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CONTENTS

SIXTEEN-INCH HOWITZER, MODEL 1920 ..... *Frontispiece*

THE RAILWAY ARTILLERY RESERVE, AMERICAN E. F. 1
By COL. H. C. BARNES

MOBILITY OF NEW 3-INCH A. A. GUNS ..... *By* CAPT. JOHN K. CHRISTMAS 34

R. O. T. C. TRAINING ..... *By* LIEUT. COL. HARTMAN L. BUTLER 43

FORMS FOR THE BATTERY COMMANDER'S COMBAT ORDER, ANTI-AIRCRAFT ARTILLERY ..... *By* MAJ. JOSEPH C. HAW 52

MECHANIZATION IN EUROPE ..... *By* MAJ. C. C. BENSON 56

A NICKEL'S WORTH ..... *By* CAPT. ALBERT M. JACKSON 66

THE DEVELOPMENT OF HEAVY ARTILLERY DURING THE WORLD WAR ..... *By* LIEUT. ALVIN T. BOWERS 70

COLONIAL COAST FORTS 74

PROFESSIONAL NOTES 79
Commissioned Personnel, O. C. C. A.—Graduates of the Coast Artillery School—Review and Exhibition Drills by the 243d Coast Artillery (H. D.)—Foreign Periodicals.

COAST ARTILLERY BOARD NOTES 84

BOOK REVIEWS 86
One Man's War: The Story of the Lafayette Escadrille—Uniforms of the World—Memoirs of the Late Frank D. Baldwin, Major General, U. S. A.—Our Neighbor Nicaragua—The 1929 Rules and Laws of Auction Bridge—Instinct and Intelligence—Sketches of One Hundred and Twenty-five Historic Virginia Landmarks—A Shopping Guide.

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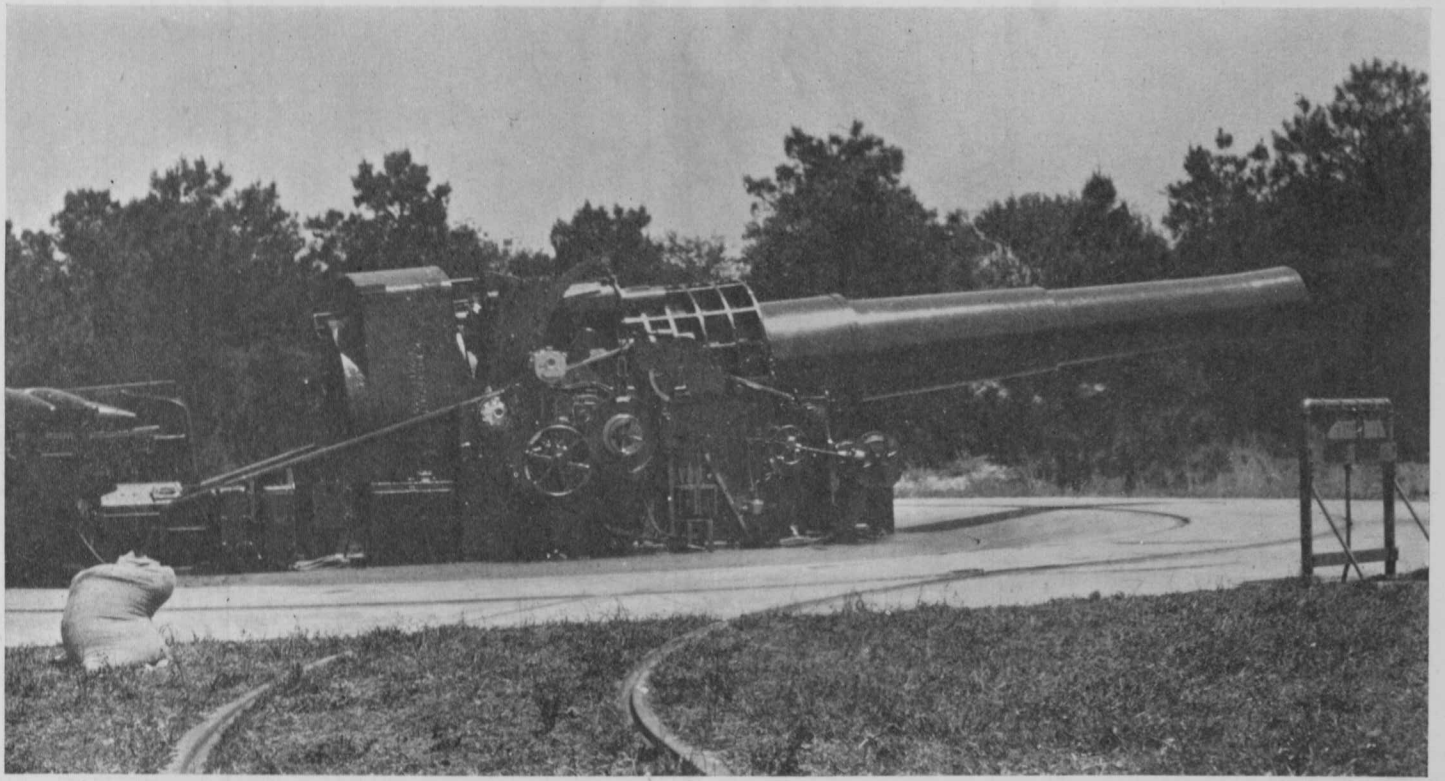

SIXTEEN-INCH HOWITZER, MODEL 1920, MOUNTED ON 16-INCH HOWITZER CARRIAGE, MODEL 1920

THE COAST ARTILLERY JOURNAL

Volume 71 July, 1929 Number 1

The Railway Artillery Reserve, American E. F.

By COL. H. C. BARNES, C. A. C.

TEN years have passed since the final report of the activities of the Railway Artillery Reserve, American E. F., was submitted (December 15, 1918) by Brigadier General William Chamberlaine, U. S. A., who was in command of that organization at the time of its demobilization. There are, however, many officers still in the service whose names appear on the rolls of those who commanded, from time to time, its subordinate units. These, and possibly others, may be interested to read an account of the activities of this organization, which was brought into being and maintained by the Coast Artillery Corps for service with the American Expeditionary Force.

This account has been prepared by the writer largely from data contained in the final report above referred to. However, he has no fear of being charged with plagiarism in the matter since he himself was largely responsible for the preparation of that report, having been at the time of its preparation, and for some time previous thereto, Chief of Operations of the R. A. R.

The nucleus from which the Railway Artillery Reserve, American E. F., expanded and grew consisted of a, so-called, Expeditionary Brigade, Coast Artillery Troops, which was organized during the latter part of July and the early part of August, 1917, at Fort Adams, Rhode Island. This brigade was commanded by Brig. Gen. G. T. Bartlett, U. S. A., and consisted of a Brigade Headquarters and the 6th, 7th, and 8th Provisional Regiments, commanded respectively by Cols. William Chamberlaine, Johnson Hagood, and Frank K. Fergusson, all Coast Artillery Corps. The enlisted men for these regiments were provided by the transfer to the regiments, with but two or three exceptions, of existing units of the Coast Artillery Corps of the Regular Army. The officers above the grade of first lieutenant, with only a few exceptions, were officers of the regular Coast Artillery Corps. The lieutenants were enlisted men of the Coast Artillery Corps given temporary commissions during the war.

Each of these regiments consisted of a Headquarters and Supply Company, composed largely of enlisted specialists, and three battalions of four batteries each. Each battery consisted of three officers and one hundred

and thirty-two enlisted men, organized with a view to manning one 10-inch gun on railway mount—twelve guns per regiment.

Upon completion of the organization of the brigade in the early part of August, 1917, the movement to France was begun. The Brigade Headquarters and the 6th Regiment, the 7th Regiment, and the 8th Regiment, left Fort Adams and sailed from New York, in the order named, between August 13 and 25, 1917. The brigade, in three Cunard Line steamers (*Andania, Aurania,* and *Panonia*), proceeded to Liverpool, England; thence via Southampton and Le Havre, to Mailly le Camp (Aube), France, where it was assembled early in September, 1917. In the meantime Brig. Gen. G. T. Bartlett, U. S. A., had been detached from the brigade and Col. F. W. Coe, C. A. C., had been assigned to command the same. The latter, promoted to brigadier general, N. A., continued in command of the brigade until relieved on May 22, 1918, and sent back to the United States to become Chief of Coast Artillery.

The designation of the brigade was changed in September, 1917, to "1st Separate Brigade (C. A. C.)." The designations of the regiments comprising the 1st Separate Brigade (C. A. C.) were changed in February, 1918, as follows:

6th Provisional Regiment to 51st Artillery (C. A. C.).
7th Provisional Regiment to 52nd Artillery (C. A. C.).
8th Provisional Regiment to 53d Artillery (C. A. C.).

The designation of the brigade was, in March, 1918, again changed from "1st Separate Brigade (C. A. C.)" to "30th Artillery Brigade (C. A. C.-Railway)."

In March, 1918, there was organized within the 30th Artillery Brigade, (C. A. C.-Railway), a provisional regiment, designated the "Howitzer Regiment, 30th Artillery Brigade (C. A. C.-Railway)." This provisional regiment, as finally organized, consisted of a Regimental Headquarters and Supply Company and four battalions of two batteries each.

In April, 1918, the 30th Artillery Brigade (C. A. C.-Railway), comprising the 51st, 52nd, and 53rd Regiments of Heavy Artillery, American Expeditionary Force, together with such auxiliary troops as were permanently assigned to the service of the railway artillery, was designated the "Railway Artillery Reserve, 1st Army, American Expeditionary Force."

The 54th Artillery (C. A. C.) joined the Railway Artillery Reserve in April, 1918, and was designated as the Replacement Regiment for Heavy Artillery.

In June, 1918, Brig. Gen. William Chamberlaine, N. A., was assigned to command the Railway Artillery Reserve and the 30th Brigade of Heavy Artillery. General Chamberlaine assumed command on June 29, 1918,

and remained in command of the Railway Artillery Reserve until it was demobilized in December, 1918.

In the interval between the relief from command of Brigadier General Coe and the assumption of command by Brigadier General Chamberlaine, Col. Malcolm Young, C. A. C., commanded the Railway Artillery Reserve by virtue of seniority.

In July, 1918, the 51st, 52nd, and 53rd Artillery (C. A. C.), and the Howitzer Regiment, 30th Artillery Brigade (C. A. C.-Railway), were reorganized into six regiments, viz: 41st, 43rd, 51st, 52nd, 53rd, and 81st Artillery (C. A. C.). The organizations of the original regiments were retained in the newly organized regiments except that Batteries "F" and "G," 51st Artillery (C. A. C.), were transferred to the 57th Artillery (C. A. C.). To replace these two batteries in the Railway Artillery Reserve, Batteries "C" and "D," 57th Artillery (C. A. C.), were transferred to the new 43rd Artillery (C. A. C.). At this same time the 42nd, 52nd, and 53rd Artillery (C. A. C.) were assigned and the 43rd Artillery (C. A. C.) was attached to the 30th Artillery Brigade (C. A. C.), and the 30th Artillery Brigade (C. A. C.), with the 43rd Artillery (C. A. C.) attached, was assigned to the Railway Artillery Reserve. The 51st and 81st Artillery (C. A. C.) were assigned to the 39th Artillery Brigade (C. A. C.) and were detached from the Railway Artillery Reserve. Later on the designation of the 81st Artillery (C. A. C.) was changed to the 44th Artillery (C. A. C.).

In October, 1918, all units which had theretofore been assigned to the Railway Artillery Reserve, 1st Army, American Expeditionary Force, were redesignated as constituting the Railway Artillery Reserve, American Expeditionary Force.

The following Coast Artillery Corps organizations joined the Railway Artillery Reserve at Mailly le Camp (Aube), France, during the latter part of October, 1918. No orders assigning these organizations to the Railway Artillery Reserve were ever received:

Headquarters, 40th Artillery Brigade (C. A. C.)
73rd Artillery (C. A. C.)
74th Artillery (C. A. C.)

Advance School Detachments from the 75th Artillery (C. A. C.) also joined the latter part of October, 1918, but due to the cessation of hostilities this regiment never joined.

In September, 1918, the U. S. Naval Railway Batteries, Rear Admiral C. P. Plunkett, U. S. N., commanding, were announced as a part of the Railway Artillery Reserve.

During the existence of the Railway Artillery Reserve, the following auxiliary organizations became a part thereof, either by assignment thereto or by creation within the organization:

Railway Artillery Supply Depot, American Expeditionary Force.
Military Police Detachment.
Motor Transport Detachment.
Railway Artillery Repair Shop.
1st Provisional High Burst Ranging Section.
1st Railway Artillery Operation Battalion, A. S. C.
1st Railway Artillery Construction Battalion, A. S. C.
Organization and Training Center No. 6, including the Railway Artillery Specialists' School.

The armament manned by the units of the Railway Artillery Reserve, American Expeditionary Force, at the date of the signing of the Armistice, consisted of the following:

16—24 G's
32—19 G's
12—32-cm.
2—340-mm.
4—400-mm.
5—14-inch U. S. Railway.

Total 71 pieces.

The distinctive insignia adopted by the Railway Artillery Reserve, American Expeditionary Force, was called the Oozlefinch, although it did not in any respect resemble the original bird of this name, the history of which was portrayed by Col. E. R. Tilton, C. A., in *Liaison*, issue of June 21, 1919, and reprinted in the COAST ARTILLERY JOURNAL for July, 1928. General Chamberlaine and the writer of this article were both of the opinion, when the matter of the adoption of a distinctive insignia for the R. A. R. was up for decision, that the Oozlefinch would be quite appropriate for adoption. This opinion was based upon two facts: First, that the Oozlefinch was distinctly Coast Artillery, there being but one in existence and that one in a glass cage in the Fort Monroe Club, and second, that the R. A. R. was the largest single Coast Artillery organization in the American Expeditionary Force. General Chamberlaine and the writer both made many attempts to reproduce the bird on paper, but we lacked either a sufficiently distinct recollection of his appearance or sufficient artistic ability to picture our recollection of him. We finally gave it up and, as time did not admit of getting a reproduction from the States, the artist of the R. A. R. was given as complete a description as we could give and directed to submit several drawings from which to select. This he did and the bird which was given the name of the Oozlefinch and was used as the distinctive insignia of the R. A. R. was one of those submitted. In this connection the following correspondence which passed between Brig. Gen. William Chamberlaine, commanding the Railway Artillery Reserve, American Expeditionary Force, and Maj. Gen. F. W. Coe, Chief of Coast Artillery, as

well as "A Toast to the Oozlefinch," by Abraham B. Cox, Captain, Ordnance, U. S. A., on duty with the R. A. R., may be of interest.

HEADQUARTERS RAILWAY ARTILLERY RESERVE
France, 24 October, 1918

General:

1. I have the honor to send you herewith, a design of the "Pochoir," which you will readily understand is the distinctive mark painted upon all transportation belonging to the Railway Artillery Reserve, American Expeditionary Force.

2. This design, which is the combined effort of all the genius contained at the present time in the Railway Artillery Reserve, is intended to represent as well as can be recalled by memory, the Oozlefinch, a rare bird which you will recall was incarcerated in a cage in one of the card rooms at the Fort Monroe Club. You will recall that this bird is a *sui generis*, and believed to be the only one in captivity, hence, after much reflection, I have concluded to adopt it as the emblem of the Railway Artillery Reserve, American Expeditionary Force, being symbolic of the only Railway Artillery Reserve known to exist in our service. You will note from examination of the accompanying drawing, that the Oozlefinch is very proud of himself. He wears a trench helmet, perhaps uselessly, but with effect. He has not many feathers, but in order to give a coquettish appearance, he has his left foot cocked up in the air. On this foot you will notice a wrist watch, which indicates 7:30. This is the hour for all hands in the Railway Artillery Reserve to begin work. On his right leg, he wears a *plaque d'identité*, which all chic soldiers are now supposed to wear in France. You will further notice that he is perched upon a section of rail, symbolic of the Railway Artillery Reserve, being surrounded by epis, which permits him to fire in any direction. The design is placed upon a white polygon, surrounded by red, suggestive of the Coast Artillery Corps, and having many sides, is supposed to be an allusion to the capabilities of the Coast Artillery Corps officers, who, in France, perform any duty but that pertaining to the Artillery Corps.

3. The motto of this design is "*Abandonné en France, sans ami*," which you will readily interpret, "Abandoned in France without friends."

4. I ask you to accept again the continuance of my highest esteem and beg to remain,

Very sincerely,
(Signed) WILLIAM CHAMBERLAINE.

MAJ. GEN. F. W. COE,
Chief of Coast Artillery,
War Department,
Washington, D. C., U. S. A.

OFFICE OF THE
CHIEF OF COAST ARTILLERY
Washington, D. C.

November 19, 1918.

From: Chief of Coast Artillery.
To: Commanding General, R. A. R., A. E. F.
Subject: Distinctive mark for Railway Artillery.

1. The "Pochoir" of the Railway Artillery Reserve which you so kindly forwarded, arrived in perfect condition and at present adorns the wall of

my office where I can gaze upon it with all the admiration and perfect understanding that it has awakened in me.

2. Feeling that such a work of art and genius should be embodied in the archives of the great war, I turned it over for a day to the Military Intelligence Bureau who, wishing to show their undying appreciation and gratitude for such an unprecedented honor, submitted the following information, which is, to my mind, both interesting and instructive:

> The OOZLEFINCH, a rare and almost extinct bird having but one feather, which it displays with great pride and gusto. This bird lives entirely on "hopes," which it forages from promises, rumors, mimeographs, and unconfirmed orders.
>
> While ordinarily of happy disposition it has been noted that lately the OOZLEFINCH has been plunged at times to the depths of despair, despondency and desolation, which is doubtless caused by the fact that it is unable to ascertain if the hour of 7:30, symbolic of the time at which all hands in the R. A. R. commence work, is a. m. or p. m.
>
> The chief enjoyment of the OOZLEFINCH is to sneak off to an Artillery park and there to listen to an M. T. S. calling to its mate, repeating to himself all the while, "gazook-gazoo"—which, when translated, means, "I DIDN'T KILL A SINGLE BOCHE 'CAUSE OUR POWDER DIDN'T COME."

3. As I have remarked several times since its arrival, the "Pochoir" is not only interesting and instructive but inspiring, as can well be shown by the following "Ode to the OOZLEFINCH," written by an Ordnance officer after a short glance at the wonderful bird, and anything that can inspire an Ordnance officer is indeed a thing to be marveled at and its glory should be sung in every publication from the COAST ARTILLERY JOURNAL to the *Police Gazette.*

ODE TO THE OOZLEFINCH

O ffensives, are his dotage, advancing foot by foot
O riented, so to shoot *"Dans tous les azimuths";*
Z ealous and Resourceful, and just 'twixt me and you
L eave it to our warlike bird, is the word at G. H. Q.
E very time he flaps his wings, the big guns go in action
F iring from a railway track to get the proper traction.
I n this war he was so young, Ah, yes it was too bad,
N ever once could he flap his wings when one feather's all he had;
C ome what may, however, this one fact is a cinch,
H ere's to the R. A. R., by gosh, and its little—

F. W. COE,
Major General,
Chief of Coast Artillery.

HEADQUARTERS RAILWAY ARTILLERY RESERVE
American Expeditionary Forces, France
6 January, 1919

From: The Commanding General.
To: The Chief of Coast Artillery, Washington, D. C.
Subject: Distinctive Insignia for Railway Artillery, American E. F.

1. The Railway Artillery Reserve is highly gratified to know that its "pochoir," the Oozlefinch, properly placed upon the wall of the Headquarters

of its parent Coast Artillery Corps, is receiving its due measure of respect and admiration.

2. It is thought, perhaps, that the merits of this rare, noble and almost extinct bird are not fully appreciated, and that this failure is the result of a lack of sympathetic understanding on the part of your Military Intelligence Bureau.

3. It is true that upon his arrival on the scene of action "over here," he had little else but "hopes" upon which to live, and further, that these "hopes" were only born and kept alive by his own foraging from promises, rumors, mimeographs, and unconfirmed orders—the latter being given at times "By direction." However, being a wise bird, and knowing that "hope deferred maketh the heart sick," he bestirred himself and foraged, not only from "promises, rumors, etc.," but from other and more tangible sources, with the result that as time passed and his development proceeded, he subsisted on a substantial fare of big guns and plenty of ammunition—"hopes" serving but to spur him on to added activities.

4. In fleeting moments of the past, shadows of despair may have clouded the countenance of the Oozlefinch, customarily so contented, yet expressive of punctilious pride and martial bearing; but this mental desolation, if in truth it really existed, other than in the minds of the uninitiated, did not reflect any indecision as to whether 7:30 is a. m. or p. m. Only one who views the struggle at long-range from beyond the seas could fail to know that in the land of France, the military day contains but one 7:30.

5. In the days of his early development it is said that he did derive satisfaction from repeating to himself the refrain: "Gazook-Gazoo." However, in his later days, it was noticed that this expression was entirely eliminated from his vocabulary. The fact that his foraging produced results in powder, as well as in other necessities, and that evidence was not lacking to prove that more than a "Single Boche" succumbed to his marksmanship would indicate that possibly your translation of the above refrain is made with a reasonable degree of accuracy. In this connection it might be interesting to record the fact that, among other Boche casualties which are to be credited to the Oozlefinch, he proudly plumes himself on having brought down one Boche aeroplane and having captured the occupants thereof.

6. The Oozlefinch of the Railway Artillery Reserve was born in time of strife and tribulation; but over this handicap he proved his mastery. After ten active months on the battlefield, he sent his last token to the Hun at 10:57, 11 November, 1918, and now that his part in this great war is over, he will fly back to his home with the Coast Artillery Corps and there reflect with satisfaction upon the fact that he deposited within the enemy lines five million five hundred sixty-eight thousand pounds of cold and convincing steel.

7. During the coming years of enervating peace, his faithful adherents will proudly call to mind his record which may be briefly stated as follows:

He left his home for "over there," among the first to go,
Hell bent to give the cruel Hun a rocky road to hoe.
At first he fed on "hopes," which he foraged, by direction,
From orders, rumors, promises—all lacking confirmation.

The song he sang: "Gazook-Gazoo," in those days of hope deferred,
May indicate that despondency then gripped our sacred bird.
We'll translate it into English, which may assist you some:
"I haven't killed a single Boche, 'cause my powder hasn't come."

His innate wisdom later on showed this to be all wrong,
So he set his mind and heart and soul to find another song.
He saw the fields he foraged in were barren, save for "hope,"
So he looked about, in his wise young way, for fields of better dope.

He found these fields, and he foraged there—guns and powder galore.
And then his troops went to the front. Believe me, the Boche were sore.
For months and months our sacred bird harassed and harried the foe,
And did his bit to make for the Hun a rocky road to hoe.

Counter-battery fire! Interdiction fire! He was always in the fray;
And his last he fired at three minutes of 'leven, on that good armistice day.
So now the song he sings to himself is bright and jolly and gay,
As he sends his troops, with hollers and whoops, back on their homeward way.

His faithful adherents will never forget him,
To do so, would be absurd,
And they dedicate here, the following ode,
To their grand resourceful bird:

O ffensives were his food and drink, he wanted but to shoot,
O riented so to fire *"Dans tous les azimuths";*
Z ealous and resourceful, and just 'twixt you and me,
"L eave it to our warlike bird," was the answer over sea.
E very time he flapped his wings, the big guns got in action,
F iring from a railway track, to get the proper traction.
I n this war he was so young, 'twas wondered what he'd do,
N ot only did he do his bit, but he did it straight and true.
C ome all of you and join' us. Here's a fact that is a cinch—
H appy is the R. A. R. to toast its—

WILLIAM CHAMBERLAINE,
Brigadier General, U. S. A.

A TOAST TO THE OOZLEFINCH

1. You may sing of the EAGLE, that splendid bird
Who dwells by the sounding sea.
Whose head is bald, but whose eyes are keen,
Whose sentinel form is but seldom seen
Keeping watch o'er the Land of the Free.
Long—too long—has he watching perched
And slumbering seemed—perchance,
Till he stretched his wings, as in days of yore,
For a flight which no eagle had ventured before,
To the battle-scarred land of France!

2. You may raise, Civilians, your hats to him,
While soldiers from every land—
Conscript, volunteer, veteran grim—
Stand to salute when his myriads trim
Pass—then strike hand to hand!

Yet, Bulldog Tommy, and Poilu bold—
Ye who at naught would flinch—
And sons of the Roman Legions old,
In our EAGLE'S BROOD you may not have been told,
Of his fledgling—the OOZLEFINCH.

3. Drawn by his snorting steeds of steel—
Like Titan of ancient days—
Beneath the tread of each chariot wheel
The strong earth trembles, as dreading to feel
The burden that on her he lays.
And loud when the storm of his cannon breaks,
With the blast of each thunderbolt thrust
The foe's proud citadel shudders and quakes
While each stricken rampart totters and shakes
And crumbles to rubbish and dust.

