

The
FIELD ARTILLERY
Journal



IN THIS ISSUE:

Japanese Artillery

MARCH, 1941

THE SOLDIER'S HANDBOOK

To meet the demand for additional copies of *FM 21-100, THE SOLDIER'S HANDBOOK*, the U. S. FIELD ARTILLERY ASSOCIATION is pleased to offer an exact reproduction of this important manual for the basic training of the soldier.

This handbook was prepared to help the new enlisted personnel of the Army of the United States over the rough spots as rapidly as possible during their transition from civil to Army life. It is also a valuable book for those who might want to acquaint themselves with basic military procedure before joining the Army.

In addition to the material contained in the Field Manual, a supplement has been included to cover History of Artillery, Modern Artillery, Miscellaneous Facts for Handy Reference, and List of Field Artillery Organizations as of February 1, 1941. This portion also contains organization charts for new field artillery units; photos of new types of materiel; the Field Artillery song (words and music); and a glossary of field artillery terms.

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U. S. FIELD ARTILLERY ASSOCIATION

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WASHINGTON, D. C.

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YOUR ATTENTION is directed especially to two features in this issue which you should preserve for future reference: Lt. Col. Guy Kurtz, of the Training Section in the Chief's office, has compiled a list of the various field artillery training manuals, technical manuals, etc., which is printed herein under "From the Chief's Office." The second item is the index of publications pertaining to field artillery materiel, which is given under "Notes from the Field Artillery School."

THE JANUARY issue, containing five antitank articles, sold out within a week although we printed several hundred extra copies. Owing to the great interest in this subject we are printing two antitank studies in this issue, and have at least three more "on the way."

THE IMMINENT organization of two additional armored divisions makes material on this subject of great timeliness. Col. Doniat, who will soon be relieved as head of the War Plans section of the Chief's office, gives us the organization of the artillery with armored units, together with a discussion of how these tables were produced.

LIEUT. COL. PETTIGREW, who furnishes us the detailed description of Japanese field artillery, served an "attachment tour" with a Japanese regiment several years ago. He is now on duty with the War Department General Staff.

MAJOR ARTHUR E. SOLEM, whose treatise for equitation instructors is of especial value at this time when our "stock" of trained instructors in animal management has been spread perilously thin, has spent many years on the faculty at Fort Sill.

THE LIST of Field Artillery organizations printed herein was correct on the date on which compiled. Recent changes may have occurred, however, which do not show in this list. The JOURNAL would be glad to receive rosters of officers, from those regiments and other units which have not yet sent such rosters to this office. It is hoped to print a complete station list later in the year.

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Japanese Field Artillery

By Lieutenant Colonel M. W. Pettigrew, GSC (FA)

GENERAL ORGANIZATION*

Prior to mobilizing for the present conflict with China, the Japanese Field Artillery consisted of:

- 14 regiments of divisional light artillery
- 3 regiments of divisional pack artillery
- 3 independent regiments of pack artillery
- 1 independent regiment of horse artillery
- 8 regiments of medium field artillery
- (6 regiments of horse-drawn 155-mm. howitzers, 2 regiments of tractor-drawn 105-mm. guns, grouped into 4 so-called heavy field artillery brigades).

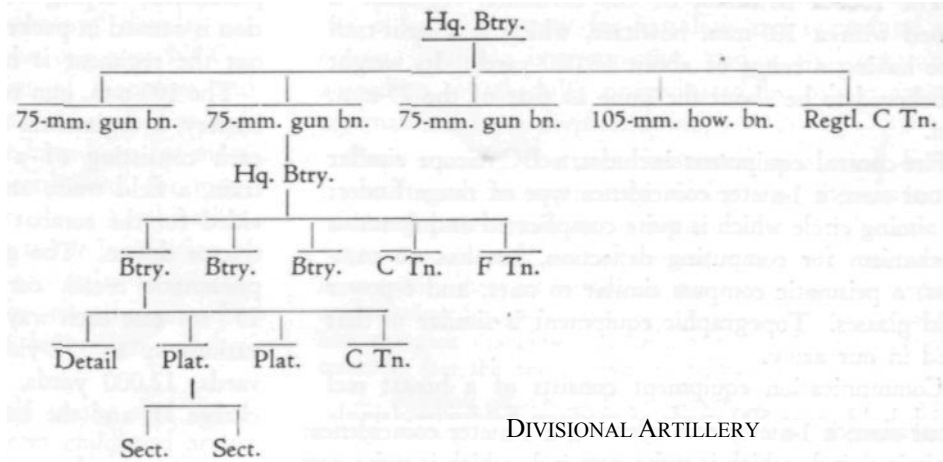
Thus, of the 17 infantry divisions, 14 had as their divisional artillery one regiment of field artillery, composed of three 75-mm. battalions and one 105-mm. howitzer battalion, while the remaining three divisions, organized for mountain warfare, had one regiment of pack artillery, composed of three 75-mm. pack howitzer battalions.

There is no corps artillery, the Japanese having no unit between the division and the field army. The field army, which varies in strength and composition but would perhaps average 5 divisions of which one would be pack, usually includes as army artillery at least a brigade of medium artillery, an independent regiment of pack artillery, and a battalion of horse artillery, the latter for work with the army cavalry.

The conscription system, which has been in use in Japan for many years, of course renders instantly available trained personnel for several times the number of organizations existing in peace time, and the present organizational strength of the field artillery is in

*For details of organization and materiel, see *Kurt Passow, Taschenbuch der Heere, J. F. Lehmanns Verlag, Munchen, 1939*—a remarkable volume which is the "Janes" for all armies (except Germany's).

fact between two and three times that listed above.



DIVISIONAL ARTILLERY

The organization of the divisional artillery regiment, war strength, is generally as shown above:

Notes: 1. The 105-mm. howitzer battalion is organized similarly to the 75-mm. gun battalion.

2. Combat trains consist of caissons; field trains of two-wheeled carts.

3. Regiment contains a total of 105 officers and 2,365 enlisted men.

4. Auxiliary weapons—365 pistols, 152 sabers, 72 LMG's.

The pack artillery regiment, the divisional artillery of the "pack division," consists of a regimental headquarters battery; three battalions each of three batteries, a combat train, and a field train; and a regimental combat train. All transportation in this regiment is pack.

The standard light gun is a 75-mm. Krupp type, manufactured in Japan. It has the sliding type of breechblock, hydraulic-spring recoil system, modified open box trail. Equilibrators and trunnioning of the tube back of the center of balance provide for high-angle fire without the necessity of digging a recoil pit. The gun is equipped with an excellent panoramic sight of Japanese manufacture. The

range for shrapnel is about 9,000 yards, and with shell about 11,800 yards. The weight of the gun limbered is about 4,500 pounds.

Auxiliary vehicles in the 75-mm. battery include limbers, caissons, battery wagons, and carts for fire-control



International News Photo

Japanese mountain gun in action.

and communication equipment.

The fourth battalion of the divisional regiment is armed with a 105-mm. howitzer, which is a split-trail type having a range of about 12,000 yards. Its weight is believed to be about the same as that of the 75-mm. gun.

Fire-control equipment includes a BC 'Scope similar to our own; a 1-meter coincidence type of range finder; an aiming circle which is quite complicated and contains mechanism for computing deflection, but has no compass; a prismatic compass similar to ours; and 6-power field glasses. Topographic equipment is similar to that used in our army.

Communication equipment consists of a breast reel which holds over 500 yards of medium field wire (single strand); a hand reel which mounts a spool holding 500 yards of light outpost wire (single strand); a buzzer phone; a field telephone similar to our EE-5; blinkers; and airplane panel sets. There are two radio sets in each regiment; one is a four-tube set with a range of about 4 miles, the other a 7-tube set for work with airplanes. It is possible that the Japanese have recently developed more modern sets. The 4-tube set operates on the 300-600 meter band.

The draft animals are excellent small, compact, animals, averaging about 15 hands one, and about 1,100 lbs. The majority have been bought at about two years, and issued to troops after having been kept at the remount stations until they reach 5 years of age. The majority are half bred Percheron or better. After being issued to troops they receive special remount training for one year before being turned to duty. Consequently by the time they are turned to duty they are very well trained, and go quietly in draft. Yearly automatic replacement 1/10.

The riding horses are likewise a good small type of excellent quality. It is said that their quality has improved greatly in recent years. Their yearly automatic replacement is likewise 1/10. A specially good type, usually $\frac{3}{4}$ or full thoroughbred, are issued for use as officers' mounts. These average extremely high in quality. Automatic replacement on these is 1/6.

In this connection I should like to take this occasion to scotch the ancient belief that the Japanese are poor horsemen. I never saw better trained animals come from any remount station than those I saw issued to the Guard regiment, better preliminary training within the regiment, nor better handling in the field.

MEDIUM ARTILLERY

The 155-mm. howitzer regiment consists of a headquarters battery, a regimental combat train, and two battalions, each composed of a headquarters battery, a combat train, a field train, and three batteries. The howitzer is the old 1905 model, redesigned to break down for transport into two six-horse loads instead of the one former eight-horse load. Traverse is on the axle, with 3° each side of center. Elevations from minus 5° to plus 65° are

possible. The recoil mechanism is hydropneumatic, varying from $2\frac{1}{2}$ feet to $5\frac{1}{2}$ feet. Ammunition is carried in packed caissons. All transport throughout the regiment is horse-drawn.

The 105-mm. gun regiment consists of a headquarters battery, a regimental combat train, and two battalions, each consisting of a headquarters battery, a combat train, a field train, and two batteries. Trucks are provided for the combat and field trains; a few loads are tractor drawn. The gun is a modern split-trail, hydropneumatic recoil, carriage-traverse type weapon, with 15° traverse each way from center, and capable of elevations up to 35° yielding maximum ranges of 10,900 yards, 12,000 yards, and 13,950 yards for charge I, charge II, and the long pointed shell, respectively.

PERSONNEL

Officers.—The standards of character, education and training of the regular army officers are very high. Practically all of them have been through the full course at the Military Academy during which they also serve a six-month tour of troop duty as enlisted men. By the time they have completed the course, their education and training has been such that they are well qualified to fill any duty pertaining to the rank of second lieutenant. The course at the Military Academy is not entirely complete as to general education, but this deficiency is somewhat remedied by the courses in mathematics and science which they receive at the Artillery and Engineer School. After the completion of the year's course at this school, part of the class remains for advanced work, and a few of the best students are sent to the Imperial University for research work. The rest of the officers return to their regiments. Students for the War College (a 3-year course) are selected by competitive examination from officers who are about due for promotion to captain. Promotion above the grade of first lieutenant is selective, hence graduates of the War College advance rapidly. Many officers are "plucked out" by the time they reach the grade of lieutenant colonel; this is accomplished through an age-in-grade rule. Officers who are plucked serve in the Reserve. This system provides the Japanese Army with a great reserve of former active officers of varying degrees of ability.

Enlisted men.—Japanese conscripts are called to the colors at the age of 20. Prior to this time a fair proportion of them will have had some military training in school or in a young men's training corps. The cream of the crop serve in the active army for two years, after which they go to the reserve. Other classes are called out for shorter training periods and are assigned to First or Second Replacements. Many men volunteer for service at the age of 18, hoping to become NCO's. A man must serve two years before he can become an NCO. Aspirants for these grades receive special training and schooling during their first year of service (with the regiment) and are then sent to an NCO school for an additional year of training. Their general standard of

ability is very high on account of their thorough basic training; furthermore they have served in many positions in battery, battalion, and regimental details, and are consequently more versatile than our own NCO's.

Discipline and morale.—In point of discipline and morale, the Japanese troops deserve to be ranked as high as any in the world. The Japanese have been for many centuries an essentially military people, and for many years a strictly regimented people. This combination, aided by the attention that is given to the inculcation of a spirit of military discipline and of loyalty to government and constituted authority, by means of weekly lectures on the subject, produces a high degree of loyalty, discipline and esprit.

Since all ranks are comparatively young and vigorous, and since the Japanese are from childhood accustomed to discomfort and frugal living, the hardships of field service present nothing novel to them. The Japanese officer or soldier never grumbles or expresses dissatisfaction. Company punishment is rare. Relations between officers and men are pleasant; officers treat the men with courtesy,

battery instruction; and the third period, which extends from the middle of July through November, is utilized mostly for battalion and regimental exercises. Training is progressive, and is well organized according to schedules promulgated by organizational commanders from division down.

Basic training doctrines, contained in a small handbook, furnish an interesting sidelight on the character of the Japanese military system:

"1. The object of military training is to so train the troops as to qualify them for wartime service. Since the two cardinal qualifications for such service are an invincible martial spirit and stringent discipline, the cultivation of these virtues becomes in fact the aim of military training.

"2. Military officers, as the backbone of the Army, constitute the real source of military spirit and discipline, and should accordingly, at all times, and in their every act, comport themselves in such a manner as to inculcate in their subordinates a willing desire to follow them to any extremity.

"3. The glory of military training is that subordinates are willing to cheerfully sacrifice their lives at the word of their commanders. Consequently troops will be trained to realize their responsibilities,



Acme Photo

Japanese heavy field artillery battering Nanking

the latter reciprocate with punctilious observance of the regulations with respect to military courtesy.

TRAINING

Conscripts enter the regiments in January for a two-year tour of duty with the active army. During this time they pass through a regular training cycle, on completion of which they may be selected for NCO schools or they pass to the reserve and are sent home. Replacement units are formed from each parent regiment, and are composed of men whose physical and mental rating upon entrance into the service is not high enough to place them initially with active units. Replacement troops receive three months' training annually and reservists three weeks'.

The training year is divided into three parts: The first period is devoted mostly to recruit and section training; the second period, which commences in April, is given over to

and to discharge their duties with sincerity and patriotism.

"4. Military training, carefully planned and strictly carried out, is the most effective measure in promoting military spirit and discipline. This spirit of training will be carried into every detail of the daily life of the troops, for attainment of the end in view.

"5. Constant endeavor will be made to master the military arts, since the knowledge that one possesses such mastery promotes self-confidence, strengthens the will, and enhances morale.

"6. Since good exercise of command depends as much upon physical strength as upon knowledge, all military men will pay particular attention to their physical condition.

"7. Since military men are the flower of the nation, and consequently are vital factors in the building up of the national spirit, military training will accordingly be conducted so as to produce not only good fighting men, but good citizens as well."

Instruction in so-called spiritual training consists of lectures on citizenship, the obligations of the soldier to his officers and to the government and the Emperor.

There is little doubt but that this training has a most beneficial effect, for the Japanese soldiers in their fighting in China have shown themselves to be well indoctrinated in military virtues.

One thing which impresses the foreign observer is the punctiliousness with which saluting is accomplished; the Japanese salute each other as far as they can see with the naked eye, and there is quite a rigid formality in the relationship between officers. This may account for some of the recent "incidents" in which foreigners have been involved, and may well result in part, at least, from ignorance on the part of the latter as to the degree of military courtesy customary in the Japanese army.

Another noteworthy thing is that in training, the Japanese totally disregard the frills, and have as their objective tactical training always under service conditions. Little attention is paid to eyewash or to spooniness in personal attire, either of officers or men. The Japanese would consider anyone insane who would suspend training on Saturday morning for the sake of seeing that everything was shined up. As to condition of materiel, they are much more concerned with its serviceability than its outward appearance; there are no fixed inspections to determine these things. Parade-ground drills and maneuvers are largely omitted; conditioning of men and animals for long, hard field marches is considered of more importance. In brief, the Japanese training is for war, not for garrison.

The thoroughness of their training rests primarily upon the fact that their conscription system brings all the new men into the organization at the same time, so that a really well-thought-out and progressive training system can not only be written on paper, but can actually be followed in fact. A secondary but extremely important factor is the extent to which they are able to keep down the overhead of special duty even in peace time. The regimental area contains only the headquarters, barracks, gun sheds and stables. No family quarters are provided for officers or non-commissioned officers, the officers living "on commutation" in the nearby community, and the non-commissioned officers living, with few exceptions, in barracks. Messing is by battalion or regiment, using large steam-pressure cookers for the basic mixed barley and rice component. Absence due to guard house confinement is practically nil. As a result, except for a small interior guard, and a remarkably small number of cooks and kitchen police, the entire strength of the regiment is available for drill every day.

In general, the training cycle progresses much as our own, the same subjects being covered. Lack of space

prevents a detailed discussion of the content of training schedules, but they are intensive and systematic. In field exercises, there is an effort to provide realism. For example, in training battery and battalion details the enemy is always outlined; small flags of different colors represent infantry, machine guns, OP's, and so on, and artillery fire is shown by smoke puffs. Consequently there is always something out front to be observed and located by intersection or by any other suitable method. The Japanese lay great stress on this phase of battalion training, and tie it in to fire direction.

The training in communication is chiefly telephone, with considerable time allotted to semaphore, and a little on wigwag and blinker. The Japanese habitually tend to keep telephone installation to a minimum. Communication between battery OP and gun position is usually by voice or voice relay. Since it is customary to lay wire from lower to higher units and to place the OP of one of the batteries within voice range of the battalion OP, the other two batteries lay command lines from their OP's to that of the battalion. Similarly the battalion lays to artillery regiment and to supported infantry. A small

switchboard is established near the main OP, and these lines radiate from it. Usually there are lines also to an auxiliary battalion OP off to the flank. These lines, called information lines, are useful in locating targets by intersection. Procedure in this is as follows:

From the switchboard position the approximate location and description of the target is given to the observers; from their reports the target is located by intersection; it is given a number which, together with its location, is furnished the batteries. When locating hostile batteries by their flash, each observer first says "now" when he sees the flash, and if they both say it at the time the flash is also observed from the main battalion OP, the locating section knows that both are observing the same flash.

Topographic men are trained in resection, establishment of base lines, triangulation, and the establishment of place marks, much as in our own field artillery units.

For all problems involving the complete battalion detail, for battalion C.P. exercises where the entire detail is present, and for complete battalion exercises, the problems are as carefully worked out beforehand as are R.S.O.P.'s at our artillery school. Mimeographed General Situation Sheets are issued the day before the problem; at the beginning of the problem mimeographed Special Situation Sheets, and during it progressive situation sheets, are issued. Umpires are present from the other battalions or from regimental headquarters, and



Japanese 75-mm. field gun. Krupp type, Model '09.

the entire affair is well worked out. At the conclusion comes the inevitable critique, which is held then and there, no matter how late it may be, or how tired the troops. The training covers all general phases of artillery operations. Of the six complete battalion tactical exercises that I saw, there were two advance guard meeting engagements, and one each of attack of position, defense of position, pursuit, and rear guard action in withdrawal. The two night problems were daylight reconnaissance, night occupation of position, and preparations for dawn attack. They were all well done.

At some time during the third training period the regiment goes to either the Mt. Fuji or the Shirakawa (Fukushima Prefecture) Firing Ground for its annual firing maneuver. Here again all firing is based on tactical situations

worked out beforehand by the battalion commanders, mimeographed, and issued as for ordinary tactical problems. All field officers of the regiment, off on R.O.T.C. or similar duty, or on

exchange with the Infantry, return to the regiment for this maneuver and, with the field officers of regimental headquarters, take their turn at working up the tactical situations. Likewise all battery officers of regimental and battalion headquarters take their turns at firing. The great majority of the firing is what we call axial firing "from the hip," in advance or rear guard actions. The battery commander will have only a few minutes to select his position, and no time to lay any wire. He will as a result usually have to put his guns near his OP and will consequently quite frequently be forced to occupy positions not particularly well concealed. Ranges fired are usually short, from 1800-3000. The soil at the Mt. Fuji firing ground is soft volcanic ash, and as they do not have any well thought-out trail log equipment, the guns tend to jump around somewhat. Likewise their tendency to rely almost entirely on voice communication, in which they attach more importance to a loud, military-sounding noise than to clear enunciation, and the fact that all Japanese are from childhood accustomed to doing all arithmetical problems on the abacus and are consequently weak at mental calculation, gives rise to rather frequent errors in deflection and to irregular sheafs. Their sequence of commands is likewise faulty in that the range, once given, is not repeated again unless changed (the much less

important method of fire is repeated each time, even though unchanged), and occasionally the battery will continue to fire lost salvos with an erroneous range for several salvos, while the battery commander is attempting to find his bursts by deflection changes. On the whole, they are probably weaker at the technical phases of "offhand" firing than they are on any other subject. Eventually they usually get on their target, but after expending more time and ammunition than would our regular army officers.

Their ammunition allowance is quite liberal, a regiment receiving about 3,200 rounds of service ammunition per year. They also are quite prone to make the mistake of adjusting with height of burst too high, and of not making bold enough changes in height of burst during adjustment.

Though they do very little of such firing at their maneuver, from watching them during their officers' classroom firing, I would say that they are quite well up on the types of firing in which they have more time to consider



their problems, such as precision fire, transfers, witness-target firings, bilateral observation, high-burst ranging, and firing involving weather corrections. They spend little time on lateral fire, in the classroom, and none at the firing ground.

I think, however, that it would be a mistake to underestimate their ability as artillerists, because of the shortcomings mentioned above. Their faults, except for their tendency to occasionally choose poorly-screened positions, are largely technical. Giving them due credit for their ability to profit by their mistakes, I think that a little actual service against an enemy having good artillery would quickly cure them of their tendency to subordinate good tactical positions to simplicity of communication. Likewise, a little concentrated technical firing during the early stages of their firing maneuver, better trail-log equipment, and more emphasis on clearness of enunciation would, I think, produce firing of a considerably higher grade.

The division fall maneuvers are the culmination of the training year for the entire division. The maneuver is divided into three phases, the 1st, in which each of the four regiments of infantry, with a battalion of artillery (this requires drawing on some 155 How. regiment for a battalion), a platoon of cavalry, and a company or

platoon of engineers, attached, holds its own maneuver, opposed only by a detachment carrying flags of various sizes and colors to represent the nature of the enemy being represented. During the 2nd phase, within each infantry brigade, two such forces oppose each other under the direction of the infantry brigade commander. During the 3rd phase, the two infantry brigades, with their attached troops, oppose each other under the supervision of the division commander. The maneuvers are strenuous, it being usual to operate continuously in each phase, under service conditions, for about 60 hours, followed by a 30-hour rest period in which the troops will be billeted in civilian houses for a day of rest.

They then start on the next phase, which will be a repetition on a larger scale of the phase just finished. Supply, while improvised, will follow along the lines of actual service, the field ration being carried by the men and in the organization spare-parts wagon. The battalion intendance officer will simulate supply of forage by arranging for local delivery at points to simulated distributing points. The maneuver is kept lively by the supervising brigade, or, in the 3rd phase, the division commander, who will issue situations causing one side or the other to withdraw whenever there is any sign of a deadlock. The movement is usually so rapid that the improvised artillery liaison details have not much more time than to establish mounted messenger contact with the supported infantry, and the broken and wooded terrain makes contact so difficult that the artillery will frequently occupy position practically in the infantry front lines, rather than spend time hunting for positions in the rear. Anyone who has seen what they are up against in the nature of terrain, however, will agree that such practice is not altogether unreasonable. Marches during the active parts of each phase are usually long, the average during the 60-hour period being close to 35 miles. The men, however, are young, hardy and accustomed from childhood to cold and damp, and the horses are hard from their year-round steady work. Great attention is paid to care of animals on the march, and particularly to watering. At every halt the animals are given all the water they can hold. This is of course an easy matter in Japan, where water is to be found everywhere. The troops are also aided by the Reservists' Association. These groups are always on hand at all hours of the day and night, assisting in the way of water for the animals, and always have coffee ready for the men. As a result of the care of animals during the march, and I think, especially on account of the care given the matter of water, the Guard Artillery Regiment in the year of my attachment to it, after finishing the usual 10-day fall maneuver, and going on into the three-day Grand Maneuver, which meant another phase more strenuous than any of the others, returned to Tokyo with an average loss in weight per animal of only 15 pounds. (Animals average about 1,125 pounds.)

All divisions stage this annual maneuver, and each year two to four will continue on through the Grand Maneuvers.

One naturally expects troops who spend as much time in basic and preliminary training to put on these maneuvers well and without undue confusion, which they certainly do, but the most impressive part of the whole thing to a foreign observer is the stolid and uncomplaining attitude of the men. Throughout the maneuvers one never hears a single word of complaint or a single word of question as to the wisdom of carrying out any order, from the highest unit down to the smallest. In this respect I unhesitatingly rate them as superb.

GUNNERY METHODS

Japanese gunnery, as indicated in preceding paragraphs, lays stress on simple methods adapted to open warfare. Nevertheless, they study the more complex methods. In preparation of fire, the aiming-point method of obtaining data is the most commonly used. Here they apply simplification in that they generally use the measured angle direct, without applying any offsets. Since their observation is usually axial or very nearly so, this method is adequate and rapid. Deflection difference is simplified by the application of arbitrary corrections which depend on the range.

Site is obtained by standard methods.

Deflection is also obtained in the usual graphical manner (plotting) and by using the observing instrument as an aiming point. In this latter case no obliquity is applied.

Survey proceeds much as in our own service. The base line, however, instead of being used to lay the guns, is used as a basis for the location, by intersection and triangulation, of place marks and aiming points and targets, after which the batteries are laid by means of the aiming point.

Firing is classified as adjusted fire, map data corrected, and special fires. For the first category, the Japanese use more or less the same methods as we do, including bracket adjustment, precision adjustment, bilateral, and high-burst ranging. In bracket adjustment the principal variant from our own methods which should be noted is one in which two axial observers are used. The Japanese say that this works well against targets on which ordinary axial observation is difficult, as against the smoke or flash of hostile batteries. The battery commander usually acts as one observer, from the main OP, where he adjusts deflection in the usual way. Another observer is placed on the other side of the gun-target line and at least 100 yards beyond it. Communication is by voice or flag. There are three variations:

a. In which the observers report only the deviation of the round as deflection *correct*, *right*, or *left*. If the range can be determined by either observer he follows his deflection sensing by *over* or *short*. In any event, if the round falls inside the G-T line for both observers it is short; if outside for both it is over; if inside for one

and outside for the other it is doubtful. The battery commander carries on his adjustment as usual, simply taking advantage of the additional sensing thus obtained. Adjustment is with one gun.

b. In which the observers report the amount as well as the direction of the deviations. If the difference between the two reports is less than two mils, the round is sensed for range no matter where it falls. Thus if the right observer reports 18 R and the left observer reports anything less (right) than 16 R, the round is taken as over. Consideration of the angle T may require enlargement of the 2-mil value.

Their zone fire for effect is similar to ours, although they have an interesting method of prescribing the number of rounds required for neutralization. To produce a density of fire of 1 round per square meter, called *density 1*, with burst interval approximately 25 meters, they fire:

a. Shrapnel up to 4000; from each gun at each range a number of rounds equal to the thousands of range.

b. Shell up to 5000, from each gun at each range 7 rounds.

c. For longer ranges, they increase the above. With this *density 1* as standard, there is a list which shows the probability of securing complete neutralization with *density 1*, and by inverting the fractions in the table the density required to produce complete neutralization may be calculated. This list is: (See column opposite.)

Transfers of fire are conducted by the same methods as in our service.

Procedure in map data corrected is almost identical with ours except for the handling of the calibration correction. In each regiment one gun is selected as standard for the regiment, and its deviation from standard is known as the absolute calibration difference. The calibration differences of all the other guns in the regiment, with respect to the regimental standard gun, are called the relative calibration differences. In correcting, the absolute calibration correction is applied to all guns of the battery, and then the relative calibration corrections applied to the individual pieces. This system insures coordination of such corrections throughout the regiment.

Special fires include barrages, night firing, smoke, firing with star shells, fire against tanks, and fire against balloons.

TACTICAL EMPLOYMENT OF FIELD ARTILLERY

As with the Germans, the inclusion of an organic battery of artillery (pack artillery in the Japanese army) with the infantry regiment, and of two 70-mm. cannons with the battalion, has lightened somewhat the task of the artillery in providing direct support.

Throughout their tactical doctrines the Japanese insist vigorously on superiority of the offensive. The object of all maneuver is to close quickly with the enemy, where the assumed superiority of the Japanese in close combat can be realized to the utmost. Like the French army at the outbreak of the first World War, the Japanese similarly believe that in the attack there is a mystic virtue which can

overcome materiel weapons in less active hands. Consequently boldness is the keynote of all Japanese operations and this condition is naturally reflected in their handling of the artillery. Their problem is likewise complicated by the fact that they have to superimpose neutralization for general support requirements on artillery that is barely sufficient to carry out its mission of direct support.

As a result, in attack, they will usually direct that the artillery execute preparation and neutralization missions during the earlier stages, and then hand practically all of it over for direct support, depending on liaison between infantry regiments and artillery battalions rather than upon fire direction from artillery regimental headquarters.

How well this system will succeed will, of course, depend very greatly upon the success of the liaison system, and this is a point that is somewhat difficult to judge. They have a quite well worked out pamphlet on the subject and it is evident that they are keenly aware of the importance of good liaison. During peace, however, no

<i>Type target</i>	<i>Required density</i>	
	<i>Shrapnel</i>	<i>Shell</i>
Mounted troops	1	1
Dismounted troops		
Standing	2	3
Kneeling	3	3
Prone	5	3
Intrenched	10	3
Artillery personnel		
If flanking fire	3	4
If frontal fire	15	4

battalion nor regimental details exist, and when going out to the fall maneuvers, these details have to be made up from N.C.O.'s and men drawn from the batteries. Such personnel will have been trained previously for detail work, and the details, in fact, work quite well. By the time, however, that the barest essentials of regimental and battalion details have been provided for, very few men remain for making up the liaison details, and the regimental and battalion liaison details will usually consist of only the liaison officer, perhaps one mounted messenger and a three-man wire detail. Moreover, the Japanese insist upon rapid action during these maneuvers, and the action will usually be so rapid that by the time the skeleton liaison squad has laid the wire, the infantry has begun to move, and from then on, about the only liaison they can possibly provide is the liaison that can be effected by the one mounted messenger shuttling back and forth between the artillery liaison officer and the artillery. This much they always have, and in time of war, when they will have plenty of trained men available, it is probable that their system will work reasonably well.

In defense, more reliance is placed on fire direction

from artillery regimental headquarters than in attack, but once the offensive is taken, the problem will again resolve itself to a question of how well the system will work.

