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COAST ARTILLERY JOURNAL

FOUNDED IN 1892 AS THE JOURNAL OF THE UNITED STATES ARTILLERY

VOLUME LXXXVI

JULY-AUGUST, 1943

NUMBER 4

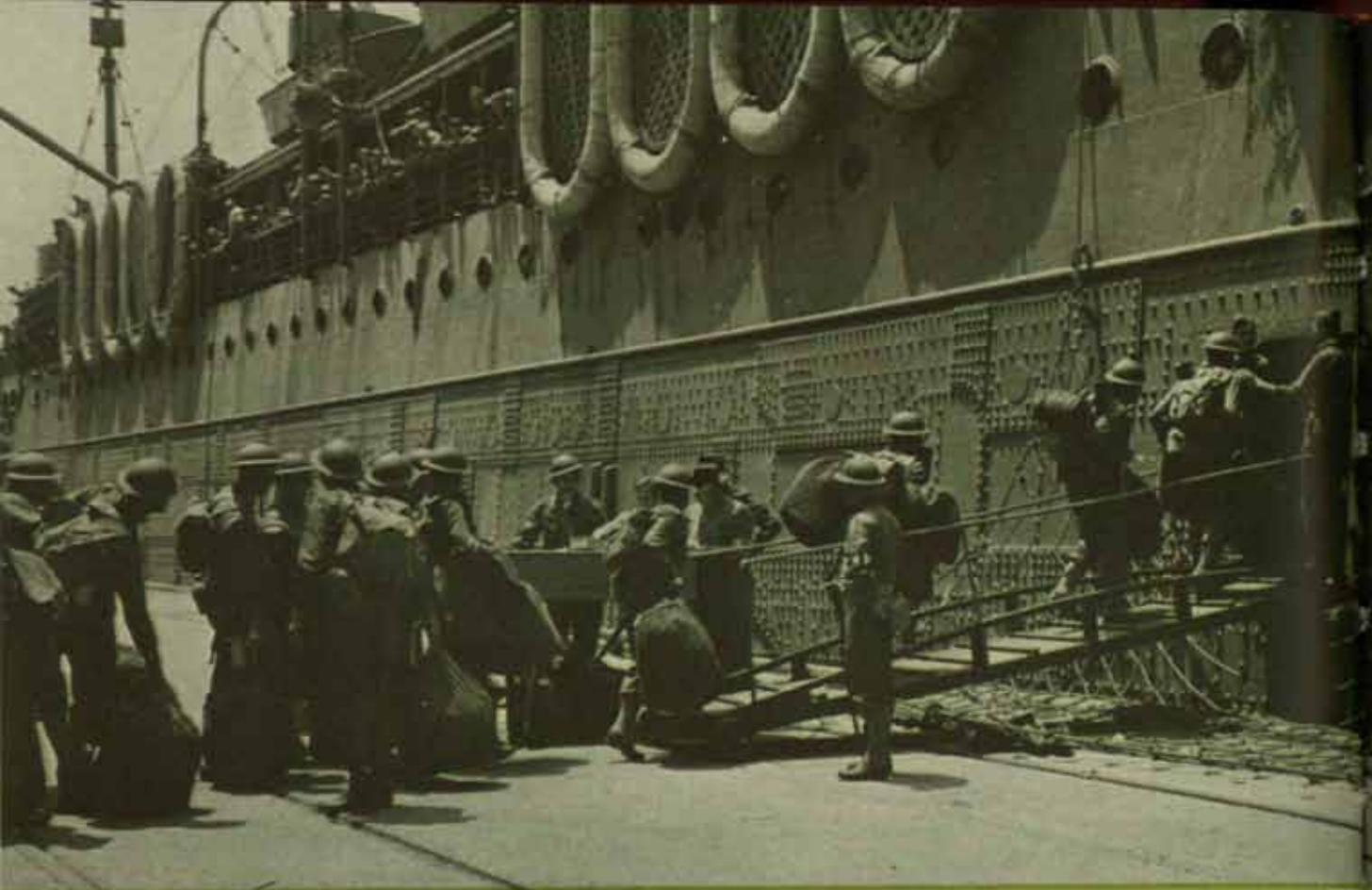
CONTENTS



COVER. Color Guard, Camp Callan. <i>Photo by Sergeant O. C. Sweet.</i>	
FRONTISPIECE. <i>Photo by Coast Artillery Board.</i>	
MOVEMENT OVERSEAS. <i>By Lieutenant Colonel Lloyd A. Corkan</i>	4
GERMAN A.T. GUN TACTICS. <i>By Lieutenant Colonel G. B. Jarrett</i>	10
TROOP LEADERSHIP FOR JUNIOR OFFICERS. <i>By Lieutenant John H. Thornton, Jr.</i>	16
THE .50 MACHINE GUN AS A SUBCALIBER "40"	20
ANTI-AIRCRAFT AROUND THE WORLD (<i>Pictures</i>)	24
IF YOU DON'T KNOW—YOU GET KILLED. <i>By Lieutenant Donald A. Carlson</i>	26
STEREOSCOPIC VIEWER. <i>By Colonel Maurice Morgan</i>	28
BARRAGE BALLOON OPERATIONS BOARD. <i>By Captain James S. Webb, Jr.</i>	30
CARTC TRAINING AIDS. <i>By Warrant Officer Sam Horowitz</i>	32
ITALIAN MATERIEL (<i>Pictures</i>)	34
INDIVIDUAL TRACER CONTROL. <i>By Major George W. Race</i>	36
NEBELWERFER 41. <i>By Willy Ley</i>	42
PRACTICE SPOTTING TRAINER. <i>By Lieutenant Colonel Joseph S. Pivam</i>	44
SOLVING TRIAL SHOT PROBLEMS. <i>By Major John Parmakian</i>	46
INDIVIDUAL PROTECTIVE COVER (<i>Pictures</i>)	49
SHADOWGRAPH FOR RECOGNITION TRAINING. <i>By Lieutenant J. F. Carlson</i>	50
IMPROVISED DEPRESSION POSITION FINDER. <i>By Captain David J. Caldwell</i>	52
A METHOD OF EMERGENCY RANGE FINDING. <i>By Captain George E. Ellard</i>	54
COAST ARTILLERY BOARD NOTES	56
NEWS AND COMMENT	60
COAST ARTILLERY ACTIVITIES	66
BOOK REVIEWS	83

PUBLICATION DATE: AUGUST 1, 1943





movement

Signal Corps Photo

By Lieutenant Colonel Lloyd A. Corkan, Coast Artillery Corps

The training of a separate battalion of antiaircraft artillery may be divided into three phases, consisting of: the initial period of training in the Antiaircraft Artillery Training Center; the time spent in the Staging Area near the Port of Embarkation and on board the transport, and finally, the life of the Organization in the Theatre of Operations.