4. A stout trench helmet is worn by him,
Protecting his massive pate
(Full of trig. functions and logarithms);
His watch he wears on a nether limb,
He is ready early or late.
Though nobody loves him, he does not cry,
But dances—his lone feathered tail
He proudly raises, he cannot fly
To the rear, or retreat—he would scorn to try,
For he marches forward by rail.

5. You may sing of the bird-men, reckless and free,
Of the Infantry, fearless and strong,
But what of the Railway Artillery
When the field guns fail, when the enemy
Has held his position too long?
And, comrades all, though with honors few
And with glory small, yet our part
We each of us did, though none others knew
To the BRAVE OLD FLAG how we ever were true
Both in deeds and in thoughts of the heart.

6. So "HOW!" Here we drink to the Oozlefinch,
And the Railway Artillery.
They did their duty—it wasn't a "cinch,"
With "Bière de Châlons" our friendship we'll clinch,
While we toast them and VICTORY!
And here's to our General, gallant and wise,
And to Mailly and Haussimont
And THAT LAIR whence the Oozlefinch shall rise
And smite our foeman betwixt the eyes
Should they e'er dare their faces to show!

ABRAHAM B. COX,
Captain, Ordnance, U. S. A.

The activities of the various auxiliary organizations of the Railway Artillery Reserve, American Expeditionary Force, and the active operations at the front of its combatant units, were as follows:

Headquarters Railway Artillery Reserve, American Expeditionary Force

These headquarters, under the designation "Headquarters Expeditionary Brigade, Coast Artillery Troops," were engaged during the latter part of July and the early part of August, 1917, in perfecting the organization of the Expeditionary Brigade, Coast Artillery Troops, at Fort Adams, Rhode Island.

From August 13 until early in September, 1917, they were en route to France. Early in September they arrived at Mailly le Camp (Aube), France, where the brigade was assembled. The headquarters were established at Mailly le Camp at that time and remained there continuously under various designations, as set forth above, until the Railway Artillery Reserve was demobilized and units thereof returned to the United States or assigned elsewhere for duty. This demobilization took part in the latter part of November and early in December, 1918.

The activities of the Railway Artillery Reserve Headquarters, under its various designations, were many and varied, consisting principally of the gradual organization and development of the service of American Railway Artillery in France. In addition to this, however, these headquarters supervised the early development and primary organization of Tractor Artillery in the American Expeditionary Force, the first six battalions of such character having been organized, trained, and sent to the front under the supervision of these headquarters. Also, a large percentage of the instructional personnel, including the directors of instruction, for the Tractor Organization and Training Centers, were furnished from this command. The Heavy Artillery Board, American Expeditionary Force, was originally established as an auxiliary of the Railway Artillery Reserve and functioned as such until its removal to Angers early in July, 1918, after which it operated directly under the Chief of Artillery, American Expeditionary Force. The Heavy Artillery School, American Expeditionary Force, although never strictly a part of the Railway Artillery Reserve, was, until July, 1918, under the command of the Commanding General, Railway Artillery Reserve, and instructional personnel for this school was furnished entirely from this command until July, 1918, when the school was removed to Angers.

From a small Brigade Headquarters and three regiments, as shown above, the command gradually grew larger as its activities grew broader until at the time of demobilization it consisted of the following organizations:

Railway Artillery Reserve, A. E. F. Staff
Railway Artillery Supply Depot, A. E. F.
Military Police Detachment
Motor Transport Service Detachment
Railway Artillery Repair Shop
1st Provisional High Burst Ranging Section, R. A. R.
1st Railway Artillery Operation Battalion, A. S. C.
1st Railway Artillery Construction Battalion, A. S. C.
Organization and Training Center No. 6, including the Railway Artillery Specialists' School
Railway Artillery Replacement Battalion
30th Artillery Brigade (C. A. C.)
42nd Artillery (C. A. C.)
52nd Artillery (C. A. C.)
53rd Artillery (C. A. C.)
43rd Artillery (C. A. C.) (attached)
40th Artillery Brigade (C. A. C.)
73rd Artillery (C. A. C.)
74th Artillery (C. A. C.)
75th Artillery (C. A. C.) (Advance School Detachments only)
U. S. Naval Railway Batteries.

The following organizations, not a part of the Railway Artillery Reserve at the date of its demobilization, were a part thereof until separated therefrom in August, 1918:

44th Artillery (C. A. C.)
51st Artillery (C. A. C.)
Batteries "F" and "G," 51st Artillery (C. A. C.)—later transferred to 57th Artillery (C. A. C.)

The authorized organization of the headquarters for the proper administration and supply of this command and for the proper supervision of the operations of the units composing the same, was increased from time to time as changing conditions necessitated, until in August, 1918, it comprised the following personnel:

1 Brigadier General
2 Lieutenants (Aides)
2 Colonels
4 Lieutenant Colonels
22 Majors
10 Captains
3 Lieutenants
4 Field Clerks
46 Enlisted men.

It was organized into a General Staff, comprising the five sections which were customary during the war, and an Administrative Staff.

This allowance and distribution of staff officers was, at the time of its authorization (August, 1918), announced as tentative. The Commanding General, Railway Artillery Reserve, was authorized to make such changes in the distribution of duties as experience dictated to be advisable. It was directed that the officers assigned to the G-3 Section of the General Staff should be given an intensive course of training so that each officer of this section would be competent to prepare detailed plans for the tactical employment of units of the Railway Artillery Reserve. The officers of this section were intended to be available for duty as R. A. R. representatives on the staffs of the Chiefs of Artillery of Armies. The Commanding General, Railway Artillery Reserve, American Expeditionary Force, was informed that it was not the policy of higher authority to assign Railway Artillery Reserve staff officers permanently to Armies, but that, when units of the Railway Artillery Reserve were assigned to an Army for employment, he would be directed to designate a sufficient number of staff officers for temporary duty with the Army to assist in the preparation of the detailed operation plans and, upon completion of this mission, they would be returned to R. A. R. Headquarters and made available for assignment elsewhere.

On August 19, 1918, pursuant to instructions from Headquarters, Army Artillery, 1st Army, A. E. F., the Commanding General, Railway Artillery Reserve, proceeded in person with a small staff to establish an advance echelon of the Railway Artillery Reserve Headquarters at Coussey (Vosges), in the vicinity of Headquarters, 1st Echelon, Army Artillery, 1st Army, American Expeditionary Force. These headquarters were established with a view to participating in the operations of the 1st Army, American Expeditionary Force, which had taken over from the French the sector of the front from the Moselle to Fresnes.

As indicated above, it was at this time the general consensus of opinion that a certain number of officers from G-3, Railway Artillery Reserve, should be attached for duty to the staff of the Chief of Artillery of each Army for the purpose of performing the necessary staff functions in regard to the operations of the Railway Artillery attached to the Army. It was soon found, however, that the many and varied details requiring prompt and careful attention were such as to necessitate one officer of superior rank to command all the Railway Artillery attached to the Army and to direct their operations—this officer to act under instructions from the Army Artillery commander and to be provided with a proper staff to handle the details.

The duties of this officer, in addition to commanding the Railway Artillery attached to the Army, were outlined by the Commanding General, Railway Artillery Reserve, American Expeditionary Force, as follows:

(a) To act as advisor to the Army Artillery commander in matters concerning the use and operation of Railway Artillery in the Army.

(b) To collect all information regarding the possible use of Railway Artillery in the Army sector, to keep records of the same, and to keep the Army Artillery commander advised thereof.

(c) To maintain a continuing study of the possibilities for the use of Railway Artillery in the Army sector, for the extension of existing firing epis, etc., both in the sector as it exists and, in case of an advance or retirement, dressing the front, and, from time to time, to make recommendations to the Army Artillery commander looking to the improvement of these conditions.

(d) To prepare plans for use of Railway Artillery for offensive and defensive action within the Army sector, including their organization into sub-groupings.

(e) To prepare firing programs covering the firing to be done by the elements of the Railway Artillery in the Army and to supervise the execution of the same.

(f) To supervise and direct the operations of the Artillery Operation Battery in the Army sector.

(g) To supervise and direct the operations of the organization provided for handling ammunition for all Railway Artillery armament in the Army.

(h) To supervise and direct the operations of the Railroad Construction Troops attached to the Army for the purpose of constructing firing epis, access tracks, etc.

(i) To render to the Army Artillery commander, or other proper authority, such reports as might be required concerning the operations of the Railway Artillery in the Army sector.

(j) To exercise, under the Commanding General, Railway Artillery Reserve, such functions concerning the administration and supply of the Railway Artillery units as might be necessary during the period of their attachment to the Army.

The staff maintained at the 1st Echelon, Railway Artillery Reserve, was, from time to time, changed to meet the conditions, until it was believed that a suitable staff, that is, one properly organized to handle the work, had been developed. It was then found that, in practically all essentials, this staff was the same as that authorized for a heavy artillery brigade, the only essential difference being that one or more officers from G-3, Railway Artillery Reserve, should be attached for the purpose of having immediate direction, under the brigade commander, of the operations, the number of such officers so attached being governed by the activities of the Army at any given time. As the Railway Artillery Reserve at this time included in its organization two Brigade Headquarters [30th and 40th Brigades (C. A. C.)], Headquarters, 30th Artillery Brigade (C. A. C.),

joined the 1st Army, American Expeditionary Force, on October 13, 1918, and replaced the 1st Echelon Railway Artillery Reserve and, the 2nd Army, American Expeditionary Force, being in process of formation, Headquarters, 40th Artillery Brigade (C. A. C.), joined that Army about October 31, 1918.

It was the plan of the Commanding General, Railway Artillery Reserve, American Expeditionary Force, that there should be assigned to each Army one brigade headquarters from the Railway Artillery Reserve. These headquarters were to form a permanent part of the Army to which it was assigned and was to be the office of record for all matters concerning railway artillery in that Army. Since the conditions surrounding and governing the use of railway artillery in the Army sector required a continuing study looking to the necessary extension of railroad tracks, construction of new epis, access tracks, etc., the permanent assignment of such headquarters was considered necessary. The number of troops of the Railway Artillery assigned to an Army necessarily varied from time to time, depending upon the activity of the Army, and, during quiet periods, such numbers would be reduced far below that which would constitute an appropriate command for a brigadier general. However, during such periods, the importance of the studies to be made and construction work involved were considered to be such as to justify the retention on duty in the Army sector of a brigadier general and his headquarters.

The cessation of hostilities prevented further study and development along this line.

From August 19 to November 11, 1918, the 1st Echelon Railway Artillery Reserve, afterwards Headquarters, 30th Artillery Brigade (C. A. C.), took part in the St. Mihiel and Argonne-Meuse operations. During the St. Mihiel operation, the organizations comprising the Railway Artillery Command consisted of one Railway Operation Battery, one Railway Construction Battery, and three Railway Groupings (total 22 batteries and 64 guns of caliber from 19-cm. to 400-mm.). A total of 2110 rounds were fired by the command for counterbattery, interdiction, harassing, and destruction purposes against enemy targets. During the Argonne-Meuse operation the organizations comprising the Railway Artillery Command consisted of one Railway Operation Battery, Detachment Railway Artillery Motor Transport Service, Special Meteorological Station for long-range firing, 1st Provisional High Burst Ranging Section, and two Railway Sub-Groupings (21 batteries and 41 guns of calibers from 19-cm. to 400-mm.). A total of thirteen thousand two hundred and twenty-seven rounds were fired by the command for counterbattery, interdiction, harassing, and destruction purposes against enemy targets.

The Headquarters, 40th Artillery Brigade (C. A. C.), had made plans for the use of the Railway Artillery in a contemplated offensive in the 2nd Army, American Expeditionary Force sector, and the units were being

assembled when further activities were stopped by the cessation of hostilities.

Railway Artillery Supply Depot, American Expeditionary Force

A depot was established at Mailly le Camp (Aube), France, on January 3, 1918, designated the "Heavy Artillery Supply Depot, American Expeditionary Force." The Brigade Supply Officer, 30th Artillery Brigade (C. A. C.), and his assistant, were directed to transfer to the proper offices of the depot all property and funds for which they were accountable and it was directed that the official records of the Brigade Supply Officer be incorporated with, and become a part of, the official records of this depot.

This depot was organized into the following divisions: Administration, Quartermaster Division, Subsistence Division, Finance Division, Motor Transportation Division, Miscellaneous Transportation Division, Ordnance Division, Engineer Division, Signal Division, and Gas Supply Division.

The depot, up to June 30, 1918, with the exception of three officers of the Quartermaster Corps, two officers of the Ordnance Department, and one officer each of the Engineer and Signal Corps, consisted of personnel of the Railway Artillery Reserve detailed on special duty at the depot. On July 1, 1918, a depot personnel was authorized consisting of six officers, Quartermaster Corps; four officers, Ordnance Department; ten officers, Coast Artillery Corps; one hundred and thirty-five enlisted men of the Quartermaster Corps; twenty-six enlisted men of the Ordnance Department; and eighty-six enlisted men of the Coast Artillery Corps.

In July, 1918, the designation of the depot was changed to the "Railway Artillery Supply Depot."

This depot equipped practically all troops of the Railway Artillery Reserve. It supplied all troops stationed at Mailly le Camp (Aube) and at Haussimont (Marne) from the date of its organization and furnished the greater part of the supplies used by all elements of the Railway Artillery Reserve, even when those elements were on duty at the front. Supplies were shipped by rail and motor transportation to units of the Railway Artillery Reserve situated on all parts of the line from Belfort (Alsace) to Compiègne (Oise). The officer in charge of the depot handled the details of all troop movements and of all movements of supplies until July 18, 1918, at which time a Railway Transportation office was established at Sommesous (Marne). The officer in charge of the depot also exercised most of the functions of supply officer for the command and was largely responsible for its proper equipment until the expansion of the staff of the Railway Artillery Reserve in August, 1918.

Upon receipt of instructions to return all troops of the Railway Artillery Reserve to the United States, all property that did not accompany those troops to the base ports was turned in to this depot. This included

all French armament in the hands of units. The depot was discontinued and completed its functions early in January, 1919.

Military Police Detachment

No military police being available from the Service of Supply and the necessity for such police becoming apparent, a detachment was organized in January, 1918, composed wholly of special duty men drawn from the various regiments of the Railway Artillery Reserve.

Traffic regulation posts were established in Mailly le Camp (Aube) and in Sommesous (Marne), and detachments were placed in all the small towns within 15 kilometers of Mailly le Camp and Sommesous, as well as in Troyes (Aube), Châlons (Marne), and Virty-le-François (Marne).

These detachments were relieved from time to time by the Military Police from other organizations until in September, 1918, the only detachments still being maintained were those in the small towns in the vicinity of Mailly le Camp and Sommesous.

During the months of March, April, May, and June, 1918, several detachments were kept on duty at various posts on the front near which units of the Railway Artillery Reserve were serving.

Early in July, 1918, the detachment was reorganized and given an official status with a strength of three officers and one hundred and forty-nine enlisted men. This strength was maintained and the duties of the detachment remained the same until the demobilization of the Railway Artillery in December, 1918.

Motor Transport Service Detachment

All motor transportation of the Railway Artillery was originally under the direction of the Brigade Supply Officer, 30th Artillery Brigade (C. A. C.). Upon the formation of the Supply Depot this transportation was placed under the direction of the officer in charge thereof and remained under his direction until July, 1918, when it was turned over to the Motor Transport Officer of the Railway Artillery Reserve.

This transportation was operated entirely by special duty men drawn from the regiments until the arrival, early in February, 1918, of the 1st, 2nd, and 3rd Motor Transport Detachments from the United States. Upon their arrival, these detachments were used to replace special duty men in so far as possible. Some motor transportation was brought from the United States with the original brigade and more was issued from time to time. This motor transportation was of many different types and included motor cars, motorcycles, trucks of many makes, and tractors, both of the Latile and caterpillar type.

The problem of training drivers became an important one and a tractor school was established about the middle of February, 1918. This school was finally incorporated in the Heavy Artillery School, American Expedi-

tionary Force, and later officially disbanded. The equipment, however, was retained in part and some instruction was continually carried out until this school was finally absorbed in the Railway Artillery Specialists' School.

A repair shop was established early in this period and equipment was gradually accumulated until, at the beginning of July, a shop capable of making almost all classes of repairs was in operation.

During this period, five Tractor Artillery battalions and six Railway Artillery battalions were equipped with motor transportation and sent to the front.

The Motor Transport Service Detachment, as such, was organized in July, 1918. The bulk of the three motor transport detachments, mentioned above, were absorbed into this organization and the identity of those detachments lost.

The Motor Transport Service Detachment never had sufficient strength to handle all of the motor transportation assigned to the Railway Artillery Reserve. As a result, a large share of it was handled by members of the regiments and the activities of the detachment were largely confined to the operation of the repair shop at Mailly le Camp, the garages at Mailly le Camp and Haussimont, and the operation of such transportation as was not assigned to regiments.

Two Mobile Repair Shops were constructed in the repair shop at Mailly le Camp and, during the months of September, October and November, 1918, these mobile shops were invaluable in keeping the motor transportation of the units at the front in good operating condition.

Railway Artillery Repair Shop

This shop was established in July, 1918, at which time the first machine tool was put into operation. The shop complete was ready to operate, and to execute any repair work that might be required, in August, 1918. At that time the work of maintaining the French railroad mounts assigned to the Railway Artillery Reserve was taken over. The operations of the shop, in addition to the maintenance of the French railroad mounts, consisted of making all characters of repairs to trucks, machine guns, and antiaircraft mounts. The personnel of the shop consisted of four officers and one hundred and fifty-three enlisted men.

The operations of the shop continued until just after the Armistice when the work of dismantling all material and packing same for shipment was begun.

First Provisional High Burst Ranging Section

This section was organized in July, 1918, when five officers and fifty enlisted men, drawn from the 54th Artillery (C. A. C.), were sent to Salins d' Hayères (Far), for a course of instruction at the French Telemertie School at that place. This course lasted one month and was fol-

lowed by one month's observation of 75-mm. firing at the same station. The section was sent to Haussimont (Marne) in September, 1918, and became a part of the Railway Artillery Reserve from that time. It remained at Haussimont observing fire of large calibers on the Mailly firing grounds until the latter part of October, 1918, when the section was moved to the front of the 1st Army, American Expeditionary Force, where stations were established in the Verdun sector at Forts Douamont, St. Michel, de Souville, Belleville, and De Marr, with P. C. at Belleville. The section reported ready for operation on November 1, 1918. Due to exceptionally unfavorable weather conditions and certain trouble with fuzes, no adjustments were accomplished in the eleven days intervening between the completion of the installation and the cessation of hostilities on November 11, 1918. The section returned to Haussimont on November 19, 1918, and was disbanded on November 29, 1918, by transferring the personnel to various organizations of the Railway Artillery Reserve.

First Railway Operation Battalion, A. S. C.

The organization of this battalion was authorized in October, 1918. It was to be organized under a table of organization made up of twenty-eight officers and one thousand and twenty-one men.

The Headquarters and Battery "A" were organized and instructed in their duties in accordance with "Instructions for Operation Battalions, Batteries and Platoons."

The personnel of these operating units were charged with operating and maintaining all railway garages controlled by the Railway Artillery.

Their operations were to be carried on under the following policies:

1. The railway system established under the Railway Artillery on an operating front comprises:

   (a) Certain battery positions, epis, platforms, etc.
   (b) Lines of access to such positions.
   (c) Certain lines for circulation.
   (d) A depot for the ammunition of Railway Artillery.
   (e) A locomotive depot to which may be attached a repair unit.
   (f) Garages for combat units.

2. One or more operation batteries are assigned for duty with the Railway Artillery Brigade operating with an Army.

   There are established well to the rear of each Railway Artillery Brigade, large garages designated to receive Railway Artillery units in reserve.

There was established at St. Eulion a general park repair shop, stores for rolling stock, and construction supplies.

The authorized strength of a battery was six officers and two hundred and fifty men. Its equipment included 55 locomotives, nineteen cars, one automobile, five motorcycles with side cars, and five bicycles.

These operating units were charged with the following duties:

(a) Supervision and maintenance of all railway lines and garages assigned to Railway Artillery.

(b) The equipment of such lines and garages.

(c) The hauling of Railway Artillery trains, ammunition, supplies, etc.

(d) All relations with the railway officials and local railway agents.

(e) Maintenance and supply (fuel, oil, etc.) of all Artillery locomotives assigned to the Railway Artillery and the repair of its rolling stock.

(f) Routing of material; investigation and verification of reports concerning routing.

(g) Insuring on the front not only the management of lines and garages, but also maneuvers of combat units of Railway Artillery at garages and at firing positions.

The 1st Platoon of Battery "A," after receiving a course of instruction in the Railway Artillery Specialists' School, was assigned to duty with the 40th Artillery Brigade (C. A. C.), in the sector of the 2nd Army, American Expeditionary Force. Due to the cessation of hostilities, however, the platoon took part in practically no operation at the front. The battery, from the date of its organization was in complete charge of, and responsible for, the care and operation of all railroad rolling stock at Camp No. 2, Railway Artillery Reserve, consisting of nine Standard Baldwin and four Belgian engines and about two hundred cars.

First Railway Artillery Construction Battalion, A. S. C.

The organization of this battalion was authorized in October, 1918. It was organized under a table of organization made up of twenty-four officers and seven hundred and eighty-eight enlisted men. From the date of its organization it performed construction work at Camp No. 2, Railway Artillery Reserve, consisting of ballasting of track at Ordnance shops, laying out garages and grading for garage tracks.

Due to the cessation of hostilities no opportunity was afforded for the use of this battalion at the front.

Organization and Training Center No. 6

Including Railway Artillery Specialists' School

This organization and training center was established in October, 1918. Its organization was never completed in accordance with the authorized organization tables because of the cessation of hostilities. From the date of its establishment its duties consisted of the organization of the Center and the training of the personnel of the 73rd and 74th Artillery (C. A. C.),

other than specialist personnel, which latter received its training in the Railway Artillery Specialists' School. Upon the departure of the 73d and 74th Artillery (C. A. C.), in November, 1918, en route to the United States, the activities of the organization and training center ceased.

The Railway Artillery Specialists' School was established in conjunction with the organization and training center at the same time.

The school was designed to complete the training of the specialist personnel, both commissioned and enlisted, of all newly arriving units, while the unit itself was undergoing, at the organization and training center, a final course of training to fit it for service at the front. It was also intended to put through the school the specialist personnel of units, which, after service at the front, had been returned to the station of the Railway Artillery Reserve to await orders.

The necessities of the military situation limited the course of instruction to six weeks.

The school opened on October 21, 1918, with nine commissioned and twenty-three enlisted instructors and with a quota of specialists drawn from the 73d Artillery (C. A. C.) forming the student body.

The school was organized with eight departments as follows:

(a) Administrative Staff.
(b) Department of Signalling.
    (1) Radio Division.
    (2) Telephone Division.
(c) Department of Topography.
(d) Department of Railway Operation.
(e) Department of Camouflage.
(f) Department of Automobile Operation.
(g) Department of Gas Defense.
(h) Department of Machine Shop Work.

Each department was, in reality, a school in itself. The staff officer of the Railway Artillery Reserve who would eventually employ or supervise the employment of the personnel trained in his department, was, *ex officio*, the director of that department. He prepared the outline of the course to be pursued in his department and supervised the work therein, thereby assuring not only a course of study based on field service conditions, but also a sense of personal responsibility on his part for the actual training.

The quota of the 73d Artillery (C. A. C.) began its course of training October 21, 1918, and that of the 74th Artillery (C. A. C.) on November 4, 1918. The 75th Artillery (C. A. C.) supplied a reduced quota on November 13, 1918. This regiment never joined the Railway Artillery Reserve but was held in the S. O. S., its signalling, topographical, and railway operations personnel being sent forward for the purpose of receiving this instruction.

A few officers and selected men from the Replacement Battalion and

from the older units of the Railway Artillery Reserve entered the school and undertook the course with one or another of the above quotas.

At the time of the closing of the school (November 22, 1918), upon receipt of orders to prepare the command for return to the United States, the quota from the 73d Artillery (C. A. C.) had almost completed its course, that from the 74th had completed one-half of its course, and that from the 75th about one-third of its course.

The Railway Artillery Replacement Battalion

The 54th Artillery (C. A. C.), of which this battalion was originally a part, arrived at Mailly le Camp from the United States early in April, 1918. It was designated as a Replacement Regiment for the Heavy Artillery at that time.

The regiment was moved to Haussimont (Marne) early in May and remained at that station until in September, 1918, when it was divided into a Heavy Artillery Training Battalion, a Tractor Replacement Battalion, and a Railway Artillery Replacement Battalion. The first two battalions left Haussimont (Marne) late in September, 1918, for other stations.

