with artillery fire. The Third Army was directed to withdraw two Corps headquarters from line, for use in the next offensive towards Paris and/or Amiens, and both the First and Third Armies were ordered to assemble well back of the front, out of range of hostile artillery, their divisions in reserve ready to move in any direction on short notice. These divisions were to have their artillery returned to them. The Third Army was to surrender corps and army artillery, labor troops, and special units, at an early date. To assure an early fall of Reims itself, the First Army was to

make plans, to be carried out at a very early date, for the capture of:

a. Fort de la Pompelle;

b. the line: Sept Saulx—Baconnes—Ft. de St. Hilaire.

17 JULY

The front of the attack, which on the morning of the 15th had been about 60 kilometers, had been reduced to about 32 kilometers on the 16th, exclusive of the holding attack in Champagne. For the 17th, the attack front was to be only about 15 kilometers.

The Seventh Army ordered its troops south of the Marne to hold all their positions; the troops north of the Marne were to continue the attack to the Reims—Epernay road. The First Army ordered its XV Corps, around Reims, to assist the Seventh Army in their attack by strong artillery support; its VII Reserve Corps was charged with preparing a plan for the capture of Fort de la Pompelle. The other corps were to improve their local positions by limited attacks, which would also induce the enemy to believe that another battle on a large scale was imminent. Troops moving *to* the front, had permission to do so by daylight; troops moving *from* the front were required to do so by night; this order applied also to the reserves.

Fighting this day was naturally of lesser intensity. South of the Marne, several enemy counterattacks were repulsed, and local positions were prepared for defense. The enemy made a gain of about 1 kilometer, securing possession of Chene-la-Reine and Montvoisin. Two bridges across the Marne were destroyed by artillery fire, and losses at, and near, points of crossing were serious. North of the Marne, very strong resistance was met. There was better liaison with the artillery. The 2d Guard Division captured part of Venteuil. The 22d Division gained St. Denis, and the high ground just north of Nanteuil-la-Fosse. They captured an Italian 24-cm. battery and the CP of the Italian 52d Infantry. The 123d Division gained Pourcy, but on the other hand, Clairizet was lost. The army artillery fired on Paris, Meaux, Coulommiers, Montmirail, and Montfort. The last two places were believed to be army CP's. Aviation was very active south of the Marne, and reported only slight enemy circulation in this area.

The Soissons—Chateau Thierry front was relatively quiet. Minor fighting occurred at only one point, and here the enemy was driven back a short distance. Great strength in hostile aviation was noted in the morning, and air reconnaissance was practicable only over forward areas. It was reported that there was but little traffic on roads and railroads, and only a few cars at the Villers Cotterets railhead.

The high command was concerned over the slow development of the efforts to take Reims. It was so necessary to lines of communications for the next offensive. About noon, General Ludendorff telephoned the Crown Prince, directing that the capture of Reims be expedited. He indicated that the main attack should be roughly along the Ardre brook, southwest of Reims, with a secondary attack east of Reims against Fort de la Pompelle.

The Army Group, at 12:30 PM. directed the Seventh Army to attack along the Ardre brook, at an hour and date to be announced later. First efforts were to be directed to seizing Hill 240, just southwest of Vrigny, and Hill 256, about 1½ kilometers southwest of Ecueil, so as to secure the high ground overlooking Reims. The First Army was directed to prepare to take Fort de la Pompelle. Ammunition for a thorough artillery preparation, which would be sure to push the infantry through, was to be brought up at once. Changes in artillery positions were to be hastened.

These two attacks were to be ready for 21 July.

The chief of staff of the Ninth Army visited three divisions in line, and discussed the situation. No one had anything unusual to report. He so reported to the Army Group.

About 5:30 PM, the chief of staff of the Seventh Army submitted to the Army Group a written estimate of the situation. This stated that the French artillery fire south of the Marne still continued, but that the infantry attacks appeared to be about over. The hostile artillery fire on the Marne bridges was so strong and accurate that destruction was faster than reconstruction. The bridge trains to date had lost 70% of their materiel. Repairs to bridges were possible only if the offensive was continued, so as to push the enemy artillery back out of range of the Marne. From the artillery point of view, a great deal of additional ammunition would be necessary, which would be difficult to supply. The artillery had lost many horses, and some materiel. From the viewpoint of the infantry, they had suffered much from constant artillery shelling and air bombing, and they seemed to be opposed by numerically equal and fresh forces. The Seventh Army had no interest in holding ground south of the Marne, unless this was necessary for other Armies. If not necessary, they would appreciate early orders authorizing preparations, to commence that very night, to abandon the terrain south of the Marne.

The Army Group approved this estimate of the situation, and authorized preparations to abandon the south bank. But in view of the proposed new attack north of the Marne, tentatively set for 21 July, it was not desired to give the enemy a chance to enfilade the lines north of Venteuil; for this reason, the withdrawal would not be made until a date to be announced later.

18 JULY

The event most feared, but which had been thought to be improbable—an attack on a large scale on the Soissons—Chateau Thierry front occurred.

There was little warning. Army and Corps staffs had closed their duties the night before, on the assumption that the enemy was fully occupied on the south side of the Marne, and in Champagne. The day was expected to be one of preparation for the limited attacks against Reims, scheduled for 21 July, and for preliminary assembly of troops for transportation towards the front towards Paris and Amiens. The night passed without special activity. There was considerable artillery fire east of the Villers Cotterets forest, and north thereof. It attracted no particular attention, as this sector had been long active. That there might be another limited attack in this vicinity had been foreseen, and the front lines had been arranged in great depth.

The divisions in line on the Soissons—Chateau Thierry front were:

Divisions	Corps	Location
241st	VIII Reserve	just south of the Aisne
11th Bavarian		near Cutry
42d	XIII Wurtemburg	near Verse Feuille
14th Reserve		near Chavigny
XXX Boundary between Ninth Army (north) and Seventh Army (south) XXX		
115th	XXV Reserve	near Corcy
40th		near Chouy
78th Reserve		near Neuilly St. Front
10th Bavarian		near Chevillon
4th Ersatz	VIII	near Bussiares
87th		near Belleau
201st		near Vaux

Most of the foregoing divisions had been deprived of part of their artillery to reenforce the Reims offensive. They had been in the sector for a long time, and had suffered considerable losses for which replacements had not been received. They had many men sick with influenza. Requests had been made to GHQ for fresh divisions to take the place of these battle-worn ones. This had been refused, as it was desired to conserve fresh divisions for the contemplated offensives which appeared to be the last chance to win the war. It was contrary to policy to weaken this mission by detaching good troops for minor missions. There was little corps or army artillery in the sector, and no large reserves close by. These were some distance to the east, supporting the attacks against Reims.

About 3:00 AM, two deserters arrived near Cutry. They reported that an attack by the French would come between 4:00 and 5:00 AM. The 11th Bavarian Division immediately called for a barrage, which was laid down by their artillery. About 3:30 AM, noise of motors was heard within the enemy lines, and again the barrage came down. The noises stopped, and nothing more happened. The 11th Bavarian Division thought the enemy might be preparing for another limited attack, and other divisions were not alerted; only the 11th Bavarian Division stood to arms.

At 4:40 AM, a terrific artillery preparation was started by the enemy from about 10 kilometers north of the Aisne, past the Villers Cotterets forest, down to near Belleau. This was a front of about 50 kilometers. At both corps and army CP's, it was immediately realized that something important had started. Without waiting for information, the Ninth and Seventh Armies had, within 15 minutes, alerted the divisions in reserve, ordering them into march order. As the artillery preparation continued, the Army Group, by 6:00 AM, alerted its reserves and ordered its motor trains to be ready to move divisions on short notice. GHQ was promptly notified.

All communication was out by 5:00 AM, and no information came from the OP's. It was not known what was happening, but it was clear that a great battle had started. At 6:45 AM, the Seventh Army ordered the 10th Division, nearest available reserve, which was northwest of Chateau Thierry, just withdrawn from the Marne attack, to assemble near Villeneuve-sur-Fere. One additional regiment of light artillery was attached. Motor trains were ordered to transport the dismounted elements to a destination to be announced later. The Ninth Army, about the same time, ordered the 8th and 34th Divisions, from army reserve, directly to the battle, southwest of Soissons, and ordered the 46th Reserve Division, which was north of the Aisne in reserve, to cross that river at Soissons, where orders would meet it.

Still no information from the front; it was impossible to reestablish lines of communications. The only news came from stragglers and occasional runners. Around 8:00 AM it became known that the 10th Bavarian Division, near Chevillon, had had its front penetrated; and that the 40th Division, next to the north, was receiving a tremendous gas shelling. No information from elsewhere, and none from the Air Service, except that the air from the Aisne to the Marne was full of a very superior force of Allied planes. The tremendously strong artillery fire continued with undiminished intensity, and could be seen moving eastwards.

South of the Marne an infantry attack, with tanks, came near Chene-la-Reine. This attack was stopped. There was also heavy fighting north of the

Marne near Nanteuil-la-Fosse, but the country was so wooded that although there was communication with the OP's the latter could not determine who was attacking what. The First Army was trying to assist in this fight by delivering strong artillery fire against what was believed to be the hostile positions opposing the Seventh Army. They observed great animation in the enemy lines in Reims, but were unable to make out what was going on. In Champagne, patrol actions occurred, and the enemy harassed the lines with machine-gun and artillery fire, but there was no regular attack.