A commander and staff of a newly activated unit frequently find their attention so occupied in carrying out the many details of the Mobilization Training Program that they lose sight of the goal toward which all of their efforts must be directed. This training objective has been defined for antiaircraft artillery as "the attainment and maintenance of a complete state of readiness for field service and for combat of individuals and units." Viewed from the maze of activities occupying the battalion's attention in its first few weeks of training, the time when such a state of readiness

must be reached seems far distant. However, the well prepared unit commander realizes that the few months stretching ahead offer all too little time to turn his newly arrived fillers into soldiers, unless he makes the most of each phase of instruction scheduled for his unit.

To achieve this means much long range planning on the commander's part if he hopes to bring his battalion into the theatre of operations well prepared for the task assigned to it. The program as outlined for the unit provides for such training as will best fit the new soldier for the demands made upon him in modern battle. These may be divided into several types of preparation, first, such training as will build a sound body and a keen mind; second, the type of instruction that will best teach complete mastery of the weapons employed; and finally a course of mental conditioning that will inoculate the mind of the young soldier

with confidence and morale which will be vital to his success in battle. If the foregoing is to be realized, each period of instruction in every subject must be carefully planned and at the same time coordinated with that preceding as well as that lying directly ahead. The program then will not become one of so many periods, days or weeks, but rather a well integrated process by which the selectee develops into a well trained soldier.

During the early phase of training the battalion commander will find much of his time taken up with the organization and instruction of his troops. However, he should also devote considerable thought to the problems that he will find confronting him after the M.T.P. has been completed and the unit alerted. By a careful study of the ensuing period, he will be able to anticipate many of these problems before they arise and make certain definite preparations which will aid materially in their solution.