The organization of the 3d Battalion as the Railway Artillery Replacement Battalion was completed in September, 1918. It remained at Haussimont (Marne) until December, 1918, when it departed for Angers to rejoin the other battalions of the 54th Artillery (C. A. C.) and return to the United States. This organization classified, trained, and dispatched to the front, replacements for the various units of the Railway Artillery Reserve. Its records show that between April 26, 1918, and November 26, 1918, five hundred and eleven officers and six thousand four hundred and twenty-four enlisted men were disposed of as replacements.

Headquarters Detachment, 30th Artillery Brigade (C. A. C.)

The headquarters of this brigade were established at St. Andre (Meuse), France, in October, 1918, and became the headquarters of the Railway Artillery Grouping of the 1st Army, American Expeditionary Force. As such, it controlled, under the direction of the Army Artillery commander, all activities of the Railway Artillery of the Army and its commander exercised command thereof. The cessation of hostilities on November 11, 1918, ended all tactical activities. The detachment returned to Haussimont (Marne) on November 21, 1918, where it remained until November 28, 1918, when it left en route to the United States.

Headquarters Detachment, 42nd Artillery (C. A. C.)

This headquarters detachment, as Headquarters and Supply Company, 52nd Artillery (C. A. C.), joined the VIII French Army in July, 1918, at Toul (Meurthe-et-Moselle), where it remained until August 9, 1918, with no active functions to perform. On the latter date the designation

of the detachment was changed to Regimental Headquarters Detachment, 42nd Artillery (C. A. C.), and the detachment proceeded to join the VII French Army, occupying a station at Montreux Vieux (Alsace), where it remained as Headquarters, Groupement McMillan, Groupement Kerrick, and Groupement Watson, in turn, until October 26, 1918. On the last mentioned date the detachment returned to Haussimont (Marne) where it remained until December 3, 1918, when the 62nd Artillery (C. A. C.) left en route to the United States.

HEADQUARTERS DETACHMENT, 1ST BATTALION, 42ND ARTILLERY (C. A. C.)

This detachment, as part of Headquarters and Supply Company, 52nd Artillery (C. A. C.), joined the VII French Army on April 17, 1918, at La Chapelle-sous-Rougement (Alsace), where it remained until October 9, 1918, having been reorganized in August, 1918, into the Headquarters Detachment, 1st Battalion, 42nd Artillery (C. A. C.). On October 9, 1918, this detachment moved to Dannemarie (Alsace) where it remained to November 26, 1918. During the period April 17 to November 26, 1918, the detachment operated as Headquarters Detachment, Groupe Wing, taking part in all operations of the VII French Army during that period. The detachment returned to Haussimont (Marne) on November 27, 1918, where it remained until December 3, 1918, when the 42nd Artillery (C. A. C.) left en route to the United States.

BATTERY "A," 42ND ARTILLERY (C. A. C.)

This battery manned four 24-G guns (French), Model 1875/76, Railway Mount.

As Battery "I," 52nd Artillery (C. A. C.), it joined the VII French Army on April 18, 1918, and occupied a position at La Chapelle-sous-Rougement (Alsace), until the cessation of hostilities on November 11, 1918. It was reorganized in August, 1918, and designated Battery "A," 42nd Artillery (C. A. C.). During this period the battery executed firings on many targets. Total number of rounds fired: one thousand and eighty-six. The battery returned to Haussimont (Marne) on November 26, 1918, where it remained until December 3, 1918, when the 42nd Artillery (C. A. C.) left en route to the United States.

BATTERY "B," 42ND ARTILLERY (C. A. C.)

This battery manned four 24-G guns (French), Model 1876, Railway Mount.

As Battery "K," 52nd Artillery (C. A. C.), it joined the VII French Army on April 18, 1918, and occupied a position near La Chapelle-sous-Rougemont (Alsace) until the cessation of hostilities on November 11, 1918. It was reorganized in August, 1918, and designated Battery "B," 42nd Artillery (C. A. C.). During this period the battery executed firings on many targets. Total number of rounds fired: one thousand two hun-

dred eighty-two. The battery returned to Haussimont (Marne) on November 26, 1918, where it remained until December 3, 1918, when the 42nd Artillery (C. A. C.) left en route to the United States.

HEADQUARTERS, 2ND BATTALION, 42ND ARTILLERY (C. A. C.)

This Headquarters Detachment joined the VIII French Army on September 12, 1918, occupying a position in the woods of St. Paul where it remained until September 25, 1918, as Headquarters, Groupe Merrill. On September 25, 1918, the detachment returned to Haussimont (Marne), where it remained until December 3, 1918, when the 42nd Artillery (C. A. C.) left en route to the United States.

BATTERY "C," 42ND ARTILLERY (C. A. C.)

This battery manned two 32-cm. Glissement (French) Railway guns, Model 1881, from December, 1917, until April, 1918, after which date it manned four 24-G (French) guns, Model 1876, Railway Mount.

As Battery "L," 52nd Artillery (C. A. C.), it took part, February 10 to 14, 1918, in a *coup de main,* in the IV French Army, occupying a position south of Butte du Mesnil, during which period the battery fired six rounds. It joined the VIII French Army July 5, 1918, where it occupied a position (219) in the Woevre Sector until September 25, 1918. During this period the battery was held in readiness for defensive purposes, but no opportunity was afforded for active operations. On September 25, 1918, the battery returned to Haussimont (Marne), where it remained until December 3, 1918, when the 42nd Artillery (C. A. C.) left en route to the United States.

BATTERY "D," 42ND ARTILLERY (C. A. C.)

This battery manned two 32-cm. Glissement (French) Railway guns, Model 1881, from December, 1917, until April, 1918, after which it manned four 24-G (French) guns, Model 1876. As Battery "M," 52nd Artillery (C. A. C.), it took part, February 10 to 14, 1918, in a *coup de main* in the IV French Army, occupying a position south of the Butte du Mesnil, during which period the battery fired five rounds. It joined the VIII French Army on July 5, 1918, where it occupied a position in the woods of Champenoux and one in the Forest of St. Paul until September 25, 1918. From these positions the battery fired a total of one hundred and fifty-four rounds at enemy targets. On September 25, 1918, the battery returned to Haussimont (Marne), where it remained until December 3, 1918, when the 42nd Artillery (C. A. C.) left en route to the United States.

This battery was part of the first unit of Railway Artillery of the American Army to fire a hostile shell on the western front.

HEADQUARTERS DETACHMENT, 3D BATTALION, 42ND ARTILLERY (C. A. C.)

This Headquarters Detachment, as Headquarters Detachment, 2nd Battalion, 53d Artillery (C. A. C.), joined the IV French Army on April 16,

1918, near Somme Suppes (Marne), where it remained until September 22, 1918, as Headquarters, Groupe Gilmor, Groupe Longino, and Groupe Hardaway, in turn, taking part in all the operations of the IV French Army during that period, including the defense against the German offensive of July 15, 1918. On September 22, 1918, the detachment returned to Haussimont (Marne), where it remained until December 3, 1918, when the 42nd Artillery (C. A. C.) left en route to the United States.

Battery "E," 42nd Artillery (C. A. C.)

This battery manned two 32-cm. Glissement (French) Railway guns, Model 1881, from December, 1917, to April, 1918, after which it manned four 19-G (French) guns, Railway Mount, Model 1875/76.

As Battery "H," 53d Artillery (C. A. C.), it took part, February 10 to 14, 1918, in a *coup de main* in the IV French Army, during which period the battery fired 29 rounds. It joined the IV French Army again on April 16, 1918, and occupied positions near Somme Suppes (Marne) and near Suippes (Marne) until September 22, 1918, firing at many enemy targets, and, among other operations, participated in the defense of the IV French Army against the German offensive of July 15, 1918. Total number of rounds fired during this period: two thousand and seventy-four. On September 22, 1918, the battery returned to Haussimont (Marne), where it remained until December 3, 1918, when the 42nd Artillery (C. A. C.) left en route to the United States.

This battery is credited with firing the first shell fired by the Railway Artillery in the American Army on the western front. This shell was fired on February 13, 1918.

Battery "F," 42nd Artillery (C. A. C.)

This battery manned four 19-G (French) guns, Railway Mount, Model 1875/76.

As Battery "F," 53d Artillery (C. A. C.), it joined the IV French Army on April 16, 1918, and occupied positions near Somme Suippes (Marne) and Courtemont (Marne) until September 22, 1918, firing on many enemy targets and, among other operations, participated in the defense of the IV French Army against the German offensive of July 15, 1918. Total number of rounds fired during this period: one thousand nine hundred and sixty. On September 22, 1918, the battery returned to Haussimont (Marne), where it remained until December 3, 1918, when the 42nd Artillery (C. A. C.) left en route to the United States.

Headquarters Detachment, 52nd Artillery (C. A. C.)

This Headquarters Detachment joined the VIII French Army on July 11, 1918, occupying a position at Toul (Meurthe-et-Moselle), where it remained until August 7, 1918, with no active operations to perform. On August 8, 1918, the detachment moved to Auve (Marne) where it joined

the IV French Army and where it remained until October 20, 1918, taking part in the operations of the IV French Army during that period as Headquarters Detachment, Groupement Young. On October 20, 1918, the detachment returned to Haussimont (Marne), where it remained until December 2, 1918, when the 52nd Artillery (C. A. C.) left en route to the United States.

HEADQUARTERS DETACHMENT, 1ST BATTALION, 52ND ARTILLERY (C. A. C.)

This detachment joined the II French Army on August 16, 1918, occupying a position near Thierville (Meuse), where it remained until August 26, 1918. On the latter date the detachment moved to a position near Blercourt (Meuse), still serving with the II French Army, where it remained until September 1, 1918, at which date it moved and joined the 1st Army, American Expeditionary Force, occupying a position near Génicourt (Meuse), where it remained until September 17, 1918, forming a part of the West Railway Grouping and taking part in the St. Mihiel operation of the 1st Army, American Expeditionary Force. On September 17, 1918, the detachment moved to a position in the vicinity of Récicourt (Meuse), where it remained until October 10, 1918, forming a part of the 2nd Railway Sub-Grouping and taking part in the Argonne-Meuse operation of the 1st Army, American Expeditionary Force. On October 11, 1918, the detachment returned to Haussimont (Marne), where it remained until December 2, 1918, when the 52nd Artillery (C. A. C.) left en route to the United States.

BATTERY "A," 52ND ARTILLERY (C. A. C.)

This battery manned two 37-cm. (French) guns, Model 1870/81, Railway Mount.

The battery joined the II French Army August 16, 1918, occupying a position near Thierville (Meuse), where it remained until August 26, 1918, forming a part of Groupe Greene. Total number of rounds fired during this period: forty-two. On August 26, 1918, the battery moved to a position near Blercourt (Meuse), where it remained until early in September, 1918, still as a part of Groupe Greene. Total number of rounds fired during this period: thirty-five. Early in September, 1918, the battery moved and joined the 1st Army, American Expeditionary Force, occupying a position near Génicourt (Meuse), where it remained until September 17, 1918, forming a part of Groupe Greene in the West Railway Grouping, taking part in the St. Mihiel Operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: fifty-eight. On September 17, 1918, the battery moved to a position near Récicourt (Meuse), where it remained until October 20, 1918, still as a part of Groupe Greene, in the 2d Railway Sub-Grouping, and taking part in the Argonne-Meuse Operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: seventy-eight.

On October 21, 1918, the battery returned to Haussimont (Marne), where it remained until December 2, 1918, when the 52nd Artillery (C. A. C.) left en route to the United States.

BATTERY "B," 52ND ARTILLERY (C. A. C.)

This battery manned two 32-cm. (French) guns, Model 1870/81, Railway Mount.

The battery joined the II French Army on August 16, 1918, occupying a position near Thierville (Meuse), where it remained until August 26, 1918, forming a part of Groupe Greene. Total number of rounds fired during this period: twenty-eight. On August 26, 1918, the battery moved to a position near Blercourt (Meuse), where it remained until early in September, 1918, still as a part of Groupe Greene. Total number of rounds fired during this period: twenty-eight. Early in September, 1918, the battery moved and joined the 1st Army, American Expeditionary Force, occupying a position near Génicourt (Meuse), where it remained until September 17, 1918, still as a part of Groupe Greene, in the West Railway Grouping, and took part in the St. Mihiel Operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: twenty-nine. On September 17, 1918, the battery moved to a position near Récicourt (Meuse), where it remained until September 30, 1918, forming a part of Groupe Greene, in the 2d Railway Sub-Grouping, and took part in the Argonne-Meuse operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: ten. On October 2, 1918, the battery returned to Haussimont (Marne), where it remained until December 2, 1918, when the 52nd Artillery (C. A. C.) left en route to the United States.

HEADQUARTERS DETACHMENT, 2ND BATTALION, 52ND ARTILLERY (C. A. C.)

This detachment joined the 1st Army, American Expeditionary Force, on September 5, 1918, where it occupied a position near Grosrouves (Meurthe-et-Moselle), where it remained until September 21, 1918, as Headquarters Detachment, Groupe Walker, in the East Railway Grouping, taking part in the St. Mihiel operation of the 1st Army, American Expeditionary Force. On September 22, 1918, the detachment moved to a new position near Haudainville (Meuse), where it remained until November 17, 1918, as Headquarters, Groupe Walker, in the 1st Railway Sub-Grouping, and taking part in the Argonne-Meuse operation of the 1st Army, American Expeditionary Force. On November 17, 1918, the detachment returned to Haussimont (Marne), where it remained until December 2, 1918, when the 52nd Artillery (C. A. C.) left en route to the United States.

BATTERY "C," 52ND ARTILLERY (C. A. C.)

This battery manned two 32-cm. (French) guns, Model 1870/81, Railway Mount.

The battery joined the 1st Army, American Expeditionary Force, on

September 5, 1918, occupying a position near Grosrouves (Meurthe-et-Moselle), where it remained until September 21, 1918, as a part of Groupe Walker in the East Railway Grouping, taking part in the St. Mihiel operation of the 1st Army, American Expeditionary Force. On September 22, 1918, the battery moved to a new position near Haudainville (Meuse), where it remained until November 17, 1918, as a part of Groupe Walker in the 1st Railway Sub-Grouping, taking part in the Argonne-Meuse operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: three hundred and eight. On November 17, 1918, the battery returned to Haussimont (Marne), where it remained until December 2, 1918, when the 52nd Artillery (C. A. C.) left en route to the United States.

BATTERY "D," 52ND ARTILLERY (C. A. C.)

This battery manned two 19-G (French) guns, Railway Mount, Model 1875/76, from December 1, 1917, to February 23, 1918, after which the battery manned two 32-cm. (French) guns, Model 1870/81, Railway Mount.

The battery joined the 1st Army, American Expeditionary Force, on September 5, 1918, occupying a position near Grosgrouves (Meurthe-et-Moselle), where it remained until September 21, 1918, as a part of Groupe Walker in the East Railway Grouping, taking part in the St. Mihiel operation of the 1st Army, American Expeditionary Force. On September 22, 1918, the battery moved to a new position near Haudainville (Meuse), where it remained until November 17, 1918, as part of Groupe Walker in the 1st Railway Sub-Grouping, taking part in the Argonne-Meuse operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: four hundred and thirty-five. On November 17, 1918, the battery returned to Haussimont (Marne), where it remained until December 2, 1918, when the 52nd Artillery (C. A. C.) left en route to the United States.

HEADQUARTERS DETACHMENT, 3D BATTALION, 52ND ARTILLERY (C. A. C.)

This detachment, as Headquarters Detachment, 3d Battalion, 53d Artillery (C. A. C.), served with the IV French Army from February 10 to 13, 1918, taking part in a *coup de main* at that time. The detachment served with the VIII French Army from March 5 to 27, 1918, and again with the IV French Army from April 7 to October 10, 1918. During these periods the detachment occupied positions as follows: Position 2 between Somme Suippes and Somme Tourbe; position 165 near Hans; position 266 between Saint Remy-sur-Bussy and Croix-en-Champagne; position 262 at Ferme d'Alger, near Vaudemange; position 166 near Hans; position 2 between Somme Suippes and Somme Tourbe; and position three near Jonchery-sur-Suippes. The detachment served as Headquarters Detachment, 3d Battalion, 53d Artillery (C. A. C.), until August 7, 1918. The batteries composing this battalion were:

Battery "I," 53d Artillery (C. A. C.), later Battery "E," 52nd Artillery (C. A. C.).

Battery "K," 53d Artillery (C. A. C.), later Battery "F," 52d Artillery (C. A. C.).

Battery "L," 53d Artillery (C. A. C.), later Battery "E," 53d Artillery (C. A. C.).

Battery "M," 53d Artillery (C. A. C.), later Battery "F," 53d Artillery (C. A. C.).

After August 7, 1918, the detachment became the Headquarters Detachment, 3d Battalion, 52nd Artillery (C. A. C.), the batteries comprising the battalion being Batteries "E" and "F," 52d Artillery (C. A. C.), formerly Batteries "I" and "K," 53d Artillery (C. A. C.). On October 10, 1918, the detachment returned to Haussimont (Marne), where it remained until December 2, 1918, when the 52nd Artillery (C. A. C.) left en route to the United States.

The commanding officer, 3d Battalion, 52nd Artillery (C. A. C.), composed of Batteries "E" and "F," 52nd Artillery (C. A. C.), received a letter from Commandant Pichelin, of the IV French Army, bestowing the congratulations of the general in command of the artillery of the IV French Army for the efficient help contributed by this groupe; also one from Lieut. Col. Bourgain, commander of the grouping of which this groupe was a part, thanking him for the excellent shooting of this groupe, particularly the firing upon the Marne tunnel, which firing resulted in a complete destruction of the tunnel. The enemy was bringing reinforcements through this tunnel and throwing them against the advancing allied infantry. The closing of the tunnel enabled the allied infantry to take and hold valuable ground.

Battery "E," 52nd Artillery (C. A. C.)

This battery manned two 32-cm. (French) guns, Model 1870/81, Railway Mount.

The battery, as Battery "I," 53d Artillery (C. A. C.), served with the IV French Army from February 10 to 13, 1918, taking part in a *coup de main* at that time. The battery served with the VIII French Army from March 5 to 27, 1918, and again with the IV French Army from April 7 to October 10, 1918. During these periods the battery occupied positions the same as shown under Headquarters Detachment, 3d Battalion, 52nd Artillery (C. A. C.). Total number of rounds fired: February 10 to 13, 1918, fifteen; April 7 to October 10, 1918, two hundred and seventy-eight. On October 10, 1918, the battery returned to Haussimont (Marne) where it remained until December 2, 1918, when the 52nd Artillery (C. A. C.) left en route to the United States.

In addition to manning the 32-cm. guns assigned to it, this battery was trained in the service of 105-mm. (French) guns and 155-mm. (French) Schneider Shorts and fired on enemy positions with these calibers under dates of August 24 and 28, 1918.

Battery "F," 52nd Artillery (C. A. C.)

This battery manned two 32-cm. (French) guns, Model 1870/81, Railway Mount.

The battery served with the VIII French Army from March 5 to 27, 1918, and with the IV French Army from April 7 to October 10, 1918. During these periods the battery occupied positions as follows: near Courtemont, near Isse, near Hans, near Somme Suippes, and near Jonchery-sur-Suippes. Total number of rounds fired during this period: three hundred and fifty-four. On October 10, 1918, the battery returned to Haussimont (Marne), where it remained until December 2, 1918, when the 52nd Artillery (C. A. C.) left en route to the United States.

In addition to the manning of guns assigned to this battery, the battery received instruction in the service of 105-mm. (French) guns from August 9 to 16, 1918, the battery officers and thirty-seven enlisted men having manned a four-gun battery of this caliber near Courtemont and firing fourteen rounds per gun against the enemy. This battery was also instructed in the service of 155-mm. (French) Schneider Shorts from September 6 to 11, 1918, the battery officers and forty enlisted men having manned a four-gun battery of this caliber near Courtemont and firing thirty-three rounds on Septemer 12, 1918.

Headquarters Detachment, 53d Artillery (C. A. C.)

This detachment joined the IV French Army on July 11, 1918, at Auve (Marne), where it remained until August 7, 1918, without any active functions to perform. On August 7, 1918, the detachment was reorganized at Haussimont (Marne), where it remained until September 2, 1918. It joined the 1st Army, American Expeditionary Force, on September 3, 1918, at Donevère (Meurthe-et-Moselle), where it remained until September 16, 1918, taking part, as Headquarters Detachment, East Railway Grouping, in the St. Mihiel operation of the 1st Army, American Expeditionary Force. The detachment moved on September 18, 1918, to Récicourt (Meuse) and on October 16, 1918, to the vicinity of Charny (Meuse), in which latter position it remained until November 19, 1918. During this period (September 18 to November 19, 1918), the detachment took part, as Headquarters Detachment, 2d Railway Sub-Grouping, in the Argonne-Meuse operation of the 1st Army, American Expeditionary Force. The detachment returned, on November 20, 1918, to Haussimont (Marne), where it remained until December 6, 1918, when the 53d Artillery (C. A. C.) left en route to the United States.

Headquarters Detachment, 1st Battalion, 53d Artillery (C. A. C.)

This detachment joined the 1st Army, American Expeditionary Force, on September 5, 1918, occupying a position, with Battery "A," 53d Artillery (C. A. C.), at Dieue (Meuse), where it remained until September 18, 1918. On the latter date the detachment moved, with Battery "A," 53d Artillery (C. A. C.), to a position in the vicinity of Verdun (Meuse), where

it remained until November 10, 1918. On November 11, 1918, the detachment moved with Battery "A," 53d Artillery (C. A. C.), to a position near Royaumeix (Meurthe-et-Moselle), joining the 2d Army, American Expeditionary Force, where it remained until November 22, 1918. On November 23, 1918, the detachment returned to Haussimont (Marne) where it remained until December 6, 1918, when the 53d Artillery (C. A. C.) left en route to the United States.

This detachment had no opportunity to operate as a groupe headquarters detachment because of the fact that the two batteries of the battalion, Batteries "A" and "B," were assigned to the service of entirely different armament and never served together as a tactical unit.

Battery "A," 53d Artillery (C. A. C.)

This battery manned two 400-mm. (French) guns, Railway Mount.

The battery joined the 1st Army, American Expeditionary Force, on September 5, 1918, occupying a position at Dieue (Meuse), where it remained until September 18, 1918, forming a part of the West Railway Grouping and taking part in the St. Mihiel operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: twelve. On September 18, 1918, the battery moved to a position in the vicinity of Verdun (Meuse), where it remained until November 10, 1918, forming a part of the 1st Railway Sub-Grouping and taking part in the Argonne-Meuse operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: two hundred and fifteen. On November 11, 1918, the battery moved to a position near Royaumeix (Meurthe-et-Moselle), joining the 2nd Army, American Expeditionary Force, where it remained until November 22, 1918, on which latter date the battery returned to Haussimont (Marne), where it remained until December 6, 1918, when the 53d Artillery (C. A. C.) left en route to the United States.

Battery "B," 53d Artillery (C. A. C.)

This battery manned one 340-mm. (French) gun, Model 1912, Railway Mount, from May 30, 1918, to July 1, 1918; four 19-G (French) guns, Railway Mount, Model 1875/76, from July 1, 1918, to July 23, 1918; and one 340-mm. (French) gun, Model 1912, Railway Mount, after July 24, 1918.

The battery joined the III French Army on June 5, 1918, occupying a position near Ribecourt (Oise), where it remained until June 9, 1918. This position was occupied as a defensive measure and no firing was done. The battery joined the 1st Army, American Expeditionary Force, on September 4, 1918, occupying a position near Somme Dieue (Meuse), where it remained until September 17, 1918, forming a part of the West Railway Grouping and taking part in the St. Mihiel operation of the 1st Army, American Expeditionary Force. Total number of rounds fired: one hundred and one. On September 18, 1918, the battery moved to a position near Verdun (Meuse), where it remained until October 3, 1918, forming

a part of the 1st Railway Sub-Grouping. No firing was done from this position and on October 3, 1918, the battery returned to Haussimont (Marne). On October 15, 1918, the battery again joined the 1st Army, American Expeditionary Force, occupying the same position near Somme Dieue (Oise), where it remained until November 13, 1918, forming part of the 1st Railway Sub-Grouping and taking part in the Argonne-Meuse operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: fifty. On November 13, 1918, the battery moved to Marbach (Meurthe-et-Moselle), joining the 2nd Army, American Expeditionary Force. On November 24, 1918, the battery returned to Haussimont (Marne) where it remained until December 6, 1918, when the 53d Artillery (C. A. C.) left en route to the United States.

HEADQUARTERS DETACHMENT, 2ND BATTALION, 53D ARTILLERY (C. A. C.)