About 10:00 AM, more information began to arrive. It came in driblets; and it was not good. North of the Aisne, the hostile attacks had not been pushed, and appeared to be dying down. The lines here seemed to be intact. South of the Aisne, in Ninth Army territory, strong enemy forces had everywhere pushed the front back. It was impossible to state how far the enemy had advanced; he seemed to be still coming. The situation was serious, as the reserves were yet a considerable distance away. As far as could be ascertained, the front was somewhere near the line Chaudun—Vierzy—Hill 196, east of Villers-Helon. This indicated that the front had already been driven in 5 to 6 kilometers, and this must have entailed extraordinary losses of men and materiel. The 46th Division was expected to be on the high ground just southwest of Soissons about 1:00 PM, and, together with the 8th and 34th Divisions, expected later, would form a new line of resistance, east of La Crise brook, from Belleau, exclusive, to the south. The 211th Division was coming up from reserve, but it was far to the east, and north of the Aisne; it was expected to be at Vregny some time during the day.

In the Seventh Army, the entire front north of Belleau had been attacked at 6:00 AM by a large force of tanks; 80 had been counted just south of the Ourcq. All divisions knew their front was retreating, but in the absence of communication, the exact situation could not be determined. The enemy was still attacking, and was believed to be near the line: Villers-le-Petit—Chouy—Neuilly St. Front—Macogny—Breuil. This was an advance of 6 to 7 kilometers, and indicated he must be in great strength. No reserves would be available before the end of the day, and the situation, in view of the enemy's continuing attack, was most serious. The artillery could give but little support, as there was not much of it, and their OP's were largely out of communication, and when available could not distinguish their infantry.

South of the Marne, another enemy attack, started at 7:30 AM with tanks and armored cars near Montvoisin, had driven the 10th Reserve Division back to Oeuilly. Still another attack started here at 9:00 AM, but it was shortly after stopped. North of the Marne, southwest of Reims, there was heavy fighting near Pourcy, but it was impossible to find out what had happened. The First Army reported that strong artillery fire continued against their front, but there had been no attacks. They had themselves made a raid near Prosnes, which had netted 82 prisoners, from whom it was ascertained that the enemy had no attack intentions on this front.

At 12:00 noon, General Ludendorff telephoned the Army Group, authorizing the withdrawal of troops south of the Marne at a future date, in accordance with a plan which was to be submitted to GHQ for approval. But the Army Group at this hour was very concerned with its west front. New information indicated that the enemy kept on advancing; there was not much artillery to oppose him; the enemy had tremendous artillery superiority; he

was using an unprecedented number of tanks, which had broken through the infantry, and were now within the artillery lines; there was an unheard of number of hostile planes in the air; no reserves were in sight before night, by which time no one could foresee what the situation would be. To the Crown Prince and his staff, it looked as if a great disaster might be imminent. Energetic measures would have to be taken, and at once.

Starting at 1:00 PM, the Army Group rapidly,

a. Ordered the Seventh Army to withdraw from south of the Marne, as early as possible. GHQ was requested to approve this, in view of instructions not to withdraw without their authority.
b. Assigned the 3d Division to the Ninth Army, as additional reserve.
c. Assigned the 51st Reserve and 33d Divisions to the Seventh Army.
d. Ordered the assembly that night of the 20th, 19th Ersatz, and 9th Divisions, from the First and Third Armies, in Army Group reserve, in the Aisne valley, respectively at Sermoise, Mont-Notre-Dame, and Fismes.
e. Ordered, as the next line of resistance, the line Soissons — Hartennes—le Plessier-Huleu — Latilly — Epaux — hills north of Chateau Thierry, but
f. Directed that before the enemy could displace his artillery forward, he be defeated in front of the line Saconin — Vaucastille — Villers-Helon.
g. As a precaution, ordered another defensive line to be reconnoitered and marked from Bucy-le-Long—west of Acy—Droizy—Beugneux—Coincy—Epieds—and Charteves.

The Seventh Army lost no time in issuing orders to abandon the south bank of the Marne. During the coming night, 18-19 July, artillery and noncombat troops were to withdraw, while the infantry held all positions south of the river during the next day, with their artillery protection furnished by batteries north of the river. During the night of 19-20 July, the withdrawal would be completed as follows:

9:00 PM.	No change prior to this hour. Battle reserves withdraw.
10:00 PM.	Front line, less combat patrols, withdraws, and occupies railroad along the Marne. Security detachments at south exits of villages south of the river.
2:00 AM.	Troops start across the Marne; move north immediately.
4:00 AM.	Combat patrols retire as, and if, necessary, delaying enemy as much as possible.
NOTE.	Bridgeheads to be left on south bank at Barzy, Treloup, and Vincelles until dark 20-21 July.

Immediately after evacuation of the south bank, that is, by morning of 20 July, divisions would be withdrawn from line to corps reserve as follows:

By the XXIII Corps	36th Division
VIII Reserve Corps	2 divisions
IV Reserve Corps	1 division

Each of the two last-mentioned corps were to surrender one additional division for reserve, by morning 21 July. This would provide for the west front, if needed, 4 divisions by night of 20 July, and 2 additional divisions by the next night, in addition to forces already on their way.

During the afternoon, the attack on the west front came to a halt, and it became possible to ascertain what had occurred, and to take some measures to prevent further enemy gains, should he renew his attack. North of the Aisne, the enemy had secured ground as far as Osly-Courtil, but this attack did not appear to be serious, and the withdrawal of divisions from reserve north of the Aisne to south of the river apparently involved no immediate danger.

South of the Aisne, the enemy attack

extended over a front of 40 kilometers. Except for the 11th Bavarian Division, it had been unexpected. The attacking infantry were preceded by a large number of tanks, which were invulnerable to infantry fire. They were covered by smoke. The OP's were nearly useless. Few could maintain communication, and with the smoke they were unable to distinguish where the enemy or their own infantry was. The infantry had not understood this method of attack; in many places they lost their nerve and gave way, when they might have held out. They were surprised by the character of the attack, and felt that their weapons were unsuitable to meet it. Along the entire front the enemy had made practically uninterrupted progress until about 9:00 AM. Commencing at this hour the hostile tanks began to run out of the protection of their barrage and their smoke screens. They became visible to some of the batteries, near whose positions they now were. The batteries put many tanks out of commission; disabled tanks were strewn liberally about the field. About this time the local reserves came into action; there began to be some control, and the enemy's advance slowed down. In the north sector the advance was practically stopped by 10:00 AM, but in the south sector it was noon before he was brought to a standstill.

During the afternoon, several limited attacks developed, some of which were accompanied by violent artillery fire. Their success was only partial; the thin German line held. At the end of the day, the line was Mercin—Vaux—Missy-aux-Bois — Chaudun — Vierzy—Blanzy—Hill 182—Chouy—Neuilly-St. Front—Breuil—Courchamps, all inclusive except Missy-aux-Bois. Part of the 241st Division, near Pernan, still held there, cut off from the rest of the German line by the hostile advance in the sector farther south. Arrangements were made, and later successfully carried out, for the engineers of the 53d Reserve Division, north of the Aisne, to evacuate the personnel of the 241st across the river.

The attack had covered the front of 9 divisions, south of the Aisne. In this zone, there had been identified 9 French, 1 Morocco, and 1 American (2d) divisions, all confirmed by prisoners, except the Morocco Division, which was identified by statements only. One additional American division (the 4th) was identified as attached. Counting American divisions as 2, this gave 15 fresh hostile divisions as against the 9 German divisions, which were worn. It was not, however, certain but that the enemy might have more divisions, which had not been identified.*

South of the Marne, renewed enemy attacks in the afternoon were beaten off. The enemy appeared to have on this front 7 French and 1 American (28th) divisions. His fire against the Marne bridges had again been very destructive, and it had been difficult to forward supplies. About 8:30 PM, the 37th Air Squadron dropped, near Mareuil-le-Port, 200,000 rounds of infantry ammunition, and 14 parachutes of subsistence stores, all of which was secured by the front-line infantry. This is one of the first known instances of the use of planes to supply forward troops.

North of the Marne, southwest of Reims, the enemy attacked again in the afternoon, and captured Tincourt. His strength in this sector appeared to be 4 French and 1 Italian divisions. Up to date the Seventh Army reported that it had taken 292 officers and 12,700 men prisoners; the First Army added to this 91 officers and 3,800 men. The only army reporting casualties was the First. Since the 15th, they had had

*The American 1st Division was not identified for some days.

8,248 wounded. The Seventh made no report as to casualties; the Ninth Army reported their losses on the 18th as probably great.

Considering the results of the day, the Seventh and Ninth Armies, and the Army Group, agreed on the estimate of the situation. Full credit was given, in the written estimates, to Marshal Foch, for having assembled with the greatest rapidity, and under absolute secrecy, a strong force against the Soissons — Chateau Thierry front. It was easily seen that the mission of the attack was by an advance on Soissons and Fismes to cut off the forces in the Marne salient, and then to annihilate them. The attacks southwest of Reims, and south of the Marne, were recognized as holding attacks, to prevent withdrawal of troops along those fronts. Credit was given to French GHQ for securing a complete tactical surprise. The concentration of enemy troops within the Villers Cotterets forest had been observed, but the number of troops the enemy had there had not been appreciated.