As pointed out previously this phase will cover the period beginning with the time when the unit is alerted and continue until its arrival in the Theatre of Operations. During this phase, it will be the chief responsibility of the battalion commander to hold his troops at the peak of their training. If he is successful in his efforts he will bring his command into the combat zone in such a condition that they may inflict the most damage on the enemy.

The accomplishment of this task will require the entire battalion to be kept in the best physical condition possible. It will mean that the officers and men keep up training with their present weapons, as well as familiarizing themselves with such new equipment as they may receive at the Port of Embarkation. Finally, it will necessitate the most careful advance planning on the part of the commander and all of the officers to maintain a high state of discipline and morale during the movement of the unit from the training camp to the combat zone.

At first one is apt to be alarmed over the large number of problems arising from a consideration of the foregoing. And well might the average battalion commander faced with such a task feel perturbed. Fortunately, his outlook is considerably brightened when he begins to explore the field of experience which has been made available to him. These consist largely of two types

← "Accustomed to moving up the gangway rapidly."

overseas

of publications, first, those issued by the War Department and second, various reports and articles on successful overseas movements. In the first group the outstanding one is a document entitled *Preparation for Overseas Movement*, issued February 1, 1943. A study of such sources clearly presents the problems confronting the commander of an alerted battalion. Furthermore, it should suggest certain preparatory steps, which if taken by him while his command is still in training camp, will aid greatly in the successful completion of the movement of his command overseas.

Out of the large number of problems to be considered the writer has selected a list of seven. This group does not include all of the important items requiring attention from the unit commander and staff, but rather some which may be profitably considered by them while the battalion is still engaged in the M.T.P. Those selected are:

1. Personnel.
2. Equipment.
3. Administration.
4. Movement to Port of Embarkation.
5. Training.
6. Security.
7. Morale.

Because of its importance the condition of the personnel of the unit is given first consideration. Upon the organization being alerted, officers and men will be immediately warned about any "absences without leave." As many furloughs and leaves, as consistent with maintaining training at a high level, should have been given previously; this caution will be chiefly directed toward malingerers or shirkers anxious to get out of going overseas. If a proper state of discipline has been instilled in the command, the number of such individuals will be small. Therefore it is important, during the several months of basic training, to develop a spirit of combat



"A number of men must be crowded into a small space."

Signal Corps Photo

mindfulness on the part of the men if they are to welcome this new experience.

Men, physically unfit for active service, will be transferred from the unit. Those remaining will be checked for completion of necessary vaccinations and immunizations. Those requiring spectacles or dental treatment as the result of this final physical checkup, may have to be left behind thus reducing the number of trained personnel in the unit. This condition could have been averted by having such defects corrected previously. While personnel will be furnished from the Point of Embarkation Pool to bring the unit up to full strength, it is always preferable to keep such additions to the minimum. Fewer casualties would be needed if unit commanders kept a closer check on their men for remedial treatments of physical defects.

Next, we will turn our attention briefly to the matter of equipment, including personal equipment and clothing as well as the property of the battalion as a whole. Upon a unit being alerted a "show down" inspection is made at the home station to determine "original" shortages. This will include both the items missing as well as those unserviceable. These shortages must be filled by the home station from such stocks as are available. Where certain items are lacking they must be obtained elsewhere, which delay may result in certain inconveniences. Here again proper attention to the state of clothing and equipment from the

beginning of basic training will result in the minimum loss of "original" shortages.

Shortly after the new filler joins his unit he finds himself in possession of certain personal equipment in addition to his complete issue of clothing. All of this is generally in such condition that if properly cared for it could be carried with him overseas later. However, the young soldier must be taught to mark his possessions properly. He must be instructed in the best methods of caring for his uniforms to keep them serviceable and presentable. Such of his equipment as was in an inferior condition when originally issued should be exchanged when that of a suitable quality is available. Where this procedure is followed in a unit, the size of last minute requisitions will be considerably reduced.

In the case of organizational equipment, similar steps should be taken by the battalion commander to present it in a complete and serviceable condition at the Port of Embarkation. One of the important tasks facing an alerted unit is that of packing. Many of the reports, coming back from overseas, indicate that a certain amount of equipment is arriving in the Theatre of Operations in an unserviceable condition. This can generally be attributed to improper preparation for shipping. Admitting that antiaircraft units have much delicate equipment to move, there is still no valid reason why packers cannot be properly trained to crate such objects as directors, height finders, and rangefinders.

standers to withstand shipment by transports. Practically all training centers offer courses in packing and early in their training units should take advantage of these schools.