This detachment, at the time of its organization on August 7, 1918, was serving with Battery "D," 53d Artillery (C. A. C.), in the VIII French Army sector near Dieulouard (Meurthe-et-Moselle), where it remained until September 19, 1918. On the latter date the detachment moved with Battery "D," 53d Artillery (C. A. C.), to a position near Nixeville (Meuse), where it remained until October 9, 1918. On October 9, 1918, the detachment moved with Battery "D," 53d Artillery (C. A. C.), to a position near Somme Dieue (Meuse), where it remained until November 4, 1918, when it moved with Battery "D," 53d Artillery (C. A. C.), and joined the 2nd Army, American Expeditionary Force, at Marbach (Meurthe-et-Moselle), remaining in the latter position until November 23, 1918, when it returned to Haussimont (Marne), remaining there until December 6, 1918, when the 53d Artillery (C.A.C.) left en route to the United States.

This detachment had no opportunity to operate as a groupe headquarters detachment because of the fact that the two batteries of the battalion (Batteries "C" and "D"), were assigned to the service of entirely different armament and never served as a tactical unit.

BATTERY "C," 53D ARTILLERY (C. A. C.)

This battery manned two 400-mm. (French) guns, Railway Mount.

The battery joined the 1st Army, American Expeditionary Force, on September 7, 1918, occupying a position near Grimacourt (Meuse), where it remained until September 19, 1918, forming part of the West Railway Grouping and taking part in the St. Mihiel operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: twenty-nine. On September 19, 1918, the battery returned to Haussimont (Marne), where it remained until December 6, 1918, when the 53d Coast Artillery (C. A. C.) left en route to the United States.

BATTERY "D," 53D ARTILLERY (C. A. C.)

This battery manned one 340-mm. (French) gun, Model 1912, Railway Mount.

The battery joined the VIII French Army on March 30, 1918, oc-

cupying a position near Somme Dieue (Oise), where it remained until May 12, 1918. This position was occupied as a defensive measure and but one round was fired during this period. On May 12, 1918, the battery joined the IV French Army, occupying a position near Ribecourt (Oise), where it remained until June 10, 1918. Total number of rounds fired during this period: nineteen. On June 10, 1918, the battery returned to Haussimont (Marne), where it remained until July 3, 1918, on which latter date the battery again joined the VIII French Army, occupying a position at Dieulouard (Meurthe-et-Moselle), where it remained until September 19, 1918. During this period the 1st Army, American Expeditionary Force, had taken over this sector from the VIII French Army and this battery at that time joined the 1st Army, American Expeditionary Force, forming a part of the East Railway Grouping and taking part in the St. Mihiel operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: forty-nine. On September 19, 1918, the battery moved to a position near Nixeville (Meuse), where it remained until October 9, 1918, forming part of the 2nd Railway Sub-Grouping and taking part in the Argonne-Meuse operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: eighty-four. On October 9, 1918, the battery returned to its position near Somme Dieue (Meuse), where it remained until November 4, 1918, forming a part of the 1st Railway Sub-Grouping and continuing to take part in the Argonne-Meuse operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: thirty-five. On November 4, 1918, the battery joined the 2nd Army, American Expeditionary Force, at Marbach (Meurthe-et-Moselle), where it remained until November 23, 1918, at which latter date it returned to Haussimont (Marne), remaining there until December 6, 1918, when the 53d Artillery (C. A. C.) left en route to the United States.

HEADQUARTERS DETACHMENT, 3D BATTALION, 53D ARTILLERY (C. A. C.)

This detachment joined the 1st Army, American Expeditionary Force, on September 5, 1918, occupying a position near Blenod (Meurthe-et-Moselle), where it remained until September 18, 1918, as Headquarters Detachment, Groupe Glassburn, in the East Railway Grouping, taking part in the St. Mihiel operation of the 1st Army, American Expeditionary Force. On September 19, 1918, the detachment joined the IV French Army occupying a position near Vienne-le-Ville (Marne), where it remained until October 24, 1918, as Headquarters Detachment, Groupe Glassburn, Groupement Young, taking part in the offensive of the IV French Army during that period. On October 25, 1918, the detachment again joined the 1st Army, American Expeditionary Force, and was held in reserve until November 8, 1918, at which time it joined the 2d Army, American Expeditionary Force, at Blenod (Meurthe-et-Moselle), where it remained until November 27, 1918. On November 28, 1918, the detachment returned to Haussimont (Marne), where it remained until De-

cember 6, 1918, when the 53d Artillery (C. A. C.) left en route to the United States.

Battery "E," 53d Artillery (C. A. C.)

This battery manned four 19-G (French) guns, Railway Mount, Model 1875/76.

The battery joined the 1st Army, American Expeditionary Force, September 5, 1918, occupying a position near Blenod (Meurthe-et-Moselle), where it remained until September 18, 1918, taking part in the St. Mihiel operation of the 1st Army, American Expeditionary Force. On September 19, 1918, the battery joined the IV French Army occupying a position near Vienne-le-Ville (Marne), where it remained until October 24, 1918, taking part in the offensive of the IV French Army during that period. On October 25, 1918, the battery again joined the 1st Army, American Expeditionary Force, and was held in reserve until November 8, 1918, when it joined the 2nd Army, American Expeditionary Force, at Blenod (Meurthe-et-Moselle), where it remained until November 27, 1918. On November 28, 1918, the battery returned to Haussimont (Marne), where it remained until December 6, 1918, when the 53d Artillery (C. A. C.) left en route to the United States.

Throughout the period covered above this battery formed a part of Groupe Glassburn and fired a total of five hundred and eighty-five rounds at enemy targets.

Battery "F," 53d Artillery (C. A. C.)

This battery manned four 19-G (French) guns, Railway Mount, Model 1875/76.

The battery joined the 1st Army, American Expeditionary Force, on September 5, 1918, occupying a position near Blenod (Meurthe-et-Moselle), where it remained until September 18, 1918, taking part in the St. Mihiel operation of the 1st Army, American Expeditionary Force. Total number of rounds fired during this period: eighty-nine. On September 19, 1918, the battery joined the IV French Army, occupying a position near Vienne-la-Ville (Meuse), where it remained until October 24, 1918, taking part in the offensive of the IV French Army during that period. Total number of rounds fired: five hundred and forty-four. On October 25, 1918, the battery rejoined the 1st Army, American Expeditionary Force, and was held in reserve until November 8, 1918, when it joined the 2nd Army American Expeditionary Force, at Blenod (Meurthe-et-Moselle), where it remained until November 27, 1918. The battery returned to Haussimont (Marne) on November 28, 1918, where it remained until December 6, 1918, when the 53d Artillery (C. A. C.) left en route to the United States.

Throughout the periods covered above this battery formed a part of Groupe Glassburn.

(To be continued.)

Mobility of New 3-inch A. A. Guns

By Capt. John K. Christmas, O. D.[1]

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THE trend of modern military development is towards mechanization of all the functions of combat. The four main elements open to mechanization are: 1. Fire power; 2. Mobility; 3. Protection; and 4. Contributary and subordinate but complex functions, such as fire control.

An important element of any sizable armed force is a unit to protect the other arms against the attacks of hostile aircraft. Such a unit is an antiaircraft regiment. To be in keeping with the spirit of mechanization an antiaircraft regiment in a modern army must have, in some form, the four elements enumerated above. These take the following forms: the improved 3-inch antiaircraft trailer mount, M1, with a high rate of fire is also very mobile while the difficult functions of fire control are performed by mechanical and electrical means. Regarding the third element, protec-

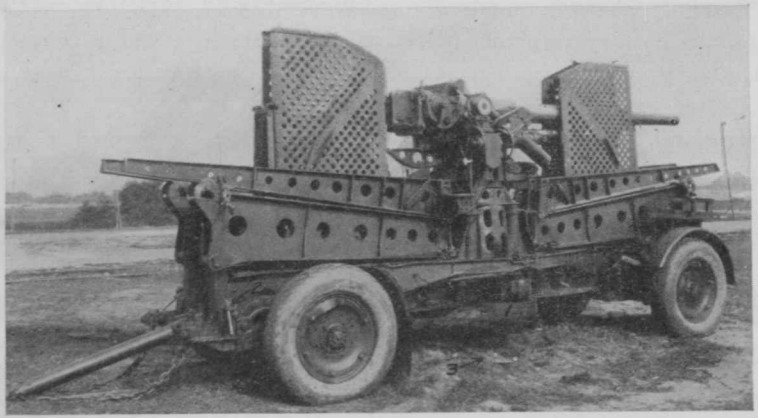

Fig. 1. New 3-Inch Antiaircraft Trailer Mount in Traveling Position

tion, it is neither necessary nor practicable to give mechanical protection (armor) to an antiaircraft battery; its protection lies in the fact that it is employed in the zone away from small arms fire, in concealment, and in its own offensive power.

In March, 1929, the War Department ordered the 62nd Coast Artillery (A. A.), permanently stationed at Fort Totten, N. Y. (near Brooklyn, N. Y.), to proceed to Fort Story, Va. (near Cape Henry, Va.) for its annual target practice and for some special firings against gliders in connection with the Air Corps from Langley Field, Va. The 62nd Coast Artillery (A. A.) is a mobile, or motorized, regiment and was ordered to proceed from Fort Totten to Fort Story *by marching,* this being at once a training in strategic mobility and a test of the new 3-inch antiaircraft mobile mount, M1. Four of these guns were in the hands of the regiment,

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one being picked up at Aberdeen Proving Ground on the march south.

The main items of equipment furnished this regiment by the Ordnance Department were: Eight 3-inch antiaircraft guns (4-M1, 4-M1918), antiaircraft machine guns, antiaircraft fire-control directors, fire-control instruments, sound locators, 5-ton tractors, trailers for the tractors, and artillery repair truck.

The 62nd Coast Artillery (A. A.) consisted of the following units:

Headquarters and band;
Headquarters battery;
Service battery.
1st Battalion:
Headquarters detachment and combat train;
Battery "A" (searchlights);
Battery "B" (4 3-inch antiaircraft guns, on trailer mounts, M 1918);
Battery "C" (4 3-inch antiaircraft guns on trailer mounts, M1) (new model).
2nd Battalion:
Battery "E" (machine guns);
Battery "F" (machine guns).

The march order issued by Col. H. C. Barnes, C. A. C., the regimental commander, directed that the march to Fort Story be conducted by battalion convoys. That is, the battalions marched as separate units under the battalion commanders. The writer, as an observer, accompanied the 1st Battalion, commanded by Maj. L. B. Magruder, C. A. C.

The 1st Battalion left Fort Totten, N. Y., at 5 a. m. March 18, 1929; the 2nd Battalion left on March 19. The 1st Battalion convoy consisted of the following vehicles:

4 guns, 3-inch antiaircraft trailer mount, M1 (new type);
4 guns, 3-inch antiaircraft trailer mount, M1918 (old type);
3 class B trucks;
9 searchlights on Cadillac trucks;
1 Chevrolet sedan;
4 rolling kitchens;
4 water trailers, 300-gal.;
4 trailers, 10-ton;
1 tank gasoline, 750-gal., F. W. D.;
1 Dodge light repair truck;
1 G. M. C. ambulance;
1 Artillery repair truck, F. W. D.;
5 White reconnaissance cars;
6 G. M. C. ¾-ton trucks;
2 5-ton artillery tractors, M1917;
34 trucks, F. W. D., 3-ton.

—

84 Total vehicles.

The personnel of the 1st Battalion consisted of eleven officers and about two hundred and seventy-five enlisted men. A medical officer and an ambulance were attached.

The itinerary of the march is given in the table below.

ITINERARY OF 500-MILE MARCH 62ND COAST ARTILLERY (A. A.)

Place	Date of Departure March	Mileage	Total time on the road hrs.	min.	Rate: Miles per hour including all halts
Fort Totten, N. Y.	18	59.7	12	15	4.9
Raritan Arsenal, N. J.	19	59.9	13	08	4.6
Frankford Arsenal (Philadelphia, Pa.)	20	41.9	8	50	4.8
Wilmington, Del. (Armory)	21	46.9	8	10	5.7
Aberdeen Proving Ground, Md.	22	58.2	11	25	5.1
Fort George G. Meade, Md.	23	52.2	16	40	3.1
Sunday, rest and overhaul	24	(at Ft. Humphreys, Va.)			
Fort Humphreys, Va.	25	41.3	7	55	5.2
Fredericksburg, Va. (Armory)	26	51.8	10	0	5.2
Richmond, Va. (Armory)	27	66.3	9	50	6.7
Fort Eustis, Va.	28	42.0	10	0	4.2
Fort Story, Va. (arrived)	28				
Total		520.2			
Averages: (Per day, Sunday excluded)		52.0	10	50	4.8

Average of total of daily halts: 4 hours 15 minutes (approx.); this gives a *mean running rate of 7.9 miles per hour,* a good figure for the trucks used.

The 3-ton F. W. D. trucks used as prime movers for the guns and other trailed loads were of the type procured for the Army in the World War. Briefly, this is a 3-ton truck, 4-wheel drive, solid-tired and powered with a 4-cylinder 36-horsepower engine; it is equipped with a cargo body and canvas top (See Figure 3). This truck, while it did excellent work in service during the late war, is now over ten years old in design. Added to this, the majority of the trucks in the 62nd Coast Artillery were *old in point of mileage,* and a good number practically worn out. The condition thus existed of having a new and highly efficient antiaircraft trailer mount drawn by an obsolete and in many cases worn-out prime mover.

Leaving Fort Meade a second class road was encountered which delayed the convoy considerably although the principal delay was caused by the inability of the trucks to pull the guns up the short steep grades on this road. Over this road it took the convoy five hours to march eleven miles.

The 3-inch antiaircraft trailer mount, M1, was initiated by the Ordnance Department in 1926 and the first pilot mount tested at Aberdeen Proving Ground in October, 1927. This gun has now been adopted as standard equipment. This weapon consists of the latest type of 3-inch antiaircraft gun mounted on the new improved four-wheel trailer mount, equipped with 40-inch by 9-inch balloon tires inflated to fifty-five pounds per square inch. The firing platform and the necessary long outriggers to give the mount stability in its firing position have been ingeniously designed so that the whole carriage is a compact vehicle weighing about eight

tons, with a 66-inch wheel tread and a 160-inch wheel base. The overall dimensions of this weapon in traveling position are: length, twenty-five feet; width, seventy-seven inches; height, one hundred and eight inches. The center of gravity is only forty-four inches above the ground, giving the carriage excellent stability on its wheels. The gun is 50 calibers in length and is equipped with a removable liner; the muzzle velocity is 2600 f. s., giving a vertical range of about ten thousand yards and a horizontal range of about fifteen thousand yards. The maximum rate of fire is about twenty-five shots per minute. Figure 1 shows this remarkable mount as it was convoyed on the road by the 62nd Coast Artillery, and

FIG. 2. 3-INCH ANTIAIRCRAFT MOUNT IN FIRING POSITION
Change from traveling to firing position requires fifteen minutes.

Figure 2 shows the mount in firing position. To go from the road or traveling position to the firing position *requires only fifteen minutes.*

The march of five hundred and twenty miles from Fort Totten, New York, to Fort Story, Virginia, showed that this carriage rides literally "like a touring car," which is of great importance in prolonging the life of the gun and in protecting its delicate mechanisms. Although the speeds ordinarily used in the convoy were from ten to fifteen miles per hour, due to the limitations of the F. W. D. trucks used, the speed at times went up to about twenty miles per hour coming down hill. At no time was there any objectionable sway or vibration of the trailer mount. The special mechanical four-wheel brakes provided were so effective that they held not only the gun carriage but, coming down hill, also the heavy towing truck which, in many cases, had very poor brakes. The brakeman rides in a seat on the left rear of the carriage and operates the brake with a hand lever. The march has demonstrated that the trailer mount, both as concerns the equipment and the personnel, can be taken safely on long campaign or strategic marches at speeds up to 25 miles an hour, such as could be maintained with modern vehicles (trucks). The tests made in the Mechanized

Force at Fort George G. Meade, Maryland, in the summer of 1928, with modern high-speed prime movers have demonstrated conclusively that this carriage may be towed safely over good roads at speeds up to forty miles an hour. The mobility of this carriage is, therefore, all and more than is necessary, and is only contingent on supplying the necessary modern truck to furnish the motive power.

The normal *strategic moves* (moves approaching the battle) of antiaircraft units will be made over hard or improved roads allowing the use of wheeled prime movers or trucks. After the antiaircraft unit arrives in the theatre of operations near its intended firing position, it can be moved *tactically* (in the combat zone) by its truck where practicable. Where access to the intended position is impracticable with a truck or wheeled

FIG. 3. SECTION OF CONVOY, 62ND COAST ARTILLERY.
The new antiaircraft gun and the old F. W. D. truck.

prime mover, the trailer mount is detached from the truck and is pulled into its final position across country by a small track-laying (5-ton or equal) tractor. One such tractor is carried in each battery particularly for that purpose and to pull out wheeled vehicles that are mired. The 62nd Coast Artillery is provided with the 5-ton tractor, M1917, on a standard trailer for use in such *tactical* movements, as shown in Figure 4; these tractors are now being replaced by two new Caterpillar "20" tractors.

The march of the 62nd Coast Artillery was of five hundred and twenty miles, which is a very long strategic move even for a motorized regiment to make under its own power. It is believed that in most cases in time of war such long moves would be made partly by boat or rail. The time consumed in making this march is not exceptionally good, but it is about what can be expected with the obsolete and partly worn-out truck equipment with which this regiment was provided. The performance is nearly the same as that obtained in convoys of the Experimental Mechanized Force at Fort George G. Meade, in the summer of 1928, when it is con-

sidered that in the E. M. F. loads as heavy as the 3-inch antiaircraft trailer mount, M1, were ordinarily towed either by a Class "B" (Liberty 5-ton) truck or by some modern heavy commercial truck. It is my opinion that a certain appreciable part of the difficulties encountered with the motor equipment on this convoy, and in other Army convoys as well, must be laid to the type of enlisted personnel furnished. The increasing complexity and quantity of technical equipment provided the various combat units of the Army today demand a more intelligent and a better-trained type of enlisted man than is now being obtained generally with the existing pay ratings, to which must be added the difficulties of training personnel due to large turnovers of enlisted men.

As a corollary to the excellent mobility of the new 3-inch antiaircraft trailer mount, as well as to its superior efficiency as a firing weapon against celestial targets, it may be of interest to discuss the possibility of using this carriage for terrestrial fire, i.e., against ground targets. While this weapon was not primarily designed for terrestrial fire, its excellent mobility, its high rate of fire, and its very complete and reliable fire-control system make it an excellent weapon for many forms of terrestrial fire. This form of carriage (pedestal mount) is not now considered, due to its weight and the length of time required to go into position, the most desirable for light field artillery, but we all know that in time of war the capable type of leader will make use of any means at hand to accomplish his objective. With the terrestrial fire capabilities of the 3-inch antiaircraft trailer mount there would arise in combat many occasions where a commander could and would make use of this weapon for terrestrial fire. Some such occasions may be enumerated:

1. Where our planes control the air the antiaircraft battery could be used to augment the barrage in an attack.

2. In a defensive battle, due particularly to the excellent fire control of this weapon, it could be used very effectively against fast-moving attacking tanks.

3. The antiaircraft artillery being already in position somewhat behind the light artillery, the former could be used in emergency to cover the withdrawal of the forward elements of a retreating army.

4. As the Coast Artillery also plans, this gun may be used against fast-moving unprotected naval targets, such as destroyers and mine-layers.

Another aspect of the excellent mobility of the new 3-inch antiaircraft trailer mount lies in its greater value as a coast defense weapon against air attacks. The fixed antiaircraft battery can with advantage be emplaced in positions of importance near large cities, important harbors, industrial plants or arsenals, many of which are almost sure to be objectives of enemy air attack in time of war. However, even in these objectives there would be a large element of uncertainty as to which of the objectives the enemy would select for his attack. Also, in a country as large as ours the war-

fare would be very unlikely to extend all over the country; it would be more likely to be localized in a certain section such as New England, Southern California, or Florida. It is manifestly very expensive, and in time of peace almost impossible, to provide adequate fixed antiaircraft defense for *all* important cities, industrial plants and government activities. With the highly mobile 3-inch antiaircraft gun, this is not necessary for as the war develops and localizes itself in certain sections, the antiaircraft defense of that section may be quickly augmented by drawing in from all over the country the necessary, and perhaps all, available *mobile* antiaircraft units. This has the advantage of concentrating our total antiaircraft effort at the point where it is most needed, while at the same time lessening the financial burden of antiaircraft defense in time of peace.

FIG. 4. 5-TON TRACTOR ON TRAILER—FOR TACTICAL MOBILITY OF GUNS.

Further, if the war be of any considerable duration the objective is likely to shift, in which case the antiaircraft defense may be shifted to the new zone of combat with very little difficulty.

It might not be out of place here to state that this new gun, with its newly developed nearly automatic fire control has roughly a *five times greater efficiency* in hitting airplanes than the weapons used during the World War, as well as a much greater mobility; but we must also bear in mind that the effectiveness of an antiaircraft gun lies not only in its actual hits on attacking airplanes, but in its potential hitting power and in its moral effect on the enemy by its mere presence and fire. While recognizing the latter factors as being very large, it is, of course, impossible to measure this phase of an antiaircraft gun's value as it depends somewhat on the skill and daring of the enemy aviator. However, it may certainly be considered that the effectiveness of an antiaircraft gun, in keeping away enemy planes by its threat, or potential power, is at least as great as its power to keep away enemy planes by actually bringing them down. The so-called moral effect of an antiaircraft gun may be likened to a man

swinging a saber: he need not strike his opponent, in most cases, in order to keep him away.

Another important element of any weapon, particularly in the United States, is the degree of training required of its personnel. The 3-inch antiaircraft gun and its accompanying fire-control mechanism have been so built that automatic mechanical devices perform the functions of much highly trained personnel and do those functions better. Such personnel we would not have available in any quantity on the outbreak of a war and takes many months to train. This takes care of that element of this weapon which has to do with its fire-power. As regards its mobility, that is only dependent on providing ordinary truck transportation, and no other country has a larger or better reserve of trained automobile drivers and mechanics. That this is so was well demonstrated on the convoy described herein, as this regiment contained a large proportion of recruits, in spite of which with obsolete motor equipment this regiment made a march of over five hundred miles with no serious accidents, adhered to its previously laid down schedule and maintained in running order a great deal of poor motor equipment. As an index to the condition of the trucks in this regiment it may be stated that on one day of this march ten of the F. W. D. trucks were towed into camp at the end of the day. Again, on the last day of the march, so many vehicles were out of order that in one case an F. W. D. truck was pulling a rolling kitchen, a 3-inch antiaircraft gun and a disabled F. W. D. truck. A number of F. W. D. trucks were left behind at Raritan Arsenal at the end of the first day's march, overhauuled F. W. D. trucks being borrowed from that arsenal to replace them.

In taking note of the time lost on this march, due to halts, it should be noted that after the third day, a "maintenance section" was organized and orders issued that when a vehicle became disabled it was to drop out of the convoy to be picked up by the maintenance section running at the tail of the convoy. The maintenance section then either repaired the vehicle, if this could be done in a reasonable time, or took it in tow into camp. In this way the main body of the convoy was enabled to proceed on scheduled time with a ten-minute halt every hour. Before instituting this method of procedure it had been the practice to stop the whole convoy whenever a truck fell out, thereby losing considerable time. Another cause of considerable delay was the necessary time to halt for lunch, this time being from 1½ to 2½ hours. In time of emergency this time could be considerably reduced or eliminated by having cold lunches issued to the men in the morning before starting.

The daily march averaged fifty-two miles, which, considering the prime movers provided for these heavy loads (eight tons), is very good; *it is over twice the daily march that could be expected from a horse-drawn light artillery unit* over the distance this regiment marched. On some days the march could have been made considerably longer had it not been necessary to halt at military reservations or armories, where arrangements for

camps had been made beforehand. Somewhat better time could have been made, it is believed, with Class "B" trucks as prime movers for the guns; this estimate is based on the performance of the 1st Battalion of the 6th Field Artillery in the Experimental Mechanized Force in the summer of 1928, when daily marches of seventy to eighty miles were made on several occasions. What the daily march could be with modern truck equipment is, of course, only an estimate, but it is believed that one hundred and fifty miles a day would be not at all unreasonable. In closing, a word must be said for the zeal and ability of the officers and men of this regiment in making this long march under the considerable handicaps due to malfunctioning and inadequacy of the motor equipment. No serious accidents occurred either to the personnel or property, and this although many of the men were recruits and all of them were tired from long hours on the road, to which were added additional hours spent in making and breaking camp.

It is believed that the American Army has a mobile 3-inch antiaircraft gun equal, if not superior, to that of any other nation, in its accuracy, fire power, dependability and mobility. With the increasing mechanization of armies the latter quality is of prime importance.

In planning for the preliminary organization of the citizen forces we recreate the World War units as far as possible and assign them officers locally, thus maintaining the traditions of their splendid service as a stimulus to younger generations, through whom we would always preserve the spirit of devotion to those units. There could be no better foundation upon which to build for the future.—Gen. John J. Pershing.