It now was realized that the Reims offensive had failed because of two assumptions, which events subsequently showed had been erroneous. The first was that the Reims offensive would overrun a weak and surprised enemy without interruption, or in other words, that a catastrophe would develop in the Reims salient, into which the available hostile reserves would be drawn. The second assumption was that the number of divisions at the disposition of the enemy was so low that it would be impossible to occupy strongly the Reims front, and at the same time concentrate large fresh forces in the Villers Cotterets forest. The first assumption was proved wrong on 15 July, when it was found that the enemy on the front attacked was neither surprised nor weak; but this very fact tended to induce a belief that the second assumption was probably correct. Now, on 18 July, this assumption was seen to be equally wrong.

Finally, the offensive value of tanks, with strong artillery support, had been underestimated. The November, 1917, battles near Cambrai should have given indications as to what success might be expected from the surprise use of massed tanks, coordinated with mass artillery fire. It was evident that the enemy had grasped the idea. He had improved his tanks technically, and had increased their numbers. He had done the same thing with his artillery, increasing the proportion of heavier calibers. The combination of massed tanks and massed artillery fire had enabled the Allies to win a great victory.

The situation was not hopeless; the afternoon had brought signs which gave some encouragement. The hostile tanks had low speed. After the enemy artillery preparation and barrage had ended, the tanks became visible; in some cases they were in direct view of batteries. The light artillery stopped their advance. Deprived of their protection, the hostile infantry soon lost offensive spirit, and having been densely formed behind the tanks, in thick formations, which the enemy had hazarded, because of the tank and artillery mass employment, had suffered heavy losses. Although the attack had stopped, it was certain that the defense had been late, and that the enemy had secured considerable ground, inflicted severe casualties, and captured important supplies. It was acknowledged that Marshal Foch had won a great strategical and tactical success.

The situation on the south side of the Marne appeared to be that strong hostile forces were attempting to drive back over the Marne the troops which had crossed. The battlefield here had but little depth, and the troops had to rely for supplies on a very few river crossings; these were under heavy and

continuous artillery fire. The attack on the west front of the Reims salient was still in progress and it was gaining ground, but only step by step, and meeting a most tenacious resistance.

The situation of the Seventh Army, in view of the enemy success this day, was precarious, and might well become critical should the enemy maintain the same rate of advance in the next few days. The most dangerous direction of penetration was in the direction of Soissons. If that city were lost, and the enemy advanced to the hills east thereof, the lines of communication north would be cut, and there would be danger of the capture of the troops within the Marne salient.

About 6:30 PM, the decision was made by the Army Group to support the attacked flank, and the farther north this was, the farther north it would be supported. The south side of the Marne would be evacuated, and all possible measures taken as quickly as possible, and with all available forces, to support the flank which was wavering.

In compliance with this decision, orders were issued directing that the six divisions ordered into second line in the Ninth and Seventh Armies prepare a defensive position along the line already selected, to which, however, the front-line divisions were not to fall back unless absolutely necessary. The previous intention to defeat the enemy while he was displacing his artillery forward was abandoned in view of later information showing the great strength of the enemy, and the losses and disorganization of the front line. Artillery was ordered transferred from the Marne front to the west front, and preparations were made to organize a strong defense. The withdrawal of troops from south of the Marne was to proceed according to plan; it was announced that this was the only withdrawal contemplated. Better to meet the new situation, the following transfers of corps, with their assigned divisions and troops, was made, effective at midnight:

XIII Wurtemburg Corps, east of the Villers Cotterets forest, from Ninth to Seventh Army;

VI Reserve Corps, southwest of Reims, from Seventh to First Army;

XVII Corps headquarters, from Army Reserve to Seventh Army.

At 7.30 PM, GHQ wired approval of the proposed evacuation of the south bank of the Marne.

19 JULY

The night of 18-19 July was relatively quiet. Artillery on both sides was active, shelling lines of communications, and supposed locations of targets. But the infantry was exhausted; it could fight no more until rest had been had.

South of the Marne, artillery and noncombat troops were transferred to the north bank. The enemy failed to detect the movement, and the losses were only slight. The infantry held their lines, and prepared to defend them; they arranged for good liaison with their artillery, now far to the rear.

The Ninth Army had, south of the Aisne, but one remaining corps, the XXXVIII Reserve. Divisions which had been in the previous day's battle were withdrawn, and the 8th and 34th Divisions substituted, on a line north from Missy-aux-Bois, east of the Saconin creek. The withdrawn divisions had lost most of their artillery, had had severe losses, and were unfit for further duty. Three remaining divisions, the 46th Reserve, 3d, and 211th, were assigned to the second line, which followed roughly the Soissons—Chateau Thierry highway.

The Seventh Army reorganized its front; its north boundary now ran through Chaudun and Berzy-le-Sec. The

transferred XIII Wurtemburg Corps covered the north sector as far as Vierzy. The newly assigned XVII Corps was inserted in line, taking over from the XXV Reserve Corps the sector north of the Ourcq. The XXV Reserve Corps extended south to Hill 115 (south of Monnes), where connection was made with the VIII Corps. The front line had new divisions, replaced in the same manner as for the Ninth Army.

Along the whole west front the enemy started a tremendous artillery preparation at 4:00 AM, followed, at 4:20 AM, by an infantry advance supported by numerous tanks. The Ninth Army, better to coordinate artillery fire, attached the two divisions north of the Aisne, for tactical purposes only, to the corps south of the river. The corps chief of artillery gave appropriate orders for utilizing the fire of the batteries north of the river, in coordination with the battle south of the Aisne. In spite of this measure, and the reorganization accomplished during the night, the mass fire of the enemy artillery covered such a vast section of terrain that it neutralized many units by constant gas shelling, and the enemy's advance was almost as rapid as on the preceding day. Especially opposite the Villers Cotterets forest, where most of the enemy artillery seemed to be, the defense was overwhelmd by a storm of gas and HE shell, and the enemy captured Vierzy and Villers-Helon, and kept right on until he reached the second position along the Soissons—Chateau Thierry highway.

In the Ourcq valley, and farther south, the enemy's artillery support seemed to be less, and resistance was better. Here the enemy advance was material, but it was not so great as elsewhere, and he was stopped by effective artillery fire when he had reached the line Maubry — Sommelans during the morning.

South of the Marne, a new enemy attack near Chene-la-Reine broke down under coordinated machine-gun and artillery fire. Apparently the enemy discovered nothing new in this position. Along the front from the Marne to near Reims, the VI Reserve Corps, just transferred to the First Army, was attacked by both colored and white troops, which resulted in the enemy retaking Courmans. Otherwise only minor fighting was reported on this front. The First Army reported numerous raids by both sides, through which they had captured 13 officers and 295 men. Their aviation bombed Epernay, and started large fires.

During the afternoon the attack on the west front came to a stop. The Ninth Army found the enemy had taken a line through Vauxbuin. From statements of prisoners, and captured documents, it appeared that a continuation of the attack next day was to be expected. Numerous statements indicated that the attack would be prolonged, north of the Aisne, by 7 or 8 divisions. Two French cavalry divisions were located as in reserve; one being at St. Pierre-Aigle. Against this force the Ninth Army reported its troops exhausted, and no reserves left.

There was very heavy fighting along the west front of the Seventh Army, lasting through the entire afternoon. The enemy was strongly supported by artillery fire and by tanks, and by dark had pushed the line back to Vauxbuin—Villemontoire—Parcy-Tigny—Blancy—St. Remy—Billy-sur-Ouecq—Rozet-St. Albin—Sommelans—Monthiers, all inclusive. Villemontoire had been lost, but had been retaken by a counterattack.

South of the Marne, no change had occurred. A raid at Mezy brought in 8 prisoners, and 7 machine guns from the American 3d Division, which was supposed to have been relieved from line; it also recovered 8 wounded Germans

with 2 of their machine guns, who had been abandoned on 15 July.

The Army Group was seriously worried. The Crown Prince and his staff found it necessary to make a new estimate of the situation. Notwithstanding that new troops had been inserted, and the artillery strengthened, 19 July had netted to the enemy almost as substantial gains as on the day before. On 18 July, the enemy had secured a tactical surprise, but this was not the case this date. Troops were prepared, and the defensive organized. OP's were located farther to the rear, and had given some results. Villages and woods had been defended, counterattacks had been made, and artillery support had improved. On the other hand, by inserting divisions in an emergency manner, support had come to critical points, but the consequent mixing of units had caused much trouble to leadership. If the enemy attack continued, which seemed probable, neither the Ninth nor Seventh Armies had any reserves immediately available.

Losses had been severe. Only the Ninth Army sent in reports; these stated:

The 11th Bavarian and 241st Divisions had lost a large portion of their artillery; their infantry strength could not be given even approximately.

The 6th and 34th Divisions had lost part of their artillery. They were still in line, but their effective strength was unknown.

Six other divisions had strengths varying from 88% to 62% of their proper numbers. They were considered unfit for line, until at least three weeks' rest and reorganization.

Two divisions remained—they were en route; had not yet joined; their strengths were unknown.

The Seventh Army promised a strength return later. The First and Third Armies were in good condition, but they were far away; they had divisions in reserve which fortunately had begun to withdraw from line on 16 July. They were being sent for in all haste, as reserves had to be found for the battlefield.