In both attack and defense, their artillery positions will be found much closer to the infantry than will ours. This results from a number of causes, the causes being in order of probable importance, (1) the broken and wooded nature of the average terrain, (2) the rapidity of movement of the maneuvers, and (3) the fact that they lay all lines by hand dismounted, which, while ideally suited to the Japanese terrain for short lines, makes the establishment of long circuits very difficult.

GENERAL ESTIMATE OF THE WAR EFFICIENCY OF THE JAPANESE ARTILLERY

I credit the Japanese artillery with a high standard of wartime efficiency. My reasons for so rating them are:

(1) The thorough training of officers, N.C.O.'s and men, secured as the result of careful and well planned preliminary training, and careful and thorough training plans for the conscripts passing annually into the reserves. The conscript system is of course the basis for the thorough training of the men, as it makes possible the planning of a progressive training scheme, extending over the entire year, which can actually be carried into execution.

(2) They have a true conception of the real objective of training, which is not, after all, the training of the men immediately in hand, who will of course, in the event of a major war, be swallowed up in the mobilization that will follow. Their conception of the objective of training is the keeping filled up of the reserves, both of officers and men, with men who are thoroughly trained for duty in war. And the Japanese idea of a trained man is a really trained man. Witness the provision in their peacetime training system, for the thorough training of not only the detail men, and the drivers and cannoners needed for routine garrison training, but also the training of meteorological observers, gas defense men, anti-aircraft gunners, etc., that their mobilization plans properly regard as being essential in war. Witness also their system of early retirement of officers and N.C.O.'s to insure that the additional regiments to be organized in war will have, in all officer grades above

2nd lieutenant, and in all the higher N.C.O. grades, men of former long service in the active army.

(3) The excellence of the men with which they carry on their training. The officers except for a sprinkling of Imperial Princes of the Blood have all entered the army by passing competitive examinations; and they enter their War College, the gate to an assured future, by competitive examination. The N.C.O.'s are likewise the survivors of a rigid competitive system, and the conscripts themselves are the cream of the men reaching manhood each year.

(4) The spirit of discipline and of the obligations of citizenship, and of patriotism with which all ranks carry out their daily work and training. It is natural for a people to display these qualities when aroused by the fervor of war, but these people have them to a superlative degree even in peace.

(5) The improvements in materiel and equipment which will continue to take place. The military have for the past several years been writing their own ticket for the budget, and they are not blind to their deficiencies.

Rating them separately, the various subdivisions of artillery operation, I think, are about entitled to the following:

On discipline, morale and esprit.....	Superb
On mobility	Superior
On endurance	Superior
On fire direction and firing.....	Very Good.

Comparison with our own Field Artillery is difficult for the reason that the answer depends on what one compares. If one compares our pre-1940 Regular Army field artillery with the field artillery that is normally in training in Japan in peacetime, I think one might fairly state that we are considerably better in fire direction and firing. If, however, one attempts to compare the general standard of the artillery of the Japanese wartime army with the artillery of the corresponding American Army one must realize that the Japanese conscription system enables them to at once throw into the field an army of, let us say, a million and a half men, the overwhelming majority of whom have had two years' active service within the last ten years.

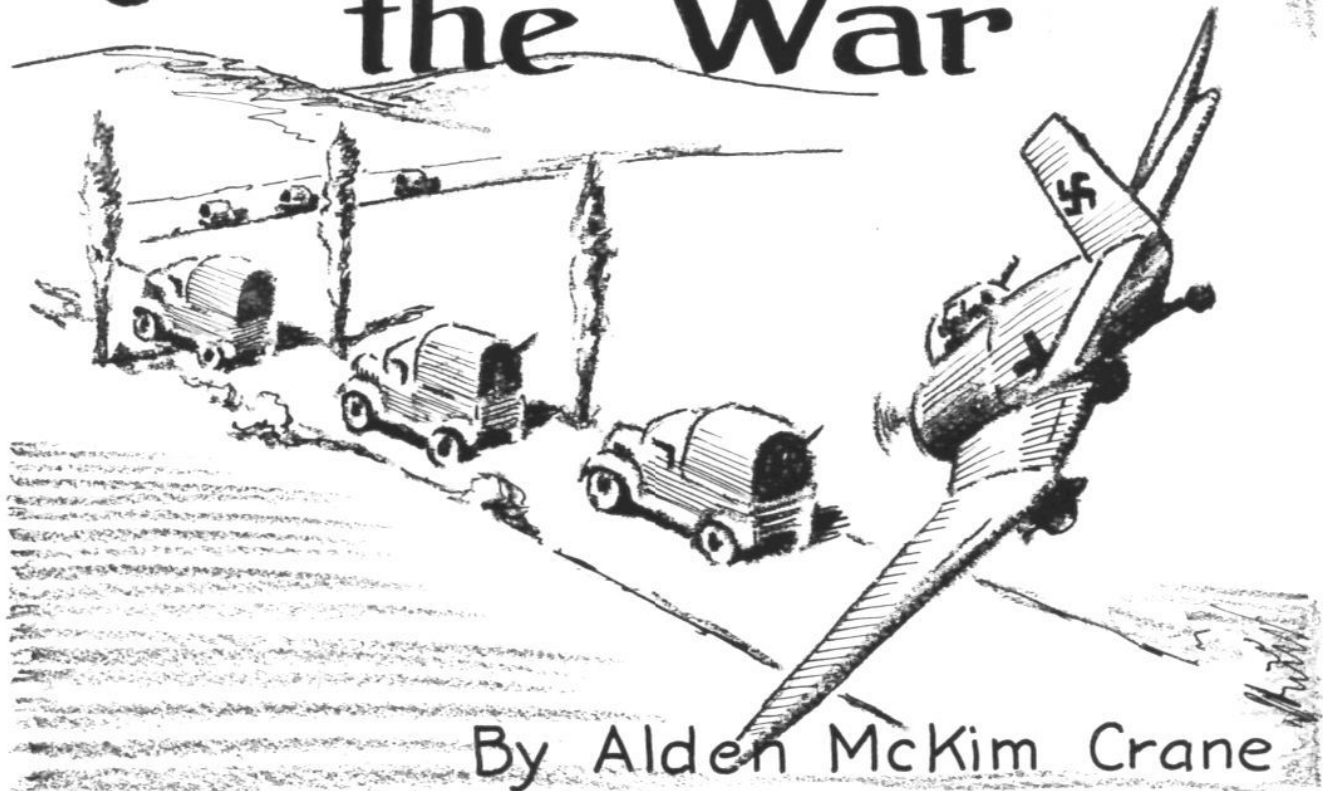
RUSSIAN GENERALS

Some hint as to the size and organization of the Russian Army may be gained from the following list of general officers:

Field marshals, 5; generals, 3; general-colonel, 6; general-lieutenant, 95; general-lieutenant of artillery, 7; general-major of artillery, 52; general-major of tank troops, 43; general-major of signal troops, 10; general-major of engineer troops, 11; general-major of technical troops, 15; general-major of QMC, 18; general-major of infantry, 241; general-lieutenant of aviation, 13; general-major of aviation, 89.

Apparently a general-major corresponds to our brigadier general, a general-lieutenant to our major general, and a general-colonel to our lieutenant general.

Roadside View of the War



By Alden McKim Crane

June 3, 1940.

DEAR DAD:

You seem to be getting my letters, at least I get them off to you without any trouble, so I will try to tell you some more of what I saw.

About the fifteenth of May British troops started coming back. I was on a road southwest of Ternath one morning about that time and saw an air raid against a moving column.

The road was cluttered up with vehicles from every branch of the service and although the drivers were doing their best to keep decent intervals, they were having a hard time. There was a crossroad just ahead slowing things down and the people behind kept pressing forward. For

In response to our inquiry as to how he happened to be in Belgium and how he got out. Mr. Crane writes: "Before the war started I had a farm where I kept a string of jumpers which I rode in European shows. On the outbreak the Belgians took my horses, and just as we made arrangements to depart, the Germans attacked and we were unable to leave . . . I had a hell 'v a time getting out. Finally, about the end of October the U. S. Attache in Berlin got things fixed up, and with fifty other Americans we left Brussels by train. After a five-day tour through France and Spain we arrived in Lisbon, where I spent a month waiting for a ship, getting fat, and riding with a pack of hounds said to be descendants from those brought over by the Duke of Wellington."

anti-aircraft defence they had the usual Bren guns mounted in the backs of their light trucks, the guns pointing to the rear. Then at the crossroads they had heavier stuff which looked to me like Bofors anti-aircraft guns.

Well, we were moving along rather slowly when an air raid was signaled and the column stopped. Everyone, with the exception of the machine gunners in the trucks, jumped for the nearest ditch. But we had still about ten feet to go when the German planes were on us. As usual they machine-gunned the road and dropped bombs. That is the first plane did and by the time the second one came over we had reached the ditch. The part I jumped into was half full of water. I see that I have been rather ambiguous above. The first plane machine-gunned the road and dropped bombs on the side of it. But the second and planes following it concentrated on both sides of the road. I never saw the Germans drop a bomb on a road except once and then it landed in the back of a truck without going off. They always raised



hell along the sides of roads. You can figure out for yourself why they do that.

The men around me seemed to have been through the same thing before; they knew exactly what to do. The machine gunners got into action as soon as the first plane appeared, while the other men used their rifles and pistols from the cover of the ditch. I saw one British soldier with a Belgian sub-machine gun like the Belgian gendarmes carry. Some of the men with rifles fired them while lying flat on their backs. Others crouched in the ditch and waited until the planes were almost overhead; then sprang to their feet and fired, keeping it up until the planes disappeared down the line.

The planes (there were five of them) only went down that line once, yet I actually saw two shot down. Whether they were hit by machine-gun or rifle fire was impossible to see.

I am not trying to sound blasé, but it seemed to me that those raids, when they are against good troops, are mostly noise. Of course there was an awful racket going on and it seemed that nearly everyone was getting bumped off. However, when things quieted down, there were only twelve casualties discovered in my immediate area. And most of them were from machine gun bullets. Several trucks were chewed up, but all of them would still run. I got a bomb splinter through one finger, but never even knew it until I saw the blood. Guess I was too scared.

This may sound like I am sticking my neck out, but after being in that raid and others, I began to get a few ideas. It seems to me a better plan to have every other machine gun pointing to the front, instead of all pointing to the rear. You know when you are shooting ducks, it is often easier taking them coming toward you; but if you miss, you seldom have time to get in a second shot, unless you spin around. On the other hand, ducks going away from you are rather easy to hit; you have plenty of time and just hold under them. Substitute airplanes for ducks and you have the same thing.

I saw several German artillery regiments being moved by rail and they all used that system. They had their anti-aircraft guns mounted on flat cars carrying low loads. The cars to the front and rear were also flat cars with low loads, so that there was no danger of not being able to see an oncoming plane, nor was there any interference with the gun's field of fire.

Another thing. When a column is standing still and they get a raid, the men have a pretty good chance to scatter, though I noticed that in Flanders everyone hit for the ditches which usually flank those roads. But when a column is moving, it takes time to stop it and for the men

to dismount. Things move so fast in an air attack that the planes are usually on them before they can get out of the trucks. Why not put light armor plate (it would not have to be very heavy to stop machine-gun bullets and bomb fragments) around and on top of the drivers' cabs on the trucks? The slight additional weight would not make much difference, and although you would get some casualties, you would not get more than you would if the men scattered. With armor plate around the trucks it would not be necessary to stop a column when there is an air raid. All raids I ever saw came from the rear, except once when they cheated and attacked the middle. The enemy launches those attacks for two reasons. One, to stop the column and cause confusion; and two, to damage materiel. So when you stop, you are playing right into his hands.

On the seventeenth of May there was a British tank outfit in the grounds of our place. They had light tanks and were using radio for communications. Only one tank had a receiving and sending set; I am sure the others had no radios because I only saw an antenna on the one tank and the others were called in by a smoke bomb fired from the commander's tank.

That outfit was the only thing between us and the Germans. About eleven o'clock they got orders over the radio to move towards Brussels. As they started out the gate, one of the men tipped me off as to where they were going and added that if I wanted to see a scrap, I would

get a good chance to do so if I went up in the village church tower. Emine insisted on coming with me. When we got to the top of the tower we were just in time to see the tanks enter a small village on the outskirts of Brussels. They had left one tank and a truck with a machine gun mounted on it just outside the village. There was a lot of shooting going on around Brussels and we knew damn well that the Germans were there. I never saw the tanks which went into the village again, but about ten minutes after they had disappeared, the tank which had been left in support and which had been backed up against a house, started to move, firing its guns as it did so.

That tank did not get far. It had only gone a hundred yards when someone popped an anti-tank shell right through the motor (I could not see that at the time, but got a good look at the tank yesterday), and the tank stopped, but still kept on firing.

As soon as the tank stopped, the truck which had been some distance behind it hiding in the shelter of some trees, came hell busting down the road with a chap standing up in the back working the machine gun. The Germans shot at that truck with everything they had



German field radio set.

without hitting it. The truck reached the tank, spun around, and before it stopped, the men in the tank jumped out and into the truck, and back down the road they went. They did not get very far, because the truck stopped. Probably a vital part of the motor was hit. There was a railway embankment alongside the road there; when the truck stopped, the men jumped out and, dragging the machine gun and their rifles with them, got behind the embankment and opened fire against the Germans who were coming out of the village into which the other tanks had disappeared.

There were only five British soldiers behind that embankment, but they slowed up the German advance for quite some time. Finally the Germans managed to surround them and then, chucking grenades, rushed them. The last I saw of those British soldiers was one man standing up on his feet fighting the Germans off with his clubbed rifle. Talk about guts!

About that time someone turned a machine gun on the church tower. I guess they saw the lenses of my field glasses flashing in the sunlight. Anyhow they nearly shot the tower out from under us, so we went down hurriedly.

Things quieted down after that, but just as we finished lunch, firing from light guns commenced. At first it was rather spasmodic, but then it got heavier and shells began to land among the houses near our place. Finally one knocked the corner off my stable.

I went over to see the burgomaster and finally located him in his beer cellar. I told him that he and I had better go to the Germans and tell them to lay off. There were no British troops near and if that firing kept on, the village would be wiped out. He did not think much of my idea, so I decided to go alone. I borrowed a bed sheet from his wife and, after tying it to a rake handle, set out.

The road was in plain view from a ridge, the only place the Germans were likely to be, and I figured out that they would not waste any shells on a lone man, much less one with a flag of truce. I was right. They only shot at me once and missed.

They were exactly where I figured they were. When I got to the ridge, two men with rifles popped out from behind a hedge and held me up. I managed to explain to them that I wanted to speak to an officer. They caught on and took me before a lieutenant. Fortunately he spoke English. I told him that there were no troops in the village and that his shells were causing casualties among civilians.

Of course I kept my eyes open and tried to see as much as I could. And I was rather interested when I saw that officer was relaying my information over a portable radio. They used voice. He was clearly in communication with the guns, because they stopped firing immediately. He sent another message and after he received an answer told me that I would have to go back to the village with two soldiers to prove my story. He intimated that if I was lying it would just be too bad.

I don't say that the Germans do not use telephones for field communications, but I never have seen any, nor have I seen any wire other than some very heavy stuff they use for semi - permanent lines.

That wire is carried on very heavy reels which are in turn carried in trucks. The reels have solid rubber tires on them. But they can be laid and taken up with the help of a small two-wheeled pneumatic-tired hand cart. The cart has a chain arrangement connecting one wheel with the reel.

Nearly every little outfit I saw had a portable radio; big outfits had several of them.

Well, to get back to my story. The lieutenant sent me back to the village with two soldiers on a motorcycle. They found nothing. We went back to where we had left the officer and then the whole gang began to move. All the men were mounted on bicycles, with Belgian license plates on them. They had a bunch of light guns and they were towed by Belgian commercial trucks. In fact, about seventy-five per cent of their vehicles were civilian ones captured in Belgium.

That night a cavalry regiment pulled in. Their horses were pretty well tuckered out. But I noticed that the



Two British light tanks disguised as trucks and, below, the decoys stripped of their disguise.

Royal Tank Corps Journal

horses had apparently been groomed along the way. None of them were caked with sweat, though it was very hot. The men were leading their animals on foot.

That outfit had six of those portable radios and kept men at duty on them all night.

They left early the next morning and their place was taken by a field ambulance section. All those men were very well behaved.

A thing which struck me almost immediately about German troops was that none of them had the slightest idea about field sanitation. We had several outfits with us, some of them staying for over a week. But I never saw a latrine or any kind of a refuse pit. The men used the woods about the house, often within ten feet of their field kitchens, for a latrine, while the cooks chucked garbage into the bushes beside their rolling kitchens. When an outfit left, one of my workmen and I used to spend several days cleaning up the mess they had left. I never could understand that, as I had always thought of the Germans as being clean and efficient. But as far as field sanitation is concerned, they are the dirtiest troops I ever saw.

Do you remember at Sill when you gave me that thin colt and I wanted the stable sergeant to increase his oats, you told me "Groom him and graze him?" Well it looks as if you were right. When that artillery regiment, about which I wrote in my last letter, pulled in, all of their horses, with the exception of the two pulling an escort wagon, were in awful shape. But those two were just as fat and sleek as any of our old loafers who spend most of their time looking out over the top of a corral fence.

I was rather curious to know why those two horses were in good condition while the rest, even though they had done no more work, were just skin and bones. So I watched their driver rather carefully. He groomed each horse for at least an hour a day and spent a lot of time grazing them. In addition he went around picking up pieces of bread the other men had thrown away. He added those pieces to his own bread ration and fed the lot to his animals.

The German military postal system seemed pretty good. Each rolling kitchen had a mail box nailed to it and the box had a number on it. Men mailed and received their letters

where they ate. Mail was addressed to the men to their box number, i.e., Otto Schultz, Fieldpost No. 2200. There was nothing else on the envelope, no organization number or anything else. The advantage of such a system is obvious.

Another use they had for their rolling kitchens was as a gasoline distributing point. When trucks brought rations, they were accompanied by other trucks carrying gas and oil in ten liter containers. Those cans were very well made and all car and motorcycle drivers had to do was to swap their empty cans for full ones. Each car and motorcycle had places to carry the cans.

Even if I wanted, I was unable to learn the number of any organization. The Germans carry their regimental numbers on their shoulder straps. But they had all numbers hidden by pieces of cloth-covered elastic which could be slipped off quickly.

At present we have an engineer battalion here. They are by far the best troops I have seen, even though their ideas of field sanitation are just as bad as the others. They have a radio mounted on one of their light reconnaissance cars. Also they have a reel of very, very thin wire mounted on the car. The wire is too flimsy for serious field work, so I imagine it is for use in an emergency when they cannot use their radio.

I may be mistaken, but I think that they are able to send with those sets by using batteries. I have never seen a generator. They use the same type of antenna on their cars as we use on ours. The sets which that cavalry outfit brought into the house had no antennas.

Things have quieted down since the Belgians capitulated. Everyone with whom I have spoken seemed to think that the King did the right thing, though of course they are all disappointed that their army had to surrender.

The British bombers visit Brussels every night and seem to have things pretty much their own way. The airport at Evere is only a couple of miles from our house, so we get in on the shows.

Now that the scrap has quit here, I want to leave, so don't be surprised to get a cable from me from some neutral country, if there still are any, yelling for cash. I have not seen a paper for over two weeks.

—ALDEN.

SUBSCRIBERS! Don't forget to send us your changes of address or rank. Occasionally we get changes-of-address cards, and even new enrollments, which are totally blank. If you are one of those whose new enrollment has not been entered, or whose address has not been changed, perhaps you forgot to sign your card. PLEASE!

STRATAGEM IN THE NORTH



By
Colonel Conrad H.
Lanza

**A Startling New
Account of How
the Germans
Entered Norway
by Means of a
Ruse**

*German reinforcements and
supplies arriving in Norway*

In March, 1940, Germany inquired of Norway as to whether she had any food products for sale. Rations were none too ample at home; Germany was in the market for anything that could be had.

Norway replied that she had excellent fresh fish for sale.

How much did she have, and what would the price be?

Well, Norway had a considerable quantity. Owing to the blockade she had been unable to export as usual. Cold storage warehouses at Narvik, Bergen and Trondheim were full of fresh fish. As a matter of fact, there was 30,000 tons of this product for sale. If Germany could take all of it at

an early date, so as to release the cold storage space, Norway would make a very attractive price.

Germany replied that this was exactly what she was looking for. She would take the whole consignment, and was prepared to remove it without delay.

Terms were agreed upon. Norway was to deliver the 30,000 tons of fresh fish at her ports for cash. Germany was to provide the ships, load the cargo, and carry it away at her own risk.

Before the contracts were signed, Norway stated that a slight delay would be necessary. To preserve her neutrality

she had made it an invariable rule to favor neither belligerent as to trade. Before she could close the contract with regard to the 30,000 tons of fresh fish, she first would have to consult Great Britain and France. Germany would of course understand Norway's reasons for this.

So Norway notified London and Paris that she had 30,000 tons of fresh fish for sale. She wanted to get rid of it. She needed the money and the cold storage space occupied. Germany was willing to buy the whole 30,000 tons, but if the Allies desired, Norway would allot them one half—15,000 tons to each party, under exactly the same price and terms, share and share alike. If the Allies did not want fresh fish, they could take other Norwegian supplies, of an equivalent value. Norway had some good whale oil, lumber, and some other products. She would be delighted to sell any or all.

No record has been found of any reply from France. Great Britain answered that she had plenty of fish on hand, wanted no more. She would take an equivalent value, including the whale oil, lumber, and some iron ore from Narvik.

Norway notified all hands as to the two deals. Each knew what the other was to receive. In this way it was hoped that neither side could charge Norway with favoring one party over the other. The contracts were signed.

Germany sent Oslo in advance a list of ships proposed to be sent to Narvik, Bergen and Trondheim to secure those 30,000 tons of fish. As refrigerator space was required, it would need a considerable number of ships to take the whole shipment at one time. The list of ships was long, but as a check showed that the refrigerator space on those vessels was around 30,000 tons, Norway approved the list.

The German equivalent for the Quartermaster Department found it necessary to send commissary inspectors to the Norwegian ports to make sure that the purchase was up to specifications. The Finance Department sent agents to make up the vouchers and accomplish the payments. To avoid having the fish spoiled in transit from warehouses to ships, Germany advised that the customary deck crews would be doubled in order to expedite the loading. Germany was also anxious, she said, to get the ships back promptly, not knowing what the next phase of the war might be.

The German consular service consequently increased its force in order to be ready to investigate and settle difficulties which might arise. In view of the opportunity for transportation afforded by the despatch of the German ships, a considerable number of traveling salesmen took advantage of this to proceed to Norway, where they debarked with their samples and established themselves



German troops being landed in Norway

temporarily at hotels. Numerous tourists, who for a long time had desired to visit Norway, were allowed transportation to the extent of the passenger capacity of the ships. Thus many Germans sailed for Norway with the cargo ships.

The vessels arrived at Narvik, Bergen and Trondheim on 6, 7 and 8 April. To Norway, everything seemed normal. The Germans were welcomed.

G-2 at Allied GHQ heard about the fresh fish, but he did not feel in the least concerned. The Allied naval command, however, did pay some attention to this deal. German ships were accustomed to creep along the Scandinavian coast, keeping within neutral waters. They had been doing this since the commencement of the war, transporting iron ore from Narvik. The Allies had not liked this, and if the traffic was to be extended to include food products, it was going a little too far. The Allied plan for winning the war was based on blockading German sea approaches, and preventing food, munitions, and raw materials from reaching the enemy. If food products in large quantities were now allowed to go through, of what use was The Plan? It was up to the Allies to do something to correct this condition.

To maintain a blockade of Norway ports by use of ships would be hazardous, and require vessels needed elsewhere. A better and more economical way would be to mine Norway's neutral waters to close the passage within the three mile limit. This would force the German vessels out to sea, where they could be lawfully intercepted. It was believed that the fact that the inshore passage had been closed by mines would be sufficient to induce the Germans to abandon efforts to trade by sea with the Atlantic ports of Norway.

In furtherance of this project, mines were laid on 8 April at three selected places along the Norwegian coast, inside the three mile limit. It was too late to prevent the German "fresh fish" ships from reaching their destination, but it might make it impossible for them to carry their cargo back to Germany. Incidentally, the mine field might end that iron ore traffic from Narvik to Germany.

The mines were laid in the morning, and Norway was officially notified of this on the same day. Allied newspapers carried glowing accounts of the accomplishment.

Something else happened on 8 April. A German ship, the *Rio de Janeiro*, listed as en route to Bergen to load part of the 30,000 tons of fresh fish, got outside neutral waters and was sunk by a British destroyer. This may have been a result of the mine laying. If it was, it is the only casualty which the record to date shows was caused by the mine fields.

The *Rio de Janeiro* was full of German soldiers. Many were drowned. But not all; some were rescued. They stated that they were en route to Bergen to protect Norway against an invasion by the British and French.

This information was in the possession of the Allies (and of Norway) that afternoon. The situation was discussed by the Norwegian cabinet for three long hours. Norway decided that she would protest the laying of mine fields within her home waters. As to the *Rio de Janeiro* incident, it had been believed up to that time that the Germans were entitled to a high rating under the head of Intelligence. If, however, German soldiers were as credulous as those on the *Rio de Janeiro* appeared to be, apparently the Germans had been overrated.

The decision of the Norwegians was reported that evening. Allied G-2s seemingly concurred, for they took no action on the *Rio de Janeiro* report.

The Paris papers on the night of 8 April published the accounts of the laying of the new Allied mine fields. The "military experts" commenting thereon pointed out that one more leak in the blockade had been closed; some explained that the initiative had now passed to the Allies. London papers, while not so exuberant, commented along the same lines.

The German ships which arrived at Narvik, Bergen and Trondheim had the necessary papers for securing the 30,000 tons of fresh fish. The local authorities reported to Oslo as to their arrival. Allied ships arrived at the same ports on the same days to take away the lumber, whale oil and other products which they were to have. German and Allied ships in some cases tied up to the same piers.

One very large "American" ship—the *Jan Willem*—put in at Narvik. It had taken on a Norwegian pilot down the coast, who found the personnel speaking English. The captain explained that his craft was a whale factory en route to the Arctic. He was putting in for rations and fuel, preparatory to a long cruise.

Oslo checked the list of German ships, and found the same to be in accord with the approved agreement. The local authorities were told to go ahead and deliver the 30,000 tons of fish.

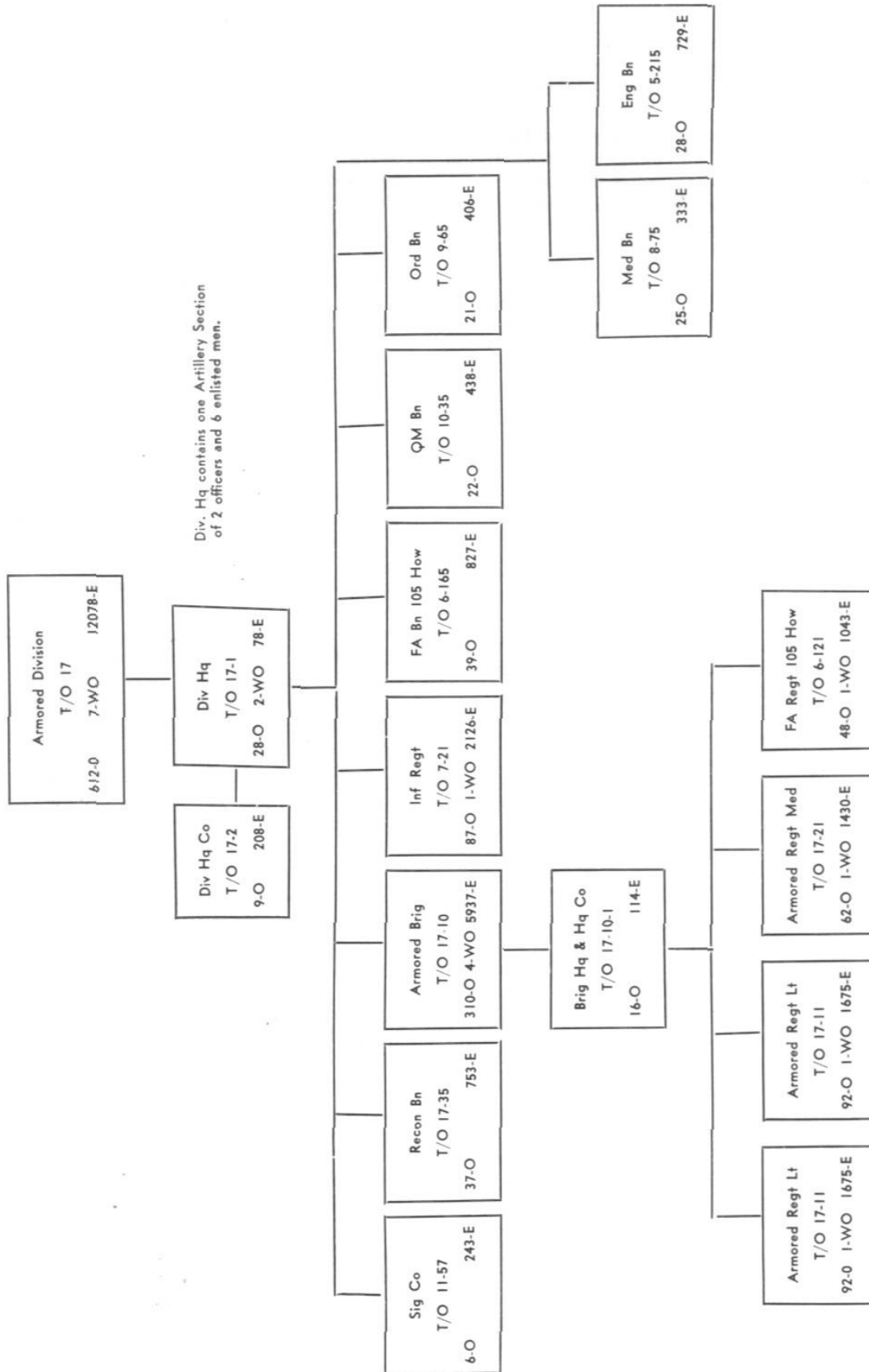
So when very early on the morning of 9 April, German soldiers in force debarked from the ships scheduled as to load fresh fish, and in which they had been concealed, they met little opposition. At Narvik there was none; there was no army post at Narvik, or anywhere near.