If the preparation of personnel and their equipment for overseas movement presents a huge task, that of preparing the necessary administrative records is by no means less difficult. Even with efficient staffs the amount of administrative work necessitated by such a change will be considerably increased, but in the case of some units, the additional labor involved in such a situation becomes overwhelming because of failure to prepare in advance for such a change.

In the case of the men and officers of the unit, certain specific records must be prepared after the battalion has been alerted. This means extra work for the personnel section. How much work will depend on the degree to which the unit has early impressed on its men the importance of settling personal affairs such as insurance, allotments, wills, and care of dependents. With proper foresight and guidance many of these individual matters could have been taken care of early in the training period, with better results for both the men and the unit. The personnel section which has allowed its records to get behind will find itself overwhelmed with the effort of catching up, along with the additional reports, rosters, current locator cards, emergency addressee cards and similar forms necessary to the movement.

In like manner, the staff which has been trained through a series of field problems and exercises to carry on the work of their several sections, outside a well equipped office, will encounter little difficulty in adjusting itself to the movement ahead. The battalion supply section which is thoroughly trained in its work, and which has kept its records and property in order, will approach its added responsibilities in an intelligent manner. This will also apply in the case of the administrative records of the battery as well as that of the battalion. Here, as well as in larger units, advanced planning will pay large dividends.

We have already considered briefly the general problem of preparing the personnel and their equipment for the movement. Let us now enumerate some of the specific steps we must take in planning for the journey itself. In the case of most units going overseas, this movement will be made partly by rail or truck to the Point of Embarkation and by transport to the Point of Debarcation. In the former case, definite plans for loading men or matériel on cars must be worked out. Those units, which have early in their training developed an S.O.P. of loading, will be well off. By careful packing and marking of equipment for the rail movement, many last minute changes at the Point of Embarkation may be avoided. In like manner, if the trip is of sufficient length, the men will profit by the experience of being separated from their barrack bags for several days, as such will be the case later on the transport.

This initial movement will likely terminate in a staging area near the Point of Embarkation. Here the battalion may be delayed for several weeks, depending on its state of preparation for overseas service. Final inspections of personnel, equipment and records will be made by the Commander of the Port. Where the list of "last minute shortages" is long, or records are incomplete or inaccurate, the unit may be detained for a longer period. The latter con-

dition is an unpleasant one to consider because during this time of inactivity, the personnel must be maintained at the height of physical condition, and training must be most intensive, all without any impairment of morale.

While these two aims are closely related, one cannot always confine all training to physical conditioning. Under certain conditions new equipment may reach the unit at the Point of Embarkation. Where possible it is desirable to familiarize all concerned with its usage. Some of the training in the staging area certainly should be devoted to preparation for the embarking and disembarking of the unit itself. Personnel must be rehearsed in "sailing list" formation several times. They must become accustomed to moving from the dock up the gangway to their berths with barrack bags, rifles, and full field equipment, rapidly. Likewise, encumbered by arms and packs, they can well afford to practice moving down cargo nets into boats. Where this has been part of their training at the home station, such formations can be directed toward attaining speed in loading.

Another type of loading, equally important to the unit, will be the act of getting their organizational property, large weapons, and fire-control equipment on board the transport in the sequence necessary for its use during the voyage. Where it is desired to have machine guns so placed on shipboard as to increase the original armament of the transport, care must be exercised in their disposition and that of the necessary ammunition. To effect this requires close attention of "liaison personnel" of the battalion on the loading of its cargo nets. Staff officers must devote long hours to the preparation of sailing lists and assignment of quarters. Time must be given to the preparation of schedules for motor convoys bringing unit personnel to the dock from the staging area. Every effort must be made to arrange motor convoy schedules so as to prevent idle gangways between arrivals of successive motor convoys.

It is hardly necessary to stress here the importance of making the physical training of the troops in the staging area as rugged as possible. While on board the transport the opportunity for activity will be considerably reduced due to lack of space, so their physical condition must be of the highest, if the troops are to arrive in good shape overseas. A full training program in the concentration area will also serve to keep the minds of the men occupied during their final days in the "continental limits." This is important since the young soldier, restricted to the area, is apt to develop a low state of morale and this may lead to a number of A.W.O.L. cases.