If the Reims offensive had been successful, the roads and railroads through that city would have been available for bringing up these divisions from the east to the west. But the enemy was still in Reims, and it was necessary to detour that city. Transportation by rail was impracticable; the railroad net did not lend itself to such a movement. Marching was too slow; the troops would arrive too late. Motor transportation had to be used, and this was only sufficient to move dismounted elements. In this manner the infantry could arrive in time; it did. But it arrived tired, and without its artillery. There was plenty of artillery, but it had to be withdrawn at night from active fronts, and then marched to the new area. For motorized artillery this was not easy; for animal-drawn units, it involved a delay of several days.

It was evident that the hostile attack could not be met with the full strength of available forces for 2 to 3 days, and then only with mixed-up units. The latest information as to the strength of the enemy was:

Soissons—Chateau Thierry front: At least 16 divisions were in line, including 2 American (2d and 26th); at least 4 more divisions were in close reserve, including, again, 2 American (1st and 4th), exclusive of 2 mounted cavalry divisions.

South of the Marne: 8 hostile divisions had been identified, including 1 American (the 28th), with the 3d American, and possibly others, in reserve.

Southwest of Reims: 6 hostile divisions had been identified.

The location of 12 divisions, which had been recently withdrawn from line, was unknown; they might be in the vicinity. Altogether, G-2 was of the opinion that the enemy might have around

the Chateau Thierry salient as many as 46 divisions, plus 3 cavalry divisions. His latest information was that there were now 26 American divisions in France, of which only 11 had been located as in line. Apparently 15 American divisions, equivalent to 30 German divisions, were in reserve, and could appear. The enemy had superior strength in line, and in reserves.

The Army Group commander considered the possibility of the enemy making further gains, especially near Soissons. The main highway south from there was already cut, and the only railroad into the salient was threatened. Bringing troops and supplies into the Chateau Thierry salient, with the enemy in Reims, had always been difficult; it was equally difficult to get them out. There were 40 divisions in the salient; the march length of their artillery alone exceeded 370 miles. If infantry is included, and corps and army troops, there were about 600 miles of marching columns if evacuation of the salient was decided upon. This certainly appeared to be a possibility; careful planning, and action, was required.

If, against renewed attacks of the enemy, the wornout front did not hold during a movement to the rear, a catastrophe was likely to occur at any time. Consequently the mission was, clearly, to strengthen the west front, and at the same time to withdraw troops by echelon, and gradually contract the arc, force the enemy to new concentrations, and consequent loss of time. This withdrawal could not begin on the sector near Soissons, where the enemy was directing his main pressure, because here every foot of ground gained by the enemy brought him dangerously nearer to the railroad from Missy-sur-Aisne to Fere-en-Tardenois. Withdrawal would have to commence with the most southern detachments.

The foregoing facts, the rapid progress of the hostile attack, and the desire of the Crown Prince and his staff to overcome a fatal situation without too great loss, led to the decision to abandon the Reims offensive and withdraw from the Marne salient. Orders were at once issued, directing the VIII and XXIII Reserve Corps, one on each side of Chateau Thierry, to withdraw that night to the line Billy-sur-Ourcq—Latilly—Epaux-Bezu—Hill 208 — Hill 224 — Brasles. Withdrawal east of Brasles could not be made at this time, as the Marne had to be held east of this point to cover the retreat of the troops still south of the Marne.

20 JULY

During the night of 19-20 July, the troops, mostly infantry, south of the Marne, withdrew to the north side, according to plan. The enemy did not interfere, and apparently failed to note what was occurring. Soon after daylight, a strong infantry attack, supported by tanks, and preceded by a rolling barrage, advanced against the abandoned positions. From their positions on the north bank, the artillery fired heavily at the enemy, and apparently inflicted considerable losses.

This ended the Reims offensive. Launched on 15 July with the mission of reducing the Reims salient, it ended almost exactly five days later. Five decisive days, which marked the turning point of the World War, and forever ended the German initiative. Instead of reducing the Reims salient, the end of the five-day period saw the complete failure of the mission, and the Allies well on the way to reducing the Marne salient.

COMMENTS

1. The German artillery preparation on 15 July, and the Allied preparation on 18 July, both used mass artillery

fire, directed against areas, and employed a maximum amount of gas shell. Both preparations accomplished their missions, with this difference:

a. The German preparation covered an area of too little depth. The enemy, less detachments, abandoned the forward area, and suffered little loss from the hostile artillery fire. He met the attack on a rear position, for the shelling of which there did not remain sufficient ammunition. The gain of about 3 kilometers was insufficient to afford a victory.

b. The Allied preparation covered an area of six or more kilometers in depth. This was sufficient, in this case, to break all lines of resistance.

The artillery preparation of the American First Army on 1 November, at the Battle of Buzancy, covered an initial depth of 7 kilometers, subsequently extended to 11 or more kilometers. This was enough to carry the infantry through all lines of resistance. Insufficient depth to an artillery preparation may prevent a victory.

2. Displacements of artillery forward on 15 July were too early. New positions were not available, as an assumption had been made that the enemy's resistance had been broken, and that open-warfare conditions now existed, until the Marne would be reached, some 20 kilometers away. The enemy's resistance had not been broken; it had merely withdrawn to a rear position, and the artillery moving forward was caught in unfavorable locations, where it was next to useless.

3. Defensive barrages along the Marne were of great value. They were the cause of the failure of that offensive, as they made it impossible to support the troops which had crossed the river. This was a very favorable case for use of defensive barrages, as the points of river crossings were relatively few, and could not be camouflaged.

4. Liaison between artillery and infantry was found to be an absolute requirement for a successful attack. Where the attack proceeded according to a prearranged plan, as on 15 July with the Germans, and on 18 July, with the Allies, the plan worked, and the infantry went right through following the artillery rolling barrage. The fact that they were behind it indicated that the plan was proceeding as intended, and that no friendly artillery would fire short of the barrage, but would cover everything in front of it. It gave the infantry a feeling of confidence, by visible indication that the advance was moving as intended.

When the barrage was lost, as on 15 July, in places, owing to the infantry not being able to cross the Marne in time to follow the barrage, the infantry found difficulty in even crossing the terrain abandoned by the enemy except for small delaying parties. Where later that day, and on other days, attempts were made by the infantry to advance independently, without any plan, notwithstanding exceptionally good visibility, it was impossible for the artillery to support the attempted advances, as they could not keep track of the moving situation. Reasons were:

a. On the Marne front there was much cultivated terrain, mostly covered with wheat, which at that date was quite high. Infantry disappeared into it, and could not thereafter be located.

b. All Seventh Army territory contained numerous woods. No OP could see into or through the woods and, as they expressed it, it was impossible to tell who was attacking what.

c. In First Army territory, the country was generally flat and open. But it was one of the most terribly devastated fronts in France, being for kilometers nothing but a mass of shell holes. From the OP's, mostly with low relief, it was impossible to

tell which shell holes were occupied by which infantry.

d. Attempts to designate targets to the artillery by messages from front lines took too long. Only a few targets were located, not enough to make their eventual neutralization of any importance.

5. The plan for the Reims offensive failed, within five decisive days, because:

On the part of the Germans, there had been

a. Failure to obtain secrecy;

b. The artillery preparation failed to cover the real enemy line of resistance.

On the part of the Allies,

a. Secrecy had been obtained;

b. The artillery preparation covered, and overwhelmed, all lines of resistance.

———————

Editorial Note—Colonel Lanza's account is told from the German side. The fog of war that pervades the battlefield, illumined only by the feeble and intermittent flashes of local intelligence, is here, we think, excellently described, with no accompanying second guesses. What of the Allied armies on the eve of this attack? From General Reilly's "Americans All" (which quotes "America's Part"—Farrar and Rinehart) we take some extracts:

(The picture: Confronting the German forces are the Fifth French Army (Berthelot), from Chateau Thierry to Reims; the Fourth, from Reims east, under Gouraud. General Gouraud, the evening of 14 July, has invited Major General Menoher (42d US Division) and other American officers to dine. He makes them a little speech to the effect that plans to receive the attack have been completed; he has every confidence in the morale of the French and American troops under his command; they will now join in a friendly meal.)

". . . The enemy has made no trench raids to get prisoners; he has not retaliated to the artillery fire brought down well inside his lines to interfere with troop and supply movements. By day the French airplanes can find no movement; by night they can see nothing, but do hear the noises which indicate considerable movement. The trench raids made by the French have brought back from the German front lines only the older men of the division habitually used in the quiet sectors; no younger men of the 'storm troops' used for attack have been caught. . . .

". . . With sunset of the 14th began another period of anxiety. Would the attack come? After all, was the French high command wrong? Had it made a terrible mistake in concentrating its reserves of infantry and artillery back of the Fourth and Fifth armies, with the consequence that the war would be lost because of the ease with which von Hindenburg and Ludendorff would decisively smash through elsewhere?"

(A raid is made by a small group from the Fourth Army; prisoners are secured.)

"Questioning proved these men to be 'storm troops;' also that the artillery preparation for the attack was to begin at midnight and the infantry to go over the top at daylight.

"If this were true, the country opposite for miles back was swarming with the advancing hordes of German infantry moving to the positions from which they would make the assault in the morning. If this were true, here was a target for the French and American artillery, long adjusted to fire on every road, every path, and every communicating trench for miles back in the German territory opposite.

"If it were not true, and the command was given to fire, the tremendous artillery conflagration which would blaze forth would notify the Germans as clearly as a message printed in the blackest and largest type on the whitest sheet of paper that the French expected the attack along this front . . .