The *Jan Willem* whale factory turned out to be the CP of General von Dietl, commanding the German expedition.

Thus ended a major stratagem of war. It secured three bases for Germany. It deprived the Allies from the chance of seizing bases from where they might have prevented the capture of Norway. The main German force, landed at Oslo, was able to start open warfare at once and to maintain it to a successful conclusion.

It seems obvious that the preparations for the stratagem and for the invasion of Norway were extensive. It must have taken considerable planning to assemble the forces and to have them and their supplies at the proper place at the proper time.

CHART I — ARMORED DIVISION



DEVELOPMENT OF
TABLES OF
ORGANIZATION

American experience with armored troops is quite limited, and under modern battle conditions is nil. Since organization must be based upon tactical employment, it is hardly to be expected that we can make up ideal tables of organization until our units have had more tactical training with their newly acquired equipment. It takes time and experience to learn how to use new weapons, and how to organize for the best work with large numbers of them.

Tables of organization for new military units all go through an evolutionary stage. Initially, some one guesses how a new type of unit should be constituted, and a provisional organization is set up. After service tests, it becomes apparent to those conducting the tests that several changes are desirable. They submit their recommendations to the War Department, through channels, and if they are lucky the intervening commanders will not disapprove all the changes.

When such changes reach the War Department, they are referred to the Chief of Arm for study and recommendation. If he agrees that changes in tables of organization should be made, he prepares correction sheets or new tables and submits them to the General Staff. Frequently he will direct that tests or studies be made at the School, or by the Board, of his arm, before he himself reaches a conclusion regarding the proposed changes.

In the General Staff, the proposed changes in tables of organization have to run the gauntlet of the G-3, G-1 and G-4 Sections. G-3 examines them to see if the platoons, sections, etc., conform to platoons and sections that do similar work in other units. If the proposed table calls for more enlisted men, G-3 has to indicate the source of the additional personnel. In time of peace, as well as during this emergency, *a definite limit is placed upon the enlisted*



Field Artillery Organization Armored Force

By Colonel F. A. Doniat, FA.

strength of the Army. This may not be exceeded. If one unit is allotted an increase in personnel, it is always at the expense of one or more other units. G-3 also examines tables for form, accuracy, and other matters.

Next, G-1 examines new tables to see that grades and ratings are in line with other tables, and with the War Department policy.

Finally, G-4 goes over the tables to pass upon the type and quantity of the major items of materiel and equipment. In recent years, G-4 has had a great deal of concern about the large number of motor vehicles which

the several arms ask for, as well as the endless variety of vehicles wanted. As an example: For the same type of work, one arm will desire a solo motorcycle, one a motorcycle with side-car, one a tricycle, and one a small truck. One arm will want all its trucks to be of 1½-ton capacity, another arm will want them all to be of 2½-ton capacity.

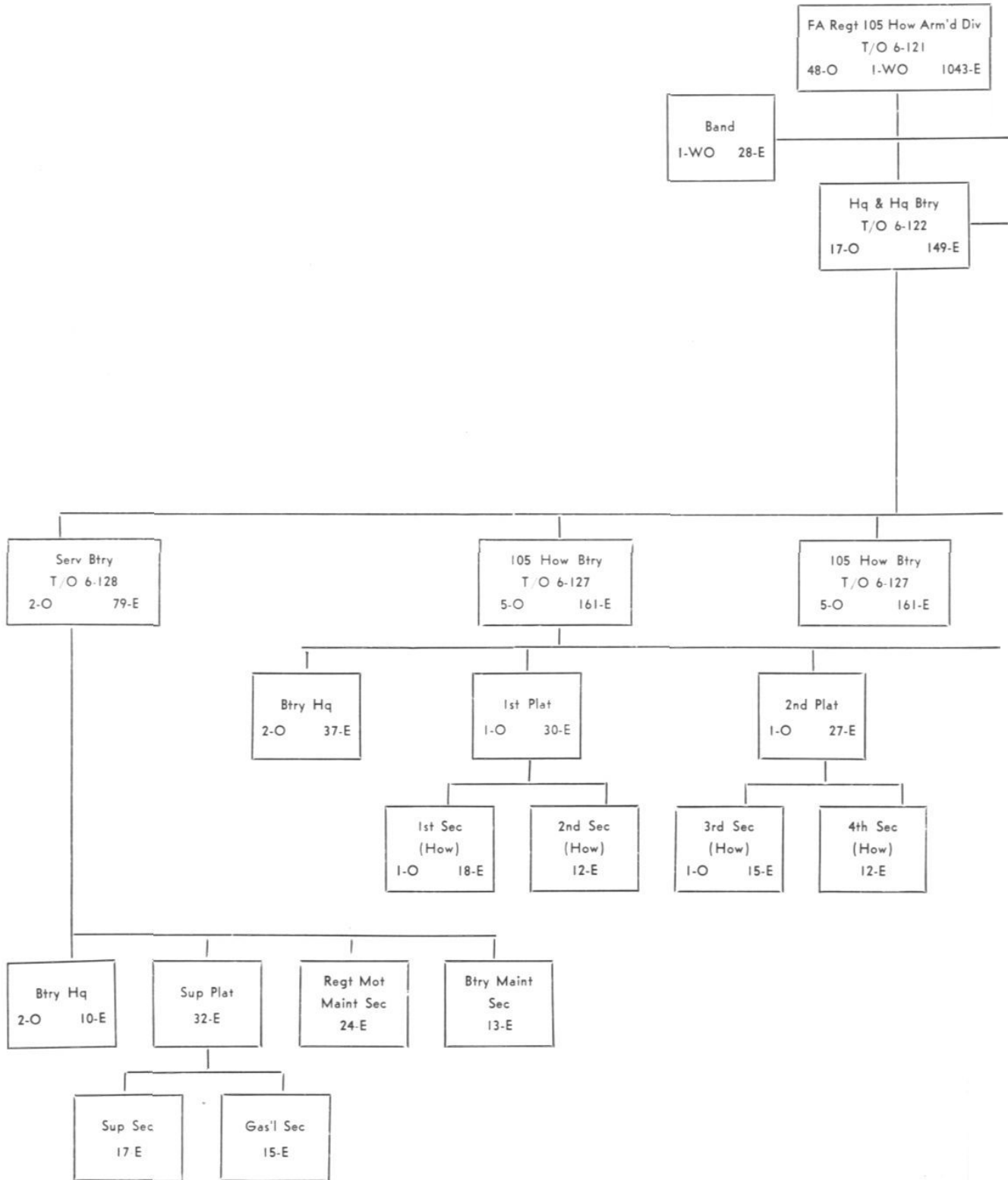
As indicated above, in "cooking up" a new table of organization, many cooks take a hand. Sometimes the final dish, which is always a compromise of the recipes of all the cooks, is not palatable to any of them. That is still the status of the tables for the Field Artillery component of the Armored Force; it does not yet seem to taste just right to any of the cooks who had a hand in its preparation.

CORPS HEADQUARTERS

In the summer of 1940, our one reinforced armored brigade was expanded to an army corps of two divisions, plus an armored force school, and other overhead installations.

No field artillery units were set up as corps troops, such as are in the corps troops of an Infantry Army Corps. However, an Artillery Section was incorporated in the tables of organization for the Headquarters. Armored Corps (T/O 170-1). This Artillery Section consists

CHART II — FIELD ARTILLERY REGIMENT



105-MM. HOWITZER, ARMORED DIVISION

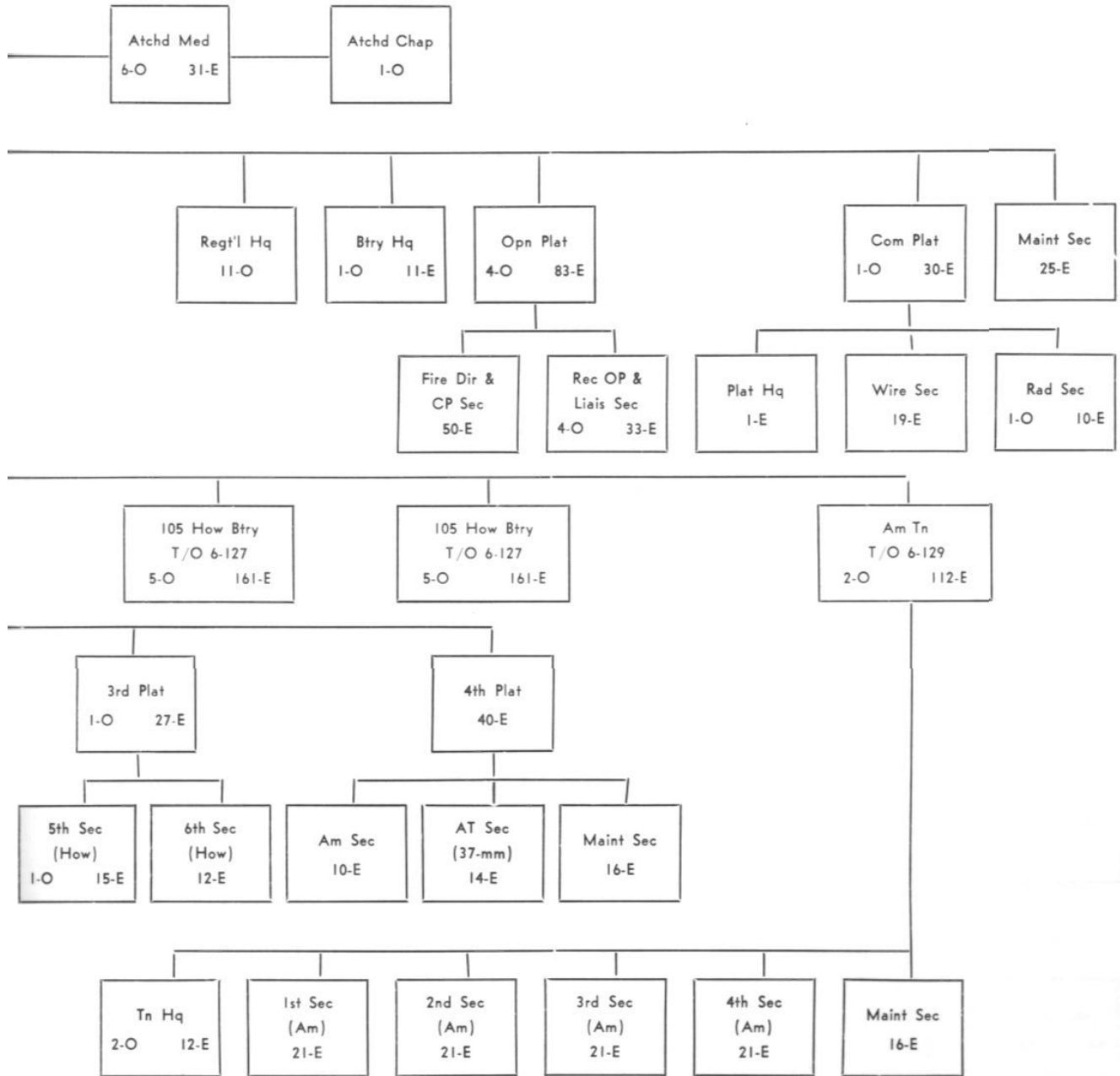
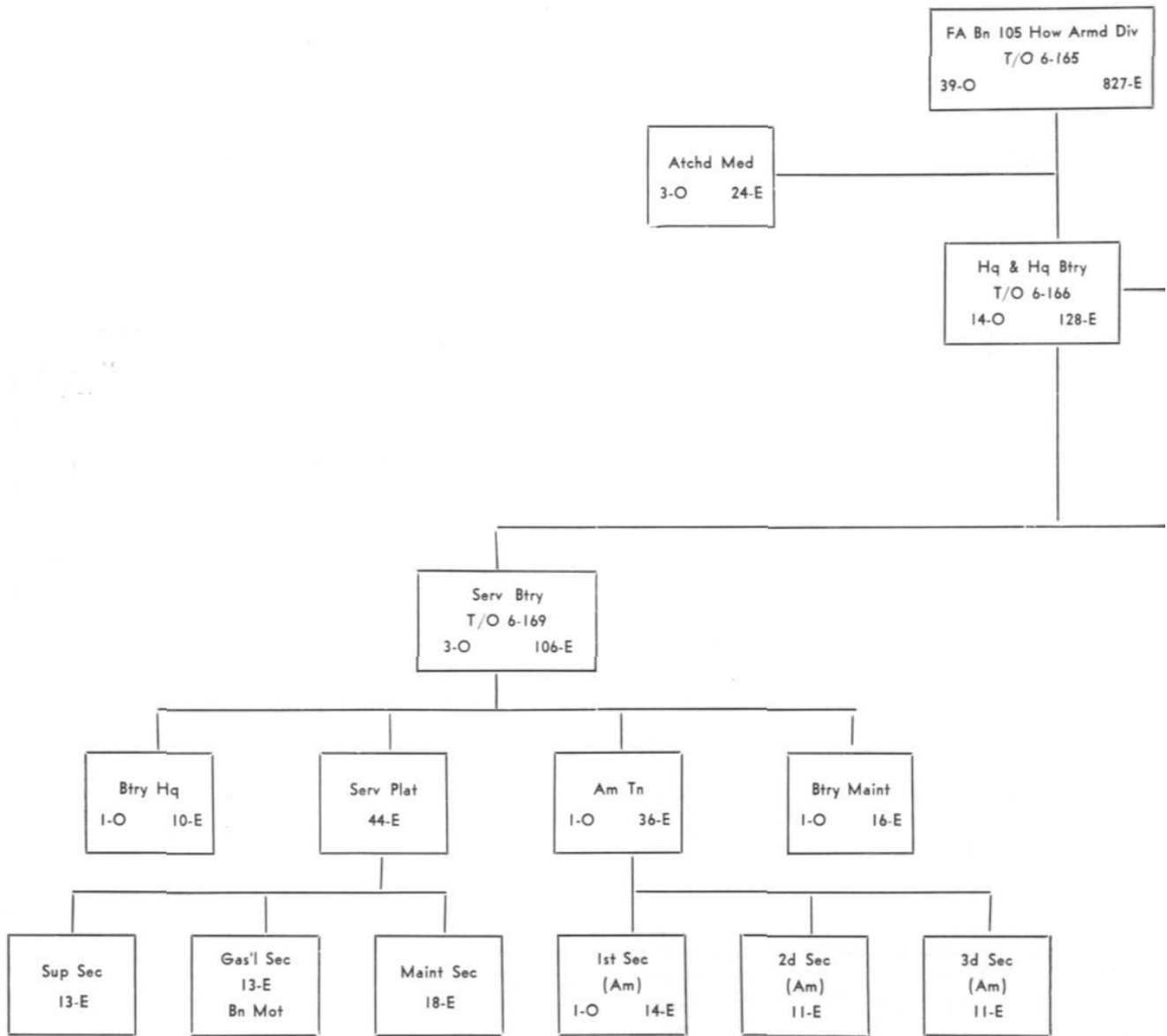
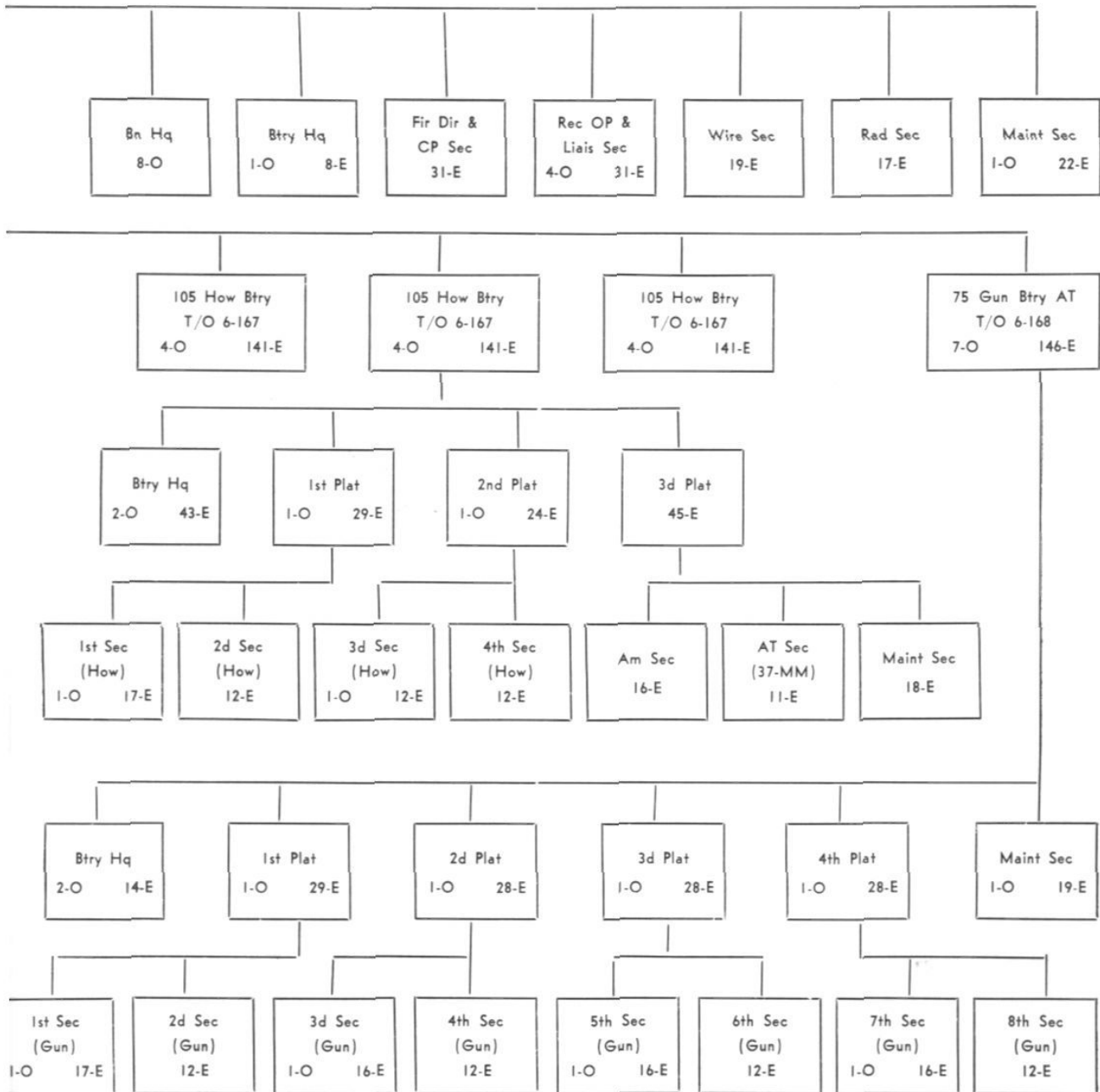


CHART III — FIELD ARTILLERY BATTALION



105-MM. HOWITZER, ARMORED DIVISION



of six officers and eleven enlisted men, the artillery officer of the corps being a brigadier general.

FIELD ARTILLERY OF THE ARMORED DIVISION

The Field Artillery of the Armored Division (Chart I) consists of the following elements:

- a. An artillery section of division headquarters.
- b. One regiment of 105-mm. howitzers, armored.
- c. One battalion of 105-mm. howitzers, armored.

DIVISION ARTILLERY SECTION

The Division Headquarters contains one general staff section and 13 special staff sections, one of these latter being the *Artillery Section*. The latter section consists of a colonel, a captain, and six enlisted clerks. This personnel can perform staff work, such as the preparation of the artillery paragraphs of orders, planning of operations, and can make studies of miscellaneous character. However, the section lacks the organization and equipment needed to enable the senior artillery officer to command the field artillery of the division; it lacks the reconnaissance, operations, and communications personnel, and the equipment required for effective command. Of course, as the division is now organized, the field artillery regiment is an integral part of the armored brigade, so that, unless this regiment is detached from the brigade by the division commander, only a battalion of field artillery remains directly under division control.

A better organization for the field artillery of the armored division is thought to be the following:

- a. One Field Artillery Headquarters and Headquarters Battery, Division Artillery (T/O 6-80-1).
- b. Three battalions organized similar to the present battalion of the Armored Division (T/O 6-165), but without the 75-mm, antitank battery.
- c. One 75-mm. antitank battery (T/O 6-168).

FIELD ARTILLERY REGIMENT

The field artillery regiment (Chart II) of the armored brigade is quite different from any other regiment of this arm in our army, or, for that matter, of the principal European armies. Like many another organization, it was organized along the present lines as a compromise about one year ago. At that time, the sum total of mechanized troops in our army was one reinforced brigade. Its artillery component was one battalion of four batteries, each having four 75-mm. field howitzers. By that time, our mechanized force had had enough field training to establish the fact that the fire power of its field artillery was inadequate to give needed support to its force of combat cars. The Chief of Field Artillery, the Commander of the Mechanized Brigade, and the Commander of the Field Artillery of that Brigade, all recommended that this four-battery battalion be expanded to a regiment.

Of course, this required more personnel, more materiel, and more prime movers and trucks, none of which could be obtained without Congressional appropriations. The special

transportation of this unit alone required a very sizeable increment to normal peace time appropriations, which was not easy to get. Therefore, it was proposed by the then Commander of the 68th Field Artillery that the increase in fire power be obtained by increasing the number of guns in each battery from four to six. This would make the total number of 75-mm. howitzers in that battalion 24, which was the same number of cannon as our 75-mm. gun regiments then had.

As a result of this suggestion, the Chief of Field Artillery had an extended test made at Fort Sill to determine whether six-gun batteries were practicable. These tests proved that a battery of this size was practicable, and that it could be controlled effectively by one battery commander. So the Chief of Field Artillery recommended that the mechanized field artillery battalion be reorganized into one containing four batteries, each having six 75-mm. field howitzers. A slight increase also had to be made in the battalion overhead, but it was a very modest increase for a fifty per cent increase in fire power. The War Department approved those recommendations and ordered the battalion reorganized accordingly.

As far as size, fire power, and importance was concerned, this reorganized unit was, in effect, a regiment, but the War Department continued to call it a "battalion" for quite a long time.

A little later, as a result of European trends towards heavier armor, the War Department decided that the 75-mm. howitzer did not have quite the power needed in a unit of this kind, so it was decided to arm the regiment with 105-mm. howitzers as soon as a supply of these weapons became available. At the present time it is still armed with 75-mm. howitzers.

We have observed that this regiment differs from other field artillery regiments; the principal points of difference are:

It has six howitzers per battery, a matter that has already been mentioned.

It has more radio equipment and personnel than other comparable units, because in many situations it is impracticable to use wire communications.

There are no battalion organizations; the regimental commander and staff deal direct with the batteries.

A larger number of staff officers is provided for forward reconnaissance and forward observers.

Each howitzer battery has one section of two 37-mm. antitank guns.

The prime movers, reconnaissance trucks, and wire trucks are all to be half-track *armored* vehicles. Each half-track vehicle (scout car or half-track truck) is equipped with the following weapons:

- 2 machine guns, cal. .30, heavy
- 1 machine gun, cal. .50 (H. B.)
- 1 submachine gun, cal. .45

This unit often operates at such great distances from the main body that supplies from service trains can not

reach it for days. The fact that so many of the trucks are half-tracks makes the gasoline and oil consumption per vehicle per mile much greater than in units using all-wheel trucks. Therefore, this regiment is provided with more trucks for carrying gasoline and other supplies than are other regiments.

105-MM. HOWITZER BATTALION

The organization of the 105-mm. Howitzer Battalion of the Armored Division is shown on Chart III. It differs considerably from the 105-mm. howitzer battalions that are a part of the field artillery in the triangular and square infantry divisions, and of the cavalry divisions. Its batteries also differ from the corresponding batteries of the regiment in the Armored Division Field Artillery.

Attention is called to the fact that the battalion headquarters and headquarters battery has three more staff officers than the 105-mm. battalion of other divisions. One is an additional officer for reconnaissance, and the other two are battalion forward observers. Radio being the primary means of communication, this battalion is favored in the matter of radio personnel and equipment.

The howitzer batteries of this battalion have only four howitzer sections (not six as have the firing batteries of the regiment). They each have an antitank section of two 37-mm. guns.

The antitank battery (T/O 6-168) (75-mm. guns) of this battalion is much like the antitank battery in the 155-mm.

howitzer battalions that are included in our non-armored divisions and in our corps artillery. Of course, it has the armored scout cars and half-track trucks and slightly more radio personnel and equipment.

The principal point of interest about the service battery is that it contains a gasoline section as a part of its service platoon.

GENERAL COMMENTS

In the present organization, the division commander exercises command of his field artillery partly through his artillery officer, partly through his brigade commander. This is not an ideal arrangement.

The whole organization of the armored force was drawn up with the idea of facilitating the very rapid delivery of very strong blows. That calls for plenty of forward reconnaissance officers and observers who have available ample radio communication. It also means lots of fire power. The following imposing list of weapons of the field artillery of a single armored division gives an idea of this fire power:

105-mm. howitzers.....	36
75-mm. guns.....	8
37-mm. antitank guns.....	14
Machine guns, cal. .50 (H. B.).....	238
Machine guns, cal. .30, heavy.....	400
Machine guns, cal. .30, light.....	68
Submachine guns, cal. .45.....	303
Pistols, cal. .45.....	1,901



Cadet Major Wayne D. Hawkins, Salt Lake City, Utah, University of Utah; Chemical Engineering; Scabbard and Blade, Alpha Chi Sigma; Honor Graduate ROTC 1941.



Cadet Captain Gilbert F. Orcutt, Jr., Olean, N. Y., St. Bonaventure College; Accounting and Business Administration; Delta Sigma; Honor Graduate ROTC 1941.

All ROTC Cadets are Eligible to Become Associate Members of the Field Artillery Association

ROTC GRADUATES SUCCESSFUL AS BATTERY COMMANDERS

A general officer writes to the Chief of Field Artillery: "I have been highly pleased with the performance of our reserve officers. Fourteen of my battery commanders are reservists. The ROTC. on which you worked so hard during your various tours in the office, may well be our salvation. When I compare these men with the ones I got in 1918, who were earnest and willing but lacked the background that these boys have. I am impressed with the fact that our success in this emergency will be due, in large part, to what they learned in the ROTC."

The Artillery in Large Armored Units

The campaign in the west came as a shock to critics and students who were awaiting evidence as to the performance of large armored units under conditions which were generally taken to be favorable to defense against them, and against an enemy universally credited with efficiency of materiel and with powers of spiritual recovery even under the most unfavorable conditions.

Von Kleist's new mechanized army, repeating on an infinitely greater scale the successes of the special armored units in Poland, surprised the enemy on the Albert Canal and forced a passage, drove back the defenders of Belgian Luxemburg and prevented them from carrying out the intended demolitions, appeared unexpectedly on the Meuse, and penetrated the enemy's territory with the effects known to all. Pretty much the same thing happened in the northern Brabant corridor; in the Rouen sector during the battle of the Three Rivers, something much worse.

And so, it is said, the case is proved; such events can not be accidental. We see a new phenomenon.

But those of us who have worked simple arithmetic on numbers of kilometers covered and time required; collected carefully the official reports of the German losses in men and machines; and meditated certain highly eloquent communiqués issued by French commanders after the first few weeks of the war; are in some doubt as to the propriety of basing our views upon the experience of the recent conflict and upon it alone.

We should not forget that at the opening of the campaign in France there was no clearly defined doctrine for the employment of large armored units, and no precise orientation as to the cooperation of tanks and planes; nor that the units themselves, although in general they showed a well-balanced and strong organization, nevertheless had serious technical deficiencies (e.g., in light tanks), or unsatisfactory compromises in technical and tactical matters (e.g., in the artillery). Perhaps we may suspect that these enthusiastic praises of mechanized warfare, and especially of the tank and plane combination, are chiefly of historical interest.

Thus far, we have seen no reports that, in the sectors where they were used, the German tanks faced any really strong front, vigorously defended, and provided with properly organized anti-tank and anti-aircraft artillery. There was not a single example of a situation in which the

by Colonel Oete Blatto*

German air force was seriously hampered in its systematic pounding of the hostile positions.

Our introduction is perhaps a trifle long; but this much had to be said to give the reader warning. The present writer is an infantryman; and he is, in a certain sense, a sworn enemy of hasty conclusions and of pseudorevolutionary expectations. The point of view of the artillery is taken for two reasons, one sentimental, so to speak, and the other practical.

Convinced that it is a trifle excessive to think—as some do think—that the air force is now able to take over all tasks of the artillery, the writer would take pleasure in seeing, ever present, his powerful brother-in-arms the gunner, even in operations conducted with the greatest speed and boldness. Convinced even more firmly that the methods hitherto adopted for the artillery of large armored units are not satisfactory, either quantitatively or qualitatively, he believes it desirable to open the discussion.

In any study to determine the characteristics of the instrument to be used, we must always keep clearly in mind the purposes to be gained; and we must think, with a large factor of safety, of the difficulties to be anticipated.

The purposes or tasks of the large armored units are two—breakthrough, and the exploitation of success. All tasks may be classified in these two types. The so-called "wide maneuver," for example, has a close operative analogy to the second of the two types.

In determining the organization of the large armored unit, we must have in mind the most difficult task that may be allotted to it. This task may seem, at first sight, to be the breakthrough; but as a matter of fact it is the exploitation of a success.

That is to say, in the breakthrough action it is practicable to make use of an increment of power, limited only by means at hand and by the time available. In exploitation of a success this is not possible without materially altering the tactical and logistical nature of the unit.

In other words, when a defensive front is to be reduced, there is no problem for the artillery of the armored unit as such, but only the general problem for a force of artillery sufficient in number of pieces and suitable in range and power to accomplish the tactical purpose.

**Rivista di Artiglieria e Genio*. September, 1940. Translated by O. L. S.



German tanks being cleaned after an action in France

In the breakthrough actions in the campaign in France, for example, the Germans always succeeded in deploying an overwhelming force of artillery, and did not hesitate to bring heavy guns to the very front lines, in order to employ fire throughout the whole depth of the positions and across the whole sector to be attacked. The heavy artillery, in fact, suffered heavier losses than any other arm.