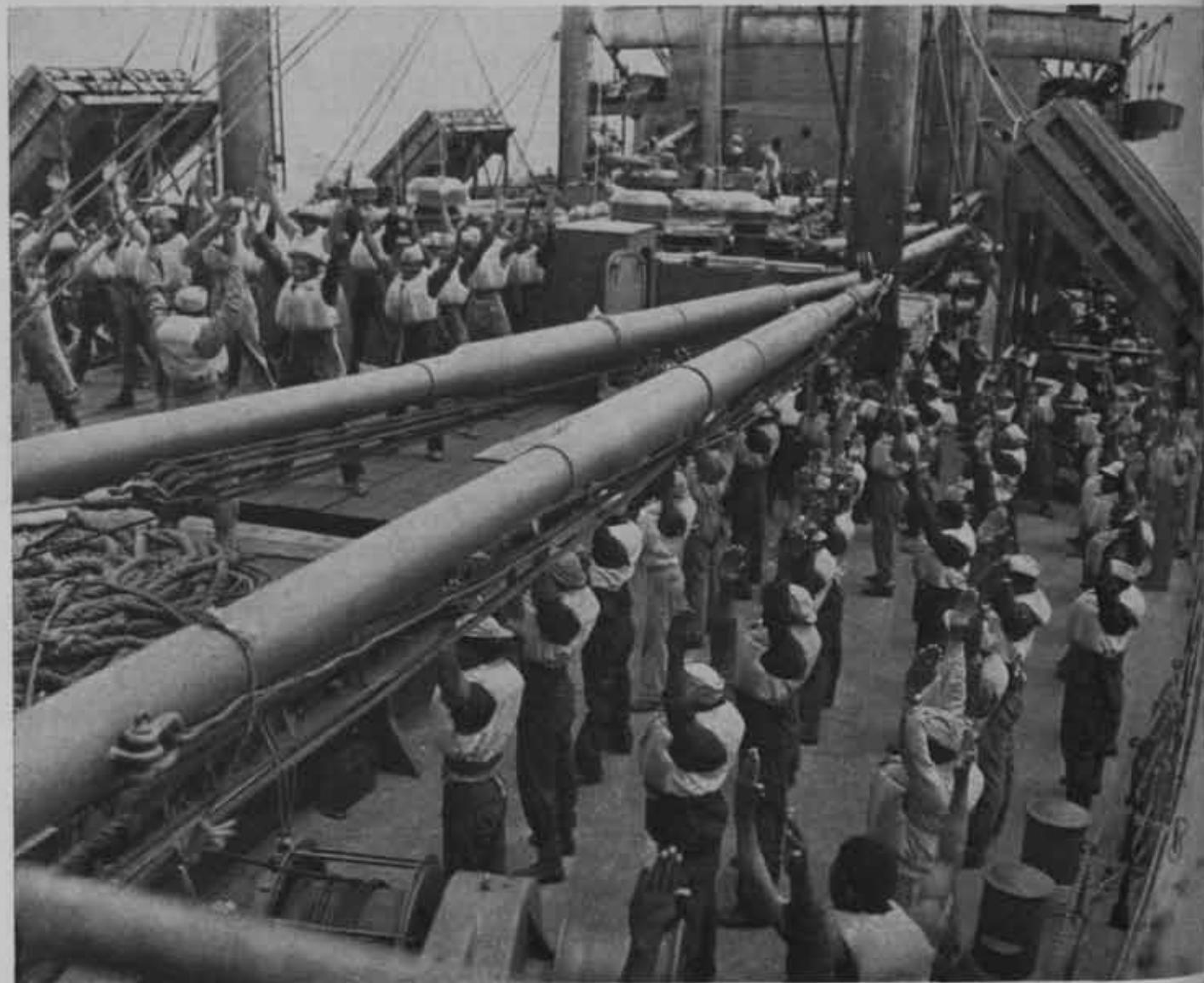
As the far-sighted unit commander prepares for the alert period, he must not lose sight in his planning of the security of his command during this important phase. Here, many of his problems will be readily solved if he has a well developed S-2 section. Too much emphasis cannot be placed on the development of this important staff function while the battalion is at its home station. As soon as the troops are alerted, security measures must be placed in effect, which will insure the secrecy of movement for the unit from the training camp to the overseas theatre. All identifications must be removed from individual and organizational equipment. Only authorized markings will be placed on motor vehicles. National colors and unit guidons will be turned in to the Battalion Supply officer for safe keeping. Identifi-

fication cards (WD, AGO Forms 65-1) for all officers and warrant officers will be properly filled out. Current censorship regulations will be studied and unit censorship set up in proper accordance while the unit is in the staging area. All possible steps must be taken to impress on the men the importance of keeping their movement secret. How well this goal will be reached depends largely on the instruction the unit has had during its M.T.P. in the important subject of security.