". . . After listening to the result of questioning the prisoners, General Gouraud, without hesitancy, and without undue delay, gave the command for the heavier long-range guns, and half the lighter guns, to fire at 11:30 PM. . . .

"With a crash that was heard in Paris, 100 miles away, with a fiery flare that illuminated the night, so that crowds poured from their houses into the streets of that city to watch it, thousands of guns opened fire on the twenty-five miles of the Fourth French Army front. Thirty minutes later, at midnight, the Fifth French Army, on the left, opened the same fire.

"Minute after minute passed and not a shot from the Germans. Ten minutes passed, fifteen minutes, twenty, twenty-five, and still silence . . . .

"General Gouraud, watch in hand, stood silently waiting to see if the German fire would begin at midnight as the Germans captured in the raid had said. Ten minutes dragged along without a word. The clock in the room began to strike twelve. It completed twelve. No fire! Minute after minute dragged itself by. No fire!

"At 12:10 came the roar of several large-sized projectiles followed quickly by the terrific crashes of their explosion. The electric power plant had been destroyed.

"In the darkness the chief of staff heard General Gouraud say, 'Thank God.'

"The anxious watchers in the trenches suddenly saw the sky behind the German lines opposite light with a tremendous flare, stretching farther to the right and left than any individual could see. In the fraction of a second longer which it took the sound to travel came the roar of . . . the greatest artillery concentration in history. The shells bursting on the whole front and reaching back for miles not only covered the battlefield proper, but fell even in the town of Chalons, twenty miles to the rear.

"This fire continued without abatement until noon the next day.

"It smashed trenches. It blasted paths and roads out of existence. It searched the ruins of villages and farmhouses, churning them up, previous fighting having left but little to blow down. It reached back and tore up small groves and woods hitherto ignored as too far to the rear. It reached into and tore down villages well to the rear of the battlefield, driving their inhabitants, who had not been fired upon in previous Champagne battles, into the fields . . .

"The German artillery fire searched every locality, every spot which four years of fighting along this same line had taught them could be useful to troops and guns in battle; every locality which desperate troops being driven back might occupy in attempting to stay a victorious advance.

"It did everything that artillery can do to prepare the way for the victorious advance, beginning at daylight, of the . . . divisions . . . which were to crash through the French and Americans of the Fourth Army. . ."

But the targets had moved.

Digest of Field Artillery Developments

Just off the press is the 1936 Digest of Field Artillery Developments, the second in an annual series prepared at the Field Artillery School. Here is a concise summary of approved practices embodying the latest studies in what may well be called field artillery research. The chapter titles include:

Critique of Service-Practice problems.
The Use of Oblique Air Photos With a Firing Chart.
Notes on Marching Truck-drawn Artillery.
Notes on Artillery Liaison.
Fire Direction—Planning Artillery Supporting Fires.
Truck-drawn Details.
Tentative Procedure, Operation and Tactical Employment of Radio Sets of the Ultra High-Frequency Type.

The book contains 90 pages and 31 illustrations, and may be purchased from the Book Department, the Field Artillery School, for twenty-five cents.

Among the several items of instruction which will be of particular value to the extension-course student is the one on oblique air photos. This is illustrated in considerable detail, and its study will go far to ground the student in the fundamentals of survey. In many large cities, accurate street maps, vertical, and oblique air photos of the city are available. The student may employ these to study the subject on terrain familiar to him.

Other recently completed texts for sale by the Book Department include:

Field Artillery Book 130, "Marches, Shelter, and Field Equipment," at fifty cents, which is a revision and consolidation of Field Artillery Books 123 and 142, and contains 197 pages and 21 illustrations.

Field Artillery Book 182, "Field Artillery Signal Communication," at seventy-five cents. This is a revision and consolidation of Special Texts 92 and 97, and contains 325 pages and 78 illustrations.

No contest for bigger and better Christmas cards is inaugurated herewith. The publication of this card is due to its accurate delineation of types of our fellow citizens. The Christmas call has developed into, from left to right: The gentleman who has committed himself to an attack on the defending left. He should be wearing earmuffs. The fellow whose argument for a frontal assault is being countered by expert estimation of the strength of the defense. (This discussion is being hampered only mildly by interruption.) On the fringe, four without convictions, who wish they had some. On his knees, the technician, who doesn't give a hang about tactics—just give him enough ammunition.

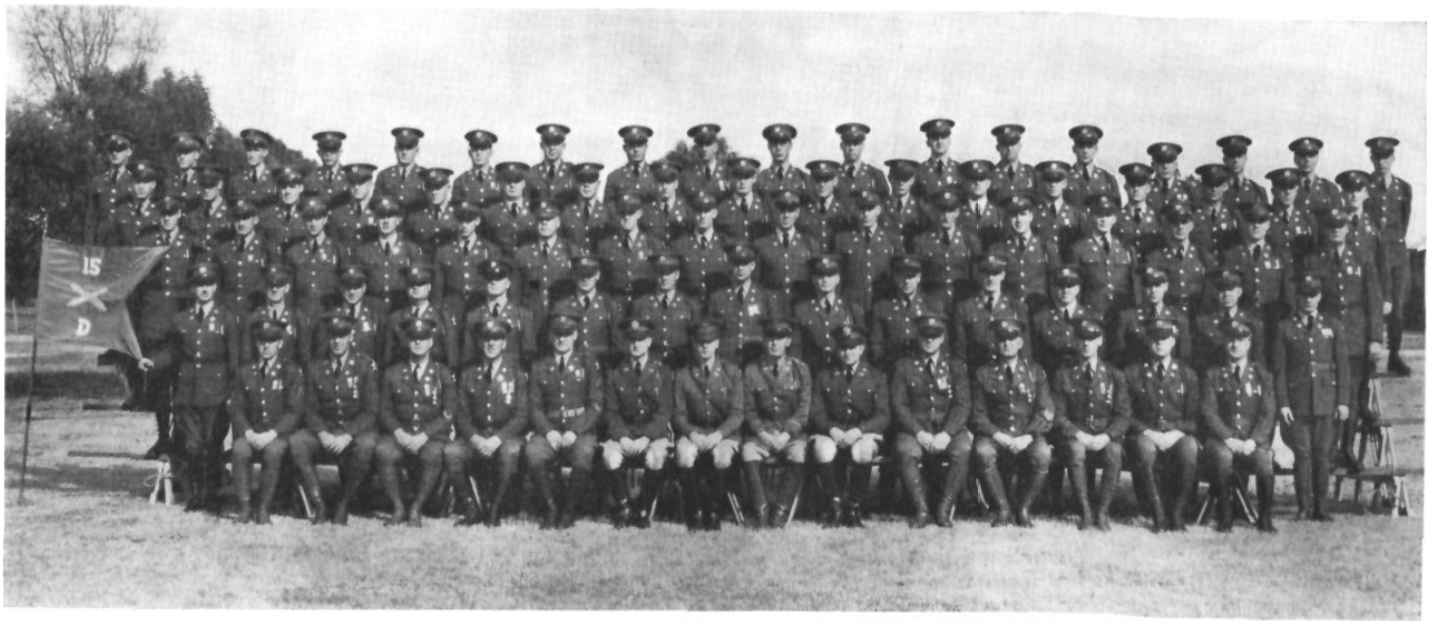
In the near foreground—orphans of the storm.

Request for Old Standards

The Commandant, The Field Artillery School, requests that those who have custody of old field artillery standards, no longer required by them, forward such standards to the Field Artillery Museum, Fort Sill, Oklahoma.

This unique and rapidly growing institution possesses other trophies, loaned collections, and varieties of armament types housed in two large buildings at the School. Visitors express their admiration and surprise at the completeness of the exhibits and the appointments of the Museum.

It is hoped that many organizations will take advantage of this invitation to add these representations of their regimental history and achievements to those now honored and cared for at the center of field artillery activities—the School.



THE KNOX TROPHY WINNERS, 1936

Knox Trophy Award, 1936

The Chief of Field Artillery announces that the Knox Trophy award for 1936 was won by Battery D, 15th Field Artillery, Fort Sam Houston, Texas, commanded by Captain John M. Works. This trophy, presented annually by the Society of the Sons of the Revolution, in the Commonwealth of Massachusetts, is the mark of outstanding achievement in all branches of field artillery practice, and in the exercise of the distinguishing characteristics of fire power, mobility, and communication. The battery is to be congratulated on its selection from among the units, listed below, chosen to represent

CAPTAIN JOHN M. WORKS AND 1ST SERGEANT CHARLES MICHAEL

STAFF SERGEANT HUGH R. BEDFORD

the commands of which they from a part, and to take the competitive test for the award:

1st Corps Area—Ft. Ethan Allen, Vt., Battery E, 7th F.A.

2d Corps Area—Madison Bks., N. Y., Battery D, 25th F.A.

3d Corps Area—Ft. Hoyle, Md., Battery A, 6th F.A.; Ft. Myer, Va., Battery A, 16th F.A.

4th Corps Area—Ft. Bragg, N. C., Battery A, 17th F.A.; Battery E, 4th F.A.; Ft. Benning, Ga., Battery A, 83rd F.A.

5th Corps Area—Ft. B. Harrison, Ind., Battery A, 19th F.A.; Ft. Knox, Ky., Battery A, 68th F.A.

6th Corps Area—Ft. Sheridan, III., Battery E, 3d F.A.