In exploitation, on the contrary, the armored unit must depend upon its own resources. It may be objected that, in this decisive phase, cooperation of the air force may be counted upon for reconnaissance, preparation, support, etc. But it may be doubted whether, in future, the mechanized forces will have the good luck to find enemies so ill prepared as the Poles and the French, and whether any air superiority gained by initial surprise can be maintained to the end, always and everywhere.

In any case, since the future is on the knees of the gods, let us stick to the present, and inquire what tasks will fall to the lot of the artillery of a large armored unit assigned to exploit a success. Specifically, we shall take the case of an armored division in first line, which, after the breakthrough, reaches out in the enemy's rear areas to find

the sensitive points of the defense. What resistance will it encounter? We may say that it will be of three forms:

(1) The reaction of similar units, acting alone or in cooperation with units of a different type (e.g., strong rear guards).

(2) Defensive organization of inhabited places, of accidents of the ground, of lines of obstacles, etc.

(3) A new position, systematically planned and strongly held.

We may say that to establish contact with such a new position—except in the case of a general collapse of the defense which will make it impossible for him to collect an adequate force in time—will exhaust the possibilities of an exploitation. On the basis of the results obtained the attacker must at once improvise a new breakthrough action, employing motorized units, or if necessary ordinary units.

If, then, we make up the armored division in such a manner as to be adaptable for combat against other similar units, and also for overcoming defensive organization in the rear areas, we shall obtain the maximum power consistent with the nature of the unit. Limiting our tactical horizon in this manner, we should be able

to state the artillery problem clearly.

Since it must deal with targets which are either very mobile and at short range, or stationary but relatively substantial, it must have two types of weapon. The first should have the same mobility as the tank, to perform the functions of anti-tank or accompanying artillery. The other should be more powerful, and possess long range, so that tactical mobility is less essential; this should assume any other function which the tactical situation may demand. It would seem that in the armies of the important powers the tendency is toward a caliber between 75 and 90 mm, on a tank or self-propelled mount, for the first type; and between 105 and 120 mm, motorized, for the second.

For the first type, we should first inquire whether such a caliber as just suggested is necessary for anti-tank or accompanying missions. The answer must be in the affirmative, if we are to have a reasonable margin of safety in the never-ending contest of gun and armor. And it would seem that we should not go beyond the 75-mm caliber (turret mount; ammunition armor-piercing and common shell in equal numbers), if we are to keep within the weight of about 20 tons, which is the present practical limit. There is also the question whether the gun should be mounted in a tank, or on a self-propelled mount. This is for the artillerist to say; but to us it would seem absurd to use a simple self-propelled mount for anti-tank or accompanying missions. Aside from other defects, its vulnerability would compel it to remain at a considerable range; this would reduce it to ordinary divisional artillery, and render it useless for its special purpose.

The 105 or 120 would thus come to constitute the entire divisional artillery, and it becomes necessary to discuss briefly its employment. The recent experience on the western front gives us no light. Throughout the campaign the artillery of the German armored division became essentially the artillery of the motorized brigade, with functions similar to those in the normal infantry division.

First, is it possible to coordinate the action of the divisional artillery and the tanks, so as to secure real tactical liaison? We doubt it. Even if we could create all the most favorable conditions, secure perfect radio communications, get the maximum value out of ground and air reconnaissance; even then the results would be slight, for the tanks, unable to halt in the presence of the enemy, would encounter situations which would be impossible to evaluate accurately. To speak of immediate grasp of the developments of combat, and lightning-like engagement, is, to our minds, pure romance. If this is the case, the divisional artillery would lack a fundamental characteristic of its action; for concentrations upon highly mobile or ill-defined targets cause great expenditure of ammunition, which can not be replaced with certainty or promptness.

But we look upon the question from a different point of view.

We regard the artillery battalions as tied to the general direction of advance, in the zone of penetration; advancing by successive echelons; selecting positions near the roads, which may be occupied and abandoned in the shortest possible time; and acting by brief concentrations upon elements of the enemy's defense system, which may be reported by air observation or by the divisional reconnaissance group (which is accompanied by artillery observation cars), or, under exceptionally favorable conditions, by observation from ground stations.

The tank units would then have only to call for cessation or shifting of the fire as required by the changing conditions of the action.

It may, of course, be objected that all this is too mechanical; that it has none of that intellectual element which should control the cooperation of tanks or infantry with artillery. But perhaps the charge of being too mechanical, in a mechanized war, may be not too burdensome. The thing of real importance is to have the artillery fire move methodically just in front of the line of tanks, checking all movement by the enemy and neutralizing his defenses.

For this purpose, the guns should have enough range (say 8 to 10 kilometers), and must be in sufficient numbers. Their grouping depends upon organizational and tactical conditions—number of tank battalions and the normal front of deployment of the division. All these considerations, of course, are mutually interdependent. In any case, it may be assumed that, since the armored division normally acts in two columns, the artillery, in order to fulfill its task in the manner just outlined, must be formed in four groups. This square grouping, so to call it, accords with the characteristics of the armored units; and it seems best adapted for rapid changes of position.

In conclusion, we must ask whether artillery should be organically assigned to the armored corps. In our opinion, it should.

In the first place, organization of anti-aircraft defense should be a function of the corps, for the modern materiel now in service or under study would overload the divisions. Of course, the division also should have organically assigned a certain number of anti-aircraft guns; in the German armored division this number is 36. But besides the anti-aircraft units, the corps should have organically assigned two or three battalions armed with the same weapons as the armored divisions; these should be attached as required to the divisions, as reinforcements. We see no specific tasks to be assigned to the corps artillery as such; even counterbattery may be executed effectively by the divisional artillery.

Lt. Jake G. Lyons, 6th Field Artillery Battalion, asks:



CAN GRANDMA, 75-mm. 1897, STOP 'EM?

The old French 75 is a wonderful gun, even after forty-three years. But its mount was not designed for rabbit shooting as is required in current war. Its limited traverse is not capable of the sudden big deflection shifts which are possible on the newer light weapons.

A direct-fire shoot last summer demonstrated the comparative efficacy of the 75-mm. howitzer, the 75-mm. gun M2, and the 75-mm. gun M1897. The targets, white cloth panels on steel-tube sleds, were towed in a zigzag course toward the gun position at 20 MPH. Each weapon was permitted to fire at two targets, released one at a time. The targets first appeared over a ridge which was 600 yards from the firing position. The gun crews knew that they might appear from any part of a sector 1,000 yards wide, but aside from that they had no prior information, and they were faced with the possibility of an initial deflection shift of 1,000 mils. *Cease firing* was given for safety reasons when the target approached to within 150 yards of the guns. Thus the crews had approximately one minute (450 yards) in which to stop the "tanks"; and even this brief period was reduced because the terrain was

Editor's note: Since it will be several months before many regiments (especially those of the National Guard) are supplied with M2 or M2A3 guns for their heavy antitank batteries, it is well to investigate what can be done with the box-trail French "75." Lieut. Lyons gives some excellent suggestions.

rolling and a target would appear only intermittently. Often when it reappeared it would be some hundreds of yards from where it disappeared, and travelling in a different direction.

On about the fifth round the M2 gun cut the tow cable at the point of attachment to the target. On its second target the M2 fired some 20 rounds, three of which were hits. The crew of the 75-mm. howitzer didn't spot their target until it had travelled about 200 yards, but they got in 12 rounds, one being a hit. On the second target the howitzer scored two hits out of 16 rounds. These two weapons appeared to be tracking the targets at all times and the crews wasted very little time in moving the guns. In other words, they would have stopped the tanks.

The 75-mm. M1897 fired 8 and 5 rounds respectively at its two targets. There were no hits.

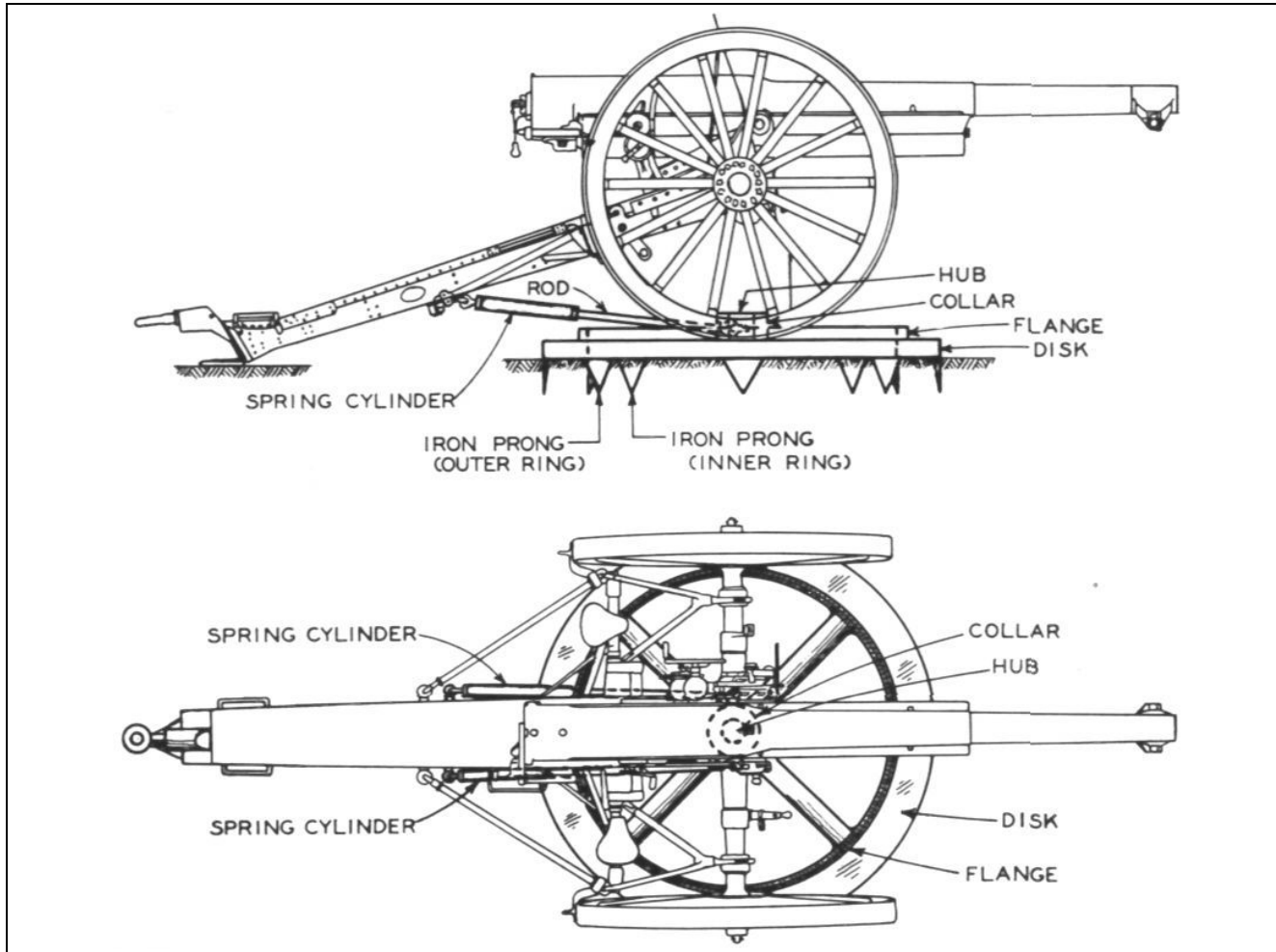
The various crews were all well trained; the demonstration was not intended as a comparative test of their efficiency, nor does it reflect on them. It showed that the 75-mm. M1897 crew spent half the time of the attack wrestling the gun around (and it was equipped with a fancy curved trail log on which a mil scale was painted). The demonstration brought out that the gymnastics of moving the old gun around requires too much sheer brawn and must be simplified and coordinated. That or give up the gun.

From these lessons we devised the following drill for direct fire in our battery. Although we had only dry

runs using four trucks simulating tank attacks, we found that we could track the tanks constantly and with little wear and tear on the gun crews. We hold these drills for one hour each week. And the cannoneers enjoy them.

We started from the premise that in direct fire with the

No. 5, unless he is a superman, cannot shift and track speedily without help. So we give him two assistants, cannoneers 3 and 4. Their positions are at the right and left wheels, respectively, with their hands on the spokes. It is important that they face No. 5. It is instinctive for them to



French 75-mm. gun adapted for use as antitank gun—special platform used by French, Yugoslavians, and British

75-mm. M1897 there are *two* gunners, the regular gunner and No. 5. The latter, as an assistant gunner, is stationed at the trail spike. He has two duties; first, to track the target by sighting directly over the tube (taking the lead if announced); and second, to keep the gunner supplied with traversing space on the axle. To explain the last more fully, if the target is moving, say, from right to left, the gunner must engage the target with the tube traversed all the way over to the right in order to track with his traversing handwheel. No. 5 should watch the axle and when the gunner is about to run out of traverse, No. 5 calls out, "Traverse." At this command the gunner runs the piece back to the opposite side of the axle as fast as possible while No. 5 at the same time tracks with the tube. Then when the gunner goes back to the sight, his cross hair should be approximately on the target.

face the target, but they should watch No. 5 constantly. In fact, Nos. 3 and 4 are under No. 5's command in shifting. With a little practice they can get their cue to rotate the wheels by watching the movement of No. 5's eyes and body; and with the help of the chief of section on the trail they can move the gun smoothly and rapidly around the points of the compass.

No. 2 loads the gun. It is a good idea to have his ammunition fuzed and stacked so as to be handy and still not interfere with the movement of the piece. This was mentioned by Maj. Van Wyck in the January JOURNAL. No. 2 takes over No. 1's job of looking through the tube between rounds. No. 1 is too busy for that.

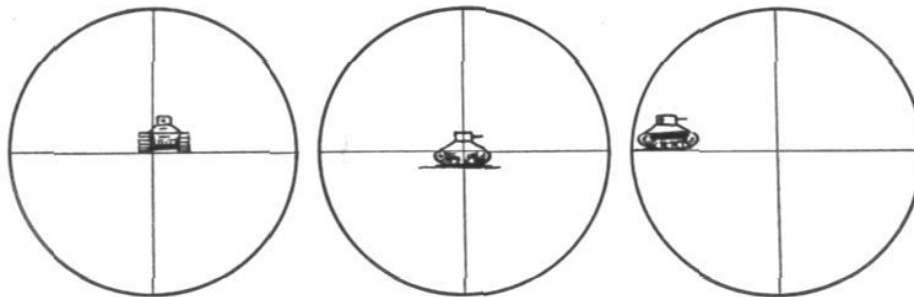
Here is a precaution. In a well-trained crew, with this set-up, fire is rapid and excitement runs high. No. 2 must exercise extreme care that he or a round which

he may be holding is not caught in the recoil. Once I saw a No. 2 struck by a recoiling tube. He landed 20 feet in rear of the piece, unconscious and his hip broken.

As to the gunner—it is faster and simpler, instead of setting deflection changes to take care of leads, to train the gunner to estimate leads as in automatic rifle antiaircraft fire. The reason is simple. Tanks are not likely to move only in one direction and at one speed. Because of terrain and barriers, and for their own defense, they will zigzag, coming head on at one moment and from either flank at the next. If the gunner were to attempt to take care of leads by deflection settings, he would spend all his time at that task alone.

It is better to let the gunner set *Plateau 0 Drum 100* and leave it there. Let him estimate and announce the lead he is taking in cases of flanking movements by the target, or, in cases where the target is halted or coming head on, put the cross hairs of the sight directly on the target.

When the gunner is on the target he gives the command, "Ready, Fire." The tank's wheels or track are shot at rather than the body of the tank. The target should appear thus in the reticle when "Fire" is given:



Tank traveling head on. Fire at the left track. If firing 37-mm., fire at right track.

Tank turning or halted.

Tank approaching from left. Gunner leads 1½ tank-lengths.

It is generally admitted that the tracks and belly are the tank's most vulnerable parts. The concussion inside the tank would be greater from a burst underneath than from a glancing blow on the side. A 75-mm. shell Mk I Fuze Long or Short will not penetrate ordinary ½-inch armor unless it hits a flat surface and directly at right angles. It would be luck to get three such hits out of sixty rounds. It is best to shoot at the wheels and tracks which are much more easily broken. Besides, shooting at the tracks gives the most effect to ricochets. Once a tank has been halted, the crew can be put out by a round into the body of the tank.

No. 1's job is to search for range, open and close the breech, and fire at the gunner's command. He should be watching the target most of the time.

All cannoneers should be trained to estimate ranges and speeds of vehicles with relation to range changes. For instance, have a truck driven around the gun park over measured courses and at different speeds. Have the cannoneers guess the speeds at first in yards per second. As they progress have them estimate the speeds in terms of turns on the range drum. Example: A tank is approaching

at 25 yards per second. To track it for range, decrease the range by ⅛ turn of the handwheel per second. And so on. Practice in estimating leads can be conducted in the same manner. Example: A tank 15 feet long travelling on the flank at 30 MPH, 600 yards in front of the guns, will travel about one tank length from the time the gun fires until the round strikes. Thus the proper lead is *one*.

Another good training scheme for estimating distances is to start at the gun park and erect signs every 100 yards up to 600, similar to signs on a golf practice driving fairway.

No. 1 should be able to make a close estimate of the range at which the target is taken under fire, set off that range on the range drum, and thereafter search range with the drum instinctively and without looking at it. This is something which requires skill and experience gained through actual firing. Nevertheless, the basic principles can be learned in dry runs in the gun park.

Finally we come to the duties of the chief of section. Ordinarily when the battery goes into position one of the first things done is the assignment to each section of zones

of observation for mechanized attack. In case of attack, the chiefs of section are given charge of their respective sections. If more than one tank appears in a gun section's zone, the chief of section designates which tank to take under fire. In case the tanks in his zone are knocked out, he designates targets in his platoon or battery zone. Practice in this is afforded by having prearranged signals which the truck drivers (who are driving the "tanks") display to simulate effective hits.

The chiefs of section should see to it in direct fire that friendly troops are not fired upon (this has happened many times in the European War). He must supervise all necessary safety precautions for his own crew. He must help No. 5 on the trail or Nos. 3 and 4 on the wheels during big shifts; order the gun moved if the wheels begin to dig in; assist No. 2 with the ammunition; and replace casualties.

These remarks may have considered the cannoneers in the reverse order of their importance. It seems, however, that the main point to remember in direct fire with the 75-mm. M1897 is that you have *two* men aiming the

gun (or four, if you count Nos. 3 and 4), and the fire power of the weapon depends largely on the team work of the cannoneers.

RECAPITULATION

Duties of the cannoneers in direct fire:

- No. 1 (a) Estimates and sets off initial range at which tank is engaged.
 (b) Searches range throughout attack.
 (c) Opens and closes breech.
 (d) Fires the piece at gunner's command.
- No. 2 (a) Loads the piece.
 (b) Looks through the tube between rounds.
 (c) Assists No. 4 on big shifts.
- No. 3 (b) On right wheel, facing trail shifter.
- No. 4 (c) On left wheel, facing trail shifter.
- No. 5 (d) On trail spike, tracks target by sighting over tube.
 (b) Keeps gunner supplied with traverse.
 (c) Commands Nos. 3 and 4 in shifting the gun.
- Gunner (a) Sets off *Plateau 0 Drum 100, Site 0*.
 (b) Announces lead if lead is taken.
 (c) Tracks target with traversing handwheel.

(d) Commands READY, FIRE.

Chief of Section (a) Commands section in direct fire.

- (b) Designates target in his zone and in contingent zones.
 (c) Supervises safety precautions.
 (d) Assists No. 2, if necessary, in handling ammunition.
 (e) Assists Nos. 3 or 4 in large shifts.
 (f) Orders gun moved if it is digging in.
 (g) Replaces casualties.

The executive announces the site if that element enters into the firing.

There are, of course, problems connected with direct fire other than training the gun squad—problems of recognizing friendly tanks, placing tank sentinels, how to resist landing parties, field fortifications, what to do if the position is smoked by planes, methods of disabling abandoned guns, etc. But the prime mission is delivery of effective fire. With gun drill along the lines described above. Grandma "75" M1897 can give a good account of herself, and maybe can even do a Joe Louis—stop 'em in two or three rounds.

THE WINNING KNOX TROPHY BATTERY

By Major C. Wesner, 11th FA

Receipt of the victory radiogram from the Chief of Field Artillery announcing the successful participation of Battery "C," 11th Field Artillery, the "Dragon Regiment," in the Knox Trophy Competition for 1940, was cause for general rejoicing. In checking previous winners, no 155-mm. howitzer battery was found to have won this signal honor since 1932, when Battery B, 11th Field Artillery, was declared the winner.

The most outstanding feature of this test was the manner in which the battery functioned during the firing. Prior to the competition, the battery was given no special consideration—no deviation from drill schedule was permitted and this included the usual daily fatigue. The attitude of the men was most commendable. At crucial moments, all signs of tension were missing and the "business-as-usual" spirit prevailed. This attitude of doing routine duty and at the same time being topnotch field artillerymen was outstanding.

In the battery were many key men who were "short timers," and have since returned in a cadre to training centers on the Mainland. Included were: First Sergeant Homer Smith; Staff Sergeant Leon House, motor sergeant; Staff Sergeant Norman Dall, signal sergeant; Sergeant Ernest Long, instruments; and Sergeant George McDowell, supply. Every battery has its key men, but key men are not a majority in any battery. While these men did outstanding work in gaining the coveted prize, credit must be equally shared with all grades who worked just as hard and just as conscientiously.

During the year, the battery won two regimental championships in inter-battery sports. The basketball squad, captained by Sergeant Ernest Long, made a clean sweep of the series. Likewise in boxing, under the



Major (then Captain) C. Wesner, 11th FA

coaching of Corporal Charles Murray, the battery squad amassed more points than any two other batteries combined.

Captain Gerald Duin, who was Executive during the competition, has since been assigned elsewhere and will return to the Mainland in the near future. My own stay is rapidly coming to a close, as I am due to leave the Hawaiian Department in March. Neither of us will ever forget the thrill we had in receiving notification that our battery had won the Knox Trophy.

Lastly, I would like to mention the courtesy and patience the board extended all battery commanders and men throughout the tests. This attitude of the board made the tests pleasant and beneficial, taking away entirely the strain that so easily develops during competitions.



A gun crew not in action should be allowed to rest; but they should be withdrawn to a more sheltered spot, leaving a sentry at the position. Men at the gun should be somewhat more alert than the crew shown here

Some Thoughts on

Emplacement of Antitank Guns

By Major Ralph Van Wyck, FA.

One bitterly cold November day an officer and eighteen soldiers, attempting to rejoin their main body, were cut off by superior hostile forces. Between them and safety lay a small gully, not a serious obstacle. A few of the enemy already were in the gully, firing at them; others circled on their flanks and rear. The situation was serious but not hopeless; by the adoption of a temporary defensive position the commander might hold out until help arrived. To one side of the route of retreat was a clump of high weeds, perhaps thirty yards in diameter. It provided perfect concealment to the weary detachment. The officer succumbed to the temptation. He led his men into the clump of weeds, where they lay down and commenced firing blindly in the direction of their assailants. But the weeds obscured the field of fire; the firing was ineffective. The enemy kept circling, shooting into the clump. Within an hour they had killed every man of the nineteen, with little or no loss to themselves.

That tragedy occurred in 1868. The massacred detachment was Major Elliot's, part of Custer's force which fought the Battle of the Washita, north of the site of Fort Sill. The enemy were Cheyennes and Arapahoes. But the lesson is as good today as it was then. A field of fire is vital for effective defense. Tank fighting is like Indian fighting. Tanks dislike to attack frontally. They stalk their prey. Poor shots themselves, they are nevertheless hard to hit when they are moving. They may be "expected to do the unexpected."

An antitank-gun position, then, must provide a good field of fire and good observation. If concealment and protection for the gun and crew must be sacrificed, that is unfortunate. But there should be no hesitation to take this step.

This field of fire must be level or gently sloping. Plunging fire, even though accompanied (as it usually is) by excellent observation, complicates the problem beyond hope of solution. No one can hit a moving target unless the fire is

grazing, like that of a machine gun. These things seem obvious; but constant repetition of the obvious will help us avoid making, under stress, simple errors which result in tragedy.

Of course the mission, the situation, and the terrain will often force one to adopt a position which is far from ideal. Nevertheless this ideal must be known and constantly striven for.

Obviously antitank sections cannot take flash or smoke defilade against their prime opponent the tank. But they can take it against hostile artillery, by selecting positions far in rear of masks. A very suitable antitank position, for example, may be at the bottom, or near the bottom, of a gentle reverse slope, about 800 yards from the crest, permitting the gun to pick off tanks as they come over the top.

Usually some protection for gun and crew will be possible without sacrificing observation and field of fire. This will take the form of concealment rather than elaborate fortification. Guns must remain mobile; if too well dug-in they cannot be displaced readily; and even more serious, their field of fire may be restricted by the very nature of the emplacement. It is necessary to remember always that an antitank gun may expect to have to fire to the rear as often as to the front.

Here is a problem for which no sure solution is apparent: The muzzle blast of an antitank gun often stirs up dust, fragments of vegetation, etc., which will temporarily obscure the field of view. Since seconds count in antitank fire, this may be very serious. Therefore, one should avoid choosing a position where the ground in

MOLOTOV COCKTAIL

Angel Perez, who fought through the Spanish Civil War, tells us that the Molotov Cocktail will continue to be effective against tanks despite reports that the most recent models of armored vehicles are proof against this weapon. The Molotov Cocktail is simply a glass bottle filled with gasoline; it may contain a crude wick made of cloth, and be ignited before it is thrown; but this is not necessary. The bottle is hurled against the rear part of the tank, where the armor is hot from the engine, and this ignites the liquid. The flames spread to the running gear, which is always covered with oil, and the tank soon becomes enveloped in smoke and flames. No doubt the morale effect on the crew is severe even if the heat and flames do not at once penetrate the interior of the tank. There is always the fear of being confined in a flaming coffin. The Molotov Cocktail is a weapon for close defense against tanks, and will be particularly useful at dusk, or at other times when visibility is so poor that men can approach the tank close enough to hurl the bottles of gasoline effectively.

front of the muzzle is loose soil or covered with bits of dried or burned vegetation. It may be possible to lay out nets, screens, wet burlap, or heavy brush to prevent dust at the muzzle; or it may be possible to keep the ground damp. The main thing is, if you do this as an afterthought it will be too late. Make it habitual, even in practice. Then you won't forget.

If gun emplacements are shallow enough to permit you to see and to fire, they won't protect much but your shins. Aside from the protection by the materiel itself, therefore, the main cover for personnel consists of slit trenches. These should be concealed, if possible, from aerial and terrestrial observation, and should be placed in such close proximity to the gun that the men can quickly take cover or jump out again to resume fire. Tank crews employ only flat-trajectory fire; when they are near the slit trenches they cannot fire effectively into them because they cannot depress their guns sufficiently. For this reason they will either attempt to run over the shelters and crush the crew, or they will open their gun ports and turrets and use submachine guns and grenades. Some tanks may be equipped with flame throwers, but these are rare and usually are reserved for attacks on fortified areas. The answer to these tactics is for the defending antitank crews to be ready with rifles, submachine guns, grenades, and "molotov cocktails." Another important feature is to construct the slit trenches so as to prevent their being enfladed. This can be accomplished by staggering them, building them in irregular shapes, and of short length. It is desirable that they be concealed by vegetation, but beware of too much inflammable material. The trenches should be narrow, deep enough to protect the men from being crushed by the tank, but not so deep that the men will be buried alive by cave-ins caused by close shell bursts.

Slit trenches should be sited to protect the position against infantry attacks from the flanks and rear. The attacking tanks may be accompanied or followed by

infantry, so the antitank gun crews must be prepared to deal with the menace of mortars, machine guns, rifles, and grenades. They will further be subjected to artillery fire and aerial attack. Hence if they are to remain in action long, their concealment and protection must receive serious consideration. On rare occasions an antitank gun may be emplaced temporarily in a defiladed spot, with preparations made to run it quickly to a firing position as soon as the tanks come within sight or approach effective range. In other words, the gun could be held behind a ridge until the last moment, then suddenly run forward to a previously prepared position on the crest. This has the disadvantage that the movement may attract attention; but hostile observation may be neutralized by careful selection of the route, and by insuring that the displacement is a short one and is made with great rapidity.

In any case, alternate positions must be prepared. The paths to these positions must be cleared of obstacles, soft spots strengthened, and some ammunition placed at the alternate positions. If the antitank gun is too heavy to be manhandled readily, it may be advisable to risk keeping a prime mover very near the position. A tracklaying, armored prime mover having low silhouette would be valuable, but if such be not available the canvas truck top should be removed from the vehicle to aid in escaping hostile notice. Reports from the European war indicate that in the dust, smoke, and confusion of close combat, vehicular movements often escape detection, especially where made with boldness and dispatch.

Without compromising for a moment the dictum that a good field of fire is the prime consideration, it should be stated that antitank obstacles in front, flank, and rear, are desirable auxiliaries in the defense. Suitable obstacles are stumps, rocks, ditches, high banks, walls, and clumps of thick woods. Some of these will interfere with the field of fire, but will be useful in protecting such portions of the periphery of defense as are not covered by supporting weapons of own or adjacent units. Sometimes it is well for an antitank gun to get its back against a thick woods, but of course there are obvious dangers in this, and one must always be certain that the woods are impenetrable to tanks. The best obstacle is one which can be covered by fire, for most obstacles only serve to delay the attacker.

Once your position has been selected (or assigned), and has been occupied, you must thoroughly reconnoiter the environs to determine deadspace areas, obstacles, routes for displacement and withdrawal, and probable routes of approach of various hostile elements. It is inexcusable to sit down in a position without knowing everything possible concerning the surrounding terrain, yet this error has been made repeatedly by non-resourceful and indolent commanders. The personnel of the entire gun crew must be thoroughly familiarized with the results of the commanders' reconnaissance, and given a resume of plans adopted to meet future contingencies.

Casualties are so heavy among antitank units that anyone at any time may have to "carry on" as commander.