R. O. T. C. Training

By LIEUT. COL. HARTMAN L. BUTLER, C. A. C.

A MEMBER of the Reserve Officers' Training Corps is a civilian military student. He is not a Regular Army man, National Guardsman, Organized Reservist, or a Cadet—he takes no military oath.

The general object of R. O. T. C. training is to qualify students for positions of military leadership in time of national emergency.

The objects of the different years of training may be stated generally as follows: 1st year, qualify as a private; 2d year, in the lower grades of noncommissioned officer; 3d year, in the highest grades of noncommissioned officer; 4th year, as a 2nd lieutenant, Officers' Reserve Corps.

The following statistics may be of interest:

PRODUCTION

(From 1st Indorsement, W. D., Feb. 18/28)
ROTC enrollment, 1926-27

Basic Course—Students enrolled.			
1st year	41,397		
2d year	26,707		
Total Basic		68,104	
Advanced Course			
1st year	7,276		
2d year	6,204		
Total Advanced		13,480	
Total, Senior units (4 yrs.)			81,584
Total, Junior units (1 to 4 yrs.) not divided into basic and advanced			38,330
Total ROTC			119,914

R. O. T. C. GRADUATES, 1927

Qualified for commissions as 2nd Lieuts., O. R. C.

From	*Certificates Outstanding*	*Appointed*	*Accepted (Mostly Under Age)*
Junior Units	213	27	25
Senior Units	392	5,490	5,411
Total	605	5,517	5,436

If it is assumed that the average student spends two years at the junior unit schools, then there are about nineteen thousand students leaving such schools each year.

In the senior unit schools the difference between the 1st year basic and those finally commissioned is about thirty-six thousand.

Students leaving Junior Schools	19,000
Students leaving Senior Schools	36,000
The total not commissioned	55,000
The total commissioned	5,436
Released yearly grand total about	60,436

These calculations are sufficiently accurate to indicate the importance of supporting and promoting that source of civilian military training which must be depended upon to supply the principal reservoir for trained officer and N. C. O. material, in truly remarkable numbers, in case of future national emergency.

General Features

In most of the institutions where R. O. T. C. units are located, military instruction is compulsory for the first two years.

All branches of the Army are represented at the different schools, some schools having as high as six different units. Except at the larger universities and technical schools, in order to secure concentration of effort and economy, it is recommended that the number of units be limited to one, or at most two.

Most of the institutions have different policies; therefore the P. M. S. & T.'s are frequently confronted with various military problems. These policies have to be met and if they are not entirely satisfactory, then the P. M. S. & T.'s may, by use of proper tact and judgment, secure gradual changes.

A. R. 145-10 prescribes that credits to enter a senior unit may be granted to students who have received equivalent military instruction at an educational institution under an officer of the Army. This applies principally to students at junior unit schools and former cadets at the U. S. M. A.

Credits are also allowed R. O. T. C. students who leave school and endeavor to secure commissions through the Citizens' Military Training Camp, but no credit is allowed to the C. M. T. C. trainee when entering a senior R. O. T. C. unit.

As the first year basic course, senior R. O. T. C. unit, is very elementary in its nature, it is recommended that the following additional men be granted credits towards entering the unit: Those with suitable former service in the U. S. Army, National Guard, and C. M. T. Camps.

The various institutions grant credits for military training towards graduation varying from 5 per cent to 25 per cent of the hours. It is greatest at the schools where the training is voluntary. In all cases, effort

should be made to secure the same proportionate amount as granted to other academic departments.

At most of the institutions military fees are required of the students, which go towards paying the insurance on government property, remuneration for armorers and laborers, small payments to certain members of the officer and noncommissioned officer personnel for extra duty, for the purchase of ranges, terrain boards, puff boards, and for other equipment not ordinarily furnished by the military department.

The service uniform now furnished by the Government to the R. O. T. C. is, in the writer's opinion, very unsatisfactory. Nothing is more demoralizing to the well-dressed college man, especially in co-educational institutions, than to have to wear ill-fitting service woolen and faded cotton uniforms. As apparently the war stocks are inexhaustible, it would be very desirable to equip R. O. T. C. units with uniforms of distinctive color such as cadet gray or blue.

The officer personnel can greatly popularize the military department by participating in faculty and campus activities, such as joining research and other clubs, serving on faculty committees, and assisting in training the varsity teams. The comradeship of faculty members who are veterans of the World War or members of the O. R. C. should be cultivated. The student rifle teams, both men and girls, are an asset. In some schools, varsity letters are awarded the members of these teams. The military fraternities, when encouraged and upon occasion "directed," are a great aid in securing students' support and in overcoming anti-military and communistic influences.

Military exhibitions, competitions, and horse shows have great value, as they attract general interest and enthusiasm and are attended by the student body, faculty members, visiting guests, and townspeople. On these occasions considerable prominence should be given to the presentation of badges and medals. The governor of the state or other prominent civilian officials should be present and take a conspicuous part in the ceremonies.

The institutional annual military training generally culminates in the War Department inspection, lasting two or three days, which is the final test to determine whether or not the unit is to reach its cherished goal of "Distinguished Rating."

Programs of Instruction—Senior Units

The War Department from time to time issues a general program for the four years of instruction to be followed by the different branches of the Army. Subjects, number of hours, texts, scope, and ojectives are indicated. These directions are the basis upon which the P. M. S. & T.'s, after consultation with the proper college authorities, submit their brief programs of instruction, separately for each unit, to the corps area commander. Reasonable variations due to climate and local conditions should

be allowed. These programs are based on the minimum legal requirements of three hours of instruction per week for the basic course students and five hours per week for the advanced course students, covering an annual period of thirty-two weeks. For the four years' work, the total hours for practical and theoretical instruction are about equal.

The senior officer present with each unit prepares and submits to the P. M. S. & T. weekly schedules and problems, based upon the approved program. The schedules should be well balanced, and conferences, lectures, quizzes, and problems thoroughly prepared. The instructor should so list the lesson assignment as to require at least as much outside study as is demanded by the other academic departments. The lesson assignment should not be too long, in which case the students may ignore them entirely or study them only slightly, and neither should there be any "snap" courses.

Some of the subjects taught in the R. O. T. C. course are very popular, such as mapping, military history, military law, and motor transportation.

The best results are obtained where the instruction is individual and therefore, in so far as the number of instructors will permit, the sections for indoor instruction should be small and the hours of instruction staggered with the periods of other departments. Whenever possible, student officers should assist in the outside instruction of the basics.

In a great many cases it will be found that student officers will voluntarily devote extra hours where they can exercise command and leadership.

Students for the advanced course should be carefully selected. Only students with proper grades and who have promise of the qualities of leadership should be enrolled. It has been found desirable at some of the institutions to make the tentative selections of these men a few weeks before the end of the second basic year, and to give these students special "spring training" in order to qualify them further for the advanced course. They should be given special training in drill and leadership. This procedure not only gives desirable training to a selected class, but adds to the attractiveness of the selection to such an extent that very few of the qualified men are willing to be omitted.

In some schools student corporals are selected from the second year basics, sergeants from the first year advanced course men, and officers from the second year advanced course men. In other schools all of the noncommissioned officers are selected from the second year basic, second lieutenants from the first year advanced, and all other officers from the second year advanced. Whatever plan is adopted, it is very desirable to give the first year advanced course men considerable opportunity to exercise command as student officers in order that they may be properly qualified to function in such capacities at the ensuing summer camp.

Combined Program

The latest W. D. program of instruction—A. G. 353 R. O. T. C. (1-19-28) (Misc.), which will probably go into effect during the next school year—is very complete, well balanced, and progressive, and prescribes a certain amount of uniform instruction for all branches of the Army. It is believed that it can be improved as follows.

ALL UNITS

Add three to four hours of instruction with the saber, officers, T. R. 25-10. Newly appointed reserve officers when first attending dismounted formations requiring the use of the saber invariably make a shocking impression in their use of this arm. In the institutions where the writer served, sabers made of wooden laths, together with sabers borrowed from officers, were used to advantage. If this instruction is to be included in the War Department program, then A. R. 145-20 should be amended to include an allowance of, say, 12 per cent of officers' sabers in lieu of rifles. There would be no extra expense; in fact, a small money saving would result.

Include under military law about four hours in the Rules of Land Warfare, W. D. Doc. 467. All officers should be informed of the more important usages of war concerning belligerents and others, especially as to its application in invaded territory.

Include under Administration and Supply a little instruction in A. R. 30-2210, Rations, Returns, and Savings Accounts. Lowest ranking officers in times of emergency will frequently be in command of companies and detachments, and the morale of their units will depend largely upon securing the complete ration and understanding mess management.

Include under Drill and Command, first year advanced, a few hours of practical instruction in drilling the platoon and company in order to prepare the men to function as student officers in the summer camp.

F. A. UNITS

Make a definite assignment of hours in Field Engineering similar to other combatant units. Concealment by camouflage and protection by shelter are very important.

C. A. UNITS

See recommendations that appear later.

Specimen Program

The courses of instruction for the various combatant branches are similar in form and coincide in several subjects and number of hours allotted. That for the Coast Artillery, for example, is quoted from A. G. 353 R. O. T. C. (1-19-28) (Misc.) as follows:

(Subjects common to all combatant branches are indicated with an asterisk).

FIRST YEAR BASIC (Freshmen)

Subject	*Hours*
*The National Defense Act and the R. O. T. C.	2
*Military courtesy and discipline	3
Drill and command (Infantry)	45
Rifle marksmanship	10
Coast Artillery instruction (2d class gunners' instruction in harbor defense, A. A., and tractor-drawn artillery)	36
	96

SECOND YEAR BASIC (Sophomores)

Subject	*Hours*
Drill and command	35
Coast Artillery instruction (1st class gunners' instruction in harbor defense, A. A., and tractor-drawn artillery)	61
	96

FIRST YEAR ADVANCED (Juniors)

Subject	*Hours*
*Map reading and military sketching	27
Drill and command	35
Coast Artillery instruction: H. D., A. A., Ry., and Tractor Arty. (Expert gunner, 18; Gunnery, Heavy Arty., 50; Gunnery A. A., 30)	98
	160

SECOND YEAR ADVANCED (Senior)

Subject	*Hours*
*Military Law and Officers' Reserve Corps Regulations	15
*Military history and policy	20
*Administration and supply	8
Field engineering	10
Drill and command	35
Motor transportation	24
Coast Artillery instruction (Artillery materiel, 12; Artillery tactics, 12; orientation, 24)	48
	160

(Note, 1929—Latest W. D. Program, 5-9-28, changes slightly a few of the hours and also adds five hours of Military Hygiene and First Aid to the First Year Basic.)

Compared with other combatant branches the principal differences are as follows:

Infantry and Engineers—

Combat principles, musketry, and more drill and command in place of gunners' instruction, gunnery, motor transportation, and orientation.

Cavalry—

Equitation, mounted action, and cavalry tactical principles in place of the same subjects listed above.

Field Artillery—

Equitation and mounted action in place of motor transportation and orientation.

The course of instruction in the Coast Artillery provides that units located in the V, VI, and VII Corps Areas will devote to antiaircraft artillery approximately 75 per cent of the time allotted to artillery subjects. This provision, in the writer's opinion, is the most important development in the Coast Artillery program. Conversation with coast artillery officers working under the provisions of this requirement in one of the above corps areas indicates that the plan to major one class of artillery is far more desirable than to extend the instruction to several classes. These officers have also served at Coast Artillery R. O. T. C. camps in harbor defenses where several classes of artillery were covered. While it is appreciated that R. O. T. C. graduates entering the O. R. C. may be transferred from time to time to different classes of coast artillery armament, yet it would be desirable to have Coast Artillery units in all corps areas concentrate on only one particular class of artillery, as is done in the field artillery.

Further changes in the Coast Artillery program are recommended as follows:

Reduce instruction in artillery material, 2nd year advanced, by ten hours and add five hours to drill and command and five to artillery tactics. It is believed the student in a half day's inspection of armament at the summer camp can secure sufficient information on artillery materiel.

Texts

The Training Regulations are the principal source of R. O. T. C. texts. In some cases these regulations require amplifications, cuts, and figures. It would be well to have these training regulations compiled under separate covers for particular classes of instruction. There are two private publications[1] which cover completely the infantry four-year course. Probably these private concerns could be induced to make for each branch a compilation in one volume of the common subjects now appearing in two or more infantry volumes. There is great need of standard textbooks for all arms other than Infantry. In the writer's opinion, such books should be prepared by boards composed of officers with R. O. T. C. experience from different climatic sections of the country.

[1] And one which covers the Coast Artillery four-year course. Engineer, Cavalry, and Field Artillery textbooks are in course of preparation.—Ed.

Summer Camps

The summer camp as a rule "sells" the advanced course enrollments in most of the institutions. The longer the journey the better. The student looks forward to this camp with a great deal of enthusiasm and is willing to devote extra hours to the training necessary to prepare him to perform the required camp duties.

As far as possible the students should be under direct control of the R. O. T. C. Regular Army instructors. It is very desirable to have the camp program prepared by R. O. T. C. instructors or, at least, prepared after consultation to determine the needs of the different units in order to coordinate the camp course with the courses already given at the institution and with the fourth year course which is to follow.

The camp instruction should be strenuous at first with a gradual lightening up towards the end. Practical, technical, and tactical instruction is given. Care should be taken not to devote too much time to small arms firing. As far as possible all instruction excepting occasional ceremonies should be given in the morning. No duties should be required on Wednesday and Saturday afternoons. Other weekday afternoons should be devoted principally to supervised athletics, group games, and swimming, and all students should be required to take part. Indoor baseball played outside is one of the forms of sport which requires no skill but affords active competition. Extensive recreational activities should be provided.

It is recommended that about twenty-five per cent of the camp training hours be devoted to close order drills and ceremonies—for discipline, command, and leadership purposes—and to equitation and to supervised athletics.

Conclusions

Beyond the military aspect of R. O. T. C. training which carries home the true value of our military policy, there are other great benefits, as can be seen from the following quotations:

> Address of Dr. Stratton D. Brooks, President, University of Missouri, to University R. O. T. C., *Columbia Missourian*, November 5, 1925:
>
> The physical benefits are commonly recognized. Alertness, erectness, coordination, and good health are fruits of military exercise. Another value of the training is the mental exercise it affords. Two-thirds of the military training at the university is now done in the classroom. The mathematics of the artillery units is as valuable as that taught in any other branch of the university. Topography, military law, and other purely educational subjects improve the student's mind, no matter where he takes them.
>
> Perhaps the greatest benefit of military training, however, is its training in the quality of leadership. It is the only school subject that furnishes this practice.

> Opinion of Dr. William M. Lewis, President, George Washington University: *Washington Star*, December 17, 1925.
>
> An undisciplined generation is a weak generation. I believe that many of

those who are arguing for and against military training in our schools tend to overlook the most essential consideration connected with it—meaning discipline.

The most casual thinker and the most unobserving cannot fail to be aware of the insidious growth of antimilitarism and communistic tendencies in the minds of a large number of the young people to today. These young people also believe that preparedness means war and they have heard much about the "Inalienable rights of American citizens." Undoubtedly the lessons learned in the R. O. T. C. classes and the contact made with the instructors of our Regular Army will have a far-reaching influence in promoting preparedness and patriotism.

Our ex-service officers and men will not always be with us, so that provision must be made to replace them. Accordingly, we maintain Reserve Officers' Training Corps units in various schools, and colleges, and Citizens' Military Training Camps of one month's duration during each summer. We thus prepare the young men who may be called upon to serve in the future, with selected leadership, than which nothing is more necessary to the proper conduct of a successful campaign. Furthermore, through this agency, we shall be able to transmit to coming generations, the results of our experience and not leave them a legacy of neglect and indifference.—Gen. John J. Pershing.

Forms for the Battery Commander's Combat Order, Antiaircraft Artillery

By MAJ. JOSEPH C. HAW, C. A. C. (D. O. L.)

INSTRUCTION Circular No. 6, The General Service Schools, Fort Leavenworth, Kansas, 9 September, 1927, published forms for the combat orders of regimental and battalion commanders of the antiaircraft artillery. The purpose of the present article is to go a step lower in the chain of command and work out forms for battery commander's combat orders. Such forms should prove a useful aid in the training and instruction of battery officers.

The following plan has been adopted: First, there is presented a "General Form" which is applicable to all the various types of batteries in the antiaircraft artillery regiment in practically all situations; second, the application of this form to each of the various types is facilitated by an enumeration of the tactical subdivisions of each type of battery. In other words, the student who is required to write a battery commander's order will find in the "General Form" a framework for his order, complete except for instructions to the tactical subdivisions of the battery, while under the heading "Organization of Batteries" he will find listed those battery subdivisions which must receive detailed instructions in paragraph three of the order.

The battery commander's combat order, in the antiaircraft artillery, will almost invariably be a straight march order or an order for the march to and occupation of positions. With few exceptions, it will be verbal, but a written record should be made for the battery files. In some situations, it will not be necessary to cover all the points listed below. With a few obvious modifications, the form is suitable for employment by platoon commanders of searchlight and machine-gun platoons.

For convenience, the "General Form" is presented as though it were to be delivered by the battery commander as a complete order at one place and time. In practice, this will rarely ever be true; the order will be fragmentary. For example, an order may be issued to put the battery in march, but only upon arrival at the position, probably several hours later, will the exact positions of the range section, kitchen, guns, and various other elements be pointed out.

As a rule, paragraph 1 should be brief. In connection with paragraph 3*b* of the form, it should be noted that every battery is equipped with machine guns, and so is the Combat Train of the gun battalion; however, in the machine-gun battalion and the searchlight battery all machine guns are in the platoons, and an independent subparagraph of paragraph 3 should be devoted to each platoon.

GENERAL FORM

(A form applicable to all types of batteries)

Paragraph 1—

a. General information of enemy; information of hostile aerial activity.

b. General plan of corps commander; location of important units covered by the battery; general plans of important units covered by the battery; missions and plans of friendly air forces as they affect the battery; general location of adjacent elements of the regiment and of other antiaircraft regiments.

Paragraph 2—

Marching at (date and hour) via (route) to position(s) at (place) the battery will cover (certain troops, establishments, or sensitive points).

Paragraph 3—

a. Composition of and instructions for battery commander's reconnaissance party.

b. Location of, and instructions for, the organic machine guns of the battery (except in machine-gun batteries and searchlight batteries).

c, d, e, etc. Instructions for each principal tactical subdivision of the battery and for attached units, if any. Instructions for elements which are to be detached from the battery.

x. Place and hour of formation for the march and order of subordinate units in column, if abnormal; road speeds; halts; road restrictions; secrecy; preparation of positions (camouflage, digging in); arrangements for reliefs to stand watch at observation posts, guns, etc.; ammunition expenditure; selection of alternate positions; hour when battery must be ready to fire.

Paragraph 4—

Location of kitchen; hours for meals; hours and general information for drawing rations, gas, oil, and ammunition from higher echelons and for issuing to subdivisions of the battery; location of battalion aid station and of any nearer aid station of other arms; water; billeting (or pitching shelter tents); parking trucks; location of latrines.

Paragraph 5—

a. Axis of signal communications for battery (and for platoons of a machine-gun battery).

b. Command post of battery (and of platoons of a machine-gun battery).

(SIG.)

ORGANIZATION OF BATTERIES

(Details of paragraph 3)

Since the various types of batteries in an antiaircraft artillery regiment differ widely in composition, it is advisable to indicate here the subdivisions of each type.

Every battery has a Maintenance Section, and the routine operations of this section are taken care of in paragraph 4 of the above general form.

However, if the Maintenance Section is to march independently or operate in an unaccustomed manner, the details should be prescribed.

The Message Center is a part of the Command Post.

The work of the subdivisions of the battery is a matter of routine and instructions for each subdivision should be very brief. Ordinarily, it is only necessary to indicate the exact locations chosen for the particular guns, instruments, command posts, or other elements concerned. This is done in paragraph 3.

When the work of any subdivision involves a variation from routine, the following points should be covered in paragraph 3 for that subdivision: Mission; exact new location; special instructions; and, if it is to march independently, the time and place of formation, hour of departure, route, and destination.

The principal subdivisions of the various types of batteries are as follows:

HEADQUARTERS BATTERY

Headquarters Detail (establishes and operates Regimental Command Post); Observation and Orientation Detail (establishes and operates Regimental Observation Post and reconnoiters); Communications Detail (establishes and operates radio and telephone communications and motorcycle messenger service).

SERVICE BATTERY

Regimental Section (Service Battery Command Post, Regimental Personnel Office, and Regimental Supply and Munitions Office); two Battalion Sections (procure and deliver supplies for the battalions, except ammunition.)

Attached: In the field, the Band will probably be attached to the Service Battery.

HEADQUARTERS DETACHMENT AND COMBAT TRAIN, GUN BATTALION

Headquarters Detachment: Headquarters Detail (Battalion Command Post); Observation and Reconnaissance Detail (Battalion Observation Post and reconnaissance); Communications Detail (radio, telephone, and motorcycle messengers).

Combat Train: Train Headquarters (Train Command Post); Train (three sections) (draws ammunition and transports it to the gun batteries).

SEARCHLIGHT BATTERY

Note: When the gun batteries go into position, generally the searchlight platoons are attached to them and only the Battery Headquarters and Maintenance Section remain under the control of the battery commander.

Battery Headquarters: Command Detail (Battery Command Post); Communications Detail (telephone and motorcycle messengers; generally split up among the platoons when latter are attached to gun batteries).

Operations Section: The three platoons (each mans four searchlights and two sound locators).

3-INCH GUN BATTERY

Battery Headquarters: Command Detail (Battery Command Post); Range Section (installs and operates fire-control instruments); Communications Section (telephone and motorcycle messengers).

Firing Sections: Four (each mans a 3-inch gun).

Attached: A searchlight platoon is usually attached when battery is going into position.

HEADQUARTERS DETACHMENT, MACHINE-GUN BATTALION

Headquarters Detachment (Battalion Command Post): Communications Detail (radio, telephone and motorcycle messengers).

MACHINE-GUN BATTERY

Battery Headquarters: Command Detail (Battery Command Post); Communications Detail (telephone and motorcycle messengers).

Firing Sections: Three platoons (each mans four machine guns).

BAND

In the field, the band will probably be attached to the Service Battery.

All these citizen units then would have either a peace or a skeleton organization as to small and large units, but ready for expansion to full strength without confusion or delay. In the light of the lessons of the World War, which we entered without men or organization, and the feeling of utter helplessness that filled us with dismay at that time, we would fall short of our duty if the provisions of the law of 1920 should remain unfulfilled.—Gen. John J. Pershing.

Mechanization in Europe

France

By MAJOR C. C. BENSON, Cavalry

EDITOR'S NOTE: *The following discussion extends the field covered by the author's 1927-28 articles on "Danger Zones." By special arrangement, this article appears in publications other than the* COAST ARTILLERY JOURNAL.

AN EFFORT to isolate the most powerful factor in the forces that have governed French policy since the World War leads inevitably to National Security. The loss of 1,400,000 men in the war has made security a national obsession. In addition to maintaining her entente cordiale with Great Britain, and giving strong support to the League of Nations, France has signed regional compacts with Belgium, Poland, Czechoslovakia, Roumania, and Jugoslavia. These compacts tend to make France the champion of weak states, and thus commit her to direct participation in all the troubles of Europe. A westward move by the Bolshevik forces, or a thrust into the Balkans by Mussolini, might easily bring French armies into action. With their usual firm grasp of realities, the French see clearly that the development of new weapons—gas, submarines, aircraft, and tanks—has practically eliminated the possibility of localizing future conflicts in Europe. Submarines have opened the sea lanes, and airplanes have flattened the Alps. It would be extremely difficult, in the event of war, for France to unite her associates under one commander; but the strategic use of highly mobile French units would serve effectively to coordinate their actions. France earnestly desires continued peace in Europe, and is doing all she can to insure arbitration of international disputes. However, she maintains a powerful army which has the strongest air force in the world. African troops to augment the strength of French units are being trained in the French colonial possessions. Whether the League of Nations can handle major issues or not, France is prepared to safeguard her national interests.

Partial mechanization of ground troops has been an accepted policy in the French army since 1917. The successful use of tanks on the Western Front, in Morocco, and in Syria, to secure decisive results without staggering losses, has convinced French army leaders that fighting machines conserve manpower. To mechanize a large part of the peace-time army is considered impracticable because of the expense involved; yet to ignore the changes that are being made abroad is obviously unwise. New fighting machines and new antitank weapons are far superior to those used in the World War. If France had to go to war today, she would make immediate use of the twenty-three hundred World War tanks that she maintains in constant readiness for action; and would at once begin mass production of new equipment to provide her armies with strong motorized and mech-

anized elements. A book recently published in France, "Motorization in the Armies of Tomorrow," by General Allehaut, discusses several phases of this problem. The author proposes, among other things, to strengthen certain cavalry divisions, which now employ only a few armored cars, by adding motorized and mechanized units. As the proposed organization embodies features of interest to all branches, it merits detailed consideration. The missions to be assigned to the new divisions—reconnaissance, security, and combat—are identical with those heretofore given the cavalry. The new division is to be organized in three tactical echelons, as follows:

Reconnaissance Echelon

Cavalry brigade (two regiments) supported by: horse-drawn or pack artillery and machine guns; artillery, tractor drawn or on self-propelled mounts, armored, capable of rapid movement across country; armored cars, either caterpillar track or wheeled machines, capable of maneuvering across country at good speed; a squadron of observation planes.