7th Corps Area—Ft. Des Moines, Iowa, Battery E, 80th F.A.; Ft. Riley, Kans., Battery C, 84th F.A.

8th Corps Area—Ft. Sill, Okla., Battery E, 1st F.A.; Battery B, 18th F.A.; Ft. Sam Houston, Tex., Battery E, 12th F.A.; Battery D, 15th F.A.; Ft. F. E. Warren, Wyo., Battery B, 76th F.A.; Ft. D. A. Russell, Texas, Battery D, 77th F.A.; Ft. Bliss, Texas, Battery B, 82nd F.A.

9th Corps Area—Ft. Lewis, Wash., Battery B, 10th F.A.; Pres. of Monterey, Calif., Battery E, 76th F.A.

Hawaiian Dept.—Schofield Bks., T. H., Battery A, 11th F.A.; Battery B, 8th F.A.; Battery D, 13th F.A.

Panama Canal Dept.—Ft. Clayton, C.Z., Battery B, 2d F.A.

Captain John M. Works, the battery commander, is a graduate of the United States Military Academy, Class of November 1, 1918, and of the Field Artillery Basic Course, 1920. He holds the degree of M.S. from the University of Pennsylvania, 1930, where he was a student in the sound-ranging course. He later served with the sound-and-flash-ranging sections of the First Observation Battalion at Fort Bragg, N. C. The battery officers are First Lieutenant J. H. Rothschild, USMA, 1930, and Second Lieutenants Harry J. Lemly, Jr., USMA, 1935, and Elmer J. Gibson, USMA, 1935.

The senior noncommissioned officer is First Sergeant Charles D. Michael.

To Staff Sergeant Hugh R. Bedford, Headquarters Battery, 77th Field Artillery, Fort D. A. Russell, Marfa, Texas, went the coveted individual Knox Medal award for excellence as an enlisted student at the Field Artillery School, Fort Sill, Oklahoma.

Sergeant Bedford was born January 2, 1907, in Newport, Rhode Island. His father died when he was three, and his mother when he was five. He attended schools in Rhode Island and Massachusetts until, in his junior year of high school, he was again bereaved by the death of his guardian in 1923. Three years later he enlisted in Battery C, 15th FA, and since that enlistment has served in the Air Corps, in Headquarters Battery, 82d FA, and in his present assignment. The story of Sergeant Bedford's surmounting of all

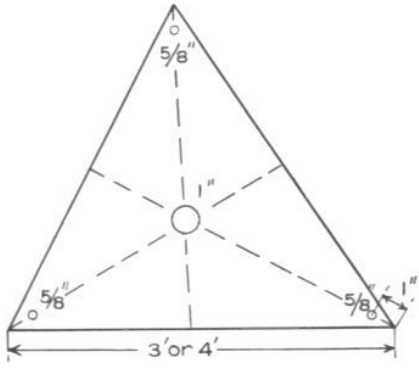
handicaps to attain his present distinction is written in his service record, beginning with a first-enlistment discharge as sergeant, character excellent. He was discharged as staff sergeant, character excellent, per ETS, in January, 1935, from the 82d, and holds his present warrant from July 23, 1936.

Talking Shop

Over in this corner is the huddle where the conversation is climaxed with, "Why don't you write that up for *The Journal?*" Contributions should be brief. Those received will be acknowledged, and printed when space permits.

Instruments on Armory Floors

Here's a method that may save your instruments a trip to the arsenal for repairs. Saw out an equilateral triangle



from ordinary 3-ply veneer panel wood. Draw lines bisecting the angles. One inch from each corner drill a ⅝″ hole almost through. (Bit point will go through, leaving a small hole to catch the point on the tripod ferrule.) At center, drill a one-inch hole completely through. This last will enable you to center the tripod on a predetermined spot for topographical work on the armory floor. For aiming circle and BC scope, make the triangular base 3 feet to a side; for range finder and plotting board, 4 feet.

—MAJOR J. O. HOSKINS, *F. A.*

Old, But Can You Prove It?

A projectile is fired from a gun horizontally. At the same instant, a similar projectile falls vertically from the height of the muzzle. Do the two projectiles reach the same level at the same time? Solution next issue.

●

123d FA, Illinois, is October Honor Regiment in attendance—followed in column by 122d, second place, and 124th, fourth place, while Btry C, of latter, is honor unit in enlisted attendance . . . . And, at Chicago Stock Show, the 124th FA wins military jumping championship, Captain Mura, Captain Ireland, and Lt. Doherty also dressing a good ride, in scarlet and gold jackets and black breeches. . . . AND, still on the subject of the 124th, their Hornets won 5 straight victories and championship of round-robin indoor polo at International Livestock Show, Lts. Rice, Fergus, and Schuh up.

FIELD ARTILLERY ROTC UNITS
(December 18, 1936)

Corps Area	*Institution*	*Voluntary or Compulsory*	*Location*	*Type**	*Number of Btrys.*	*Name and Rank of Officer in Charge of Unit*	*Enrollment, October, 1936*	*PMS&T or Senior FA Officer*	*President of Institution*
IV	Alabama Polytechnic Institute	C	Auburn, Alabama	MXD	3	Lt. Col. F. C. Wallace	1,181	PMS&T	Luther Noble Duncan
VII	Arkansas State College	C	Jonesboro, Arkansas	TKD	2	Major W. E. Corkill	155	PMS&T	V. C. Kays
VIII	Colorado State Col. of A&M Arts	C	Fort Collins, Colo.	HD	2	Lt. Col. N. P. Morrow	939	PMS&T	Charles A. Lory
V	Culver Military Academy	C	Culver, Indiana	HD	1	Lt. Col. John S. Wood	117	PMS&T	L. R. Gignilliat, Supt.
II	Cornell University	C	Ithaca, New York	MXD	3	Major C. E. Boyle	1,125	Senior	Livingston Farrand
III	Duquesne University	V	Pittsburgh, Penna.	TKD	1	Lt. Col. Mert Proctor	161	PMS&T	J. J. Callahan
V	Eastern Kentucky St. Teach. Col.	V	Richmond, Kentucky	TKD	1	Major C. W. Gallaher	130	PMS&T	H. L. Donovan
IV	University of Florida	C	Gainesville, Florida	TKD	3	Colonel W. S. Browning	1,170	PMS&T	John J. Tigert
I	Harvard University	V	Cambridge, Mass.	HD	1	Lt. Col. A. R. Harris	224	PMS&T	James B. Conant
VI	University of Illinois	C	Urbana, Illinois	MXD	4	Major Ray L. Burnell	1,307	Senior	Arthur C. Willard
VII	Iowa State College of A&M Arts.	C	Ames, Iowa	HD	2	Lt. Col. H. E. Odell	1,161	PMS&T	R. M. Hughes
IV	Louisiana St. Univ. & A&M Col.	C	Baton Rouge, La.	TKD	2	Major Christiancy Pickett	471	Senior	James M. Smith
VI	Michigan State Col. of A&Apl.S.	C	East Lansing, Mich.	TKD	2	Major A. C. Stanford	453	Senior	Robert S. Shaw
VII	University of Missouri	C	Columbia, Mo.	HD	2	Colonel M. G. Randol	854	PMS&T	F. A. Middlebush
VII	University of Nebraska	C	Lincoln, Nebraska	TKD	1	Major R. G. Barkalow	468	Senior	E. A. Burnett (Chan.)
V	Ohio State University	C	Columbus, Ohio	MXD	4	Lt. Col. E. T. Spencer	3,436	Senior	George W. Rightmire
VIII	University of Oklahoma	C	Norman, Oklahoma	MXD	4	Major R. M. Howell	1,592	PMS&T	William B. Bizzell
IX	Oregon State Agricultural Col.	C	Corvallis, Oregon	TKD	2	Major William Spence	755	Senior	George W. Peavy
II	Princeton University	V	Princeton, N. J.	MXD	2	Lt. Col. David E. Cain	419	PMS&T	Harold W. Dodds
V	Purdue University	C	Lafayette, Indiana	TKD	4	Lt. Col. Carlos Brewer	2,472	PMS&T	Edward C. Elliott
IX	University of Santa Clara	V	Santa Clara, Calif.	TKD	1	Major E. T. Barco	161	PMS&T	James J. Lyons
IX	Stanford University	V	Stanford Univ., Calif.	HD	2	Lt. Col. B. R. Peyton	235	PMS&T	Ray Lyman Wilbur
VIII	A. & M. College of Texas	C	College Station, Texas	TKD	3	Major Orva E. Beezley	780	Senior	T. O. Walton
II	St. Bonaventure College	V	St. Bonaventure, N. Y.	TKD	1	Major D. de S. Trenholm	90	PMS&T	Thomas Plassmann
IX	University of Utah	V	Salt Lake City, Utah	MXD	2	Lt. Col. C. C. Bank	705	PMS&T	George Thomas
III	Virginia Military Institute	C	Lexington, Va.	HD	2	Major J. M. Fray	326	Senior	John A. Lejeune, Supt
V	Xavier University	C	Cincinnati, Ohio	TKD	1	Major A. McK. Harper	196	PMS&T	Dennis F. Burns
I	Yale University	V	New Haven, Conn.	MXD	2	Lt. Col. F. T. Armstrong	168	PMS&T	James R. Angell

*HD—Horse-drawn—7
TKD—Truck-drawn—13
MXD—HD and TKD—8

C—Compulsory—19

V—Voluntary—9

PMS&T	19
Senior	9
Total	28

A Letter From Thorvald

Anoka, Minn.
Oktember twanty t'ree

Dear Ayditor:
Ay yust har read in magazine they sal',
W'er fellar write on Leavenworth, an' he var raisin' hal',
So maybe yu' skol bane so gude for give me little space
An' Ay skol tal' vat us Norweiyans t'ank about de place.