The Germans and the British both proved last summer that antitank mines can be used to make a position very nearly impregnable against armored attack, given sufficient time. On the Aisne the Germans could not be dislodged from certain bridgeheads because they had been given (by the French) several hours in which to sow minefields. Similarly the British at Dunkirk held off the attackers with the aid of well-placed mines. This has been mentioned previously in this JOURNAL. It is repeated because of the fear that many antitank unit commanders will not wish to burden themselves with mines, or will neglect to instruct the men in their use. In this connection, antitank commanders should be cautioned that the belly armor of modern medium tanks is proof against 6- or 8-lb. portable mines, although the explosion may damage the track. This suggests that mine fields should be covered by small-arms fire, at least, so as to prevent hostile crews from repairing their vehicles. It is beyond the scope of this article to discuss the proper methods for improving an antimechanized defense with mines. The principles are not complicated, and *all* personnel should be familiar with them. One question which ought to be settled, and the writer confesses that he has no solution to offer, is the matter of designing a foolproof scheme for informing friendly troops as to the location of minefields and routes through them.

Ever since the word *camouflage* was introduced, during the World War, there has been a good deal of "hoey" put out concerning it. There still is. We hesitate to say much, but offer a few thoughts for what they may be worth: Antitank guns will rarely stay in position long. Therefore visual aerial reconnaissance will constitute a greater danger than aerial photography. Color and thickness of camouflage material will be of greater importance than texture. The camouflage must look natural, which suggests the use of natural materials. Again, a solemn word of warning: avoid profuse use of combustible materials. The idea of hiding your gun in a haystack may sound good at first blush, but a burst of tracer bullets or an incendiary shell would turn you out looking like a piece of overdone toast.

Constantly inspect your position area to insure that there is nothing which reflects sunlight. An aviator will be attracted instantly from afar by so small a thing as the shining lid of an empty tin can or a burnished bit of metal on your materiel. The planes which are seeking you may be flying very low. The slightest bit of carelessness, the least relaxation of camouflage discipline, may lead to the death of every man in your gun crew.

Muzzle flashes are the most revealing thing about an active antitank position. This cannot be obviated. You may, however, be able to create false flashes at a dummy position, which will help confuse the attackers and cause them to disperse their effort. Any ruse which will draw fire

away from your guns will be worth while; but it must not be overdone, and must be kept secondary to the performance of your mission, which is to shoot at tanks.

For firing during a smoke attack or under other conditions of poor visibility, it may be advisable to stake out critical deflections or sectors, and to record critical ranges. Such blind firing would be effective only at point blank range, but would be better than nothing, and *might* save the day. Another idea: visibility might be bad at the gun, but better elsewhere. Therefore, make some provision for indirect fire, especially (where possible) with observation in a nearby tree. Often early in the morning or toward sunset there is a ground mist which extends not more than five or six feet above the ground but thus effectually prevents direct fire.

It is standard doctrine to emplace antitank guns in pairs. This does not mean that they should be side by side nor back to back; an encircling movement by a platoon of hostile tanks would surround both guns. They should be far enough apart to minimize this danger, but close enough together to provide mutual support. The distance will depend, then, on the effective range of the weapons and upon the lay of the ground. The purpose of emplacing the guns in pairs is not altogether to provide alternative fire in case one gun is knocked out, but to provide for quick fire to the front, rear, and both flanks. When tanks come under antitank fire, they usually halt, leave a pivot, and send some vehicles on a wide encircling movement to attack the gun from the rear.

The great German authority, von Eimannsberger, suggests that if an *area* is to be defended by antitank weapons it may be well to adopt a hedgehog formation in which the guns are placed at the points of a triangle, square, or pentagon. The pentagonal form of defense originated hundreds of years ago, and is based on unchanging principles of defense. The pentagonal redoubt, with guns at each apex of the figure, provided for unmasked mutually supporting fire of at least three guns no matter what was the direction of attack; and the shape of the works protected them against enfilade fire. Before the reader rejects this as a fantastic idea, let him consider well its possibilities. With an eight-gun antitank battery in a pentagonal defense, there will be a reserve of three guns available to be rushed to the most critical point. If each of the legs of the pentagon are 300-500 yards long, the fire of adjacent guns will be mutually supporting, yet a very respectable area will be included in the defense. A smaller area may be defended by the square or triangular formations. Of course, and we hope this is clear, no rigid geometric pattern should ever be considered—nothing so regular as to disclose the position, and nothing which does not fit the terrain and the situation. We merely wish to point out that European authorities have analyzed this carefully, and that before you think of your area defense as a circle, a line, or a square, you ought to weigh the factors mentioned above.

ARTILLERY HELPS

Actual war invariably brings difficulties greater than those encountered in peacetime training. Sooner or later the difficulties always are overcome, but there is danger in trusting too much to expedients. The Blitzkrieg demands close coordination of all elements from the beginning of the campaign to the end. For the artillery, this means that touch with other mobile elements must never be lost. Above all, the artillery itself must never become an impediment to the mobility of the main body.

In the Polish campaign, our battery was a part of a Panzer Division. On the very first day of the campaign we met up with sand and other difficulties of the Polish terrain. On the evening of the first day, the tanks of the division moved forward to attack. It was necessary for the artillery to follow closely behind the tanks throughout the night. The going was extremely hard.

It took us only a few hundred meters to develop a method for moving forward in spite of the demolished bridges, and swampy and sandy terrain. Our method involved sending two or three persons, including battery and platoon commanders, forward ahead of the column. This party reconnoitered the way on foot and picked out the most favorable terrain over which to advance. Often the way as finally selected lay far to one side of the road. After a detour had been reconnoitered, it was traced out for the first vehicle by means of pocket flashlights. The

column was never allowed to proceed until such reconnaissance had been made.

The greatest difficulty often was encountered with the ammunition and supply vehicles at the rear of the column. The wheels of the vehicles cut deeper and deeper into the earth. Often it was necessary to detruck the soldiers, give them spades, and have them fill up the ruts and otherwise repair the roads.

One expedient which proved helpful, especially in sand, was to take down the fences along the way and use the posts and boards as a sort of weak corduroy. The vehicle at the extreme rear of the column always picked up the materials so used and carried them forward so that

GERMAN HALF-TRACK TRACTOR DEMONSTRATING USE OF POWER-DRIVEN WINCH

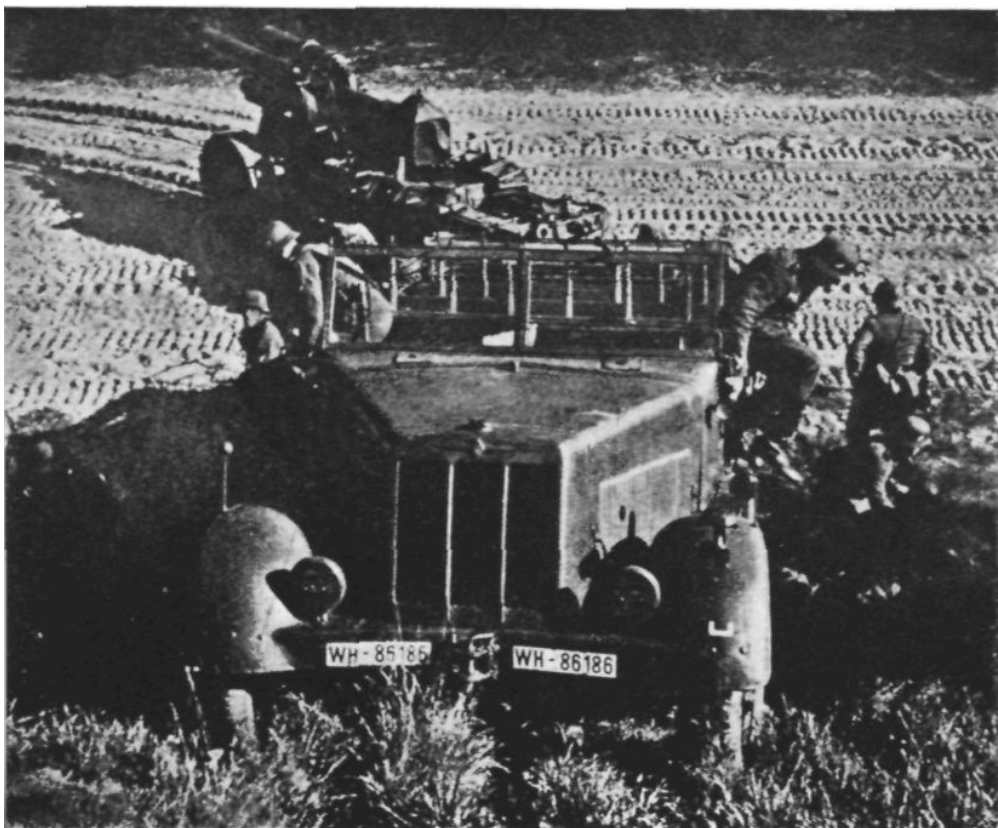
(Plates from the German weekly
Signal)

The story is told in the pictures. Below, left, a motorized 15-cm. howitzer has run against an abandoned railroad embankment, the slope of which is too steep to be negotiated by the prime mover and the towed load. The cannoneers immediately jump down and unlimber the piece. Then, below, the tractor moves up the slope alone.

On the opposite page, reading down the columns, the cannoneers pull the cable from the winch and attach it to the howitzer-carriage limber. Next, the cable is passed around a pulley to increase the power of the winch. The howitzer limber, connected to the tractor by cable, waits below.

At the top, the driver has turned on the motor winch. The cable stretches and draws the piece up the slope.

A few moments later, the howitzer has nearly reached the top of the embankment. Without this device the obstacle would have been unsurmountable.



ITSELF

Translated from *Artilleristische Rundschau* by CAPT. PAUL W. THOMPSON, Corps of Engineers



they would be on hand for the next bad situation. Our experiences illustrated the fact that the general cross-country ability of a motorized unit is increased materially when every vehicle carries corduroy or similar materials. It is always possible to superimpose a fair quantity of such materials on the normal load of the vehicles.*

Our batteries are well equipped with pioneer tools. Ability in using these tools, and willingness to use them promptly, enables a battery to overcome almost any minor obstacle. For example, if in detouring a bad place in the road, one suddenly comes upon a ditch, the latter probably can be crossed without great loss of time by the expedient of knocking down the shoulders and throwing the dirt into the bottom of the ditch.

Reserve towing power is of great use. One of our first acts was to bring our reserve tractor forward from its normal place at the end of the column to a place at the head of the column. Often, this reserve tractor would cross over an especially difficult place and then would pull the wheeled vehicles through, one at a time. The tractor then would bypass the column, regaining its position at the head.

We found it useful to outline the edges of narrow bridges or sharp curves by means of pocket flashlights, so placed as not to blind the drivers.

Occasionally, we encountered swampy land where our corduroy materials were useless and our tractor could not pull the individual vehicles through. In such cases, we felled a few trees, cut them into lengths about double the width of the road, filled the marshy area with branches and brush, laid the logs across and thereby had an improvised fill which sufficed for all loads in the battery.

The complement of pioneer tools normally issued to a battery is approximately as follows: 70 spades, 25 claw hammers, 6 axes, 4 saws, several lengths of line (2.5 and 7.5-m. long), several wire cutters, one maul, 1 sledge, 1 cable 25-m. long. Whenever possible, we added to this allotment. An addition of especial value was the rake. We secured one rake for each gun, and used it to smooth out the tracks and other evidences of movement in the sand around the gun's position.

On the 8th day of the campaign, we reached the valley of the Vistula, south of Warsaw. Bridges had been destroyed, and troops were being ferried across in pneumatic boats. Our advanced observers went across with the first waves of infantry. In the days immediately following, our fire was dependent almost entirely on the reports from these advanced observers. In the broad valley of the Vistula, battalion and other observation posts had only a limited field of vision.

The situation just described prompted the following thought: What if it should become necessary for an advanced observer to cross a river on his own resources?

*Many recent photos show German tanks and artillery tractors carrying bundles of fascines to be used for the purpose indicated herein.—Editor.

What if he had to cross the river in cold weather, perhaps with a radio instrument on his back? When we returned to our home station in Germany, we went seriously about finding the answers to those questions. First, we consulted the Pioneer Handbook. Then we made experiments, some of which are described below. Our conclusion was that rivers need be no great obstacles for individuals with equipment, but without vehicles.

We found rafts constructed from wood alone to be impractical, both because of the time required for construction and the relatively limited capacity of the resulting raft. We looked around for lighter materials. On one occasion, we took the inner tubes from trucks, inflated them, laid them out in the form of a rectangle (4, 6 or 9 tubes, adjacent one to the other), bound them together and stiffened them with wooden decking. It was noted that in Poland we could have used sections of fence for the decking. We found that one man could be supported on a raft made up from 2 tubes, but that 3 were preferable.

Another of our experiments had to do with rafts made up from individual water canteens. The idea had one great disadvantage: 8 canteens are required to support one man. The binding together and stiffening of the canteens also is difficult and requires considerable time. The resulting raft floats deep in the water, and is difficult to load.

Another of our rafts was made up from a tarpaulin filled with straw, reeds or bushes. The four corners of the tarpaulin were drawn up around the material and were tied tightly. With a tarpaulin measuring about 18 feet on the side, and with straw for a filling material, we constructed a raft which supported four or five persons. The raft could be poled or paddled, or it could be made into a cable ferry through use of the 25-m. length of cable carried in the battery.*

Expedients such as those described above always will be practicable. If the advanced observer has not the necessary materials at hand, they can be sent forward to him very quickly. Often, one can obtain adequate materials from nearby villages.

Just as a waterway need be no great obstacle to an advanced observer, so the absence of a natural observation point need not mean that there can be no observation. There always will be trees and smokestacks. Equipment wherewith to climb always should be kept available.

Thus, it is not enough to have a battery which shoots with great accuracy on the training field. Often the most difficult thing is getting the battery to its firing position at the right time.

*The Kiowa and Comanche Indians of the Fort Sill Indian Reservation informed the Editor that they used this same expedient in crossing Red River (in the 'seventies) during their raids into Texas. They carried 'paulins (furnished them by the U. S. Dept. of Interior) to make the rafts, and thus were enabled to escape from the pursuing minions of the War Department.

Wartime Procurement of field artillery materiel

By Major General William J. Snow, USA-Ret.

The two major handicaps under which the office of the Chief of Field Artillery labored in 1918 were: shortage of trained officers to act as instructors and shortage of equipment with which to instruct. Under the General Scheme for Training, which I have described previously, the first handicap was rapidly disappearing and the field artillery machine was fast coming into production when the Armistice was signed. The materiel shortage was also being remedied, but at a slower rate. It handicapped us throughout all of 1918. This is all the more surprising because of the fact that we are the greatest industrial nation on earth; uninformed, unstudied opinion would say that materiel could be promptly produced here in unlimited quantities, especially as during the previous two years we had developed a considerable munitions industry to meet the requirements of the Allies.

But before taking up the subject of materiel I want to state that notwithstanding our failure in 1918 to produce

in quantity, I have nothing but praise for the accomplishments of the Ordnance Department after Major General C. C. Williams became its Chief in the spring of that year. The achievements of his department from then on constitute a proud record, not only for the Ordnance Department, but also for American industry as a whole,—and this notwithstanding my worries and disappointments in 1918. The list of manufacturing plants which produced supplies for the Ordnance Department reads like a "Who's

Who of American Industry." Every civilian plant that could be converted into a war production plant was so converted and, in addition, many new plants were erected. But the erection of plants takes time; the adaptation of designs to quantity production takes time; the design of machine tools to make the product takes time (in 1918 we had a bottleneck in machine tool steel itself); the installation of these machine tools takes time; the training of skilled workers in their new task takes time; the actual manufacture and assembly

Editor's Note: During the past year THE FIELD ARTILLERY JOURNAL has printed excerpts from the World War memoirs of the first Chief of Field Artillery which dealt with the problems concerning organization, personnel and training. A number of interesting subjects covered in his Memoirs are omitted in the excerpts; this is for the reason that interesting and timely as these articles are, the management of the JOURNAL think that as this country is now trying to rearm with all possible haste, Gen. Snow's experience in 1918, when we were engaged in the same race against time, are even more important just now. Accordingly, beginning with this issue the series of excerpts discusses the difficulties of obtaining proper and sufficient guns, ammunition, and fire-control equipment in 1918. This problem recurs every time the nation enters into an emergency associated with military effort on a large scale.

Below: Wartime view of Snow Hall, Fort Sill.



of the new products takes time; the testing and inspection takes time; and so on until months and months have elapsed before a single product is turned out. The American people must realize that you cannot order a gun on Friday and have it delivered on Monday—you may get it in a year or a year and a half.* And, based on my 1918 experience, I would say that not the least effective way of speeding up



production is to stop changing design after production has once started; and do not start production on any article that is still in the experimental or development stage. We made both of these mistakes in 1918.

In examining the question of materiel, insofar as the Field Artillery is concerned, the natural sequence is to start with guns, as they form the basis of all training. However, at the risk of putting the cart before the horse, I am going to start with fire-control equipment. This I do because it can quickly be disposed of, and then the larger subject of guns can be taken up more at length. But the importance of fire-control equipment must not be judged by the small space devoted to its discussion here. On the contrary, it is of vital importance. Guns can produce only a negligible effect without it. Just as the brain directs the body, so fire-control equipment must be used to direct and control the guns.

For some time after we entered the war, rumors had been reaching the field artillery in this country to the effect that in France a much more elaborate fire-control equipment was used than we were supposed to have here. Actually, we had practically none. But no one here knew what articles the equipment in France included. If such equipment was in use in France, no one here knew of it positively, and the War Department apparently had taken no steps to find out, although we had been in the war for about a year. The Ordnance Department was still struggling with a list gotten up by the Field Artillery Board in 1916—a list which was deficient in many respects. From officers invalided home, a list of the Equipment Tables,

*It is a sad commentary on our present feverish effort to rearm that, during the past five or six years, in which Hitler was building his huge war machine, actually in the United States a smaller proportion of federal expenditures went for national defense than at any time for the last thirty years.

published by the Ordnance Department of the A.E.F., was obtained. This list was based on the French equipment being purchased abroad for our field artillery, and was without detailed descriptions or drawings. I at once decided to furnish the field artillery here with the same equipment as was provided in France. Some of the articles were

new to us, and I frankly admit that there were a few whose names were meaningless to me. Later, through a courier of the Ordnance Department, drawings and descriptions were obtained and manufacture started.

Why did a whole year of war pass without even finding out what fire-control equipment was necessary and vital to the accurate delivery of fire of any field artillery unit? It was because there was no Chief of Field Artillery to look after these essentials, and to prevent the arm from simply drifting along chaotically.

I decided to group this equipment under three heads, assigning to the Ordnance Department, the Corps of Engineers, and the Signal Corps the articles that naturally fell to each of these departments, as had always been the custom in our service.

On April 19th the Chief of Field Artillery submitted to the Chief of Staff a memorandum giving a detailed statement of the necessary fire-control equipment needed for the divisional brigades in this country, and divided the matter of supplying it among the three staff departments mentioned. That recommendation was approved April 30th, and the Staff Departments concerned were directed by the Secretary of War to furnish the equipment at the earliest possible moment, giving priority to brigades ordered overseas.

The following table shows the shortage among a few items only, following a check-up made *three months later*:

Called for by April	Btry. Comdrs. Telescopes	Aiming Circles	Range Finders	Prismatic Compasses
19th Memorandum	4,624	2,800	2,704	5,762
On hand. July 15th	928	408	702	1,380
Shortage	3,696	2,392	2,002	4,382

As this table showed that after three months' endeavor we had gotten only about one-fifth of our needs and that

we were not gaining very fast on our shortage, an order was issued July 30th directing that brigades sailing overseas would leave their fire-control equipment in this country. This order was issued only after we had found out that these brigades could be equipped upon their arrival in France.

There were, however, many articles on the fire-control equipment list other than the four I have just mentioned. I therefore determined that wherever commercial substitutes could be found they would be procured, and I accordingly sent officers into the open market to purchase such articles as we could use. In making selections of commercial articles as substitutes for the military articles, Mr. E. M. Douglas, of the Geological Survey, was of great assistance and picked out many different types for us. The Corps of Engineers handled their part of this procurement very efficiently, and in a short time were making deliveries.

However, due to the lack of optical glass in this country at the outbreak of the War, and to other causes, the shortage of all fire-control instruments containing optical glass was acute throughout the War and was a serious handicap to training in the United States. Of course as time went on, the situation got better, but it was never entirely corrected. The shortage in optical glass, however, did not excuse the delay of over a year in finding out that the field artillery needed such articles as straightedges, celluloid protractors, slide rules, plotting boards, steel tapes, and other articles that in general had a commercial use.

LIGHT GUNS

In my first conversation with Mr. Stettinius, Assistant Secretary of War and in charge of procurement, shortly after I became Chief of Field Artillery, he remarked almost as soon as I came through the door: "General, if you are as uneasy about guns as I am, you don't sleep at night." His words proved to be prophetic. He continued: "You have three types of light guns, French, British, and American, all of 75-millimeter caliber. Which do you prefer?" I replied: "Any one that I can get in quantity. I want guns; I don't care what kind." After some discussion we decided that for the present all three kinds would be continued, and that later when the shortage had become less acute and when I had determined by investigation which one promised the best results, we would again take up this question. Well, the shortage never got less acute, so we continued to make all three types during the War.

Mr. Stettinius, during that discussion, reviewed the history of our efforts to get guns since the date we entered the War. He told of the agreement with the French to furnish General Pershing with guns, but at the time of our discussion he felt considerable doubt as to whether the

agreement could be carried out. He therefore was anxious about our production here in case Pershing called on the United States for guns. He likewise told of General Crozier's confidential testimony in December, 1917, before the Senate Committee, in which Crozier stated that the Ordnance Department's program for an Army of 2,000,000 men contemplated 6,798 guns of 75-millimeter caliber, and of Crozier's statement that 6,040 of this number had been ordered. Mr. Stettinius then asked me how the contracts were coming on. I told him that up to the time I became Chief, 12 guns had been delivered,—one prior to January 1, 1918, and 11 during January, all 12 being of the British model. I told him that in February one American 75 had been delivered and we hoped to get 40 or 50 British during the month. (Actually we got 36.) This was not very encouraging, for we needed several thousand.

The reason we were both disturbed about the light gun more than about the heavier calibers was that under our organization as adopted for the war, two of the three regiments in every field artillery brigade were to be equipped with light guns. The importance of this caliber, therefore, is readily apparent. In fact, the number of light guns was about one-half of all the guns in the Army, so that for every gun of any other caliber made, a light gun had also to be made. The light-gun production thus became the real test of our gun production during the War.

The light gun in use in our Army at the outbreak of the War was the 3-inch on the single-trail carriage, and an excellent gun it was too. We had about 600 of these guns on hand when we entered the War, and manufacture then ceased.

This small number of 3-inch guns, of a model that was apparently not good enough to continue in production in war, proved to be our main reliance in training in this country. In reality it was an excellent weapon, which the Ordnance Department and the Field Artillery, working together, had spent over ten years in developing. During that time, in service tests, its weaknesses had been discovered and corrected. It is a pity we did not go into production with it (re-chambering to 75-millimeter caliber) at the beginning of the War, instead of following the plan we did follow. Had we done so, training in this country would have been expedited by months. The only legitimate objection to this gun lay in its slightly shorter range than foreign guns of about the same caliber.

To this small supply of 3-inch, we later added the British 75-millimeter, and these two types carried the main load of training in this country to the Armistice.

It might be interesting to interpolate here a report received from Fort Sill concerning the adoption of a standard field piece for our army:

SCHOOL OF FIRE FOR FIELD ARTILLERY FORT SILL,
OKLAHOMA

MARCH 15, 1918

MEMORANDUM FOR GENERAL SNOW: Comparison of American and French Guns.

1. Information reaching here indicates that the status of the light gun question is as follows:

The plans of the Ordnance Department at the outbreak of the war were to substitute the new split-trail carriage for the old one, and modify the 3" gun. Work continued along these lines until about the end of 1917, the old 3" gun being classed as obsolete and the new split-trail 75-mm. as standard. [Known as the American 75, Model of 1916.—Editor.] Pending completion of this gun, French 75-mm. guns were taken as a temporary expedient. The new American gun not having proved satisfactory, the whole American light-gun program has been abandoned, and the decision reached to manufacture the French 75 in this country.

2. This School has no desire to act as an obstructionist, nor to attempt to overturn existing arrangements where detriment to the service would result. But if the new arrangement has not gone into operation so far as to be irrevocable, and not even subject to modification, I wish to present the views of the School in the matter.

3. French 75-mm. guns have been in constant use here, alongside 3" guns, for nearly four months. Our instructors were thoroughly familiar with such defects as existed in our guns, and hailed with pleasure the opportunity to handle the 75 so widely and so loudly heralded as wonderful. This gun was given first place in everything, even to the extent of injustice to the 3" (as events proved); that is to say, many comparisons were made in such a way as to bring the strong points of the 75 into contrast with the weak ones of the 3". Methods of fire specially calculated for the 75-mm. were tried with the 3", instead of determining the principle involved and studying a method for applying it with other materiel. The first effect of the comparison, therefore, was to confirm the idea that the 75-mm. was a superior weapon.

4. Further experience, however, has altered this view. The conditions here afforded an exceptional opportunity for real comparison, for, in so far as we are aware, this is the only place where the two guns are in daily use side by side.

5. The principles involved in the special methods of fire with the 75 have been studied, and experiments made with the 3" to determine how that gun may get the same results. We find that we can do anything with the 3" gun on our latest model carriage that the French officers here can do with the 75.

6. We were at first informed that the 3" gun was inferior to the 75-mm. in accuracy; and we accepted the assurance. But it has gradually dawned upon us that this is not true. Our experience indicates that the dispersion of the two guns is about the same at short and mid-ranges; that from about 4,000 yards up, that of the 3" gun is less.

7. On the mechanical side, we have had the same experience. We first accepted, on faith, the superiority of the French gun, and have changed our minds. The French gun is more complicated and delicate in design, and less sturdy in construction. Specialized experts are needed to make even small repairs. Some of the structural faults may be eliminated in manufacture in this country, but this would require redesigns and delays. Our best specialists here agree that the French carriage is not likely to stand up as well as ours in heavy cross-country work; it may do so under ordinary conditions of position warfare, or under peace-time work

in France, but does not seem up to special emergencies that may arise in passing to open work over torn-up ground, and certainly not to such demands as we are in the habit of making upon our materiel.

8. Our sighting system, shields, and draft arrangements are distinctly superior to the French (except perhaps the French independent line of sight) but no special point need be made on these, since they can and should be applied to the French gun if that is made here. But the difference in facility of laying comes out very strongly in daily use; firing problems that are simplicity itself for the American gun are very difficult for the French. This is not a vital defect in position warfare, where plenty of time and all sorts of facilities are available, but will become important on transition to the war of maneuver.

9. In view of the failure of the split-trail carriage, it has become necessary to accept some type already developed. The ones most immediately available are the 3" and the 75-mm. We do not, of course, know the details of manufacturing possibilities; but *prima facie*, it would seem that production of the 3" (chambered and bored for 75-mm. ammunition) could proceed at least as rapidly as that of the French gun.

10. Unless arrangements have gone so far that very serious delay would result, the School recommends most decidedly that the American light gun, and not the French, be adopted as standard. The fact that some regiments will in any case have the French gun need make no difference; the two guns can work together perfectly well. We have gone exhaustively into the matter of drill regulations, with the assistance of a French officer, and find that the changes in our regulations, to make them apply to the French gun, are very few. A full report in this matter was forwarded from here on March 9th, 1918. In view of the practical interchangeability of the two guns, there need be no hesitancy in taking up the manufacture of the American gun, even if work is actually under way on the French. Work may go forward on both, the emphasis being placed more and more strongly upon the American design.

11. As regards the heavy rifles there seems to be no question. Our 4.7 rebored probably to 120-mm. is perfectly satisfactory; and the French 155-mm. long fills a place which no gun of ours can.

12. The heavy howitzer is in a different situation. Our 6" has not sufficient range, the Schneider 155-mm. short has. But the Schneider is subject to about the same objections as the French 75-mm.; it is delicate and complicated in design, construction, and management. If our 6" could be given sufficient range, it would be preferred, in spite of some objections to its design also. If not, the Schneider will have to be accepted.

13. It may be remarked that our firing experience with the heavy rifles and howitzers is not as extended as with the light guns. Hence, while our recommendations as to light materiel are made with some confidence, we are less confident as to the heavy materiel. However, opinion here is unanimous.

(Signed) A. S. FLEMING.
Colonel, 14th Field Artillery,
Commandant.

EDITOR'S NOTE: *In an early issue General Snow will continue his discussion concerning materiel in 1918, describing the long controversy over the American 75-mm. gun. Model of 1916, and later recounting the achievement of American industry in going into quantity production on the French 75.*

SUGGESTIONS for EQUITATION INSTRUCTORS

Prior to the motorizing of many artillery units, equitation instruction was relatively easy inasmuch as almost all field artillerymen had experience with horses. With the advent of motors on the farm and in the field artillery the task of teaching equitation to soldiers and officers becomes, more than ever, one that deals with basic horsemanship. It is the purpose of this article to discuss a few of the essentials which an instructor should follow in teaching the fundamentals of equitation and remount training.

In approaching the problems of riding instruction the instructor must realize that equitation is not a science but an art. Although it is based upon scientific principles, he who merely learns the rules does not master this subject. The always varying rider-horse equation, the balance between fear and confidence on the part of the mount and rider, the need for physical coordination, the ever-present question of the amount of force to be used, the need of constant practice, and the invariable principle of demand and reward require the use of physical coordination and, above all, tact and judgment far beyond the demands of a true science.

Since there are various methods of instruction and many types of instructors, it is believed that uniform results can be accomplished if the essentials suggested in this article are followed. Instruction of any kind requires knowledge of the subject, equitation being no exception. One should realize that to instruct with confidence the assignments must be prepared and plans made for the work to be done. Too often, classes in equitation have been conducted without previous preparation, the result being adverse comments by the students and a waste of valuable time.