Combat Echelon

Cavalry brigade (two regiments) supported by: two or three groups of artillery, part horse drawn and part motorized on cross-country vehicles; one or two batteries of direct fire accompanying guns on self-propelled mounts; one or two companies of light tanks, armed with heavy machine guns; a group of engineers, motorized for cross-country travel, with demolition equipment, antitank mines, road material, and bridging equipment; combat train, part animal drawn and part motorized.

Reserve Echelon

Infantry, half brigade, motorized for cross-country travel, supported by: one artillery battery (six guns) on self-propelled mounts or drawn by tractors, capable of cross-country maneuver; light tank battalion (less units attached to the combat echelon); machine gun battalions with partially armored cross-country vehicles; radio tanks for each battalion and higher headquarters; field trains, part animal or tractor drawn and part trucks suitable for road travel only.

In addition to the organization outlined above, General Allehaut advocates the formation of a motorized division for duties similar to those of the present cavalry division; and the increased use of motor vehicles in certain infantry divisions. His views on these matters are in close agreement with those of the French General Staff. Their problem is threefold—to maintain an army in constant readiness for immediate action; to prepare for transition from manpower to machine warfare; and to evolve mechanized units for future use. General Allehaut's proposals are admirably calculated to meet French needs during the transition period. Active operations against an enemy equipped with modern fighting machines would probably force the French into prompt adoption of similar

equipment; but their present policy is to avoid costly experiments and to progress slowly.

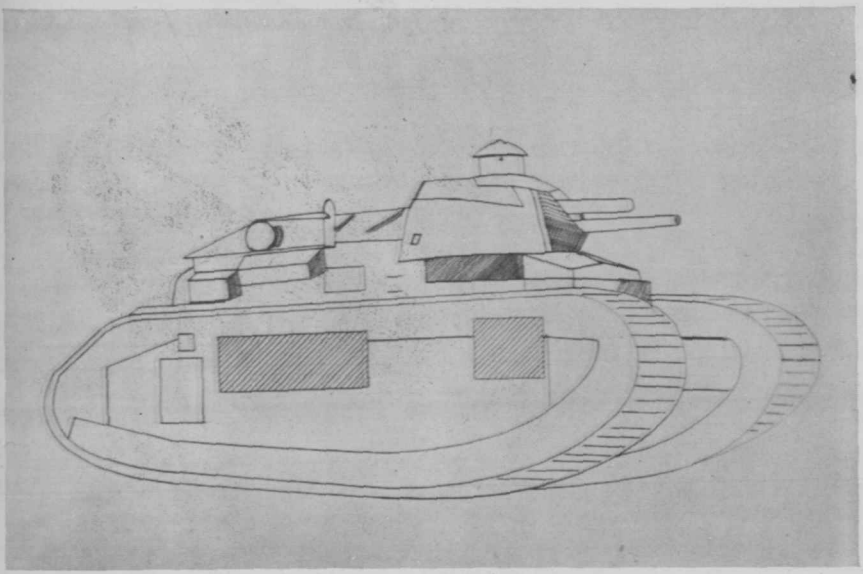
The probable development of mechanization in France has little apparent relation to the present status of her mechanized units. Post war conditions have not favored the adoption of new machines. The Treaty of Versailles prohibits the use of tanks in the German army, and as Germany is still the controlling factor in French war plans, there has been no pressing need for France to replace her numerous World War tanks with more modern ones. Furthermore, lack of money for new equipment has delayed admittedly desirable changes, not only in the French army, but also in the armies of her associates, all of which use French tanks. The deficiencies of the 1917 Renault are recognized: It is slow, lacking in fire-power, has a limited radius of action, and is vulnerable to the fire of modern antitank weapons. There are, however, a large number of these machines on hand; and they will have to be used until better ones are obtained. The French army leaders have experimented with new mechanized equipment and tactical methods for future use; but for the present, they propose to make the best of what they have.

The French tank organization, equipment, and training, are similar in many respects to our own. Constant emphasis upon the necessity for tanks to support infantry has led to the absorption of tank units by the infantry, and the elaboration of cooperative methods in the attack. The present tank establishment includes forty-seven battalions, of which about half are active. Two of these battalions are equipped with Mark V* and 2C heavy tanks, and all the others have 1917-18 Renaults—a total of about twenty-three hundred fighting machines in addition to supply and radio tanks. These machines are used in field exercises about one month in each year; they are then put in readiness for immediate action and placed in storage. Ordinary training is conducted with additional machines—seven per company—that are classed as unfit for combat service. In this training, most of the time is devoted to camping, entraining, detraining, approach marches, and driving at night, to give the tank crews practical experience in preliminary operations that are necessary for effective cooperation with infantry in the field exercises. In view of the limited mobility of the tanks now on hand, French plans for the closest possible cooperation between infantry and tanks are perfectly logical.

Tank development work is carried on by a specially selected group of officers, amid elaborate precautions to preserve secrecy. Knowledge of experimental work is withheld even from members of the regular tank battalions. Such information as is available indicates determined efforts to modernize the old Renaults, and extensive experiments to develop new tanks which vary in weight from three to a hundred and thirty tons. Some of the old Renaults are to have their machine guns replaced with short-barreled 75-mm. guns, and are to be equipped with improved Kegresse

rubber tracks. The expense of renovation is small compared to the cost of a new tank.

Efforts to improve tank tracks have followed two main lines of experiment—steel and rubber. The old metal tracks are noisy and heavy, require constant lubrication and adjustment, and so reduce the speed of the tank that it has no strategic mobility. The new tracks, made with numerous short plates of high grade steel, are lighter, more durable, and less noisy than the old. The substitution of ninety-six short track plates for the former thirty-two heavy ones on Renault tanks used in the Polish

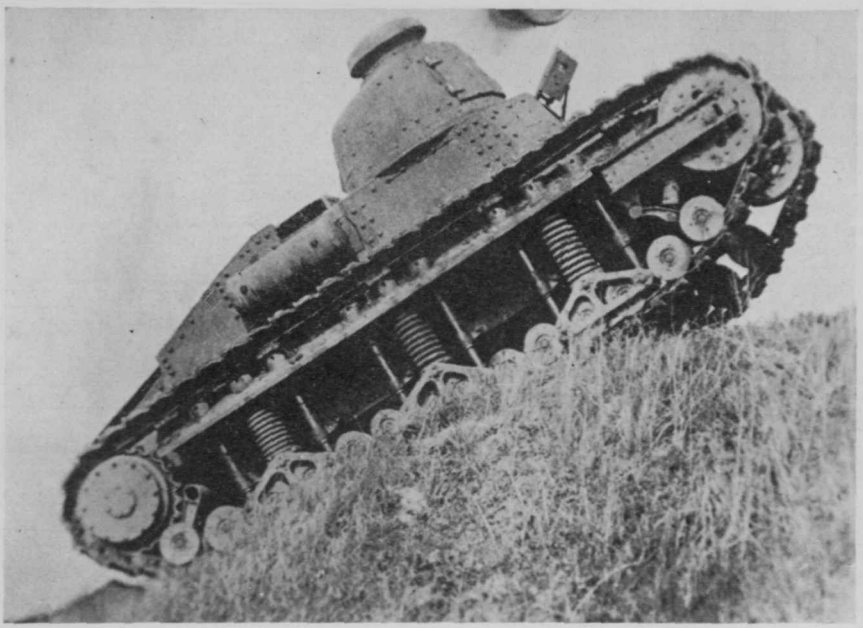


FRENCH 2C GASOLINE-ELECTRIC POWER PLANT
Sixty-eight tons; maximum speed, nearly 12 m. p. h.

army, increased the speed of the machine fifty per cent. Further increase in road speed resulted from the use of rubber pads on the track plates; but with tracks thus equipped the machine was difficult to turn. The endless rubber track developed by Kegresse made the tank so difficult to turn that forward wheels had to be provided to facilitate steering. As originally made, this track depended on friction for its driving power; it gave poor traction on snow or ice, and was subject to rapid wear. Many of the former defects have been eliminated and the improved track is now considered suitable for use on Renault tanks. It now consists of an endless fabric and rubber belt, with detachable driving lugs inside and rubber cushioned pressed steel plates outside. Worn lugs, cushions, or plates can be replaced individually. In soft soil, both the cushions and the plates are in contact with the ground; on highways, only the noiseless rubber cushions. Increased durability, positive traction, and better ability

to surmount obstacles, are some of the advantages claimed for the new track. It has survived a 950-mile test run on a Renault tank without undue wear, and has given the machine a speed of nine and a half miles per hour—double the former maximum. Further improvements in either the steel or rubber track will make the light tank less dependent upon truck transportation.

Experiments with the three-ton St. Chamond wheel and track tank have been rather disappointing. This tank has a crew of two men, and carries either a machine gun or a light cannon in a revolving turret.



FRENCH NC RENAULT, MODEL 1927
Well sprung tracks; engine in rear; driver in front.

The change from wheels to tracks can be made in one minute without dismounting; to reverse this process, one member of the crew must dismount to block the tracks, and the time required is about ten minutes. As this machine needs no truck to carry it around, it has interesting possibilities; but its comparative lack of maneuverability and inability to surmount obstacles are serious faults.

A new heavy tank weighing sixty-eight tons, called the 2C, is worthy of note because no other nation, with the possible exception of Russia, has developed a heavy tank since the World War. So far as is known, only ten of these machines have been built. The 2C carries a crew of one officer and ten men; has one 155-mm. gun or two 75's, four machine guns mounted, with four more in reserve; and is equipped with radio.

Driving power is furnished by two 350-H.P. gasoline motors, through an electric transmission which permits great flexibility of control and facilitates steering. The armor is variable up to 45-mm. in thickness; but despite its weight, this machine has a maximum speed of slightly more than eleven miles an hour. Because of its weight and height, the 2C requires special railway transportation facilities. Plans have been made for the construction of a one hundred and thirty-ton tank, and there are some French officers who advocate tanks weighing as much as six hundred tons. Such monsters would, of course, have to be shipped in sections and assembled near the intended place of employment. The French make specific provision for the protection of their tanks by means of artillery fire, smoke, and airplanes; but to protect a dreadnaught from destructive fire would be difficult. Cost, difficulties of transport, and probable lack of maneuverability are valid objections to the construction of these supertanks. As the necessary money could probably be spent more profitably on other projects, the French are not likely to be carried away by visions of an impregnable land battleship.

FRENCH NC RENAULT, MODEL 1927
Armor, 30 mm.; eight tons; 12 m. p. h.

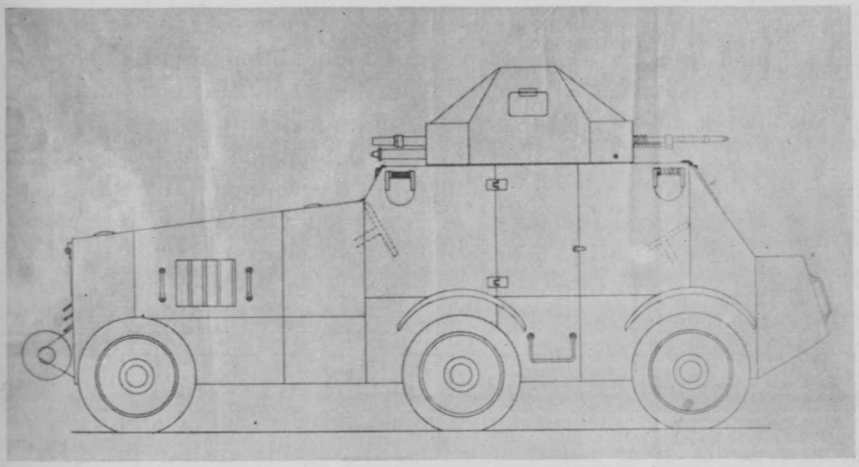
The 1927 Renault NC light tank is easily the most interesting feature of French tank development. It carries a crew of two men and can accommodate a short 75-mm. gun. Armor on the fighting compartment is 30 mm. thick, as compared to 16 mm. on the 1917 Renault. Even with this thick armor, the tank fully equipped weighs less than eight tons, and can be readily transported on a heavy duty commercial truck. The hull is similar

to that of the old Renault, with the driver in front, the gunner amidships, and the engine in rear—an excellent arrangement. A sixty-horsepower motor enables the machine to attain a maximum speed of twelve miles an hour. The running gear is a great improvement over that of the old model. The steel track plates are lighter and stronger than before; unsprung weight is minimized by three large coil springs on each side of the body, which absorb most of the jolts; and the rear driving sprocket is raised well out of contact with the ground, so as to avoid battering the engine and gears. The caterpillar tracks have been extended to the rear and the tail eliminated. By providing elastic track suspension and distributing the weight properly, the designers have given the machine good balance. Anyone who has driven a Renault will appreciate the advantages of a well-sprung flexible track. Instead of standing the machine practically on end to surmount a rigid obstacle, the new running gear enables the NC to proceed on a comparatively even keel; instead of halting to fire, as in the semi-rigid Renault, a tank gunner in the NC can fire accurately while in motion. The offensive power of the tank, and its chances of survival, are thus greatly increased. It would be desirable for the NC to have another man in the crew, greater speed for use on favorable ground in emergencies, and a stronger motor to furnish reserve power for hard pulls. Unfortunately, it must depend upon a tank carrier truck for its strategic mobility. Nevertheless the NC tank is an extremely formidable and sturdy weapon, and it has enough battlefield mobility to worry the best of the enemy gunners.

Except where special machines are obviously necessary, as with tanks, full use of current commercial vehicles is the rule. Cooperation between the military authorities and manufacturers has resulted in the development of new machines that are suitable for either commercial or military use. Substantial subsidies help Renault, Citroen, Berliet, and other firms to pay the cost of development work on machines that have military value. The government furnished generous backing for the Sahara expeditions that tested the Citroen half-track machine and the Renault six-wheeler. The military authorities encourage and assist private companies that have undertaken to establish regular motor transportation service for freight and passengers in the French colonial possessions in Africa. It is undoubtedly advantageous for the government to foster extensive commercial use of these machines in times of peace, so as to place the manufacturers on the best possible footing for rapid production in an emergency. The effects of this slow but sure policy are apparent in many phases of army mechanization acitivities. The artillery, for example, has no self-propelled gun mounts other than those provided by installing 75's and short 155's in tanks. The caterpillar tractor, which finds comparatively little employment commercially, is used to haul only the heaviest guns; and wheeled tractors or trucks are favored for transporting heavy, medium, and light

guns. A pilot model of a combination wheel and track vehicle for the heavier guns has been made; but lack of funds and the fact that it is not a commercial product have prevented its general adoption. There is a strong tendency towards the motorization of corps and divisional artillery, which is now horse-drawn, but there is little evidence of actual mechanization. For the present, the expense is considered too great. In other words, the artillery has gone as far as the present state of the French automotive industry will safely permit—and no farther.

Similar use of commercial vehicles is being made experimentally in other branches. Trucks with creditable cross-country ability, for the



FRENCH ARMORED CAR
Recent design on commercial six-wheel-drive chassis.

transportation of infantry and machine guns, for ambulances, and for supply purposes have been selected and tested. Several different makes of machines, including the four-wheel-drive Latil tractor, the six-wheel-drive Renault and Berliet, and the Kegresse track model by Citroen, have performed satisfactorily under most trying conditions in deep sand, snow, and mud. So far as the army as a whole is concerned, these developments have as yet had little effect; except for tanks and armored cars, neither the infantry nor the cavalry has been supplied with motor vehicles.

In developing armored cars the French have tried a number of different machines that have interesting possibilities. The three-ton St. Chamond wheel and track machine, mentioned in the preceding discussion of tank development, has been considered for possible use as a tank and armored car combined. The 1924 model of this machine showed considerable improvement over the model of 1921, but as yet the designers have been unable to make it into an agile cross-country machine. The St. Chamond is a non-commercial product, but practically all other models are built

on commercial truck chassis made by Citroen, White, Renault, or Berliet. The Citroen car is a half-track machine which has been used extensively in Syria with satisfactory results. The White, Renault, and Berliet are wheeled vehicles which have been modified so as to provide controls for a driver in rear. The six-wheeler, with driving power on all six wheels, has performed exceptionally well; it pulls through deep sand or mud with ease. There are usually four men in the armored car crew—front driver, rear driver, and two gunners. The armament includes a machine gun for use against personnel; another machine gun, or at least a suitable mount, for high-angle fire; and a 37-mm. high-velocity semiautomatic gun. The 37-mm. gun will enable these cars to attack hostile armored cars or even light tanks, with some chances of success. Armor carried is said to be proof against caliber .30 armor-piercing ammunition at all ranges over fifty yards. As the latest models weigh less than nine tons, the armor is probably not more than three-eighths of an inch in thickness; its ability to protect the car depends largely upon sloping the plates so as to decrease the chances that enemy gunners will secure direct hits with normal impact. Simultaneous operation of front and rear wheels for steering, similar to that used on the 1915 model of the American F. W. D. truck, is not unusual. Efforts to produce puncture proof resilient tires have met with considerable success. Provisions for ventilation, numerous well arranged observation slits, and periscopes for use in action, are other interesting features that have been built into French armored cars of recent design. Supplies of fuel, food, and water, sufficient for several days, give the new cars a great radius of action. Armored cars are provisionally organized in squadrons, which correspond to our armored car troops. They are used primarily for reconnaissance, in close cooperation with the cavalry.

For defense against the attacks of a mechanized force, French measures appear to be inadequate. Few, if any, French troops have ever faced hostile tanks in battle; and Germany, the country that is considered the only probable enemy, has no tanks. As a result, antitank defense has received less attention than it deserves. French training regulations prescribe the use of natural and artificial obstacles to bring hostile tanks into the fire of infantry light cannon or 75's which are to be concealed in the intervals between centers of resistance. Whether gunners can register destructive hits on the fast-moving machines that they will have to face, is a matter has has not yet been settled by actual tests, either in France or elsewhere. The Germans claim that modern antitank weapons, if properly used, will enable gunners to riddle the hostile machines; they have, however, assigned a battery of six 77-mm. horse-drawn guns to each infantry regiment, and have provided each infantry division with a battery of four 77's mounted on automobiles, to engage enemy tanks that penetrate a defensive position. Until thorough tests have been made, or the desired information is furnished by experience in war, the effectiveness of emplaced

guns as a means of antitank defense will remain undetermined. The French measures are less elaborate and less active than those proposed by the Germans. Even on a stabilized front where zone defense has been established, there will be urgent need for a reserve of highly mobile antitank guns; and in war of movement, any set plan of defense will prove futile, because the plan will never fit the conditions that a hostile mechanized force can impose. French war plans no doubt contemplate the rapid formation of well equipped mechanized units which will provide security and liberty of action for other ground troops; but until these units are ready, French armies will have to protect themselves as best they can. Part of the price the French are paying for their present supremacy in the air is inadequate protection for troops on the ground.

Mechanization in the French army reflects the period of transition through which the army is now passing. Compulsory service laws have recently been changed so as to reduce the period of active service with the colors. As a result, the standing army—the covering force—will have less numerical strength in the future than heretofore. World War equipment, especially automotive equipment, has deteriorated; and much of it will shortly have to be replaced. In anticipation of changes that will be necessary to maintain the covering force at the desired combat efficiency, army leaders have made extensive studies and tests of new mechanized equipment. They have in the NC Renault light tank a machine that is far superior to the 1917 Renault. Their experiments with armored cars improvised on commercial truck chassis have produced machines that are readily obtainable in large numbers and well suited to the intended role. Similar vehicles with considerable cross-country ability have been developed for the transportation of infantry machine guns and supplies. Tractors of both the wheel and caterpillar types, and trucks suitable for artillery and other services, have been selected from the commercial field. In short, the French military authorities know definitely what mechanized equipment they want; and when money becomes available, they will be ready to spend it wisely, on equipment of proven value. Plans for the organization, training, and tactical employment of mechanized units have kept pace with the development of materiel. We may expect that the French will proceed, as rapidly as funds permit, with their plans for the mechanization of ground troops. Their armies, supported by powerful formations in the air and well equipped mechanized units on the ground, will then meet fully the requirements of national security.

A Nickel's Worth

By Capt. Albert M. Jackson, C. A. C.

A CONTEMPORARY statesman once remarked that one of America's most urgent needs was a good five-cent cigar. Had he been a Coast Artilleryman of equivalent caliber he might well have said that one of the most urgent needs of the antiaircraft service is a good five-cent method of spotting antiaircraft artillery fire.

Our progress in the design and manufacture of antiaircraft cannon, ammunition, fire-control equipment, data-transmitting systems, pointing systems, etc., since 1922 has been nothing short of remarkable. We have devoted our best talent and our best dollars to the development of height finders, directors, fuze-setters, torque amplifiers, and what not. In short, we have provided for the destiny of each carefully groomed round of shot up to the time when it leaves the muzzle for a carefully planned rendezvous with the target at the point A. The frequency then with which these appointments are kept is a measure of our efficiency, and having gone to all this expense we naturally have an interest in knowing the cost of placing a burst of shell in such a position that the target will be included within its radius of action. Hence the need of a good five-cent method because that is all that is left to be spent.

Briefly stated, the problem is as follows. Given, a material target (oftentimes invisible or barely discernible to the unassisted eye) towed across the field of fire of a battery of four guns firing at irregular intervals projectiles calculated to burst in the vicinity of the target at a maximum rate (for the present) of about twenty rounds per gun per minute. Required, the coordinates in three mutually perpendicular dimensions of each point of burst, the position of the target at that instant being the origin of the coordinate system.

The following factors contribute to the complexity of the problem:

1. The rate and irregularity of the appearance of the bursts.

2. The high speed of the target and its maneuverability.

3. The necessity for bilaterial observation to obtain depth, and hence the necessity for synchronization of the two records.

4. The limitations of the human eye as regards the perception of relative movement between target and point of burst during the brief period necessary for the appearance of the smoke. Hence, under conditions of light varying from bright sunlight to darkness, the eye perceives with varying accuracy the displacement of the point of burst from the target. For example, the elapsed time between the instant of burst and the appearance of smoke is in the order of 0.08 second. Hence, under conditions of bright sunlight, where only the smoke is perceived, the target has moved towards or away from the point of burst during the time necessary to the produc-

tion of smoke and its subsequent impression on the eye. Under these conditions it is possible for a target traveling at a horizontal velocity of 20 mils per second to move either towards or away from the point of burst through an angle of 1.6 mils before the eye is aware that the burst has occurred. On the other hand, under conditions of light such that the eye perceives the flash of the burst, this lag does not exist and the eye perceives the angle subtended by the distance flash-target rather than the distance smoke-target. Hence, smoke deviations which lead the target are in reality greater than they appear, whereas trailing deviations are really less than they appear to be.

The Fort Tilden exercises in 1925 may well be taken as a starting point in considering what has been accomplished towards the solution of the problem during the last four years. Here we had an observer stationed in the vicinity of the firing battery armed with a telescope equipped with a graduated reticule. This observer had his "hands full" in more ways than one. First, he had to keep his telescope accurately centered on the target and do it unconsciously. Then as each burst appeared he had to call out to a recorder its lateral and vertical deviations and then immediately dismiss that shot from his mind so as to be on the alert for the next one. The recorder with the assistance of a timekeeper then recorded the observer's remarks in chronological order. To complete the picture there was an observer in the towing plane. He had simply to lean out into the slip-stream so that the tail wouldn't impair his vision, hold a wire grid a given distance from his eye, observe the longitudinal deviations, record them in their chronological order, meanwhile maintaining to the maximum possible degree his integrity as a passenger. The procedure followed when two or more shots burst simultaneously is rather obscure. However, we worried along and with the aid (or hindrance) of records taken under these conditions we arrived at a certain value for the quantity "hits per gun per minute" which value couldn't be proven and, what is worse, couldn't be disproven. It must be said, however, that at that time the shortcomings of the system were fully realized and it was generally conceded that photography in some form would be the ultimate solution of the problem. At that time some attempts were made to obtain motion pictures of the firings but without marked success.