De Yeneral Staff bane make de rules—var different set each fall—
Har yust one rule vich dey ain't shange—dey keep de classes small;
An' ven yu' get to be old man, like t'irty-five or six,
Yure shance har pass, for ain't no use for teach new dog old tricks.
So yu' skol know who make de rules, and never make mistake,
Dey vearin' Landon botton vere yu' gat de bellyache,
Dis har alright, Ay ain't obyeckt to anyt'ing dey do
So long de ain't forget de rest are in the Army tu.

But here var how dey work it now—dis har bane common knowledge;
Yu' vant R. O. T. C. detail at Mohler Barber College,
Yu' got same shance for land de place—an' dis bane prutty plain—
As if yu' vantin' New Deal yob, ven yu' skol vote in Maine.
Dem C. an' G. S. granulates bane gettin' all de juice,
An' all dem oder officers bane t'ankin': "Vat's de use?"
"Ay can't get into Arlington to lay my bones to rest"
"Unless certificate from skule var pinned upon my chest!"

If Yeneral Staff would only say: "Dere's some brains left on earth"
"Vich didn't grow on sacred soil of place call' Leavenworth,"
"Dem *Poikas*' in de Army yet, not yust a chosen few,"
"An' ve skol giving dem a shance for gude assignment tu,"
Den all dem solyers everywhere skol qvit to makin' yal',
An' get right down to sawin' vood, and vorkin' hard sum hal';
Dey hittin' head right on de nail, an' actin' like gude sport,
An' vork on yob instead of on—efficiency report.

Now Mister Ayditor, Ay close, an' dat skol make yu' glad,
An' Ay don't vant to go to skule, an' ay ain't really mad,
But yu' skol know de Chief of Staff, so write him, yust for fun
An' say dat he skol send to skule.

Yours,

THORVALD ANDERSON.

(As dictated to Arnold W. Shutter.)

Reviews

PERIODICALS

AS PERHAPS never before during a time of technical "peace," newspaper columns are filled with tidings of armament. Photographs and newsreels are making the uniforms, the types of weapons, even the organization, of foreign armies familiar to the man on the street. It has become obvious to many that force—present, latent, or threatened—is tied up somehow with the mysterious ebbs and flows of international exchange in goods, cash, and credit which daily affect the prosperity of all. Readers have become armament-conscious as news from Ethiopia, Spain, and China, from Germany, Italy, Russia, and Japan repeatedly deepens the impression which an ordinary advertising campaign achieves by mere repetition. To substantiate this estimate of the situation—and to supply the demand for more accurate and detailed information which comes not only from the military, but from business executives and men in all walks of life—several military magazines and digests have appeared in the publication field. Among those which have reached this office are:

Laurels. This magazine, whose subtitle is, "Monthly Chronicle of Military History in the Making," is published by Major Edmund C. Fleming, FA-Res., former regular army military attache in South America, at 1006 Iroquois Avenue, Detroit, Michigan.

Its December, 1936, issue contained 32 pages, 10 by 13 inches, on smooth paper, with some 50 photographs, maps, and sketches, most of them very large. Among the titles: "The Fight for Madrid, Switzerland Strengthens Defenses, Rank in the Red Army, Railroads to North China, A Veteran of 120 Years, New U. S. Infantry Division, National Policies and Defenses."

In the truly digest size and format, made familiar, in the last few years, to the general reader, are two other publications:

Military and Naval Digest. Colonel Irving Odell, FA-Res., commanding officer of an Illinois reserve regiment, has recently begun publication of this monthly, which is to contain 96 pages of "actual condensations of leading articles thoughtfully selected from the principal military magazines both at home and abroad." It is to contain a discussion section for the airing of readers' views, professional notes, and notes on international affairs, and a 16-page book supplement which will condense the substance of an important military publication, chosen monthly. The offices of this magazine are at 100 Telegraph Building, Harrisburg, Pa.

The Military Digest. The December, 1936, issue of this monthly periodical contained 110 pages, with more than a dozen illustrations, of condensations from French, German, Italian, Belgian, Argentinian, Mexican, and Cuban military publications, and from those of the Command and General Staff School. It is published by The Military Digest Company, 88 Montclair Avenue, Boston, Mass.

Whatever of interest the average man will continue to find in these or similar publications after the current world uneasiness subsides, all three will remain of value to the professional soldier, if only because the matter has been translated, in large part, from foreign publications, has been stated concisely, or because military news has been interpreted by persons better qualified to do so than the average so-called war correspondent.

BOOKS

COMBAT INTELLIGENCE, *Its Acquisition and Transmission*, by Major Edwin E. Schwien, *Cavalry, U. S. A.* Published by The Infantry Journal, Infantry Bldg., Washington, D. C. $2.00.

Major Schwien, graduate of the École Supérieure de Guerre, and lately instructor at the Command and General Staff School, has written a much-needed work.

Here is a book whose scope is really too important to be dismissed with a necessarily brief review. Combat intelligence is a subject more complex than crime detection; it is not enough to determine, patiently, and by cross-examination of many reluctant witnesses—by scrutiny of dozens of documents; and by reports from scores of persons excited by the pressure of imminent events, that a certain thing was, or was not, done some time ago. It is necessary to determine the act within a space of hours, and to forecast its results with precision, maintaining, with the train of events, a close and rigidly alert contact.

For that reason this admirable treatise on a little-known science must be more than read—it must be studied.

The many clear sketches and fold-out maps which illustrate the text are essential to the comprehension of the type cases which it contains. These cases stress tactical intelligence—and this is as it should be. The book explains the special interest which the field artillery, and the air corps have in their own technical intelligence problems. These, of course, are subject to change. The author's discussion of air-photo and air-reconnaissance limitations likewise is subject to change; otherwise the methods employed and the principles discussed will have as likely application in the next war as they had in the last. To the purely field artillery intelligence problem, this work contributes little in the way of solution, but since the tactics of artillery are the tactics of the arms which it supports, the text is recommended to the study of all, and particularly to those who wish to prepare themselves for the Command and General Staff School.

●

National Guardsmen named to take West Point exams March 2 include Pvt. Dick Stanley von Schriltz, 161st FA; Pvt. Roger Lee Russell, 150th FA; Pvt. Raymond J. Schnittke, 258th FA; and Pvt. Joseph Scranton Tate, Jr., 156th FA, son of Major J. S. Tate, FA. . . . . Major R. Townsend Heard's Boltar, outstanding horse in 2d Division Horse Show, wins Soissons bowl for owner. . . . 1st Lt. Hal Isaacson, 18th FA, en route to Valparaiso, Chile, with Army Equestrian Team.

●

General Henri Gouraud, 69, of the French Army, retires. His arm amputated after a Turkish shell mangled him at Gallipoli in 1915, he commanded the French and American forces which withstood the brunt of the German attack in July, 1918, described in this issue. His order:

"Soldiers of France and America, the eyes of the world are upon you tonight, and in your hands you hold the destiny of Europe. Your post is that of greatest danger, and you will hold it with honor. Many—perhaps all of you—will pay for that honor with your lives. Be it so. You are the rock to which France clings tonight, and on that rock will the enemy dash themselves in vain. The order of the night is, 'Stand or Die!'"

THANKS TO THESE—

The frontispiece was secured through the courtesy of Colonel G. H. BAIRD, Cav, Hq 2d C.A., who had a photograph taken of the original painting, which was made for a wartime recruiting poster, and which now hangs in the Officers' Club at Governor's Island.

●

Our leading article was written by Brigadier General LESLEY J. McNAIR, who attained that rank New Year's Day, and has left his assignment as Executive Officer in the office of the Chief of Field Artillery for a short leave prior to taking

BRIGADIER GENERAL L. J. McNAIR

command of the Second Field Artillery Brigade at Fort Sam Houston. Stars fell on no unaccustomed shoulders, for General McNair held that rank during the war, and the troops of the Second Division, if they read G.O. 59, 1919, will find, in the citation that awarded him a Distinguished Service Medal, "He was largely responsible for impressing upon the American Army sound principles for the use of artillery and for improving methods for the support of infantry, so necessary to the proper cooperation of the two arms." This, as senior artillery officer in the training section of the General Staff. After the war he commanded, for a few weeks in 1919, the 1st Division; was G-3 of the Hawaiian Department; P.M. S. and T. at Purdue University; Assistant Commandant of the Field Artillery School; then to the Chief's Office. General McNair is a graduate, USMA '04, School of the Line, '21, and Army War College, '29. He was on the initial G.S.C. Eligible List.

His detailed study of the autogiro recalls another phrase from the citation. "He displayed marked ability in correctly estimating the changing conditions and requirements of military tactics."

The 2d Brigade's gain will be the loss of many, and of none more than the staff of this JOURNAL.

●

Major ARNOLD W. SHUTTER, FA, who ghosts for Thorvald, is at home in any dialect, as readers of other service journals know. At present on duty in the National Guard Bureau, Major Shutter is our choice for the mantles of T. A. Daly, and Finley Peter Dunne.