Let us consider the duties of an instructor as he is preparing the plans for a class. His first thought should be the condition

of both the horses and the riders. If the class is one of the first during the course it is well to assume that the majority of the riders are not in a hardened condition. The periods allotted for equitation in a regimental training schedule or school curriculum may be interspersed throughout the first part of the course in such a manner that the riders will not have a chance to work off the stiffness between riding classes. Therefore, with the rider's condition in mind, the instructor should make his plans so that the time of actual riding will be interrupted by frequent periods of instruction and correction. In conjunction with the thoughts regarding the students' condition, he should also consider the condition and the degree of training of the horses. Normally, and fortunately, at the beginning of a course, the condition of both the horses and the riders is such that they should receive about the same



Haute Ecole, Saumur, France

By Major Arthur E. Solem, FA

amount of work.

The next considerations are the type of work, the weather, and the place where the class is to be conducted. As to type, the instructor should be careful that he varies his work daily so that he will keep the class interested. He should plan his schedule so that there are periods in jumping, cross-country work, schooling, work on slopes, and work over varied terrain. With respect to weather, he should bear in mind that little progress can be expected when a class is conducted under adverse conditions. If a riding hall is not available and the weather is so inclement that outdoor work is not advisable, he should change his schedule and give a lecture on appropriate subjects. In regard to the place to conduct the class work, precautions should be taken so that there will not be a conflict with other instructors' plans, and that facilities required by the type of work planned are available at the site selected.

The instructor's next thought is the ever important time element. He should allot time for questions, explanations, and demonstrations. He should always give rest periods and terminate classes on schedule. He should never start a new sequence of instruction near the end of the hour, since the schooling required might take longer than the time available. Furthermore, students become fatigued near the end of a period and are not as receptive to instruction as they are at the beginning.

Another important item for which he is responsible is that well-groomed and sound horses be turned out with clean and properly adjusted equipment. The psychological effect of good-looking equipment properly adjusted on a well-groomed horse will start the class with enthusiasm for the day's work.

necessary to make explanations the class or student should be told to "ride in."

Further precautions in the use of the voice are as follows: Do not give instruction to a rider who is about to take a jump. He is, or should be, too preoccupied in properly conducting his horse to the jump to hear or follow advice from the sidelines. Never use sarcasm or profanity. The student is no doubt trying, and will not be aided if you add to his particular difficulty by provoking him. Do not use a harsh voice. When necessary to correct an individual, call him by name, and give the correction in a clear loud voice. If the same fault is prevalent, have all "ride in," give the explanation and demonstration, then send them back to their work.

While making explanations the instructor should guard



Students may be told to "ride in" any number of times during a period. When all face him he can demonstrate or discuss with assurance that all can observe and hear him.

Having executed the aforementioned plans, the instructor is ready to conduct the class. If he is to have the attention of the students while speaking to them he must place himself in a position relative to the group so that he can see everyone. They should be formed on a semicircle in front of him rather than on a circle around him. If the students are working on the track of a riding hall or any rectangle, the instructor should not place himself in the center of the enclosure, but near the inside of one of the corners so that he can make corrections to each as he passes. Generally speaking, the instructor should not call to the students while they are moving, since many people do not have the faculty of listening and performing at the time time. When it is

against digressing or becoming reminiscent. Simple terms should be utilized. Phrases such as "the indirect rein of opposition in rear of the withers" may be quite simple to one having knowledge of the schooling of horses, but are merely a group of words to the novice. To quote St. Phalle, de Sevy, Fillis, or other masters of equitation is to confuse the primary student and give him the idea that the art of riding is a mystery. Later on in the instruction, however, such references serve to stimulate interest and give perspective and background. Brevity is also important. The student may be told to "ride in" any number of times during a period, but the explanations, always followed by a demonstration, should never be longer than two or three minutes. It is better

to impart one thing at a time than to bore the class with a drawn-out sequence of instruction.

If an instructor is not careful he will find that he is correcting the same students daily, and at the same time entirely failing to comment on the work of others. This should not occur, as all members of the class need instruction and many will feel neglected if they are not corrected or complimented. If possible, each rider should be spoken to at least once during a period. Excessive criticism should not be heaped on any one student. The rider may have many bad faults which will need almost constant attention, but, in order that his confidence not be destroyed, constructive criticisms or praise should be given with the corrections. Some may have a bad position fault

A method of instruction now being used at the Field Artillery School which involves the explanation, demonstration, execution, and critique system, and embraces the belief that if a rider is given every aid available he will gain confidence and learn to ride in a short period of time is briefly as follows: The instructor conducts his class to an area about the size of a polo field and gives a brief explanation and demonstration of the work to be accomplished. He then releases the students to school their horses individually in the designated area, cautioning them to work at the same gait and in the same general direction, so that they will not interfere with each other. The instructor then circulates around the area giving advice and making corrections. If during his observation he



A group working with the instructor who is making corrections or observing prior to calling all in for group or general corrections.

due to their conformation or lack of coordination. They should be told how this fault may best be remedied, and informed that it will require concentration on their part for a long period of time before the fault can be completely eliminated. Certain riders will require months of the same type of correction before they will realize that they must be definitely wrong.

Occasionally students who have had considerable riding experience are not willing to accept instruction. It should be explained to them that, although the ideas advanced may not necessarily be the best, yet the instruction should be given a trial. They must be made to realize that there is no one best method for all circumstances. The true horseman must know many means of accomplishing the desired results and have the discretion and initiative to select the one most pertinent to the situation.

finds a common fault he calls, "Ride in," explains the correction and again allows them to work individually as prescribed. By this system the student can ride and dominate his horse, executing his movements at the most propitious time, the result being better horsemanship and better trained horses. For example, a rider can assume a slow trot, when both he and his horse have lost their rigidity, and the results of such a slow trot are, of course, very valuable in placing the rider in the proper seat. In short, the system tends towards individual training of horse and rider, with the instructor advising and answering the questions of each student.

In conjunction with this type of schooling periods wherein the students work individually, all cross-country riding should be habitually executed with the class approximately "on line" with the instructor, half on each side of him, with about a ten-yard interval between

riders. In this method of conducting the cross-country work the students again will have independent management of their horses. During the first few weeks of cross-country work the instructor will note that some of the horses will have a desire to increase the pace. This tendency of impetuous horses to pull on the bit can be greatly decreased by the following procedure: The instructor requires all students to watch him for arm signals that will indicate the direction or movement. While watching the instructor the students will unconsciously relax their rein aids, which in turn will soon cause the horse to relax. If the instructor notices that the pace is increasing he can signal a right or left-about movement, which will tend to break up the increased pace without causing pulling on the reins. During a series of these about movements the horses

they are required to leave the group. Furthermore, after considerable class work the horses eventually increase or decrease the gait on the command of the instructor.

The question therefore arises, "How can changes of gaits be given without a command of execution?" The answer is as follows: When the instructor desires a change of gait he can call, "Take up an easy trot," "Bring them down to a walk," "As you come out of the northeast corner take up the gallop right," or any other such statement that will cause the riders to make a smooth transition of gait.

By comparing these two systems it is logical to believe that a rider, working individually, can cause his horse to respond to a schooling movement much easier than if he is required to execute the movement on a command. It is also



Development of balance, good hands, and security of seat by work over varied terrain.

will soon relax and be willing to travel in a group without increasing the pace set by the rider.

Let us contrast the above method with the conduct of classes in which the instructor controls all movements on a command. In the command system, the class is habitually controlled by the instructor, with the riders performing all movements and all changes of gaits on a command of execution. In addition, students are required to ride in column at the slow trot without stirrups, which subjects them to a ride that many experienced equitators would find uncomfortable. Similarly, classes are conducted cross-country in a column of twos, which deprives the individual of the opportunity of properly managing a horse that is a puller. By this system the horses eventually become so herd-bound that they are difficult to control, particularly if

reasonable to believe that a horse will be more responsive to aids and will lose his herd-bound instincts if he is worked individually.

In addition to the proper conduct of class work the instructor should understand the capabilities, condition, and experience of both horse and rider. He should change the assignments until he finds the combinations in which horse and rider are mutually best suited, giving due consideration to the weight and size of each. Once the combination has been found the instruction should continue until it is apparent that the student is able to control his horse. Then, and not until then, should there be a shifting of assignments. The theory that a rider should know how to handle all types of horses is quite correct, but that theory does not apply until the rider

has become capable of controlling a horse that is suited to him.

In jump-riding instruction the following procedure has produced excellent results. The class is conducted in an area that, if possible, has numerous solid log jumps varying in height from one to three feet. The instructor explains that the balance required for the jumping seat can best be acquired by trotting over low obstacles. He then demonstrates the jumping seat, the turn, the approach, and the proper method of negotiating an obstacle. He designates at least six jumps for the class to work over individually, cautioning them not to follow one another, not to take two successive jumps that are on line, and not to attempt to take an obstacle when their horse is out of control. He also indicates that the jumps may be taken in either direction, which has a twofold advantage, as it

proceed with instruction at the gallop. As before, the class should be conducted in an area that has, if possible, numerous solid-type jumps that are approximately a foot higher than those taken at the trot. The instructor demonstrates the proper galloping speed, the correct turn, and the correct approach while negotiating a jump. He then designates the obstacles to be worked over, and requires the students to take up the demonstrated gallop and jumping position. When he is satisfied that the horses are being properly ridden at the rate prescribed he calls, "Start jumping." As in their instruction at the trot, the students should be cautioned not to follow one another, not to take two successive jumps that are in line, and not to attempt to take an obstacle when the horse is out of control.

As soon as the students' progress indicates that they are capable of taking single obstacles, they are ready to receive



Development of balance and security of seat by work over low obstacles at the trot.

requires the students to be alert and causes them to make the proper turns, and approaches to the jumps.

While the class is jumping the instructor circulates around the area giving advice and making individual corrections. If he notices a common fault he calls "ride in," makes the correction and sends them back to their work. Because jumping at the trot is fatiguing, critiques which serve also as rest periods should be given at approximately five-minute intervals.

By this method of instruction the students receive a great deal of individual practice in conducting their horses on the turn, on the approach, and in the negotiating of a jump.

Having acquired the balance essential to the jumping seat by their work at the trot, the students are now ready to

instruction in negotiating a course of jumps.

While conducting a class wherein one student is performing at a time, the following procedure should be used: A sequence of jumping should be designated, such that on completion of one rider's performance the next in order will start the course. On completing the course each student should report to the instructor for a critique. While a rider is performing, the remainder of the class should be required to keep their horses moving around the entire area, cautioning them not to congregate in a group. They should be told to observe the good and bad points of the student performing so that they can benefit by the others' experience.

By this method of conducting a jumping class the

following benefits are derived: Each student receives an individual critique. Time is saved because the instructor does not have to call for the next rider. The individual riding of the class horses around the area has a twofold benefit, in that the horse that is performing is not influenced by his natural herd-bound instinct, and also the others are kept warm and ready to jump.

When it is necessary to conduct a jumping class of approximately twenty students in a riding hall or any enclosed area, the following procedure is recommended: Because most riding halls or enclosures are relatively small, only a few jumps should be set up. These jumps should generally be placed off the track, down the center, or on the diagonals. The track should be clear so that the class can keep moving. When jumping is to start, the students should be instructed that every fourth rider is to leave the column at a certain point, negotiate the designated obstacles, and rejoin the column. If the period of instruction is short the class can be required to take up the gallop when jumping is to start. However, if the period is comparatively long the students can work at the walk or trot and when it is their turn to jump they can take up the gallop as they leave the column. By this method the students will receive a great deal of jumping practice under adverse conditions. While conducting a class of this type, the instructor should give frequent critiques, which will also serve as rest periods.

The system of calling on one rider to perform while the others remain in a group and observe has the following faults: The students lose interest because they do not receive enough jumping practice. The horses and riders become stiff and cold while waiting their turn. The horses do not jump well because of their gregariousness.

The second phase of this article deals with the details of instruction relative to the student. The instructor should be guided in the progress of the class by the natural ability of the individuals. While teaching the essentials of the military seat, he should endeavor to stress a portion at a time and not try to create a perfect position during the first few periods. He should know the characteristics of all the horses in his section so that he can give constructive criticisms that will enable the rider to be in balance with his horse. If there is any doubt in his mind regarding the peculiarities of a horse that is giving a rider trouble, he should ride the horse himself and demonstrate to the student the aids and balance necessary for him to be "with his horse." He should know various types of exercises and aids that will enable the student to assume the proper seat. Explanations should be made prior to the execution of these exercises so that the students can concentrate on that portion of his body that is to be benefited. A few of these exercises and aids are as follows: Thigh and loin muscles can be supplanted and strengthened by work at the walk and slow trot over varied ground and short steep slopes. Hands and balance can be aided by trotting and

galloping over low obstacles. The use of cut-away stirrups, if available, will in a short period of time cause an inexperienced rider to place his lower leg, angle, and foot in the proper position. Suppling exercises of all types are of great value to the rider for all parts of his body if performed on horses that are going along quietly. However, such exercises are valueless if attempted on nervous or impetuous horses. Throughout the first few weeks of instruction it is well to warn students to do a few setting-up exercises to take the stiffness out of the muscles that normally will become sore if the individual has not ridden recently.

The final phase of this article discusses the characteristics of untrained horses. It is believed that the students will progress much faster in their instruction if the following explanations are made early in the course: They should be told never to abuse a shying horse, or attempt to force him up to the object that caused him to shy. Rather the rider should ignore the incident or, if time permits, maneuver near the object, gradually getting closer each time, and in a few minutes it will be found that the horse has lost all fear and will walk by without hesitation. Had the rider attempted to force the horse up to the object, the same forcing would be necessary every day and eventually the horse would associate the object with the punishment and become nervous on approaching anything that is new to him. A nervous or impatient horse should be calmed down by long walks over varied terrain, rather than by attempting to work him into submission at fast gaits. Herd-bound or stable-bound horses should be worked as much as possible individually. A horse should never be allowed to graze while the rider is mounted. Insistence on this will reap its benefit during field exercises wherein the rider's attentions should not be disturbed by the tugging of a horse on the reins in his attempt to graze. Stubborn horses should be induced to perform the task required and the whip or spur should be used only when necessary. The process of demand and reward will soon cause a stubborn horse to become generous and responsive. The demands should always be easy to perform and less than the capabilities of the horse. For example, if, while schooling over a four-foot triple-bar jump, the horse refuses a couple of times, lower the jump to three feet and try again; if more refusals occur, take the top rail down, and eventually the horse having been induced to take parts of the obstacle will negotiate the original jump without having had a whip used on him. If, however, the horse is stubborn over the low obstacles, the whip will be necessary to make him go on. When a rider becomes irked at a horse, beyond all doubt the best procedure is to dismount and turn him over to an orderly. Attempting to school or punish a horse while the rider is impatient results in a loss to both horse and rider. Proper riding while schooling or jumping a horse requires constant thinking. If the rider fails to concentrate while negotiating a jumping course he will no doubt

take the wrong sequence of jumps or improperly conduct his horse to an obstacle. Many accidents have occurred as a result of the rider's relaxing the lower leg and thigh position. In order to avoid such accidents, students should be cautioned never to slouch in the saddle or relax so thoroughly that if the horse should shy or become startled the rider would be policed. The old saying, "Horses are right ninety-nine per cent of the time," may be a little far fetched, but in any event it is safe to say that the rider must know more than the horse. If a student can be made to realize that he may have given the wrong aid when his horse has responded incorrectly, that he, not the horse, may

be at fault, then the instructor has conveyed one of the most important essentials of horsemanship—the use of common sense.

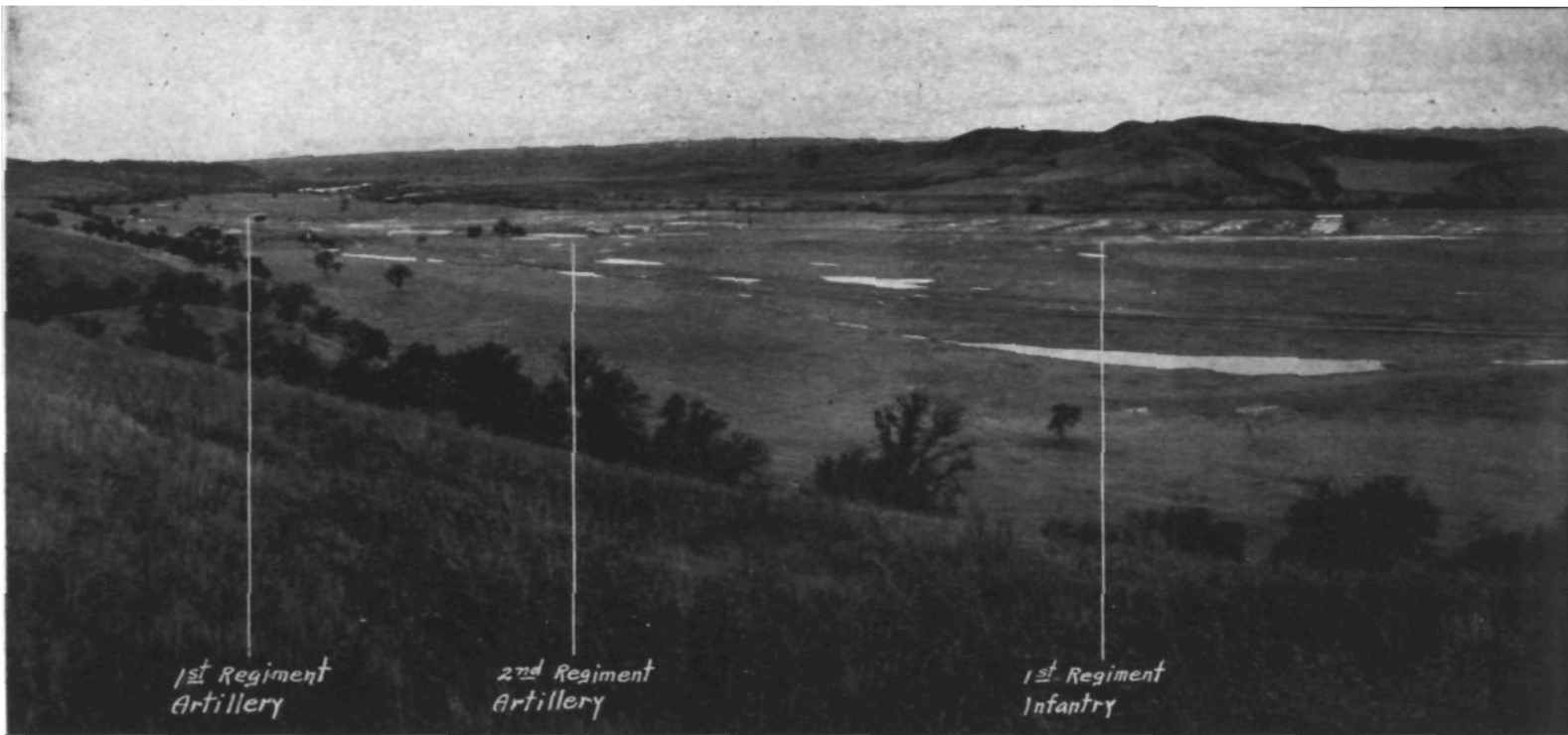
In conclusion, it is believed that if an instructor uses the salient features of this article while conducting a class the students will receive a maximum of individual instruction, they will receive a maximum of practice during jumping or schooling periods, the horses will receive the type of training which will make them easier to control for any kind of riding, and the riders will learn, from working individually, to dominate and properly control their horses.



F. A. S.

BY RAE BARKALOW

*Man, horse, caisson, piece,
Sand, dust, water, grease,
Leather squeaking, boots rubbing—
Kitchens rolling, men grubbing—
Horses, men, red-eyed, weary,
Days, cold, blazing, dreary,
Switchboard dead, battery rear,
Oh St. Barbara! Won't someone hear?
Consult the chart—fire direction,
Battery front—unlimber section!
Observation, plot deflection,
Wrong again—complete dissection.
Lead, swing, wheel, wire,
Position, ready, prepare, "Fire!"
Over? Short? Right—five zero—
Hell!!! Is this what makes a hero?*



The Camp Roberts Replacement Center

By Lieut. Col. O. F. Marston, F A

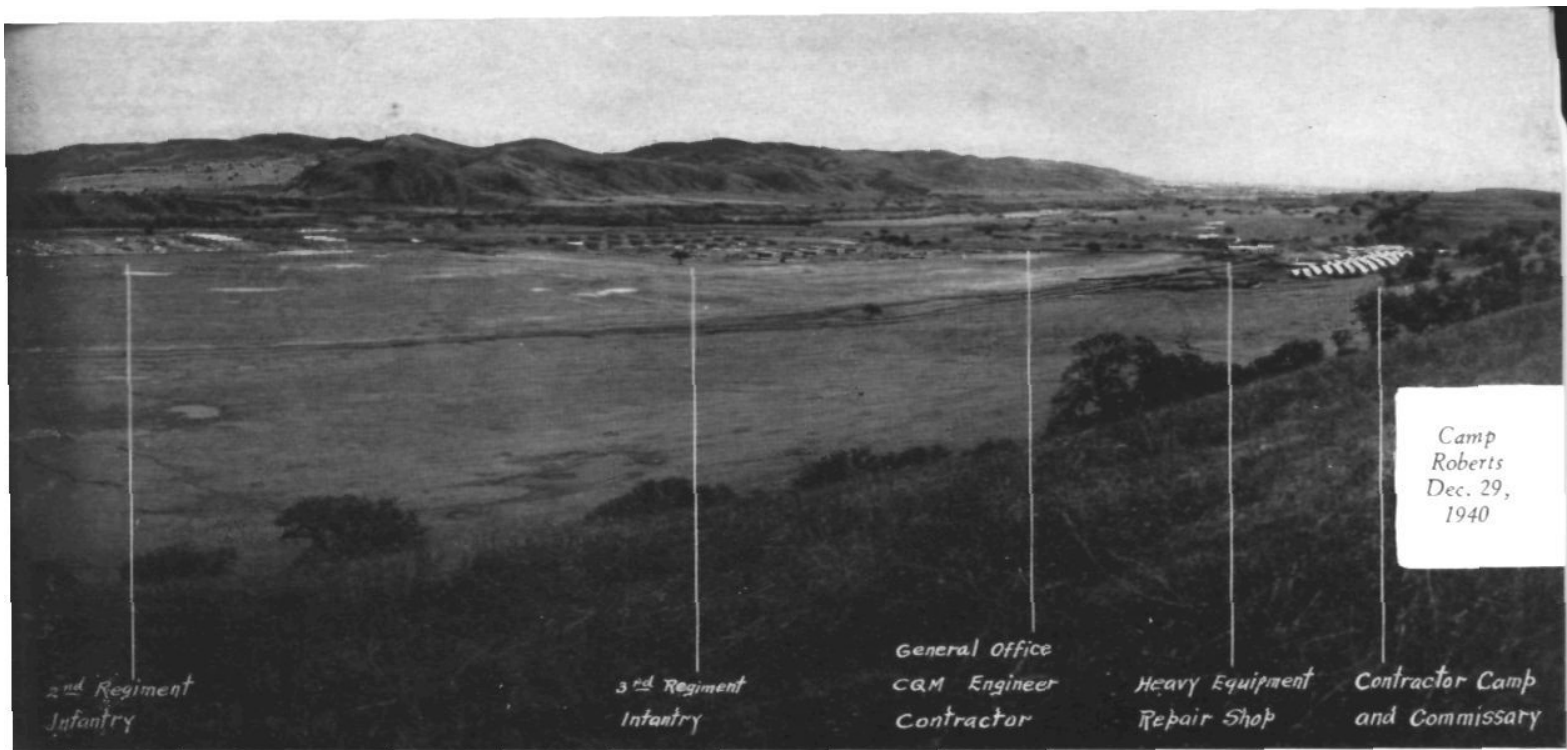
Editor's note: In the February issue of the JOURNAL Lt. Col. E. P. Parker described the general plan for organizing the three great Field Artillery Replacement Centers at Fort Bragg, Fort Sill, and Camp Roberts. In accordance with our promise, we are following Col. Parker's article with a series of reports on progress at the several Centers. Col. Marston, Plans and Training Officer at the Camp Roberts Center, furnishes the first of this series.

The Camp Roberts Replacement Center, Col. T. J. J. Christian, FA, Executive, is located at the junction of the Salinas and Nacimiento Rivers on U. S. Highway 101, about 13 miles north of Paso Robles, California, and about 2 miles north of the famous San Miguel Mission (built in 1797). It comprises about 37,000 acres of what was formerly the Nacimiento Ranch, and is just a few miles south of the Hearst Ranch (now called the Jolon Camp). The buildings are being constructed on a plateau about 100 feet above the Salinas River. The land was formerly used for cattle raising, for grain (wheat and barley), and alfalfa; and some of the surrounding rolling hills are covered with almond orchards. The climate consists of a rainy season and a dry season. It rarely freezes in the winter, and in the summer the temperatures rise to about 110 degrees. The camp site is well drained due to its location. The buildings have been very carefully located from a study of weather reports and information gained from the local inhabitants, so that in the dry season they receive the benefit of the prevailing winds up the Salinas River Valley. These winds start about 11 AM daily and have a marked effect on the temperature. (In improper locations the effect of these winds is not felt until around 3 PM.) This difference in location means that instruction may be carried on safely in the hottest part of the

day. Major General Ernest D. Peek, commanding the IX Corps Area, is taking a keen personal interest in the establishment of this Replacement Center, particularly as to the proper location of the buildings to take advantage of the terrain, locating the training aids within a short walking distance of the barracks, and at the same time laying out the entire project with a view to ease of maintenance and economy of operation.

As soon as the plan was definitely announced by the War Department General Danford wisely assembled, for temporary duty in his office, the Executives of the Field Artillery Replacement Centers, with a plans and training officer for each. These six officers worked out, with the able assistance of the officers and clerical force in the Chief's office, a complete set of tables and plans for the organization, equipment, and supply of the Replacement Centers, complete tables of basic allowances and equipment for the training courses to be given at the centers, tables of organization for the training cadres, and the personnel for these new training organizations. This prompt action has enabled the Field Artillery Centers to have approved requisitions, for all of the necessary property and training materiel, in the hands of the proper supply agencies in time to have it shipped and received so that the Field Artillery Replacement Centers will be able to open on schedule.

These Replacement Centers will operate directly under the Corps Area Commanders for administration and supply, through the station complement, and for training, directly under the War Department, through the Chiefs of Branches. Under the present plan of organization, the two Replacement Centers, Infantry and Field Artillery, at San Miguel, California, together with the station complement consisting of approximately 500 officers



and 25,000 men, will be commanded by a Major General. Each of the Replacement Centers will later be commanded by a Brigadier General.

The Field Artillery Replacement Center at Camp Roberts is the only one which had to be started from the ground up, and a few statistics will show clearly the enormous task which confronts the army, even in this small part of the National Defense Program. Captain J. T. Smoody, the Constructing Quartermaster, is very thoroughly seeing to the interests of the Government in the construction of this camp. Incidentally, he is in the Field Artillery Reserve and was called to active duty for this particular job. He is "keeping the caissons rolling."

The lease on this property was executed on October 21, 1940. The contract was started on November 2, 1940, and work on the site began on November 18. There are now (January 10, 1941) 3,000 men employed on the project, the job being about 10 per cent complete. About 30 per cent of the material for the project is now on hand, the lumber required being 33 million feet. The first small cadre, a part of the station complement, arrived about January 1. The remainder of the station complement cadre will arrive between February 1 and 15, and the initial cadre for the training of the selectees will arrive about February 15. The trainees are scheduled to arrive from the Reception Centers starting March 15 and initially will number about 15,000.

There will be a laundry and cold storage plant with an initial capacity for 21,000 men. There will be three 1,000-man theatres, an 1,100-bed hospital, 21 recreation buildings and 7 post exchanges. The barracks buildings will be the standard 63-man type with a small battery office, storeroom, and a modern kitchen for each battery. Butane gas is used for fuel and heating. Showers and toilet facilities are built into the barracks. All buildings are lighted with electricity. Each man will have a new steel cot, new mattress, and new pillows. Each officer will be provided with a small room in a barracks building. (This will not prevent his receiving commutation.)

The housing facilities for the families of officers, men and civilian employes are practically non-existent within a radius

of about 50 miles. The Federal Housing Administration is now considering a low-cost housing project for this vicinity to take care of the families of some of the civil service employes and of the non-commissioned officers below the first three grades. But as yet, no Federal Agency has been induced to give any consideration to housing of the officers' families. The writer has made a careful study of the situation and is attempting to interest the officers who will be ordered here in building their own homes under the FHA plan. Letters, explaining the housing situation and the plan, have been mailed to all the officers concerned whose addresses are known at this time. This plan is necessary because no contractors are willing to risk an investment due to the fact that the project is scheduled only until 1945. Under the FHA loan plan the carrying charges will amount to approximately $\frac{3}{8}$ to $\frac{1}{2}$ of the commutation, depending upon the officer's grade. The rental now charged on the few houses available, which already have been rented, amounts to from $\frac{2}{3}$ to the entire commutation.

Due to the untiring efforts of Lieutenant General Dewitt, Commander of the Fourth Army, the United States has acquired title to the Hearst Ranch, a few miles to the northwest of the Replacement Center. All of the Field Artillery organizations of the Fourth Army will fire the major portion of their service practice on ranges in the Jolon Area (Hearst Ranch). A complete range telephone system, concrete dugouts, observation posts, and moving target ranges are now being laid out in this area by the writer. This tract of land will be available for the year-round combined maneuvers of the army and for combat training. Service practice for the Field Artillery Units at the Camp Roberts Replacement Center will be held there.

The trainee, having received a basic foundation at the Replacement Center, will devote the remainder of his active duty with the military service of the United States to a completion of his preparation for the immediate defense of his country, his spiritual, moral, and physical well-being, so that upon his return to civilian pursuits he will be proud to say, "I am an American."



WITH THE ARMIES OF FOREIGN NATIONS



MISCELLANEOUS GERMAN GUNNERY METHODS

In the October 1940 number of *Artilleristische Rundschau* there are two articles concerning field artillery survey and related procedures:

"Computing closed traverse," by Major Bloedhorn of the Artillery School, is of interest in that it indicates the degree of technical ability required of the battalion and battery personnel. This is illustrated in the second article:

"Methods which may be used in the battery computing section." By Lt. Schulz.