The Aberdeen tests of 1926 were of considerable importance from the gunnery standpoint due to the appearance of the Vickers Directors and the Wilson Director. Here the exercises began to take on the aspect of competition—on the one hand, the best foreign instrument costing many thousands; on the other hand, the product of one of the best minds of the service at the cost of his best years. The wording of the questionnaire cannot be recalled to mind, but what was in everyone's mind was, which was the better job? How was that question to be answered? What would be more simple than to fire approximately the same number of rounds

with each instrument under similar conditions and then "compute" the percentage of hits for each instrument, using the spotting data? What would? But while everything else was going forward the spotting question had halted and the Aberdeen tests started out on substantially the same system as was used at Tilden. Then an additional telescope with observer and recorder was installed at the battery position so that one observer could read lateral deviations and the other vertical deviations. Then came an improvement in the synchronizing of records and it was here that the first recording device made its appearance. A flank observer having been added meanwhile, the recording device provided places for three recorders who were situated at some distance from the guns and received their data by telephone. Then came the first "triple sight" by means of which a central observer could keep two other observers "on target" thus permitting them to concentrate all their faculties on spotting the shots with reference to their cross-wires. About this time the use of the airplane observer's records was falling into decay and more and more attention was being paid to the value of bilateral terrestrial spotting.

In 1927 there appeared at Aberdeen the first photographic spotting device and its enormous value was recognized as soon as the first negatives were developed. Briefly, the system consisted of two electrically synchronized motion picture cameras situated one on either end of a baseline of about five thousand yards. Due to an ingenious arrangement of the instrument the presence of the target image on the film was not essential to the measurement of the deviations, the selection of film and filters having given precedence to the best possible reproduction of the burst. As constituted at that time this instrument was not suitable for recording night firing with any degree of reliability. The photographic records were immediately accepted as the basis for calculating the effectiveness of fire under the various conditions.

The merits of such a system having been proven, certain funds were allotted so that the Aberdeen tests of 1928 witnessed the appearance of a new model photographic spotting device, this time greatly improved and containing in compact form everything necessary to the finishing and projection of the films under "field" conditions. With this device the recording of night firing is accomplished with even greater reliability than day firing under adverse light conditions.

This is the good five-cent method we have been seeking because, once the first cost is amortized, it costs that much in film to produce a permanent, indisputable picture of just what happened to each shot.

What then remains to be done?

What remains to be done may be revealed by a study of any annual list of scores attained by antiaircraft artillery units. Can any average company of men, no matter how capably officered, and with ancient guns, vintage ammunition, and wartime fire-control instruments actually ac-

complish results surpassing in such striking fashion those obtained during the Aberdeen tests, where conditions for a high degree of success are so propitious? The answer is in spotting and the answer to spotting is the sensitized film.

The objection will be raised that the cost of furnishing each antiaircraft regiment with a photographic spotting system would be beyond the resources of the supplying service. The reply to this is, shoot a few hundred rounds less each year for a while and put a nickel's worth of insurance on each shot.

*We cannot rest secure in the idle illusion of the permanent protection of the great army which we raised during the World War. This great army is rapidly vanishing from the fields of possible use in warfare. They are passing the age of service and acquiring responsibilities and other disabilities for service. * * * Our reliance must be the continuance of the trained and organized reserves.*—Secretary of War John W. Weeks.

The Development of Heavy Artillery During the World War

By LIEUT. ALVIN T. BOWERS, C. A. C.

THE discussion in such limited space of the development of heavy artillery during the World War makes necessary the selection of only a few of the many subdivisions of this subject, and permits of only a general discussion of these. Since the French were, before the war, considered the authorities on artillery, and since they were participants in the entire war, a discussion of the development of their artillery will best cover the subject.

Prior to 1914 the prevailing idea in the French Army was that the primary requisites of artillery were mobility and rapidity of fire. These attributes were best accomplished by their "75" and we find this their principal, and practically only, artillery weapon, excepting a few DeBange rifles, howitzers, and mortars, antiquated weapons for fixed defense, and their heavy field artillery consisting of one hundred and four 155-mm. howitzers, with a maximum range of six thousand meters. The latter were provided with transport wagons for road transportation.

The Germans, however, had developed a theory which was later to be accepted as more nearly correct than that of the French. They, influenced probably by the fact that their plans called for an advance through fortified country and against large weapons for fixed defense, had understood the danger of indirect fire as developed by the French for their "75" and had sought some curved-trajectory weapon to counteract its effect. The result was the 105-mm. howitzer, an excellent quick-fire weapon with the mobility of a field gun. They had also developed the idea of preparation for the attack with artillery and had equipped themselves with other heavy artillery to accomplish this purpose.

As soon as the French entered the war, and particularly during their retreat across the Meuse and Aisne, their infantry suffered from the German 105-mm. howitzer, and their heavy artillery was rendered practically useless by the superior range and numbers of the German artillery. This lack of heavy artillery was further accentuated in early September, 1914, when trench warfare began and the Germans introduced their trench mortar or *minenwerfer*. So it appears that the years 1914-1915 were the years of the howitzer and mortar. The German 150 was then reinforced by the 210 for heavy destruction and counterbattery work.

Upon the stabilization of the front during latter 1915 and in 1916, the use of concrete, the depth of the defensive lines, the immunity provided by wire entanglements, the power of observation from balloons and by the young aviation, made desirable and practically imperative the use of powerful howitzers, long-range rifles, quick-firing trench mortars, firing

from the map, sound ranging, and gas shells. Due to their industrial areas being occupied by the Germans, the French were unable to keep pace with these demands, although the demand of a far-seeing minority had, before the war, caused extensive experiments to be made, and plans for satisfactory heavy weapons to be drawn up. This preparedness of plans was of paramount importance as it saved at least months of experimental work prior to effective production. The most important move of the French was, however, the mounting of their old DeBange on modern carriages. Outside of their obsolete carriages these were good weapons and this change provided a good temporary weapon, although still slightly lacking in range, power, and rapidity of fire. Their mobility was scarcely considered, since the situation remained unchanged for days and months, and gains of ground were limited to a few hundred meters. The big step in the provision of a mobile heavy artillery was the equipping of 120's and 155's with tractors. Thus ten motorized heavy artillery regiments were formed and maintained until the armistice. Also, Navy guns were mounted on railroad trucks and on barges, and the badly needed counter-battery and long range destruction material was thus provided.

In 1918, when the stagnated front became a rapidly moving line, a different situation obtained. The French found themselves unable to follow the infantry with effective accompanying fire; the counterbattery work ceased in many instances because the guns were too heavy to follow. Added to this was the difficulty of transporting and storing ammunition for such a multiplicity of calibers. The difficulty of repairing or rebuilding railroad tracks imposed their use for supplies and ammunition only. Consequently railroad artillery was looked upon as an undesirable impediment.

So at the end of the war we see practically a reversal of the accepted ideas on artillery. From an inconsequential amount of heavy artillery in 1914 and a concentration on light weapons of the 75 type we see the development of a desired preponderance of heavy artillery, mostly of the howitzer or mortar type. This development was not due to faulty premises before the war. Examination of all previous experience had shown that the inaccuracy and supply demands of heavy artillery restricted its use considerably. This, added to its lack of mobility, made its acceptance as a minor weapon logical. Conditions in this war, however, were different from those of any preceding war. Let us review those conditions and see wherein they differed.

1st. This was a war between great powers and all the resources of these great powers were made available.

2nd. The advance of modern manufacturing methods made it possible to produce ammunition in quantities never before reached.

3d. The effective range of weapons is naturally restricted to the range

of observation. The development of aviation and sound ranging increased this possible effective range tremendously.

4th. The tendency of this war, due partly to its stabilized nature, was to protect its troops and material to a far greater extent than had ever before been effected. Such for instance is the use of concrete emplacements, tanks, barbed wire, etc.

5th. The organization in depth to such a great extent as effected in this war made a long-range weapon that could reach these rear areas essential for a successful attack.

6th. The development of the use of gas made necessary a weapon which could carry gas in quantities large enough to be effective, particularly in the rear areas.

To cover briefly the evolution of the use of heavy artillery in the attack just a few words are necessary. As soon as the material became available and the infantry started to realize the tremendous effect of artillery preparations, these preparations became heavier and heavier. Thus we find a preparation of several days a common occurrence. This caused a severe drain on ammunition, however, and made supply extremely difficult. Moreover, and of much greater importance, it destroyed all element of surprise and permitted a massing of troops to meet the attack. As the accuracy of fire was gradually increased by new firing tables and greater experience, it was found desirable and possible to limit this preparation to not more than several hours.

We have thus far dealt mostly with the smaller types of heavy artillery. The development of the heavier types took place on an even larger scale. Of this, railway artillery is the most glaring example.

The introduction by the Germans of heavy mobile siege artillery was a surprise to the Allied Nations on account of both its idea and its effectiveness. The marked effectiveness of the Austrian Skoda howitzer, a 30-cm. weapon on a cradle carriage, was a distinct innovation in field operation.

To counteract the effect of this powerful weapon, the Allies lost no time in building large railway weapons. However, a weapon developed in time of war is usually a makeshift designed for some particular purpose and usually sacrifices for speed of preparation and manufacture many desirable features. Thus the first cannon provided were procured from all sources, mostly fixed defenses and naval guns, and hastily mounted on improvised field carriages.

In the war development of railway artillery three general types of carriages were involved.

1. First the glissement or sliding type, with a simple girder mount, devoid of both recoil and traversing mechanism. Horizontal changes in direction were secured by moving the mount along an epi.

2. The second type of carriage was so designed as to permit a few degrees of traverse of the piece on the carriage. The carriage was equipped

with recoil mechanism. When in the firing position these carriages were generally emplaced on field platforms.

3. The third type of carriage was not a great departure from the second except that it provided all-around fire. Some carriages of this type were provided with racers and outriggers. Others were provided with racers and concrete or structural steel bases.

It is unnecessary to point out the importance to the Coast Artillery of this development of Railway Artillery. It is becoming more and more the backbone of our coast defense and furnishes our only method of coping with the long range obtained by modern naval weapons.

The National Guard constitutes one of the key members in our defense organization. It represents that principle of self-government which protects localities by the erection of safeguards against the dangers of too highly centralized Federal Government. To eliminate the National Guard would be one step towards organized tyranny. It would also be a step toward rendering our country defenseless.—Secretary of War John W. Weeks.

Colonial Coast Forts

Hawaii, Guam, and Samoa

I. Hawaiian Islands

THERE seems to be a general agreement that Spanish buccaneers landed on the Hawaiian shores in the early part of the seventeenth century, and it is probable that shipwrecked Spaniards arrived as early as 1527. In particular, Juan Gaetano is credited with having located this group of islands in 1555.

At any rate, the credit for the discovery of the islands goes to Captain James Cook, of the British Navy, for it was he who first made them known to the world. On January 18, 1778, Captain Cook sighted Oahu while on his way from the Society Islands to the Pacific shores of North America with two armed ships, the *Resolution* and the *Discovery*, and shortly afterward he saw the island of Kauai. The next morning he saw Niihau. His first landing was at Waimea.

At this time the four principal islands—Hawaii, Maui, Oahu, and Tanai—constituted four separate and independent kingdoms. Kamehameha was a subordinate chieftain or prince on the island of Hawaii. Rising rapidly to power, Kamehameha possessed himself of all Hawaii and then turned his attention to the other islands with a view to their subjugation. In this he was assisted by two white men, John Young and Isaac Davis.

It seems that, in February, 1790, Captain Metcalf, an American fur trader, visited the islands in his vessel, the *Eleanor*, and anchored off Honuaula, Maui. Metcalf's son, in command of a small schooner called the *Fair American*, was also in the islands but had become separated from his father. The Hawaiians, under command of Kamehameha I, captured the *Fair American* and killed all the crew with the exception of the mate, Isaac Davis. John Young, who was boatswain of the *Eleanor*, was also captured and detained. Both men became loyal Hawaiian subjects and rose to importance in the islands. With their aid, Kamehameha extended his authority by 1795 over all the Hawaiian group except Kauai and Niihau. These he did not fully acquire until 1810 when King Kaumualii yielded, continuing in power as fief of Kamehameha, who had become known as Kamehameha the Great.

In 1796 Kamehameha I took a force to Hawaii for the purpose of suppressing a rebellion on that island. He then established a permanent residence at Honolulu. In 1809 he had before his house a battery of sixteen carriage guns, taken from the brig *Lelia Byrd*.

The Russians had had their eyes on Hawaii for some time, and in 1815 Governor Baranof, of Alaska, attempted to establish there a commercial

settlement. The *Myrtle* and the *Discovery* brought a number of Russians and Kodiak Indians to the islands to report to Dr. Scheffer, who had already arrived. The *Myrtle* anchored near Honolulu, where the Russians landed and erected a small blockhouse, mounting a few guns. Kamehameha I sent a detachment to observe the activities of the Russians, who did not await the Hawaiians but sailed, the night after their landing, for Kauai. Here, on a cliff commanding the bay of Hanalei, on the north side of the island, Scheffer built a slight fort and had his cannon mounted.

Kaumualii, observing that the Russians knew something about the construction of fortifications, desired Scheffer to build for him a stone fort at Waimea. This fort, built of basaltic rock, was sufficiently completed to mount a number of guns on one side before a messenger arrived from Kamehameha with orders for Kaumualii to expel Scheffer and his subordinates. Upon hearing of the order, Scheffer gathered up his property and sought refuge on the brig.

In the meantime Kamehameha had sensed the value of defensive works and had ordered the erection of a strong fort at Honolulu. This work was started in January, 1816, by Kalanimoku, under the supervision of John Young, and was completed within the year. Standing on the seaward side of Queen street, close to the shore, and across the lower end of Fort street, the fort was built of coral, loosely put up without cement. Quadrangular, almost square in form, its walls measured a little over a hundred yards on a side and were about twelve feet high and twenty feet thick. Embrasures were provided for the cannon, about forty 6-, 8-, and 12-pounders being mounted. Later eight 32-pounders were placed on Punchbowl Hill to complete the defenses of Honolulu.

Upon the death of Kaumualii in 1824, his son Humehume led a rebellion which broke out in Kauai. His forces made a desperate assault upon the fort at Waimea but were repulsed with a heavy loss by the royalist forces under Hoapili. This chieftain, in 1832, built a fort on Maui much like the fort at Honolulu. On its walls were mounted twenty-one guns. In the course of time the fort became the local prison.

The fort at Honolulu saw no service and began to deteriorate. In 1849 it mounted seventy guns, including one long brass 32-pounder, one brass 12-pounder, fourteen iron 18-pounders, four iron 9-pounders, forty-one iron 6-pounders, eight iron 4-pounders, and one 4-inch mortar. It was in this year that a misunderstanding arose between the Hawaiian government and the French consul, and as a result French forces took possession of the fort and dismantled it. It was not restored and by 1853 every gun had been dismounted, while the powder magazine served as a native dwelling house. The garrison of half a dozen lightly clad soldiers had little or nothing to do. About this time the fort, although in ruins, became the public prison.

In 1893, in a popular uprising, Queen Liliuokalani was deposed, and

Hawaii became the only republic in the Pacific. The Republic, proclaimed on July 4, 1894, did not long continue, for negotiations were opened in 1897 whereby the Hawaiian Islands were annexed, by treaty, to the United States.

II. Guam

The island of Guam was discovered on March 6, 1521, by Fernando de Magalhães, then on his historic voyage around the world. In 1565, Miguel Lopez de Legaspi visited the islands, named Ladrones by Magalhães, and took possession in the name of Philip II, of Spain. The first settlement of Europeans was established in June, 1668, when Padre Diego Luis de Sanvitores arrived at Guam with a party which included a captain and thirty-two Spanish and Filipino enlisted men. A chapel and a dwelling-house were built of wood, but nothing of a military character was at first erected.

Disaffection developed, and the natives arose in open revolt. In June, 1674, Don Damian de Esplana arrived with thirty men and assumed the office of military governor. He then attempted the pacification of the natives, but the revolution persisted and it was not until 1695 that the Spaniards completed the conquest of the rebels.

With a view to the protection of the island against possible attack by some of the many enemies of Spain, but more particularly against the buccaneers and corsairs infesting the Spanish Main, the Spaniards built a number of forts on the shores of this tiny bit of their possessions. Umata was originally selected as the capital of Guam and was later used as the summer capital. A palace for the governor and a cathedral, erected at the settlement, were defended by several forts on Umata Bay. In 1849 Umata was destroyed by an earthquake.

On the south side of the bay, west of Mount Inago, on a hill about one hundred and twenty-five feet high, the Spaniards built Fort Nuestra Señora de la Soledad. This fort overlooked the bay and was the most pretentious defensive work in the vicinity Opposite this fort, on the north point of Umata Bay, Fort Santo Angel was constructed on an isolated and picturesque rock, with an approach so abrupt that steps had to be but in the rock. About a cable north of Santo Angel was a minor work called Fort San José. At the head of the bay, opposite the church and near the river, stood a water battery called Nuestra Señora del Carmen.

In time Agaña became the capital of Guam but, as it lacked a satisfactory harbor, San Luis d'Apra became the port of entry. A fort was erected at Agaña but the principal defenses were found on Port San Luis d'Apra. Fort Santiago stood on Orote Point. On Cabras Island, a long, narrow coral island which nearly closes the entrance of the port, there was a battery of three 6-pounders in 1817 when Kotzebue visited Guam. In the center of the basin, near the anchorage, stood a rock, on which the Spaniards built Fort Santa Cruz, which was the main defensive work of the harbor.

As the necessity for maintenance of forts passed, they were allowed to deteriorate. By the latter part of the nineteenth century most of them had become mere ruins and the garrisons and guns were withdrawn. This fact was not known by Captain Henry Glass when he entered the harbor in the U. S. S. *Charleston* on June 20, 1898. After war with Spain had broken out, Captain Glass received orders to take possession of Guam. He entered Port San Luis d'Apra and opened fire on Fort Santa Cruz, but as that fort had been abandoned there was of course no reply. The Spanish governor at Agaña had not been informed of the outbreak of war, so when he heard the firing he assumed he was receiving a salute from some friendly naval vessel. The boarding officer sent by him to the *Charleston* soon learned of the error.

The island was surrendered to the Americans on June 21, 1898. Don José Sisto served as Acting Governor until February 1, 1899, when Commander Edward D. Taussig arrived, took formal possession of the island in the name of the United States, and raised the American flag over the palace at Agaña.

At that time the fortifications on Guam were in an utterly useless condition. Fort Santiago, on Orote Point, had been abandoned and was in ruins. Fort Santa Cruz had no guns and was in a partly ruinous condition. The battery on Cabras Island had long since been removed and the forts at Agaña, San Luis d'Apra, and Umate were of no value. Moreover, there were no guns remaining on the island except four small cast-iron guns of obsolete pattern at Agaña, used only for saluting purposes. Guam, having no fortifications, was defenseless.

III. American Samoa

Very little is known of the early history of the Samoan Islands. The Dutch "three-ship expedition," under Roggewein, in 1722, seems to have been the first to notice this group of islands. Then followed the French explorers, Bougainville in 1768 and La Pérouse in 1787. In 1830 the London Missionary Society established a mission on one of the islands. Lieut. Charles Wilkes, of the United States Navy, made, in 1839, the first scientific investigation of the islands. As early as 1850 England, Germany, and the United States were represented by commercial agents at Apia.

Unlike most of the islands of the Pacific ocean, the Samoan group long remained independent of European powers. No military occupation took place and the islands, with no cannon, had consequently no need for coast fortifications. Life in Samoa was reasonably quiet until after 1885, when political dissensions and civil wars started.

After a time the three powers most interested in the islands decided that the only way to control the Samoans and to secure peace would be by dividing the islands among themselves. England and Germany made a separate treaty wherein England surrendered her claim to any portion

of the group. A convention then made between Germany, the United States, and Great Britain provided that the claims of the other powers to all of the islands east of 171° west longitude were surrendered in favor of the United States, Germany receiving the islands west of that line.

By this agreement the United States received the islands of Rose Island, Manua, Olosega, Ofu, Tutuila, and Aunuu, which are commonly grouped as Manua and Tutuila, Rose Island being but a coral atoll. On February 19, 1900, the island of Tutuila was made a naval station, and on April 17, the chiefs of Tutuila made a formal cession of their islands to the United States. On July 15, 1904, the chiefs of Manua recognized the authority of the United States over their islands, and once again that country extended its territory.

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We have the best military policy of our history. The National Defense Act of 1920 is effective, economical, and essentially American.—Secretary of War John W. Weeks.

PROFESSIONAL NOTES

Commissioned Personnel, Office Chief of Coast Artillery

Chief of Coast Artillery
MAJ. GEN. ANDREW HERO, JR.

Executive
LIEUT. COL. HENRY T. BURGIN

Organization and Training Section
COL. H. L. STEELE
MAJ. J. H. COCHRAN (not yet joined)
CAPT. J. H. WILSON

Gunnery
MAJ. S. JARMAN

Personnel Section
LT. COL. H. T. BURGIN
CAPT. H. N. HERRICK

Plans, Finance, and Materiel Section
MAJ. C. H. TENNEY
MAJ. J. B. CRAWFORD (not yet joined)
CAPT. F. J. MCSHERRY

Intelligence Section
MAJ. S. S. GIFFIN
CAPT. H. N. HERRICK

Graduates of the Coast Artillery School

CLASS OF 1928-1929

THE ADVANCED COURSE

Majors

Baldwin, Karl F.
Cravens, William M.
Finley, Charles R.
Goodman, Moses
Herzer, Charles J.
Hines, Charles
Lemmon, Kelly B.
Lindner, Clarence B.
Patterson, William G.
Potts, Adam E.
Stewart, William R.
Tilton, Rollin L.
Toohey, Francis J.
Washington, William C.
Webb, Richard B.

Captains

Behrens, Henry H.
Benitez, Enrique M.
Duval, Nelson H.
Edgecomb, Franklin E.
Ericson, Gustaf H.
Hill, Ira B.
Rhein, Wade W.
Terry, Philip D.

THE BATTERY OFFICERS' COURSE

Major

Davidson, George D.

Captains

Ames, George W.
Andrews, William T.
Atkinson, Charles E.
Betts, Thomas J.
Bultman, Herbert F. E.
Crews, Leonard R.
Bottoms, Maitland
DeMerritt, Robert E.
Evans, William D.
Gibson, Manly B.
Griggs, Douglas M.
Handwerk, Morris C.
Jeffords, Thomas E.
Lowder, James R.
McCullough, Samuel
McGarraugh, Riley E.
McMorris, Watson L.
Murphy, John G.
Phillips, Thomas R.
Riggs, Carroll G.
Roberts, Caesar R.
Seeds, Edward C.
Snell, Verne C.
Swett, Francis S.
Taliaferro, Philip B.
Vogel, Berthold
Walsh, Thomas P.
Young, Ellsworth

1st Lieutenants

Anderson, George B.
Burnett, John R.
Cole, Paul W.
Cunningham, Frank J.
Duval, Henry H.
Ericson, R. A.
Goodall, James R.
Harter, Paul L.
Harris, Paul A.
Healy, John, Jr.
Heaney, George F., Jr.
Hewitt, Hobart
Howe, Paul C.
McCormick, Walter L.
McLean, Donald
Raymond, Philip H.
Reuter, Herbert C.
Ritchie, Isaac H.
Santos, Melecio M. (P. S.)
Stone, Raymond, Jr.
Stubbs, Guy H.
Turnbull, Harold T.
Witman, Clark C.

2nd Lieutenants

Bowers, Alvin T.
Bell, Arleigh T. (C. E.)

Review and Exhibition Drills by the 243d Coast Artillery (H. D.)

A regimental review was tendered His Excellency Norman S. Case, Governor and Commander-in-Chief of Rhode Island, by the 243d Coast Artillery (H. D.) at the Cranston Street Armory, Providence, Rhode Island, on Monday evening, May 6, 1929.

The Governor's Review in this regiment is an annual institution and attracts many spectators. Approximately five thousand persons were in attendance. Every seat was filled and every available bit of space was used to accommodate those less fortunate who were eager to stand and watch the proceedings.

A buffet supper for out-of-town guests, state officials, and members of the regimental Field and Staff and ladies was provided at 6:30 o'clock p. m.

Program for the evening was as follows:

Band concert by 243d C. A. (H. D.) band	8:05 p. m. to 8:40 p. m.
"Defense of a Fort"	8:45 p. m. to 9:15 p. m.
Infantry Drill by War Strength Battery	9:20 p. m. to 9:30 p. m.
Review to the Governor, and presentation of trophies won during season 1928	9:35 p. m. to 10:15 p. m.
Dancing	10:20 p. m. to 12:00 p. m.

The band concert included popular airs, marches, and classical selections. It was well rendered and was equally well received.

In the "Defense of a Fort" an effort was made to depict the defense of one of our seacoast forts against an enemy landing attack. Picture if you can the enemy warships closing in on the fort. His airplanes are visible overhead, dropping bombs on our fortifications, and by means of small boats from his transports he has landed small bodies of troops. Then you can better visualize the action which followed the bugle notes of "Call to Arms."