What we've been able to discover about Colonel EDWARD N. WENTWORTH would make a story in itself: First Training Camp captain; staff, 5th FA Brig. at St. Mihiel; mentioned in orders, 28th Div.; G-5, GHQ, Paris, 1919; Asst. Dir., College of Agriculture, AEF University; last summer CO, 161st FA Brig.; member 15 learned and military societies, and of Sigma Alpha Epsilon, Alpha Zeta, Alpha Psi, Sigma Delta Chi, Phi Kappa Psi. . . *Officier du Merite Agricole, France* . . . Ames, Cornell, Harvard . . . professor, editor, lecturer at University of Chicago. . . now Director of Armour's Livestock Bureau.

Colonel CONRAD H. LANZA was reintroduced to our readers in the September-October issue.

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And so was Captain Joseph I. Greene, Infantry, who makes traffic studies his hobby.

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Captain CRESWELL G. BLAKENEY, FA, who wrote HORSE vs. MOTOR—RECRUITS, has had opportunity to draw his conclusions. He SATC'd during the war, graduated with a B.S. degree from Purdue University in 1921, and now is stationed with the Princeton University ROTC.

●

Titles of Essays Received

Seventeen essays were submitted for the contest which ended January 1. It is hoped that the winning essay may be selected in time to publish it in the March-April number. The titles of those received follow:

Mobile Artillery
March, March, March
Reorganization of the Personnel System
Artillery Support of a Wide Envelopment
Motog
Forks and Fallacies
Concerning Horse-drawn Artillery
Artillery Missions and Doctrines
What is the Answer?
Maps for Tomorrow
A New Role for Field Artillery
An Adventure in Gunnery
Some Observations on the Employment of the National Guard in Civilian Disturbance and Disaster
The Artillery Preparation and Support of Our Attack
Out of the Fog
Better Late than Never
Finesse in Firing

●

To his record as Governor of Indiana (*term of office expired January 11*), *former National Commander of the American Legion, Colonel of Field Artillery Reserve, and long-time member of the Field Artillery Association, Paul V. McNutt adds the distinction of promotion to Commander in the Legion of Honor. . . . The eight Cunningham brothers, including two sergeants and two corporals, can man the pieces of Battery E, 132d FA Texas National Guard, until the rest of the battery arrives.*

●

Mr. J. H. Ransom, publisher of "Turf and Tanbark," 103 Park Avenue, New York City, will pay for suitable articles, dealing, comprehensively, with accounts of horse shows which contain military classes. . . .

YES, THE JOURNAL is lighter and thinner—about one-sixth of each. But it contains about 20 per cent more reading matter, which is what you wanted, isn't it? This is the result of going to two-column 10-point, instead of one-column 12-point. If you don't like it this way, let us know. As at present constituted, it affords more room for more authors—but no room for any author to run longer in the same place.

●

ORDERS ARE coming in for the last issue—the one with the movies. One officer ordered seven copies. Others write to ask if extra copies are available. They are. And there will be extra copies available of this issue, too.

●

A MEMBER writes:

"My idea of a service journal is that it should be a dignified professional publication presenting the untrammeled views of officers on the many subjects that are worthy of discussion, together with studies of recent military events and developments. The French and Italian journals, and some of the German and English ones, achieve this and I see no reason why our publications cannot do so. After observing them for about thirty years, however, I have come to the conclusion that they, in general, have not reached such a standard. I have seen them go through various stages, from the copying of regulations to the Joe Miller joke book type, and the present trend seems to be the columnist and human interest treatment—sketches of authors, personal notes on Joe Gish of the pistol team, and doings of the Umpth regiment, and articles on whether people should be tattooed for identification. I don't believe these things are needed in a professional publication."

We like this letter. We didn't have a bit of difficulty understanding what the writer meant. Within the limits of its mission, the JOURNAL endeavors to satisfy the requirements of the majority of its readers. We relish plain speaking in their views.

Other letters come to mind. One, received some time ago, was from a member who was very cross with us because, he said, we had permitted his dues to grow to an appreciable amount without drawing the matter to his attention. This letter has been tested for invisible ink and been held up to a mirror, and continues to be baffling. There was a temptation to reply that if we had a ten percent return on the extra postage the writer had cost us, we would have enough on hand to be able to send him another statement, but we counted a hundred (by fifties) and came up with what a friend calls The Perfect Solution. Whenever he is asked by a superior what in time he meant by doing so and so, he replies, "Yes, *Sir!*" This has been filed in our memory book with the late Senator Dwight Morrow's Rule Six, which was, "Don't take yourself too darned seriously." (The other five rules, it is said, were burned up in the great Chicago fire.)

There was, too, the proxy card from the member we had been hunting for diligently, with the aid of the Post-office Department, to tell him he was slightly behind in his dues. Anyway, he helped the straight ticket. Of course, we couldn't exercise the franchise

for the man who doesn't belong to the Association because he reads the JOURNAL in the orderly room. At least he reads it. (After you've read every word of it six or seven times it bores you—that's our experience.) Now and again, a letter comes into the office saying very nice things about the editorial policy—but wondering just what the editorial policy *is*.

When the first one of these arrived, we dug up the policy, dusted it off, inspected it to make sure it hadn't lapsed, and discovered it was blank. That is, there is no editorial policy we're unwilling to change, but we confess to a predilection toward making the JOURNAL a forum—but not a soapbox. Does that help any?

●

AMONG THE mistakes we made last year was reporting Captains Burger and Hittle as being at University of Missouri, instead of at their proper station, Oklahoma University.

●

REVISTA MILITAR, an Argentine military journal, in its November issue, reviewed our September-October one. In looking over the listed contents, we wondered just what a translator would do with "Trucking—And How." It was there—"Cambiando—¡y como!"

●

"YES SIR," said an early BC of ours, "when you held up your right hand, that was a tacit admission that it was possible for you to be in two places at the same time—and you had better be there. I would point out to you that to be in two places at the same time—clock time, that is—it is only necessary to approximate a velocity of 1,000 miles an hour, and I suggest that you start approximating it right now."

We had forgotten all about this until the autogiro came along.

MILITARY BOOKS

Following is a list of books on military subjects which are recommended for their professional value as well as interesting content:

	Price (*Domestic postage included*)
FIELD ARTILLERY: The King of Battles—*Maj. Gen. H. G. Bishop*	$2.00
THE AMERICAN ARMY IN FRANCE—*Maj. Gen. James G. Harbord*	5.00
WITH NAPOLEON IN RUSSIA—*Gen. de Caulaincourt*	4.00
NO PEACE WITH NAPOLEON—*Gen. de Caulaincourt*	3.00
R. E. LEE—*Freeman* (4 vols., each)	3.75
A MODERN MILITARY DICTIONARY—*Col. Max B. Garber*—Cloth	2.50
—Leather	2.75
INFANTRY IN BATTLE	3.00
THE INFANTRY BATTALION IN WAR—*Lt. Col. Walter R. Wheeler*	3.00
ITALY'S PART IN WINNING THE WORLD WAR—*Colonel G. L. McEntee*	2.00
THE NATION AT WAR—*Gen. Peyton C. March*	3.00
FOCH: THE MAN OF ORLEANS—*Capt. Liddell-Hart*	4.00
THE WAR IN OUTLINE—*Capt. Liddell-Hart*	4.00
COMBAT INTELLIGENCE—*Schwien*	2.00
WAR IN THE PACIFIC—*Denlinger and Gary*	3.00
VERDUN—*Petain*	4.00
REMINISCENCES OF A MARINE—*Lajeune*	4.00
JULY, 1914—*Ludwig*	3.50
FOCH SPEAKS—*Bugnet*	3.00
IT MIGHT HAVE BEEN LOST—*Lonergan*	3.00
THE OLD ARMY: MEMORIES—*Parker*	4.00
ULYSSES S. GRANT—*McCormick*	5.00
INTRODUCTION TO MILITARY HISTORY—*Albion*	2.25
AMERICAN CAMPAIGNS (2 vols.)—*Steele*	10.00
COLOSSAL BLUNDERS OF THE WAR—*Woods*	2.50
POLO PONIES—*Cullum*	5.00
ROBERT E. LEE, THE SOLDIER—*Maurice*	4.00
FIFTEEN DECISIVE BATTLES—*Creasy*	1.00
ORDEAL BY FIRE—*Pratt*	3.00
OFFICERS' MANUAL (Revised)—*Moss*	3.00
OFFICERS' GUIDE, 1930	2.75
HINTS ON HORSEMANSHIP—*Lt. Col. McTaggart*	2.50
ARTILLERY TODAY AND TOMORROW—*Rowan Robinson*	2.00
SOME ASPECTS OF MECHANIZATION—*Rowan Robinson*	1.50
THE FELLOWSHIP OF THE HORSE—*Lt. Col. Goldschmidt*	5.00
LIFE OF GRANT—*Fuller*	5.00
THOUGHTS OF A SOLDIER—*Von Secht*	2.50
HORSE SENSE AND HORSEMANSHIP—*Brooke*	5.00

A reduction of 10% will be made to JOURNAL readers who purchase any of the above books through the U. S. Field Artillery Association.

The Association is in a position to obtain for its members not only books on military subjects but biographies and fiction as well, at a reduction of 10%.

The United States Field Artillery Association
ORGANIZED JUNE 7, 1910

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