Often there are situations in which the OP cannot function. In such cases a competent computing section must take its place.

Survey work in the battery is best placed under the direction of the chief of the computing section. He has the necessary personnel plus the most suitable means and equipment (for example traverse tables, etc.) which the Instrument NCO can hardly carry around with him. It seems useless to give the Instrument NCO a 1:25,000 map; often the firing positions are on the edge of the map so that sheets must be joined (with the possibility of errors due to mismatching), or the map suffers from rain or wear; or there may be only one copy which must necessarily remain with the computing section.

Usually the computing section is set up near the firing battery (perhaps in the OP truck). The battery can thus continue to shoot even though all communications are cut. In order to bring the first shot as close as possible to the target, the data for the first round, *even with observed fire*, should be obtained from the computing section. This also contributes towards economy of ammunition and surprise effect. It assumes, of course, that the coordinates of the target can be determined. Conditions which complicate the work of the OP such as rain, lack of a 1:25000 map, the requirement of working on two sheets, etc., and especially enemy reaction such as blinding of observation through the use of smoke, render such procedure essential. Even though the OP is free to observe, the computing section, nevertheless, can give the first command with the greatest accuracy, including corrections for weather; it gives this command to the batteries, with the OP listening in. Improvements in the fire, if necessary, are effected by commands from the OP based upon observation. This combination works out well; any slight delay in opening fire—a well-trained computing section occasions none—are offset by the rapid and exact effect upon the target.

The practice of "coupling" the batteries in the battalion has materially increased the work of the battalion artillery survey section. This may cause delay in the issue of meteorological data. However, while awaiting the weather report, the battery can prepare a provisional weather report through the medium of its computing section. Methods are given in German regulations, which make use of the simplest equipment; all that is essential is a compass. In this way the first shots, as indicated in the preceding paragraph, can be placed close to the target. The question of "coupling" the batteries of the battalion cannot be passed over without mentioning that this close linking of the batteries is by no means a universal solution; it is limited by the tactical situation which permits no hard and fast rules. There may not be time enough to perform the necessary survey, while communications may often be quite unsatisfactory. Therefore, the importance of the battery computing section remains.

The article lists the duties of the chief and two assistants in the computing section of the battery. These are enlightening. The men are equipped with the slide-rule and traverse tables among other items. An illustrative problem shows the work of these men who are expected to be quite at home with their equipment. In addition to computing range and deflection from map data they apply the corrections of the moment, determine the fork, etc.

The use of the computing section in air-ground adjustment of fire is illustrated. Shots are reported by the observer with respect to the target, by means of an imaginary clock face centered about it with 12:00 on prolongation of the gun-target line. A sine-cosine table is given whereby bursts may be corrected in range and deflection as their distance and "hour" from the target is given. This table is used by the computing section.

The successful work of the computing section is possible only if its personnel as well as necessary replacements are carefully selected and thoroughly trained. This means mathematical ability, exact work, thorough artillery training, command of technique, ability to think independently. On the other hand, the tendency to convert the computing section into a bureau must be sharply repressed. Every means must be employed to encourage and maintain soldierly activity, such as physical exercise and work with gas masks.

—T. N.

FROM THE CHIEF'S OFFICE

TRAINING PUBLICATIONS AND TRAINING AIDS The present War Department Literature Program contemplates the eventual elimination of all Training Regulations, Technical Regulations, and Training Manuals. They will be replaced by Field Service Regulations, Field Manuals and Technical Manuals.

Field Manuals constitute the primary means for expanding the basic doctrine of the Field Service Regulations. They are published in three general divisions, as follows:

a. The Field Manuals for the several arms and services contain instructions relative to the tactics and technique involved in the employment of such arms and services, together with data needed in the theater of operations.

b. The Basic Field Manuals contain training and reference data applicable to more than one arm or service with special reference to the smaller units.

c. The Staff Officers' Field Manual is a compilation of information and data to be used as a guide for the operations in the field of the general staff or a similar staff groups of all units in peace and war.

Technical Manuals consist of a series of pamphlets supplementing the Field Manuals, covering subjects, the separate treatment of which is considered essential to a fuller accomplishment of the training prescribed in the Field Manual series. The scope of this series includes pamphlets describing materiel and containing instructions for the operation, care, and handling thereof; guide books for instructors and specialists; material for extension courses, and reference books.

The purpose of *Training Circulars* is to promulgate new doctrine for test; to issue minor changes in Field Manuals and Technical Manuals, or other training literature and to disseminate War Department training policies from time to time.

The purpose of *Mobilization Training Programs* is to provide training programs for Regimental Unit Training Centers and for Enlisted Replacement Centers.

Training Films are divided into sound and silent, and all subjects are available in the standard 35-mm. size. Those available in 16-mm. size are so indicated in the list of films given in FM 21-6.

Film Strips are prepared for use in delinescopes. Those available on October 1, 1940, are listed in FM 21-6. Additional ones have been prepared since the publication of FM 21-6.

A list of all publications available on October 1, 1940, is contained in Basic Field Manual FM 21-6, dated October 1, 1940.

The following is the present status of various Field Artillery publications and training aids:

FIELD ARTILLERY FIELD MANUALS NOW AVAILABLE:

FM 6-5 Organization and Drill.
FM 6-20 Tactics and Technique.
FM 6-40 Firing.

Service of the Piece:

FM 6-50 75-mm. Gun, M1897, and M1897A4.
FM 6-55 75-mm. Gun, M2, Horse-Drawn, and Truck-Drawn.
FM 6-60 75-mm. Gun, M1916 and M1916A1, Horse-Drawn and Truck-Drawn.
FM 6-65 75-mm. Gun, M1917A1, Truck-Drawn.
FM 6-70 75-mm. Howitzer, Horse- and Truck-Drawn.
FM 6-80 155-mm. Howitzer, M1918A1, Truck-Drawn,
FM 6-85 155-mm. Gun, M1918.
FM 6-95 240-mm. Howitzer, M1918.
FM 6-110 Pack Artillery.
FM 6-120 The Observation Battalion.
FM 6-130 Reference Data.

Manuscript Has Been Prepared:

FM 6-125 Examination of Gunners.

TECHNICAL MANUALS

Now Being Printed:

TM 6-120 Conduct of Field Artillery Fire using Air Observation:
Part One: Conduct of Fire.
Part Two: Radio Procedure.
Appendix: Fire Control Code.
TM 6-215 Abbreviated Firing Tables.
TM 6-220 Fire Control Instruments.
TM 6-225 FA Trainer.

Manuscript Has Been Prepared:

TM 6-200 Field Artillery Survey.

Will Be Prepared at a Later Date:

TM 6-205 Field Artillery Meteorology.

TRAINING FILMS

A complete list of field artillery training films now available is given in FM 21-6.

FILM STRIPS

Now Available:

FS 6-1 Field Artillery Wire Communication.
FS 6-2 Field Artillery Wire Communication.

Now Being Produced in Signal Corps Laboratory:

FS 6-3 Field Artillery Firing—Preparation of Fire.

FS 6-4	Field Artillery Firing—Conduct of Fire I.
FS 6-5	Field Artillery Firing—Conduct of Fire II.
FS 6-6	Field Artillery Firing—Conduct of Fire III.
FS 6-7	Field Artillery Firing—Elementary Gunnery.
FS 6-8	Field Artillery Weapons.
FS 6-9	Field Artillery Prime Movers and Vehicles.

FIELD ARTILLERY BOOKS

The following Field Artillery Books are official for ROTC use:

Book 20 (with Supplement)	— Military Fundamentals.
Book 120	—Elementary Automotive Instruction.
Book 140	—Elementary Mounted Instruction.
Book 160	—Elementary Gunnery.
Book 200	—The Battery Detail.
Book 223	—Elementary Tactics.

TABLE OF BASIC ALLOWANCES

No.	Title	Date
6-1	Field Artillery Units except Armored Division and Pack Units.	Nov. 1, 1940.
6-2	Field Artillery of Armored Division.	Now being prepared.
6-3	Pack Field Artillery.	Nov. 1, 1940.

TABLES OF ORGANIZATION

The following Tables of Organization have been prepared and are now available:

Number	Title	Date
SQUARE DIVISION		
6-10	FA Brig, Sq Div	11/1/40
6-10-1	FA Hdqrs & Hdqrs Btry, Brig, Sq Div	11/1/40
6-21	FA Regt, 105-mm How, Trk-d	11/1/40
6-22	FA Hdqrs & Hdqrs Btry, Regt, Lt or Med, Trk-d	11/1/40
6-41	FA Regt, 155-mm How, Trk-d	11/1/40
6-85	FA Bn, Lt, Trk-d	10/1/40
6-86	FA Hdqrs & Hdqrs Btry, Bn, Lt or Med, Trk-d	10/1/40
6-87	FA Btry, 105-mm How, Trk-d	10/1/40
6-88	FA Btry, S&A, Lt Bn, Trk-d	10/1/40
6-95	FA Bn, Med, Trk-d	10/1/40
6-97	FA Btry, 155-mm How, Trk-d	10/1/40
6-98	FA Btry, S&A, Med Bn, Trk-d	10/1/40
6-99	FA Btry, 75-mm Gun, AT, Trk-d	10/1/40
TRIANGULAR DIVISION		
6-80-1	Hdqrs & Hdqrs Btry, Tri Div, FA	10/1/40
6-80-1	Hdqrs & Hdqrs Btry, Tri Div, FA	10/1/40
6-85	FA Bn, Lt, Trk-d	10/1/40
6-86	FA Hdqrs & Hdqrs Btry, Bn, Lt or Med, Trk-d	10/1/40
6-87	FA Btry, 105-mm How, Trk-d	10/1/40
6-88	FA Btry, S&A, Lt Bn, Trk-d	10/1/40
6-95	FA Bn, Med, Trk-d	10/1/40
6-97	FA Btry, 155-mm How, Trk-d	10/1/40
6-98	FA Btry, S&A, Med Bn, Trk-d	10/1/40
6-99	FA Btry, 75-mm Gun, AT, Trk-d	10/1/40
CAVALRY DIVISION		
6-16	FA Hdqrs & Hdqrs Btry, Bn, 75-mm Gun, H-D, or 75-mm Field How, H	11/1/40
6-19	FA Btry, Ser, Trk-d, Bn, 75-mm Gun, H-D, or 75-mm Field How, H	11/1/40
6-85	FA Bn, Lt, Trk-d	10/1/40

Number	Title	Date
6-86	FA Hdqrs & Hdqrs Btry, Bn, Lt or Med, Trk-d	10/1/40
6-87	FA Btry, 105-mm How, Trk-d	10/1/40
6-88	FA Btry, S&A, Lt Bn, Trk-d	10/1/40
6-110	FA, Cav Div	11/1/40
6-110-1	Hdqrs & Hdqrs Btry, Cav Div, FA	11/1/40
6-115	FA Bn, 75-mm Field How, H	11/1/40
6-117	FA Btry, 75-mm Field How, H	11/1/40

CORPS

6-22	FA Hdqrs & Hdqrs Btry, Regt, Lt or Med, Trk-d	11/1/40
6-41	FA Regt, 155-mm How, Trk-d	11/1/40
6-50	FA Brig, Corps	11/1/40
6-50-1	FA Hdqrs & Hdqrs Btry, Regt, Corps	11/1/40
6-51	FA Regt, 155-mm Gun, Mtz	11/1/40
6-52	FA Hdqrs & Hdqrs Btry, Regt, 155-mm Gun or 240-mm How, Mtz	11/1/40
6-55	FA Bn, 155-mm Gun, Mtz	11/1/40
6-56	FA Hdqrs & Hdqrs Btry, Bn, 155-mm Gun, or 240-mm How, Mtz	11/1/40
6-57	FA Btry, 155-mm Gun, Mtz	11/1/40
6-59	FA Btry, Ser, Bn, 155-mm Gun or 240-mm How, Mtz	11/1/40
6-75	FA Bn, Obsn	11/1/40
6-76	FA Hdqrs & Hdqrs Btry, Bn, Obsn	11/1/40
6-77	FA Btry, Obsn	11/1/40
6-86	FA Hdqrs & Hdqrs Btry, Bn, Lt or Med, Trk-d	10/1/40
6-95	FA Bn, Med, Trk-d	10/1/40
6-97	FA Btry, 155-mm How, Trk-d	10/1/40
6-98	FA Btry, S&A, Med Bn, Trk-d	10/1/40
6-99	FA Btry, 75-mm Gun, AT, Trk-d	10/1/40

G.H.Q.

6-11	FA Regt, 75-mm Gun, H-D	11/1/40
6-15	FA Bn, 75-mm Gun, H-D	11/1/40
6-16	FA Hdqrs & Hdqrs Btry, Bn, 75-mm Gun, H-D, or 75-mm Field How, H	11/1/40
6-17	FA Btry, 75-mm Gun, H-D	11/1/40
6-19	FA Btry, Ser, Trk-d, Bn, 75-mm Gun, H-D, or 75-mm Field How, H	11/1/40
6-22	FA Hdqrs & Hdqrs Btry, Regt, Lt or Med, Trk-D	11/1/40
6-52	FA Hdqrs & Hdqrs Btry, Regt, 155-mm Gun or 240-mm How, Mtz	11/1/40
6-56	FA Hdqrs & Hdqrs Btry, Bn, 155-mm Gun or 240-mm How, Mtz	11/1/40
6-59	FA Btry, Ser, Bn, 155-mm Gun or 240-mm How, Mtz	11/1/40
6-141	FA Regt, 240-mm How, Mtz	11/1/40
6-145	FA Bn, 240-mm How, Mtz	11/1/40
6-147	FA Btry, 240-mm How, Mtz	11/1/40
6-155	FA Bn, 75-mm How, Pk	11/1/40
6-156	FA Hdqrs & Hdqrs Btry, Bn, 75-mm How, Pk	11/1/40
6-157	FA Btry, 75-mm How, Pk	11/1/40
6-159	FA Btry, Ser, Bn, 75-mm How Pk	11/1/40

ARMORED DIVISION

6-122	FA Hdqrs & Hdqrs Btry, Regt, 105-mm How, Armd Div	11/15/40
6-127	FA Btry, Regt, 105-mm How, Armd Div	11/15/40
6-128	FA Btry, Ser, Regt, 105-mm How, Armd Div	11/15/40
6-129	FA Train, Amm, Trk-d, Regt, 105-mm How, Armd Div	11/15/40
6-165	FA Bn, 105-mm How, Armd Div	11/15/40
6-166	FA Hdqrs & Hdqrs Btry, Bn, 105-mm How Armd Div	11/15/40

6-167	FA Btry, Bn, 105-mm How, Armd Div	11/15/40
6-168	FA Btry, 75-mm Gun, AT, Armd Div.....	11/15/40
6-169	FA Btry, Ser, Bn, 105-mm How, Armd Div	11/15/40

MOBILIZATION TRAINING PROGRAMS

Field Artillery Mobilization Training Programs for field artillery regiments at Unit Training Centers and for field artillery replacements at Enlisted Replacement Centers (MTP 6-1) have been distributed. These programs are now being used to excellent advantage in training units and will be the basis for training in the Replacement Centers now being established at Fort Bragg, N. C., Fort Sill, Oklahoma, and Camp Roberts, California.

SOLDIERS' HANDBOOK

The Soldiers' Handbook, FM 21-100, has been printed and the manuscript for Field Artillery Supplement to this book is now being prepared. This supplement has tentatively been designated as Technical Manual 6-600.

MOTOR VEHICLES

The Field Artillery Board has concluded preliminary tests of a 4-wheel-drive quarter-ton liaison truck. These tests indicate that the vehicle has great promise; it has been recommended to replace the motor tricycle now provided in tables of basic allowances. A certain number has been recommended for liaison sections in lieu of some of the ½-ton trucks now provided.



NOTES FROM THE FIELD ARTILLERY SCHOOL



INDEX OF PUBLICATIONS PERTAINING TO FIELD ARTILLERY MATERIEL

GENERAL INDEX

Basic Allowances, FA Equipment and Supplies—Tables of Basic Allowances, 1940.
Chemical Warfare Materiel—CWS Standard Nomenclature and Price List.
Field Artillery Books, FAS—Price List, FAS.
Instructional Memorandums, FAS—Price List, FAS.
Field Manuals, WD—FM 21-6.
Firing Tables—SNL F-69.
Ordnance Notes (Issued Prior to TR's)—Index published by arsenal.
Standard Nomenclature and Price Lists (SNL's)—Ordnance Publications for Supply Index, or FA Table of Allowances.
Technical Regulations (TR's) and Technical Manuals (TM's)—FM 21-6 (Gives date of publication, list of changes, and distribution).
SNL C-1—Gives major items of pack, light, and medium FA; cost price and combinations of guns and carriages.
Tables of Organization—

DETAILED INDEX

Ammunition, General. (See particular weapons for their ammunition.)
AR 50-10 (Range regs, for firing ammunition in peace time)
AR 760-400—(Alws of target materials)
AR 775-10—(General laws)
TR 1370-B—(Blank ammunition)
TR 1370-G—(Bombs)
SNL N-10—(Surveillance, demolition, testing, equipment)
SNL R-7—(Demolition and smoke puff material)
TM 9-900 (Formerly TR 1370-A)—(Ammunition in general)
TM 9-1990—(Small arms ammunition; formerly published in TR 1350-A)
SNL S-1—(Bombs)

SNL S-5—(Instructional material; grenades; pyrotechnics)
FM 9-5—(Ordnance Field Manual)
Ordnance Field Service Bulletin 3-7 (Price list)
Ordnance Pamphlet 5981—(Complete round charts)
Ordnance Safety Manual 7224—(Chemical fillers)
FAB 100—(Ammunition for Division Artillery)
Instruction Mimeo, Mat. 6, FAS—(General construction of ammunition, care and handling, etc.)
Board, Plotting, Flash, Observation.
TM 6-220
Board, Plotting, Sound Ranging, M1
SNL F-154
TM 6-220
Caisson, Light, M1
SNL C-29
Caisson, Gun, 75-mm., M1918
TR 1305-A
SNL C-5
TR 1405-A (Ordnance Maintenance)
Car, Scout, M2
SNL G-32
Cart, Artillery, M1918
TR 1305-A
SNL C-11
TR 1405-A—(Ord Maint)
Chest, Cleaning Materials and Small Stores
SNL M-8
Chest, Miscellaneous Small Parts
SNL M-8
Circle, Aiming, M1
SNL F-160
TM 6-220
Circle, Aiming, M1918, French
TR 310-20
SNL F-6
TM 6-220 (To supersede TR 310-20)

Cleaning and Preserving Materials, and Special Supplies

- TM 9-850 (Formerly TR 1395-A)
- SNL K-1—(Cleaning and preserving materials)
- SNL K-2—(Special supplies)
- Instruction Memo, FAS, Mat. 5

Construction, FA Materiel

- Instruction Mimeo. FAS, Mat. 3

Compass, Prismatic, M1918

- TR 310-20
- SNL F-23
- TM 6-220 (To supersede TR 310-20)

Device, Night Lighting

- SNL F-18

Finder, Range, 1-Meter Base, M1916

- TR 310-20
- SNL F-26
- TM 6-220 (To supersede TR 310-20)

Fire Control Equipment

- (See Instruments, fire control)

Firing Tables

- SNL F-69—(Index)
- TM 6-215 (Abbreviated firing tables)

Fuzes

- (See Ammunition and specific weapon)

Glasses, Field, EE, 6-Power

- TR 310-20
- SNL F-34
- TM 6-220 (To supersede TR 310-20)

Gun, Machine, Cal. .30, Browning M1919A4, With Tripod Mount M2

- TR 1300-30G
- FM 23-45
- FM 23-50
- SNL A-6
- SNL A-31
- TR 1400-30C—(Ord Maint)
- TM 9-1990—(Ammunition) (Formerly TR 1350-A)
- SNL T-1—(Ammunition)
- Firing tables 0.30-A-1 or 0.30-C-4

Gun, Machine, Cal. .50, Browning, M2, Heavy Battel, Flexible With Tripod Mount M3

- TR 1300-50A
- FM 23-60
- FM 23-65 (Mounted in combat vehicles)
- SNL A-39
- TM 9-1990—(Ammunition) (Formerly TR 1350-A)
- SNL T-1—(Ammunition)
- Firing tables 0.50-F-2 and 0.50-AA-E-4

Gun, 37-mm., M1916

- TR 1300-37A
- FM 23-75
- SNL A-7
- TR 1410-120—(Ord Maint)
- TR 1350-37A—(Ammunition)
- SNL R-1—(Ammunition)
- SNL R-5—(Blank Ammunition)
- Firing Tables 37-H-2 (For Shell, LE.MK I)
- Firing Tables, 37-0-1 (For Shell, practice MK II)
- Firing Tables, FAS
- IM-Mat 16, FAS
- (For subcaliber equipment, see specific weapon)

Gun, and Carriage, 37-mm., M4 (Antitank)

- Rock Island Arsenal Notes and Infantry School Notes.
- FM 23-70
- FT 37-M-3 Abridged
- FT 37-P-1

Gun and Carriage, 2.95 Inch, Mountain, Vickers-Maxim

- Ordnance handbook 1761
- SNL F-22—(Telescope, Panoramic, M6)
- SNL F-126—(Fuze setter, hand, M1912A1)
- SNL R-1—(Ammunition)
- SNL R-3—(Fuzes and Primers)
- SNL R-5—(Blank ammunition)
- TR 1370-B—(Blank ammunition)
- SNL R-6—(Drill and dummy ammunition)
- TR 1370-D—(Drill and dummy ammunition)
- Firing tables 2.95-J-1
- Firing tables, Form 1007-A

Gun and Carriage, 75-mm., M2A1, and M2A2

- TM 9-305 (To supersede the supplement to SNL C-12)
- SNL C-12, with supplement
- FM 6-55 (Service of the piece; maintenance)
- SNL F-22—(Telescope, panoramic, M5)
- SNL F-166—(Mount, telescope, M15; Quadrant, range M1)
- Frankford Arsenal Notes (Mount, telescope, M15; Quadrant, range M1)
- IM-Mat 9, (M) FAS
- FAB 100
- (See Gun, 75-mm. M1897 (Fr.) for tube, recoil mechanism, ammunition, fuze setter, Firing tables)

Gun and Carriage, 75-mm. M2A3 (Antitank)

- TM 9-305
- RIA Notes

Gun and Carriage, 75-mm. M1897 (French), M1897M1A2, and

- M1897A4 (Martin-Parry Adapter)
- TM 9-305 (Formerly TR 320-95)
- SNL C-25—(High Speed Carriage)
- SNL C-4—(Wooden wheel carriage)
- FM 6-50—(Service of the piece; Maintenance)
- TR 1405-75A—(Ordnance Maint) (Formerly TR 1410-126)
- SNL F-22—(Telescope, panoramic, M6)
- SNL F-28—(Sight, M1901, French)
- SNL F-113—(Mount, telescope, M5)
- SNL F-11—(Fuze setter, bracket M1916)
- TR 1355-75A—(Ammunition)
- SNL R-1—(Ammunition)
- FAB 101—(Ammunition)
- SNL R-3—(Fuzes and primers)
- TR 1370-B—(Blank ammunition)
- SNL R-5—(Blank ammunition)
- TR 1370-D—(Drill and dummy ammunition)
- SNL R-6—(Drill and dummy ammunition)
- FAB 100—IM-Mat 9 FAS (Ammunition)
- Ordnance handbook 1817 (for sight, M1901)
- Firing tables 75-B-4 and 75-B-4 Supplement; 75-B-2, 2b, 2d, 2f; 75-B-4-2b, 2c. (MK 1 shell, Chem Shell, Shrapnel)
- Firing tables 75-Z-2 (M48 Shell)

Gun and Carriage, 75-mm. M1916, M1916A1 and M1916-M1A1 (American)

- TM 9-310 (To supersede TR 1305-75B)
- FM 6-60 (Service of the piece; Maintenance)
- TR 1305-75B
- SNL C-2 (M1916) (Wooden wheel carriage)
- SNL C-30 (M1916A1) (High speed carriage)
- SNL F-29 (Sight M1916)
- Ordnance Handbook 1819 or WD Doc. 1035.
- (See Gun, 75-mm., M1897 (Fr.) for ammunition, fuze setter.)
- SNL F-22—(Telescope, panoramic M6)
- SNL P-4—(Ammunition for AA use)
- TR 1405-75B—(Ordnance Maint) (1940)
- Firing tables 75-E-3
- Firing tables 75-E-1, 2b, 2d, 2f.

- Gun and Carriage, 75-mm. (British), M1917, M1917A1
 TM 9-315 (To supersede the supplement to SNL C-27)
 SNL C-27, with supplement, (High speed carriage)
 FM-6-65 (Service of the piece; maintenance)
 SNL C-9—(Wooden wheel carriage)
 Ordnance Handbook 1815 (Wooden wheel carriage)
 SNL F-22—(Telescope, panoramic, M6)
 Firing tables 75-E-3; TD 75-E-1, 2b; TD 75-E-1 2d; TD 75-E-1, 2f.
 (See Gun, 75-mm., M1897 (Fr.), for ammunition, fuze setter)
- Gun and Carriage 155-mm. (GPF), M1917, M1918, M2, M3
 TM 9-345 (To supersede TR 1305-155C)
 TR 1305-155C
 SNL D-11
 FM 6-85 (Service of the piece; maintenance)
 Rock Island Arsenal Notes GC-12 (High speed carriage)
 TR 1405-155C. (Ordnance Maint.)
 SNL F-22—(Telescope, panoramic, M6)
 SNL F-24—(Sight, quadrant, M1918)
 SNL F-127—(Fuze setter, hand, M1913)
 TR 1355-155B—(Ammunition)
 SNL P-1—(Projectiles)
 SNL P-3—(Propelling charges)
 SNL P-4—(Subcaliber ammunition)
 SNL P-6—(Fuzes, primers)
 SNL P-7—(Instructional material)
 TR 1370-D—(Drill and dummy ammunition)
 SNL R-2—(Shrapnel)
 Firing tables 155-B-4; 155-B-5; and 155-B-4a. b. 155-U-1. (Shell)
 Firing tables 155-C-2 (Shrapnel)
- Gun and Carriage, 155-mm. M1 (Formerly known as Gun T4 on
 Gun-How mount T2E1)
 TM 9-350
 SNL D-24 with supplement
 FM 6-90 (Service of the piece; maintenance)
 Rock Island Arsenal Notes GC-1
 Frankford Arsenal Notes, Aug. 30, 1935 (Quadrant Mount T2 and
 Telescope Mount T16).
- Helmet, Steel, M1917A1 and M1917
 SNL B-13
- History of Development of FA Materiel
 Instruction Mimeo, Mat. 2, (R) FAS.
- Howitzer and Carriage, 75-mm. M1 (Pack)
 TM 9-320 (To supersede TR 1305-75E)
 TR 1305-75E
 SNL C-20
 SNL F-106—(Mount, telescope M3; Telescope, pan, M1)
 SNL F-126—(Fuze setter, hand, M1912A4)
 SNL R-1—(Ammunition)
 TR 1355-75A—(Shrapnel projectile)
 SNL R-3—(Fuzes and primers)
 SNL R-5—(Blank ammunition)
 IM-Mat. 7, (M) FAS
 TR 1370-B—(Blank ammunition)
 SNL R-6—(Dummy and drill ammunition)
 TR 1370-D—(Dummy and drill ammunition)
 Firing tables 75-1-2, with changes C1
 FM 6-110 (Pack artillery)
- Howitzer and Carriage, 75-mm. M3, or M3A1 (Field)
 TM 9-320 (To supersede the supplement to SNL-C-26)
 SNL C-26, with supplement
 FM 6-70 (Service of the piece; maintenance)
 Rock Island Notes HC-6
 SNL F-106—(Telescope, panoramic, M1)
 SNL F-169—(Mount, telescope M16; Quadrant, range M3;
 Telescope, elbow M5)
- IM-Mat. 8, (M) FAS
 TR 1405-75B—(Ordnance Maint)
 SNL F-11—(Fuze setter, bracket, M1916)
 (See How. 75-mm. M1 for ammunition, firing tables and hand
 fuze setter.)
- Howitzer and Carriage, 105-mm. M1A1 (eventually TM 9-325 for
 105-mm. how M2)
 Rock Island Arsenal Notes HC-4 and HC-5
 FM 6-75—(Service of the piece; maintenance)
 SNL F-22—(Telescope, panoramic M5)
 SNL F-112—(Mount, telescope, M7)
 SNL F-126—(Fuze setter, hand, M1912A5)
 (See How. 75-mm., M1 for SNL's on ammunition)
 Firing tables 105-H-2, with changes C1
- Howitzer and Carriage, 105-mm. M2
 TM 9-325
 FM 6-75—(Service of the piece; maintenance)
 Rock Island Arsenal Notes HC-15 (For T5 carriage)
 (See How 105-mm. M1 for other references)
- Howitzer and Carriage, 155-mm., M1917, M1918, M1917A1,
 M1918A1, M1918A3
 TM 9-330 (To supersede TR 1305-155A and the supplement to
 SNL C-28)
 SNL C-28, with supplement (High speed carriage)
 TR 1305-155A
 SNL C-3—(M1918—wooden wheel carriage)
 SNL C-17—(M1917—wooden wheel carriage)
 FM 6-80—(Service of the piece; maintenance)
 TR 1405-155A—(Ordnance maint)
 SNL C-7—(Limber and caisson)
 SNL F-22—(Telescope, panoramic M6)
 SNL F-24—(Sight, quadrant, M1918, M1918A1)
 SNL F-127—(Fuze setter, hand, M1913A1)
 TR 1355-155A—(Ammunition)
 SNL R-2—(Ammunition)
 FAB 101—(Ammunition)
 SNL R-3—(Fuzes; primers)
 TR 1370-D—(Drill and dummy ammunition)
 SNL R-6—(Drill and dummy ammunition)
 FAB 100
 Firing tables 155-A-2 (Shrapnel)
 Firing tables 155-D-3; 155-V-1. (Shell)
 (See 155-mm. How. M1918)
- Howitzer and Carriage, 8-inch MK VI and MK VII (British)
 M1917
 SNL P-3—(Ammunition)
 Ordnance Handbook 1798
 WD Doc. 1083—(Sights)
 WD Doc. 1090—(Sights)
 Firing tables 8-C-2 (Mk VI)
 Firing tables 8-B-1 (Mk VII)
- Howitzer and Carriage, 8-inch, M1
 (For details of carriage see 155-mm. Gun M1)
 FM 6-90—(Service of the piece; maintenance)
- Howitzer and Carriage, 240-mm. M1918
 TM 9-340 (To supersede TR 1305-240A)
 TR 1305-240A
 SNL D-4
 FM 6-95—(Service of the piece; maintenance)
 SNL F-22—(Telescope, panoramic M6)
 SNL F-24—(Sight, quadrant, M1918, M1918A1)
 TR 1355-240A—(Ammunition)
 FAB 101—(Ammunition)
 SNL P-1—(Projectiles)
 SNL P-3—(Propelling charges)
 SNL P-6—(Fuzes; primers)
 SNL P-7—(Instructional material)