The 10-inch guns and 12-inch mortars at the Fort engaged the enemy warships. The 75-mm. antiaircraft guns and .30-caliber machine guns endeavored to bring down the enemy planes, and the infantry support troops, disposed on the beach, fired incessantly to repel landing parties. During the engagement night came on, lights were extinguished, and the harbor defense and antiaircraft searchlights were brought into play. Drill primers in the harbor defense armament and blank ammunition in the rifles and machine guns, together with subcaliber ammunition in the 75-mm. guns lent the necessary "air" to the engagement, while the smoke from the pieces, the million candle power A. A. searchlights, and the miniature self-propelling planes added the necessary "color."

The varied and precise movements of the war strength battery elicited loud applause from the spectators.

The regiment formed for the review in line of battalions in column of close columns and presented a striking appearance. Special troops comprised a provisional 4th Battalion for this ceremony. Lines as they passed the reviewing officer did not falter. During the review presentation of service medals, trophies, and prizes was made by Governor Case.

Promptness at formations, snap, and precision was in evidence throughout the evening.

Following the review, refreshments were served, and dancing was enjoyed until midnight.

Among the guests of the evening were His Excellency Governor Norman S. Case and members of the Rhode Island Legislature; the commanding general, 1st Coast Artillery District; the adjutant general, quartermaster general, and U. S. property and disbursing officer of Rhode Island; the executive officer, 1st

Coast Artillery District; the commanding officer, 11th Coast Artillery, stationed at Fort H. G. Wright, New York; members of the State Staff Corps and Departments; officers of the 241st Coast Artillery (H. D.), stationed at Boston, Massachusetts; active and retired officers of the various branches of service of the Rhode Island National Guard; the commanding officer and detail of Varnum Continentals, of East Greenwich; the commanding officer and detail of Bristol Train of Artillery, of Bristol; many Reserve Corps officers, and their friends.

The 243d Coast Artillery (H. D.), with headquarters at Providence, Rhode Island, is commanded by Colonel Cyril L. D. Wells.

Foreign Periodicals

BELGIUM

BULLETIN BELGE DES SCIENCES MILITAIRES, May, 1929.

Les operations de l'armée belge pendant la campagne de 1914-1918 (continued).

Une journée de défensive (continued). Lieut.-Col. B. E. M. Janssens.

Programmes de tirs d'artillerie. Maj. B. E. M. Sottiaux.

Pour protéger l'équipage des chars de combat contre les chocs. Lieut. de Grave.

Le nouveau brancard du service de santé belge (continued).

CANADA

CANADIAN DEFENSE QUARTERLY, April, 1929.

Maj. Gen. Louis James Lipsett, C. B., C. M. G.

Civil aviation in Canada, 1928. J. A. Wilson.

A cavalry encounter. Capt. W. W. Murray.

With coastal motor boats in North Russia. Lieut. Com. Cecil G. Dickinson.

Antiaircraft. Lieut. Col. T. C. Newton.

A brief history of infantry tactics. Maj. M. K. Greene.

Mechanization. Maj. L. C. Goodeve.

The Canadian militia: The Fenian raids. Col. C. F. Hamilton.

Medical notes on Burgoyne's campaigns, 1776-77. Maj. R. M. Gorssline.

Some comments on the relations between the Services. "Optimist."

A short history of the Manitoba Dragoons. Lieut. Col. H. A. Croll.

CZECHOSLOVAKIA

VOJENSKO-TECHNICKÉ ZPRÁVY, April, 1929.

Vojenská soutez nákladních automobilu s generátor ovym plynem roku, 1927. Skpt. Jan Peterka.

Bezdymny prash jako strelivina (Colloidal powder). Skpt. Ing. J. Kraus.

Dejiny balistiky do konce XVIII. stoleti (History of ballistics to the end of the eighteenth century) (concluded). Pplk. Jan Gebauer.

Poznámka o novém protiletadlovém materiálu amerického delostrelectva (Remarks on the new C. A. materiel of the U. S. A. artillery). Col. de l'E. M. G. Ing. E. Milhard.

DENMARK

DANSK ARTILLERY-TIDSSKRIFT, April, 1929.

Artilleriets efterretningstjeneste. Kaptajn H. A. Rolsted.

Affjedringsstemer for lettere og tungere feltpjecer. Kaptajn U. S. Andersen-Hoyer.

ENGLAND

ARMY, NAVY AND AIR FORCE GAZETTE, May 9, 1929.

A reserve of staff officers.

Moltke the elder and plans of campaign against France.

A new French airship. Hon. A. F. D. De Moleyns.

THE ENGINEER, April 26, 1929.

The Shannon power scheme.

Kinetic boundary friction. Justin H. Wells.

ENGINEERING, May 10, 1929.

The Ivry port power station, Paris (continued).

Extension works at the port of Hamburg. Brysson Cunningham.

Roads and road transport. Sir Henry Percy Maybury.

ENGINEERING, May 17, 1929.

Irrigation works in the Bombay Deccan and the Bhanderdara dam and Bhatgar dams (Part II).

The Ivry port power station, Paris (concluded).

Metal construction for aeroplanes.

JOURNAL OF THE SOCIETY FOR ARMY HISTORICAL RESEARCH, April, 1929.

Artillery services in North America in 1814 and 1815 (continued). Col. Sir Alexander Dickson.

The origin of the American flag. Telfair Marriott Minton.

THE ROYAL ENGINEERS JOURNAL, March, 1929.

Airship development. Group Capt. P. F. M. Fellowes.

The 23d (Field) Company, R. E., in the Great War, Part IV. Maj. R. L. Bond.

The armoured force. Brig. R. J. Collins.

Standardization of permanent way. Lieut. Col. E. St. G. Kirke.

Palestine. Field Marshal The Viscount Allenby.

The "mechanization" of fleets and armies. V. W. Germains.

The erection of a 150-ft. wireless mast by No. 9 Company, Q. V. O. Madras Sappers and Miners.

Works supervision at home. Capt. J. C. P. Tosh.

Jottings from a field company on manoeuvres. "Geekay."

The use of power tools in a field company, R. E. Lieut. L. T. Grove.

A field company in Malabar. "Assaye Lines."

The Shannon hydro-electric power development. Capt. C. C. S. White.

FRANCE

MEMORIAL DE L'ARTILLERIE FRANCAISE, January-March, 1929.

Calcul des tables et abaques de tir (méthode G. H. M.). The entire number is devoted to this important article of two hundred and sixty-six pages by M. Maurice Garnier, Ingénieur en chef de l'Artillerie Navale.

REVUE MILITAIRE FRANCAISE, April, 1929.

Montdidier, le 8 août, à la 42e division (continued). Lieut. Col. Grasset.

Après la conference de Rabat. Général O. Meynier.

Rôle et instruction des interprètes. Colonel Paquet.

La structure générale des campagnes offensive de Napoléon. Général Lemoine.

GERMANY

MILITÄR-WOCHENBLATT, May 11, 1929.

Organisation und Ausbildung der französichen Luftflotte.

Militärische Zeit- und Streitfragen.

Ersatz und Ergänzung des Artilleriefeuers durch s. MG.

ITALY

REVISTA DI ARTIGLIERIA E GENIO, May, 1929.

Il nuovo principio fondamentale. G. Douhet.

Del montaggio di un particolare ponte in ferro sul fiume Adda presso Morbegno (Valtellina). Ing. Alfredo Mazzoni.

Il tiro dell 'artiglieria contro aerei. Giulio Ortona, maggiore d'artiglieria.

In ondazioni. S. G.

Questioni d'impiego dell 'artiglieria. Tito Montefinale, gen. di divisone.

Automobilismo e difesa nazionale. G. Stellingwerff.

Un balistico del XVI secolo: Nicolo Tartaglia (continued). A. L.

REVISTA MARITTIMA, April, 1929.

La libertà dei mari. Gen. G. Laghezza.

L'apertura delle ostilità. Cap. di Freg. R. de Courten.

Questioni nautiche. Cap. di Vasc. E. Modena.

Sommergibili: evoluzione del materiale. Col. G. N. L. Fea.

Il bilancio della marina per l'esercizio finanziario 1929-1930. A. Ramadoro.

LITHUANIA

MUZU ZINYAS, April, 1929.

Dabartiniai strateginiai ir taktiniai klausimai rumonu kariuomeneje. Kapitan.

Soninis isisaudymas, sekimo punktui esant zymiai nutolusiam nuo suviu krypties (Lateral correction of artillery fire). Kapitonas Sorockinas.

Prancuzu kavalerjia kautynese. Kavalerijos Kpt. Kraunaitis.

Centrine kariuo menes biblioteka 1928 metais. Majoras A. Ruzancovas.

PORTUGAL

Revista de Artilharia, April, 1929.

Missão de artilharia junto das tropas inglesas (concluded). Bernardo de Farioa, ten coronel de artilharia.

A teoria do universo (concluded). A. J. Bernardes de Miranda, tenente-coronel de artilharia.

No decuroso de uma instrução. F. Mena, tenente coronel.

*I am most desirous that the healthy and normal growth of the National Guard be not handicapped. * * * With our Regular Army skeletonized and the National Guard unorganized, our country would have no first line of defenses.*—Secretary of War John W. Weeks.

COAST ARTILLERY BOARD NOTES

Communications relating to the development or improvement in methods or materiel for the Coast Artillery will be welcome from any member of the Corps or of the service at large. These communications, with models or drawings of devices proposed, may be sent direct to the Coast Artillery Board, Fort Monroe, Virginia, and will receive careful consideration. W. E. COLE, *Colonel Coast Artillery Corps, President, Coast Artillery Board.*

Project No. 700, Test of Stereoscopic Trainer, T-1 (S. O. M).—In accordance with OCM Item 7174, a stereoscopic training device, designated Stereoscopic Trainer T1 has been purchased by the Ordnance Department from the Société d'Optique & de Mechanique de Haute Precision, Paris, France, and is being shipped to Fort Monroe for test by the Coast Artillery Board. The Board will test this instrument as to its suitability and satisfactoriness for the purposes for which it is intended.

Project No. 701, Comments on Target Practice Reports, 1928.—From time to time during the firing season the Chief of Coast Artillery transmits to the Coast Artillery Board the target practice reports of all firing batteries. These reports are studied by the Coast Artillery Board and pertinent comments covering materiel and methods submitted.

Project No. 702, Test of Headset, Type HS-17.—The Signal Corps has designed a new type headset, known as Type HS-17, for Coast Artillery use with fire control circuits at emplacements of 12-inch guns on M1917 mounts, where excessive noise makes transmission of data to elevating and traversing details difficult. A number of these new type headsets have been furnished to the—

Harbor Defenses of Pearl Harbor,
Harbor Defenses of Manila and Subic Bays,
Harbor Defenses of San Francisco,
Harbor Defenses of Sandy Hook, and
Coast Artillery Board

for service test at the 12-inch long-range batteries there installed. When reports of the tests are received from the harbor defenses concerned they will be studied by the Coast Artillery Board and the final report of the Board will show the concensus of opinion of the units conducting the tests and of the Coast Artillery Board.

Project No. 703, Modification of Antiaircraft Machine-Gun Tripod, M-1.—From time to time suggestions have been made that the caliber .50 machine-gun tripod be made lighter. After a study of this proposition, the Coast Artillery Board has recommended:

a. An experimental tripod six inches shorter than the standard tripod be constructed.
b. The tripod be capable of being set up in very soft ground.
c. Appliances be designed to permit setting the tripod on concrete pavements and on the roofs of buildings.
d. Necessary appliances be designed for mounting the tripod in a truck so that the method of doing this may be standardized.
e. An effort be made to have these items available for the 1929 firings at Aberdeen Proving Ground.

Project No. 704, Confidential.

Project No. 705, Test of Experimental Wire-Laying Cross-Country Car.—An experimental wire-laying cross-country car has been received by the Coast Artil-

lery Board for test to determine its suitability for adoption as a standard wire-laying unit. The chassis is Chevrolet, Model 1928, standard ½-ton commercial truck, except wheels and tires. This unit will be tested, under the supervision of the Coast Artillery Board, by the 51st and 52nd Coast Artillery and the First Sound Ranging Battery.

Project No. 706, Needs of Antiaircraft Artillery with Respect to Meteorological Information.—A study of the form and character of the special wind messages required by the antiaircraft artillery.

Project No. 707, Test of Artillery Lantern M-1 with Lantern Mask T-1.—This lantern and mask are under test in the 51st Coast Artillery to determine suitability for illumination of aiming posts.

While not professional soldiers, men of the National Guard and Reserves are prompted to service by a patriotic devotion to the high conception of citizenship. Of all our citizens, they deserve praise for the energy that leads them to spend months and often years in readiness.—Gen. John J. Pershing.

BOOK REVIEWS

One Man's War: The Story of the Lafayette Escadrille. By Lieut. Bert Hall and Lieut. John J. Niles. New York: Henry Holt and Company. 1929. 5½" x 8½". 353 p. Il. $4.00.

In a way, this is an emotional chronicle of a fighting aviator who was hard boiled long before the World War. The story is that of Bert Hall, who hails from Missouri and who had traveled over much of the world before he joined the French forces in the war against Germany. He had flown for the Turks against the Bulgarians and for the Bulgarians against the Turks and had returned to France where he crashed his plane just before the war. Bound to get into the war, he enlisted with many other foreigners in the Foreign Legion and received some preliminary training in North Africa before being sent to the trenches in France. At the first opportunity he transferred to the Air Service, and when the Lafayette Escadrille was organized he was one of the group of seven men first assigned to it. Later he was sent on a mission to Russia, where he did some flying for which he was decorated. The revolution forced his return by way of Siberia and the United States, whence he finally got back to France and the war.

Wherever Lieutenant Hall went, adventure rode on one shoulder and the goddess of luck on the other. Arrested in Bulgaria as a spy and condemned at midnight to death, he was on his way to France by morning. Crashing his ship in a tree, he was uninjured. Shot through the mouth, he managed to land his plane safely. Everywhere it was the same, and while his comrades were being shot down he managed to serve through to the end of the war, one of the two surviving members of the Lafayette Escadrille.

The account is taken from the author's diary and is full of action and interest from start to finish. The war provided the action, but romance was not lacking, for there is a procession of sweethearts through the whole book. Most of the prominent aviators of the war appear in the account—and many of them disappear. In the early part of the volume is an eagerness and an enthusiasm which disappear towards the last to be replaced by a sense of weariness and sadness, for at this stage almost all of the author's friends and companions had been killed.

Lieutenant Niles put the diary in narrative form and prepared it for the printer but he was careful to retain the racy language in which Lieutenant Hall wrote his notes and often he quotes directly from the diary. The result is a gripping, exciting account, not of the larger war combinations but of the smaller events which surrounded the author and which combined to make "one man's war."

Uniforms of the World. By Fred Gilbert Blakeslee. New York: E. P. Dutton & Company, Inc. 1929. 5½" x 8¼". 449 p. Il. $6.00.

The author is one of the world's foremost authorities on uniforms and has acted as advisor to many theatrical producers in costuming the players. He has produced one earlier volume on *Army Uniforms of the World,* but he now extends his field to include a description and the history of the Army, Navy, Diplomatic, and Police uniforms of all of the principal countries of the world. His information has been derived for the most part from official sources, such

as copies of uniform regulations or extracts therefrom made by military attachés. The only countries which have been omitted are some of the smaller ones and some of the semicivilized ones from which accurate data could not be obtained.

It would, of course, have been impossible to describe in full detail every uniform of every country, but the author has detailed every class of uniform and has, in most cases, explained the facings and the insignia which accompany it to distinguish between services and between grades. Special attention has been given to the development of the uniforms of our own Army from Colonial times to the present, including the uniforms of the Confederate Army.

A few apparent errors result from making general statements, but these are usually corrected. For example, the statement that "The cadets at West Point wear the shako" (p. xviii) might lead one to infer that they wore no other form of headgear were the statement not amplified later in the text. Also, "In our army the sword belt is worn over the dress and the service coats" is an inaccuracy which receives later correction. Certain terms are used by the author which are technically correct but which are not current in the Army. As an example, the cloth strap on the service coat on which the insignia of rank is worn is described as a "shoulder piece" to distinguish it from the "shoulder strap" of the dress coat. Such a distinction is unusual, for, practically speaking, it is unnecessary.

Regardless of these slight criticisms, the volume can be accepted as being entirely accurate. In addition to being interesting, it is a necessity to anyone who, for any reason, requires exact information concerning the uniforms of the world, and its value is enhanced by a bibliography of works relating to uniforms and official dress.

Memoirs of the Late Frank D. Baldwin, Major General, U. S. A. By Alice Blackwood Baldwin. Los Angeles: Wetzel Publishing Co., Inc. 1929. 6¼″ x 9″. 204 p. Il. $4.50.

Interesting though it is, this book has been given an inaccurate title, for General Baldwin does not figure in it nearly as much as one would reasonably expect in a volume labeled "Memoirs." In its arrangement, the work is divided into three parts, of which the first part of about forty-five pages purports to be the memoirs of General Baldwin, the second part of fifty pages consists of detached descriptions of leading events in the general's career, and the third part of ninety pages is Mrs. Baldwin's memoirs.

Except for a brief chapter devoted to General Baldwin's birth and ancestry, Part I opens abruptly with the movement of the Fifth Infantry to Montana after the Custer fiasco. From this point, the account consists principally of the moves made by the Baldwin's, of an account of life in garrison and in the field during the period covered, and of notes on Army people and military movements. Part III starts in with Mrs. Baldwin's early life and is, on the whole, a somewhat fuller account of Army hardships but one of the same character as Part I. It ends with a slight overlap to Part I and should, chronologically speaking, precede it under the same title. Part II is taken from various sources and various authors and deals almost altogether with General Baldwin.

The subject of these memoirs will long be remembered as the one man in the Army who won two Medals of Honor. During his lifetime he participated in more than twenty-five battles in the Civil War, Indian wars, and the Philippine Insurrection, in all of which he exhibited a courage and an intrepidity beyond that allotted to most men. His most famous exploit consisted in charging an

Indian encampment with a wagon train. His life is well worthy of study and emulation, but Mrs. Baldwin's admirable account of Army life on the Western plains during the latter part of the nineteenth century does not give us a sufficiently vivid picture of this remarkable warrior.

Our Neighbor Nicaragua. By Floyd Cramer. New York: Frederick A. Stokes Company. 1929. 5" x 6½". 243 p. Il. $2.00.

In many respects Nicaragua is the most backward of the Central American nations and has therefore been a country of special interest to the United States for many years. Illiteracy and peculiar political and geographical conditions have brought about a particularly unstable situation which has frequently required the guiding hand of the United States. In fact, we have had Marines stationed in the country almost continuously since 1912 and we face the prospect of having them there for some time to come.

To secure a reasonably clear insight into our relations with Nicaragua, it is necessary to learn much about her history, her people, and her relations with the other Central American nations. This is the purpose of Mr. Cramer's volume. He traces briefly the history of the country, revealing the underlying causes of the present conditions, and he discusses in some detail the two American "invasions." Sandino and his guerillas bring the situation up to date and show the difficulties which beset the governmental authorities in that country.

The author's narrative is unimpassioned, unbiased, and romantic. Much of the account was obtained at first hand and the remainder has been taken from authoritative sources. In calm language, the book carries us from the earliest days of Nicaragua to the present in the course of a single evening and leaves us with a better understanding of this "much misunderstood nation" and of our part in the development and improvement of recent years.

The 1929 Rules and Laws of Auction Bridge. By Wynne Ferguson. New York: Wynne Ferguson. 1929. 3¾" x 6". 144 p. Il. $0.75.

Mr. Ferguson gives us a great deal more in this little book than its title would indicate. The laws themselves require forty-seven pages, and the remainder of the volume is devoted to an exposition of the game and to advice on bidding and play. In his methods the author does not differ materially from other accepted authorities, but he does emphasize two points which are neglected by many authors. In the first place, the theme which runs all through the book is the advisability of not taking the game too seriously. The second point is that "how not to play auction bridge" is just as important in its way as a study of the proper bidding and play.

This volume, which is in its twentieth edition, is one of the most valuable books now on the market, partly because of the author's philosophy, but principally because of its quick reference value. Of pocket size, it can readily be carried around and studied at odd moments or produced during a game to settle disputes. Ignorance of the laws of the game is hardly excusable, yet it is the predominating weakness among bridge players. The opponents take twelve tricks against a rash bid; do they score little slam honors? When can a turned trick be examined? Late in the hand one player finds himself short a card; what is done? Does a pass out of turn differ from a bid out of turn?

Of course, many players, not knowing the laws, waive the imposition of penalties, and this, in turn, makes it unnecessary to learn the laws. In our

circle we restore exposed cards to the hand and do nothing about it; why then learn the proper procedure? Yet how this same circle would protest if they saw two football teams play without penalizing off-side play or two baseball teams agree not to call strikes which were not swung at! If we all had Mr. Ferguson's book always at hand, we would soon play a better and more enjoyable game.

Instinct and Intelligence. By Maj. R. W. G. Hingston, M. C. New York: The Macmillan Company. 1929. 5½" x 7¾". Il. $2.50.

In this volume the author asks himself the question, "Are the lower animals blind creatures of impulse or are they rational beings?" and endeavors to find the answer in a study of the behaviour of insects and spiders. Major Hingston has spent many years in collecting data and in the end he concludes that, while instinct is the dominating influence in insect behaviour, glimmerings of intelligence must be admitted. Henri Fabre, the foremost authority—but an anti-evolutionist, would never admit intelligence in insects, but he had so much difficulty in explaining their actions by instinct that he granted them what he called discernment. Bethe, Loeb, and Lefroy do not go even so far, but Hingston, presenting hundreds of examples, can find no explanation other than intelligence.

In an excellent example, he finds ants building a nest on a very steep slope on which each ant, carrying out its load of dirt, slipped and tumbled to the bottom. After some time, one ant began selecting pebbles which it carried up the slope and spread out in a platform at the mouth of the nest. Instinct or intelligence? Ants crossing a car track in column were crushed by passing cars, so they built tunnels beneath the rails. A wasp brought to its nest a spider too large to be carried through the entrance; without making the attempt she left her prey and enlarged the opening. Roller beetles, having their ball pinned down by a small stake, examine the ball, discover the stake, cut the ball in two to release it, remake it, and proceed on their way. Such examples, repeated many times, confirm the author in his belief and we, however much we may disagree with his conclusions, must agree with Bertram Russell that "The book is fascinating reading."

Sketches of One Hundred and Twenty-five Historic Virginia Landmarks from Cape Henry to Richmond. By J. Luther Kibler. Richmond: Garrett & Massie, Inc. 1929. 4½" x 6". 130 p. Il. $1.00.

The author has selected one hundred and twenty-five outstanding landmarks on historic Virginia Peninsula and on the south shores of Chesapeake Bay and presents them to the reader in sketchy word pictures of about a hundred and fifty words each. Every landmark is thus given a single page and may therefore be found quickly, but the space is too limited to give more than the barest outline of each particular point of interest.

The greatest value of this pocket-size volume will be found by the tourist who, passing rapidly through this section of the country, will be able in a moment to orient himself in the history and relative importance of each place; and his understanding and appreciation of these hallowed spots will be all the greater. Allowing for the necessity for broad statements in such a condensed account, the book is accurate and may be accepted without hesitation. However, the student, seeking detailed information, will require other authorities.

A Shopping Guide to Paris. By Thérèse and Louise Bonney. New York: Robert M. McBride and Company. 1929. 5″ x7½″. Il. $3.00.

Are you going to Paris this summer? If so, you can find innumerable guide books telling you what to do and what to see, ranging all the way from the author who tells you how to "do" Europe on two dollars a day to the author who advises you to spend your money freely, go everywhere, and have the best time possible while your money lasts. All of these books have one of two ends in view—sightseeing or amusement. They either get you up with the lark and march you around all day to see monuments, churches, museums, are galleries, and notable buildings, or they keep you up all night making the rounds of cafés, cabarets, music halls, and theaters. In either case they feed you at seasonable —or unseasonable—hours, for one has missed France who has not taken full advantage of the cooking for which France is famous.

In the current volume, the authors attack a new phase. One cannot return from France without having made some purchases of wearing apparel, gifts, etc., so it is their purpose to point out what to buy and where to buy it. There is no other similar book, although *Paris on Parade* does cover in part some of the same field.

As might be expected, nearly half of the book is devoted to dresses and hats —covering the field all the way from the famous dressmakers and milliners to the department stores. The remainder of the book takes up men's and children's furnishings, antiques, decorators, beauty parlors, interior decorators, luncheon places, physicians and surgeons, and a chapter called "Miscellaneous, Including a Little of Everything from Art to Automobiles."

The book is one for reference rather than for general reading. As such it will be invaluable as a traveling companion. The authors have lived in Paris for years and their advice may be accepted. In any case their discriminating and delightfully written book should not be overlooked.

An unprotected, undefended America would be the greatest possible menace to the peace of the world. The fact that America, in 1914, was ridiculously unprepared for war contributed in a vast and terrible measure to confirm the Germans in their determination to attack the world's peace.—Boston Transcript.