- TR 1370-D—(Drill and dummy ammunition)
Firing tables 240-B-2, with changes C1
- Instrument, Azimuth, M1918
TR 310-20
SNL F-2
TM 6-220 (To supersede TR 310-20)
- Instruments, Fire Control
TM-6-220 (To supersede TR 310-20)
TR 310-20)
SNL F-1
SNL F-2—(Obsn Bn equipment)
TR 1310-50—(Antiaircraft)
- Limber, Light, M2
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- Limber, Gun Caisson, and Gun Carriage, 75-mm. M1918
TR 1305-A
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TR 1405-A—(Ordnance Maint)
- Maintenance of Materiel
AR 35-6540—(Requisitions of property)
AR 35-6560—(Receipt, shipment, and issue of property)
AR 45-30—(Ordnance Field Service in time of peace)
Ordnance Field Service Bulletins and Circulars.
Ordnance Index of Publications for Supply. (Index of SNL's)
SNL K-1—(Basis of issue of cleaning materials, etc.)
SNL K-2—(Special oils, gases, and compounds)
TR 1-10—(Index of Training and Technical Regulations)
TM's (9 series) (To supersede TR's of the 1300 and 1400 series)
TR's (1300 series). (Battery maintenance of FA weapons)
TR's (1400 series). (Ordnance maintenance of FA weapons)
TR 1395-A—(Cleaning and preserving materials)
FAFM's, Service of the piece. (Maintenance operations in the field for specific weapons.)
Instruction Memo.-Mat. 5, (R) FAS. (General principles of maintenance; cleaning and preserving materials.)
Instruction memorandums, FAS. (Maintenance operations for specific weapons.)
Instruction memo., Mat. 6, FAS. (Care and maintenance of ammunition)
- Materials, Cleaning and Preserving
TR 1395-A
SNL K-1
Instruction Memo., Mat. 5—Maintenance of FA Materiel.
(See also TR's for specific weapons)
- Materials, Target
AR 760-400—(Allowances)
- Mortar, 60-mm., M2 (Not issued to FA)
FM 23-85
SNL A-43
Firing tables 60-B-1 Abridged
- Mortar, 81mm., M1 (Not issued to FA)
SNL A-33
FM 23-90
TR 1350-3a—(3-inch trench mortar)
Frankford Arsenal Notes. (Sight M2A3)
SNL F-148—(Sight M2)
SNL R-4—(Ammunition)
Firing tables, 81-A-1, 81-A-1 Abridged, 81-B-2 Abridged, 81-C-1 Abridged, 81-B-2
- Mortar, 4.2-inch, Chemical M1A1 (Not issued to FA)
TR-1120-75
- Pack Equipment
SNL C-20
- Pistol, Automatic, Cal. .45, M1911 and M1911A1
TR 1300-45A
SNL B-6
TR 1400-45A—(Ordnance maint)
- FM 23-35
TM 9-1990—(Ammunition) (Formerly TR 1350-A)
SNL T-2—(Ammunition)
- Pyrotechnics
SNL S-4
- Quadrant, Gunners, M1918
SNL F-13 (To be replaced by F-140)
- Recorder, Time Interval
TR 310-20
SNL F-36
TM 6-220 (To supersede TR 310-20)
- Reel, Artillery, M1909M1
TR 1305-A
SNL C-11
TR 1405-A—(Ordnance Maint)
- Reel, Battery, M1917A2
TR 1305-A
SNL C-10
TR 1405-A—(Ordnance Maint)
- Revolver, Cal. .45, Colt or S&W
SNL B-7
TR 1400-45A—(Ordnance Maint)
TM 9-1990—(Ammunition) (Formerly TR 1350-A)
SNL T-2—(Ammunition)
- Rifle, Automatic, Cal. .30, Browning, M1918
SNL A-4
FM 23-20
TR 1400-30E—(Ordnance Maint)
TM 9-1990—(Ammunition) (Formerly TR 1350-A)
SNL T-1—(Ammunition)
Firing tables 0.30-A-3 and 0.30-C-4.
- Rifle, Semi-Automatic, Cal. .30 M1 Garand
FM 23-5
SNL B-21 with supplement
SNL T-1—(Ammunition)
TM 9-1990—(Ammunition) (Formerly TR 1350-A)
- Setter, Fuze, Bracket, M1916
SNL F-11
FAB 100
Instruction Memo. Mat. 4, FAS.
- Setter, Fuze, Hand, M1912
SNL F-126
Instruction Memo. Mat. 4, FAS.
- Setter, Fuze, Hand, M1913
SNL F-127
FAB 100
Instruction Memo. Mat. 4, FAS.
- Shotgun
SNL B-9
SNL T-3—(Ammunition)
- Sighting Equipment
TR 1320-A (Not yet published)
SNL F-1
SNL F-2—(Obsn Bn equipment)
FAB 100
Instruction memo, Mat. 4, FAS. (General principles in construction of sights and mounts)
(See specific weapons)
- Subcaliber Equipment, 37-mm.
FAB 100
(See SNL of specific weapons)
Instruction Memos. FAS—Mat. 16 and Mat. 23.
- Tables, Firing
SNL F-69
- Target Materials
AR 760-400—(Allowances)

Telescope, BC, M1915	TM 6-225 (To supersede TR 430-100)
TR 310-20	SNL L-4
SNL F-9	SNL R-7 and TR 1350-A—(Ammunition)
TM 6-220 (To supersede TR 310-20)	AR 775-10—(Ammunition allowance)
Tool Rolls	Firing tables 1-A-1
SNL M-8	Truck, Half-Track, Heavy
Tools, Special FA Repair, FAS	SNL G-37
SNL C-18	Truck, Half-Track, Light
Tractor, Heavy	SNL G-34
SNL G-3 or G-22	Watch, Pocket, 15 Jewel
TR 1330-B—(10 ton)	SNL F-36
Ord Doc. 2003	TM 6-220
Tractor, Light	Watch- Stop
SNL G-7	SNL F-36
Tractor, Medium	TR 310-20
SNL G-2 or G-21	TM 6-220
TR 1330-A—(5-ton)	Watch, Wrist, 7 Jewel
TR 1430-A—(Ordnance Maint)	SNL F-36
Trainer, FA, M2	TM 6-220
TR 430-100	

Captain Edgar J. Ingmire, 51st FA Bn, Fort Sill, has developed a method of carrying the spare wheel and tire for the 75-mm. gun on the body of the Dodge 4×4 (1½-ton) prime mover. This provides a means of carrying the spare gun wheels of the battery where they are easily reached and yet are not in the way of the cannoneers or mechanics. They are so carried that no unloading of the vehicles is necessary to reach the wheels; and they do not interfere with the piece. The method consists generally in making a T-shaped iron brace which is bolted to the right side of the truck body near the right front. This brace mounts two wheel studs on which the wheel is carried.



"The mess sergeant just shot himself! The national bean crop was a failure."

FIELD ARTILLERY ORGANIZATIONS ON ACTIVE DUTY (AS OF FEBRUARY 15)

REGULAR ARMY			
UNIT	TYPE	ASSIGNMENT	STATION
Hq. & Hq. Btrys.			
Inf. Div. Arty.:			
1st		Artillery 1st Inf. Div.	Ft. Devens, Mass.
2nd		Artillery 2nd Inf. Div.	Ft. Sam Houston, Tex.
3rd		Artillery 3rd Inf. Div.	Ft. Lewis, Wash.
4th		Artillery 4th Inf. Div.	Ft. Benning, Ga.
5th		Artillery 5th Inf. Div.	Ft. Custer, Mich.
6th		Artillery 6th Inf. Div.	Ft. Des Moines, Iowa.
7th		Artillery 7th Inf. Div.	Ft. Ord, Calif.
8th		Artillery 8th Inf. Div.	Ft. Jackson, S. C.
9th		Artillery 9th Inf. Div.	Ft. Bragg, N. C.
Brigade:			
11th		11th FAB—Haw. Div.	Schofield Brks., T. H.
13th		13th FAB—I Corps	Ft. Bragg, N. C.
18th		18th FAB—VIII Corps	Ft. Sill, Okla.
Cav. Div. Arty:			
1st		Artillery 1st Cav. Div.	Ft. Bliss, Tex.
Regiments & Bns.			
1st FA Bn.	105-How.	Artillery 6th Inf. Div.	Ft. Sill, Okla.
2nd FA Bn.	75-How. Pack	Panama Canal Dept.	Ft. Clayton, C. Z.
3rd FA Bn.	75-How. Horse	Artillery 2nd Cav. Div.	Ft. Riley, Kan.
4th FA Bn.	75-How. Pack	GHQ	Ft. Bragg, N. C.
5th FA Bn.	155-How.	Artillery 1st Inf. Div.	Ft. Devens, Mass.
6th FA Bn.	75-Gun H-D	GHQ	Ft. Bragg, N. C.
7th FA Bn.	105-How.	Artillery 1st Inf. Div.	Ft. Devens, Mass.
8th FA	75-G Trk.-D	11th FAB—Haw. Div.	Schofield Barracks, T. H.
9th FA Bn.	155-How.	Artillery 3rd Inf. Div.	Ft. Lewis, Wash.
10th FA Bn.	105-How.	Artillery 3rd Inf. Div.	Ft. Lewis, Wash.
11th FA	155-How.	11th FAB—Haw. Div.	Schofield Barracks, T. H.
12th FA Bn.	155-How.	Artillery 2nd Inf. Div.	Ft. Sam Houston, Tex.
13th FA	75-G Trk.-D	11th FAB—Haw. Div.	Schofield Barracks, T. H.
14th FA	105-H Armd.	Artillery 2nd Armd. Div.	Ft. Benning, Ga.
15th FA Bn.	105-How.	Artillery 2nd Inf. Div.	Ft. Sam Houston, Tex.
(a) 16th FA Bn.	75-How. Horse	Artillery 2nd Cav. Div.	Ft. Riley, Kan.
17th FA	155-How.	13th FAB—I Corps	Ft. Bragg, N. C.
18th FA	Composite	Field Artillery School	Ft. Sill, Okla.
19th FA Bn.	105-How.	Artillery 5th Inf. Div.	Ft. Custer, Mich.
20th FA Bn.	155-How.	Artillery 4th Inf. Div.	Ft. Benning, Ga.
21st FA Bn.	155-How.	Artillery 5th Inf. Div.	Ft. Custer, Mich.
(b) 23rd FA (Btry.)	2.95"-H Pk.	Philippine Department	Ft. Stotsenburg, P. I.
24th FA	75-G Trk.-D	Philippine Department	Ft. Stotsenburg, P. I.
25th FA Bn.	75-G Trk.-D	Puerto Rican Dept.	Henry Barracks, P. R.
26th FA Bn.	105-How.	Artillery 9th Inf. Div.	Ft. Bragg, N. C.
27th FA Bn.	105-H Armd.	Artillery 1st Armd. Div.	Ft. Knox, Ky.
28th FA Bn.	155-How.	Artillery 8th Inf. Div.	Ft. Jackson, S. C.
29th FA Bn.	105-How.	Artillery 4th Inf. Div.	Ft. Benning, Ga.
31st FA Bn.	155-How.	Artillery 7th Inf. Div.	Ft. Ord, Calif.
32nd FA Bn.	105-How.	Artillery 1st Inf. Div.	Ft. Devens, Mass.
33rd FA Bn.	105-How.	Artillery 1st Inf. Div.	Ft. Devens, Mass.
34th FA Bn.	155-How.	Artillery 9th Inf. Div.	Ft. Bragg, N. C.
36th FA	155-Gun	13th FAB—I Corps	Ft. Bragg, N. C.
37th FA Bn.	105-How.	Artillery 2nd Inf. Div.	Ft. Sam Houston, Tex.
38th FA Bn.	105-How.	Artillery 2nd Inf. Div.	Ft. Sam Houston, Tex.
39th FA Bn.	105-How.	Artillery 3rd Inf. Div.	Ft. Lewis, Wash.
41st FA Bn.	105-How.	Artillery 3rd Inf. Div.	Ft. Lewis, Wash.
42nd FA Bn.	105-How.	Artillery 4th Inf. Div.	Ft. Benning, Ga.
44th FA Bn.	105-How.	Artillery 4th Inf. Div.	Ft. Benning, Ga.
46th FA Bn.	105-How.	Artillery 5th Inf. Div.	Ft. Custer, Mich.
50th FA Bn.	105-How.	Artillery 5th Inf. Div.	Ft. Custer, Mich.
51st FA Bn.	105-How.	Artillery 6th Inf. Div.	Ft. Sill, Okla.
53rd FA Bn.	105-How.	Artillery 6th Inf. Div.	Ft. Sill, Okla.
(c) 55th FA Bn.	75-Gun H-D	GHQ	Ft. Myer, Va.
60th FA Bn.	105-How.	Artillery 9th Inf. Div.	Ft. Bragg, N. C.

REGULAR ARMY—Continued				
UNIT	TYPE	ASSIGNMENT	STATION	
61st FA Bn.	75-How. Horse	Artillery 1st Cav. Div.	Ft. Bliss, Tex.	
68th FA	105-H Armd.	Artillery 1st Armd. Div.	Ft. Knox, Ky.	
70th FA Bn.	75-Gun H-D	Artillery 8th Inf. Div.	Ft. Jackson, S. C.	
71st FA Bn.	75-Gun H-D	Artillery 8th Inf. Div.	Ft. Jackson, S. C.	
74th FA Bn.	75-Gun H-D	Artillery 7th Inf. Div.	Ft. Ord, Calif.	
75th FA Bn.	75-Gun H-D	Artillery 7th Inf. Div.	Ft. Ord, Calif.	
76th FA Bn.	75-Gun H-D	Artillery 7th Inf. Div.	Ft. Ord, Calif.	
77th FA (less 1st Bn.)	155-How.	18th FAB—VIII Corps	Ft. D. A. Russell, Tex.	
77th FA (1st Bn.)	155-How.	18th FAB—VIII Corps	Ft. Sill, Okla.	
78th FA Bn.	105-H Armd.	Artillery 2d Armd. Div.	Ft. Benning, Ga.	
79th FA (1st Bn.)	240-How.	GHQ	Ft. Bragg, N. C.	
80th FA Bn.	155-How.	Artillery 6th Inf. Div.	Ft. Des Moines, Iowa.	
81st FA Bn.	Composite	Alaska	Anchorage, Alaska.	
82nd FA Bn.	75-How. Horse	Artillery 1st Cav. Div.	Ft. Bliss, Tex.	
83rd FA Bn.	75-Gun H-D	Artillery 8th Inf. Div.	Ft. Jackson, S. C.	
84th FA Bn.	105-How.	Artillery 9th Inf. Div.	Ft. Bragg, N. C.	
87th FA Bn.	75-How. Mtz.	Panama Canal Dept.	Ft. Davis, C. Z.	
97th FA Bn.	75-How. Pack	GHQ	Ft. Bragg, N. C.	
98th FA Bn.	75-How. Pack	GHQ	Ft. Lewis, Wash.	
99th FA Bn.	75-How. Pack	GHQ	Edgewood Arsenal, Md.	
349th FA	155-Gun	18th FAB—VIII Corps	Ft. Sill, Okla.	
Observation Bns.:				
1st		13th FAB—I Corps	Ft. Bragg, N. C.	
2nd		18th FAB—VIII Corps	Ft. Sill, Okla.	

NATIONAL GUARD				
UNIT	TYPE	ASSIGNMENT	HOME STATE	STATION
Brig. Hq. & Hq. Btrys.				
51st		51st FAB—26th Div.	Mass.	Camp Edwards, Mass.
52nd		52nd FAB—27th Div.	N. Y.	Ft. McClellan, Ala.
54th		54th FAB—29th Div.	Va.	Ft. Meade, Md.
55th		55th FAB—30th Div.	Ga.	Ft. Jackson, S. C.
56th		56th FAB—31st Div.	Fla.	Camp Blanding, Fla.
57th		57th FAB—32nd Div.	Wis.	Camp Livingston, La.
59th		59th FAB—34th Div.	Minn.	Camp Claiborne, La.
60th		60th FAB—35th Div.	Kan.	Camp Robinson, Ark.
61st		61st FAB—36th Div.	Tex.	Camp Bowie, Tex.
62nd		62nd FAB—37th Div.	Ohio	Camp Shelby, Miss.
63rd		63rd FAB—38th Div.	Ky.	Camp Shelby, Miss.
66th		66th FAB—41st Div.	Wash.	Ft. Lewis, Wash.
69th		69th FAB—44th Div.	N. J.	Ft. Dix, N. J.
70th		70th FAB—45th Div.	Okla.	Ft. Sill, Okla.
71st		71st FAB—VI Corps	N. Y.	Ft. Ethan Allen, Vt.
73d		73rd FAB—V Corps	Pa.	Camp Shelby, Miss.
Regiments				
101st	Light	51st FAB—26th Div.	Mass.	Camp Edwards, Mass.
102nd	Light	51st FAB—26th Div.	Mass.	Camp Edwards, Mass.
104th	Light	52nd FAB—27th Div.	N. Y.	Ft. McClellan, Ala.
105th	Light	52nd FAB—27th Div.	N. Y.	Ft. McClellan, Ala.
106th	Medium	52nd FAB—27th Div.	N. Y.	Ft. McClellan, Ala.
110th	Light	54th FAB—29th Div.	Md.	Ft. Meade, Md.
111th	Light	54th FAB—29th Div.	Va.	Ft. Meade, Md.
112th	75-Gun H-D	GHQ	N. J.	Ft. Bragg, N. C.
113th	Medium	55th FAB—30th Div.	N. C.	Ft. Jackson, S. C.
114th	Medium	56th FAB—31st Div.	Miss.	Camp Blanding, Fla.
115th	Light	55th FAB—30th Div.	Tenn.	Ft. Jackson, S. C.
116th	Light	56th FAB—31st Div.	Fla.	Camp Blanding, Fla.
117th	Light	56th FAB—31st Div.	Ala.	Camp Blanding, Fla.
118th	Light	55th FAB—30th Div.	Ga.	Ft. Jackson, S. C.
120th	Light	57th FAB—32nd Div.	Wis.	Camp Livingston, La.
121st	Medium	57th FAB—32nd Div.	Wis.	Camp Livingston, La.
125th	Light	59th FAB—34th Div.	Minn.	Camp Claiborne, La.
126th	Light	57th FAB—32nd Div.	Wis.	Camp Livingston, La.
127th	Medium	60th FAB—35th Div.	Kan.	Camp Robinson, Ark.

NATIONAL GUARD—Continued				
UNIT	TYPE	ASSIGNMENT	HOME STATE	STATION
128th	Light	GHQ	Mo.	Ft. Jackson, S. C.
130th	Light	60th FAB—35th Div.	Kan.	Camp Robinson, Ark.
131st	Light	61st FAB—36th Div.	Tex.	Camp Bowie, Tex.
132nd	Light	61st FAB—36th Div.	Tex.	Camp Bowie, Tex.
133rd	Medium	61st FAB—36th Div.	Tex.	Camp Bowie, Tex.
134th	Light	62nd FAB—37th Div.	Ohio	Camp Shelby, Miss.
135th	Light	62nd FAB—37th Div.	Ohio	Camp Shelby, Miss.
136th	Medium	62nd FAB—37th Div.	Ohio	Camp Shelby, Miss.
138th	Light	63d FAB—38th Div.	Ky.	Camp Shelby, Miss.
139th	Light	63d FAB—38th Div.	Ind.	Camp Shelby, Miss.
141st	Medium	73d FAB—V Corps	La.	Camp Shelby, Miss.
142nd	Medium	18th FAB—VIII Corps	Ark.	Ft. Sill, Okla.
144th	155 Gun	76th FAB—IX Corps	Calif.	Ft. Lewis, Wash.
146th	Light	66th FAB—41st Div.	Wash.	Ft. Lewis, Wash.
147th	Light	GHQ	S. D.	Ft. Ord, Cal.
148th	Light	66th FAB—41st Div.	Idaho	Ft. Lewis, Wash.
150th	Medium	63d FAB—38th Div.	Ind.	Camp Shelby, Miss.
151st	Light	59th FAB—34th Div.	Minn.	Camp Claiborne, La.
156th	Light	69th FAB—44th Div.	N. J.	Ft. Dix, N. J.
157th	Medium	69th FAB—44th Div.	N. J.	Ft. Dix, N. J.
158th	Light	70th FAB—45th Div.	Okla.	Ft. Sill, Okla.
160th	Light	70th FAB—45th Div.	Okla.	Ft. Sill, Okla.
161st	Light	60th FAB—35th Div.	Kan.	Camp Robinson, Ark.
162nd (1st Bn.)	Light	Puerto Rico	P. R.	Ft. Buchanan, P. R.
165th	Light	69th FAB—44th Div.	N. J.	Ft. Dix, N. J.
166th	Medium	73d FAB—V Corps	Pa.	Camp Shelby, Miss.
176th	Medium	54th FAB—29th Div.	Pa.	Ft. Meade, Md.
178th	Medium	13th FAB—I Corps	S. C.	Ft. Bragg, N. C.
180th	Medium	51st FAB—26th Div.	Mass.	Camp Edwards, Mass.
184th	Medium	GHQ	Ill.	Ft. Custer, Mich.
185th	Medium	59th FAB—34th Div.	Iowa	Camp Claiborne, La.
186th	Medium	71st FAB—VI Corps	N. Y.	Madison Barracks, N. Y.
187th	Medium	71st FAB—VI Corps	N. Y.	Ft. Ethan Allen, Vt.
189th	Medium	70th FAB—45th Div.	Okla.	Ft. Sill, Okla.
190th	155-Gun	73d FAB—V Corps	Pa.	Camp Shelby, Miss.
218th	Medium	66th FAB—41st Div.	Oregon	Ft. Lewis, Wash.
258th	155-Gun	71st FAB—VI Corps	N. Y.	Ft. Ethan Allen, Vt.

NOTES

- (a) Will move from Ft. Myer to Ft. Riley in March, 1941.
 (b) Has only Battery A now active.
 (c) Has only Battery C now active.

*NATIONAL DEFENSE
 (FROM RECENT WAR DEPARTMENT PRESS RELEASES)*

Ten thousand cotton shirts, khaki, are to be made by the Little Rock Tent and Awning Co. No doubt to assure an adequate supply of outsizes.

* * * * *

Twenty-one thousand dollars' worth of folding beds are to be produced by the Hard Mfg. Co. Soldiers are not to be coddled in this man's army.

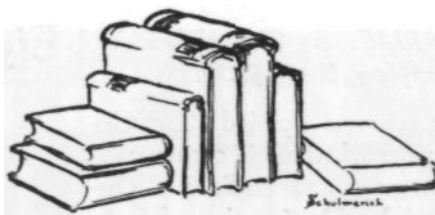
* * * * *

The Taylor Instrument Co. has been awarded a contract for \$34,950 worth of sphygmomanometers. We know that you will rest easier with this assurance that plenty of sphyg . . .—of these devices will be on hand.

* * * * *

53,800 lbs. of "hair, curled, gray" are to be furnished by Blocksom and Co. Toupees for senior officers? Hair mattresses? Or are we to go back to wearing 1776-style wigs?

BOOK REVIEWS



"This world and the whole of human culture is changing too swiftly for anybody to sit. It is an essential part of your living to know what is going on in this country and the world and to equip yourself to deal with some aspect of it."

—GENERAL HUGH S. JOHNSON.

FUNDAMENTAL ECONOMIC ISSUES IN NATIONAL DEFENSE. By Harold G. Moulton. The Brookings Institution, Washington, 1941. 25c.

Four vital problems are considered in this pamphlet, and the conclusions are as follows. (1) The national defense program will not necessitate a revolutionary readjustment in our economic life. (2) If the government can be persuaded to take certain measures the defense program can be financed without a great increase in the debt. (3) It is possible to carry out the defense program without a great increase in prices and inflation. (4) It is possible to avoid in large part the inevitable post-war depression. Altogether sound, this is the best brief discussion of the current economic situation this reviewer has yet seen, and should be read by everyone.

—H. S. F.

TEODORO DE CROIX AND THE NORTHERN FRONTIER OF NEW SPAIN, 1776-1783. Translated and edited by Alfred Barnaby Thomas. University of Oklahoma Press, 1941. \$3.00.

Not a book for the casual reader, but of value to one who would know the Spanish background of Southwestern America—source material for the serious student or writer. One interesting bit of contemporary evidence is that as late as 1781 the great herds of wild horses, later so common in our western prairies, seemed not to be in existence. The Comanches were still getting their mounts from the Spanish in New Mexico. The Towakani branch of the Wichita tribe, of whom there are now only a few dozen living near Anadarko, Oklahoma, were in 1781 a numerous and powerful people. The Spanish records call them Taguacana.

—W. S. N.

SAILOR OF FORTUNE: THE LIFE AND ADVENTURES OF JOSHUA BARNEY. By Hulbert Footner. Harper and Brothers, New York, 1940.

Mr. Footner's first book was published thirty years ago, and his mystery novels have long been famous. Here he tries his hand at history, and let it be said that the result is excellent. The last biography of Barney was published in 1924, and it appears to have been designed primarily for youthful reading; in fact, there has never been an adequate biography of the famous Commodore. This book amply fills the gap.

Barney was one of those individuals who lived in the early years of the Republic, and whose career seems fantastic to us today. He went to sea at thirteen, and at

fifteen commanded a ship in the service of the King of Spain in an expedition against Algiers. By his own count, he served in seventeen engagements in the Revolution and nine in the War of 1812. His conduct at the battle of Bladensburg is about the only incident of that unfortunate conflict which Americans have any cause to remember with pleasure. Between our two wars with England, Barney took time out to command a squadron for the young French Republic. Although he is not remembered as well as Decatur, Perry, and some of the others, Barney is unquestionably one of the most skillful naval commanders ever produced in the United States.

Mr. Footner has told Barney's story with a competence one would expect of a veteran novelist, and the result is an extremely readable chapter from our naval history.

—H. S. F.

The Old Sergeant's Conferences

COLONEL WILLIAM H. WALDRON has put into the Old Sergeant's mouth more sound advice and information than would be picked up in a year's soldiering. He tells in soldier language, the things every soldier—and officer—should know.

It is the mission of this book to place the information in the hands of the soldier to the end that he may better know and appreciate the military profession, that he may better avoid the danger places, and that his way may be smoothed out in the service.

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Success in the Army
Bad Company
Military Courtesy

A. W. O. L.
Desertion
Discharge

Army Customs

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A HANDBOOK FOR RECRUITS

BONNIE PRINCE CHARLIE. By Clennel Wilkinson. J. B. Lippincott Company, 1941. \$2.50.

Mr. Wilkinson has made very real a period of Scotch-English history, the significance of which is customarily obscured by an aura of romance and tradition. The aftermath of Prince Charles' Jacobite invasion of England is of direct interest to thousands of U. S. field artillerymen. The veterans of Culloden (where Charles was finally defeated) and their descendants settled in large numbers in the upper Cape Fear section of North Carolina. Their Revolutionary War history is that of the Fort Bragg country. The sixty thousand troops who are to be stationed at Fort Bragg should be interested in knowing the background of such place names as the "Prince Charles Road," Flora McDonald house, and other historical spots in the Fort Bragg country.

—W. S. N.

S-2 IN ACTION

BY SHIPLEY THOMAS

AS the name implies, this book deals with the technique of securing information about the enemy in wartime. However, it is not a cut-and-dried textbook; Colonel Thomas draws on his own experience in the last war to give a vivid account of the duties and tribulations of an intelligence officer.

"... Presents valuable information to all who may be assigned to, or who may be interested in, the duties of a regimental intelligence officer. Fundamental and homely information of the soundest sort is here made available."—Hanson Baldwin in The New York Times. An officer writes: "The book 'S-2 in Action' is being used with excellent results in the Intelligence School of the 8th Division. This book gives the young officer an excellent background in his study and understanding of Intelligence subjects."

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By MAJOR E. A. HYDE

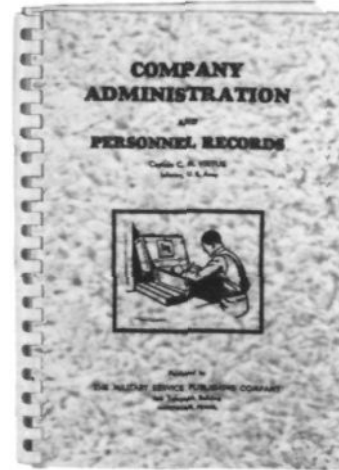
Revised edition published in 1939.

\$2.00

The title of Major Hyde's book describes its scope and purpose. It simplifies the management of the unit mess, it reduces the labor in connection with it, and if the system is carried out, a SUPERIOR MESS will be the result. The basic scheme of the book is the use of a 15-days' Bill of Fare. Each Bill of Fare is followed by instructions and recipes for each of the items included in it. All the Company Commander has to do is to prescribe that the Bills of Fare be followed out in his kitchen, turn a couple of copies of the book over to his kitchen crew, and then see that the plan is being followed.

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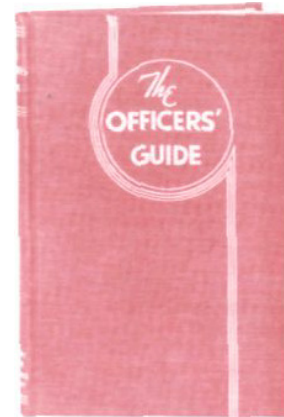


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