Lastly, let us briefly turn our attention on the most important requisite for any successful oversea movement, *i.e.* morale. To place troops with low morale in the combat zone is to invite disaster. Fortunately the M.T.P. has been built along such lines that any unit commander who follows its provisions carefully should find his battalion has reached the alert period in a good state of morale. To maintain this condition at a high level then becomes the chief duty of the leader. In the field or in combat, interest is high among the troops. Each man is anxious to do his part in the work of the battalion. But in the staging area or amidst the monotony of the voyage, this individual enthusiasm is apt to disappear and real leadership is required to maintain morale under such conditions.

As has already been pointed out, if the men are kept busy while in the staging area they will have little time to brood over temporary inaction. Here in addition to giving plenty of physical work to the troops, is an opportune time to continue their orientation courses. The fact that the average American soldier has a high degree of intelligence makes it possible to acquaint him with the details of the task confronting him. By careful instruction in the *reason*, as well as the proper procedure in such subjects as secrecy, censorship and safeguarding military information, the men are anxious to cooperate in the necessary security measures. The same approach can well be followed in preparing them for the rigid discipline which must prevail on shipboard.

On the transport a number of men must be cramped into a small space. Without the luxury and conveniences of large passenger vessels, such crowded conditions are hard to endure. Little space in which to exercise and considerable idle time on their hands make many men restless. Add to these facts a normal amount of seasickness and the result is a marked drop in morale. Like one rotten apple in a basket, one disgruntled soldier can affect a number of his fellows. To prevent this situation requires careful planning on the part of the officers. As at the staging area, keeping the men



"Personnel must be held at the height of physical condition."

... will do much to while away the tediousness of the voyage. However, all transports are crowded so mass games are out of the question. Most of the recreative activities will have to be mental rather than physical, which is not a bad state of affairs, as idle minds are sometimes the more dangerous.

Certainly high on the list of possible activities will be the abandon-ship drills. These serve two purposes. They are necessary for safety's sake and at the same time keep men busy. These may be held at scheduled times and of course some should be unannounced. The men must be impressed with the fact that life belts, full canteens and pocket knives must always be kept within reach. If these drills are to be of value they must be carefully supervised as to silence and seriousness of purpose. Sufficient time must be spent daily in police of quarters with frequent inspections to insure results. As many men as possible must be given exercise periods on deck during the day, as blackout conditions will prevail at night and keep them off the deck. In spite of all the foregoing, some men will always be idle and it will be necessary to find something for them to do.

In further preparation for the voyage a large number of classes may be organized. These should be varied and at the same time interesting enough to occupy the attention of all the men a part of the time. These may well cover an intensive review of all subjects studied during the A.T.P. To these may be added classes in language, history, and social science, particularly subject matter covering the country to which the troops are assigned. Maps of overseas areas will be shipped by the Chief of Engineers for each unit embarking. The commanders of the Point of embarkation will place these on board the transport, for use of the unit. In addition the commander of the unit may draw sufficient copies of maps of destination for study and orientation after ships are at sea. Now is perhaps the most significant time to use Intelligence Manuals dealing with the organization, equipment and tactics of the enemy. The men will be ready and anxious to obtain all possible knowledge of their opponent. Since a large amount of material is available on this subject, skillful officers can hold the interest of the troops for long periods.

Finally, organizations should avail themselves of the recreational "F-kits," which may be issued by the Port Quartermasters to transports. These kits contain standardized small game equipment for deck use. Three of these kits will go toward furnishing sufficient recreational amusement for a battalion. In addition it may be possible to draw several recreational kits each of which contains a radio-phonograph. The use of the radio will likely be forbidden, but the electric record player will be much enjoyed by the men in their crowded wardrooms. Motion picture machines might well be carried on shipboard, if there is sufficient space available for their use below decks. But regardless of what recreational equipment is finally chosen, officers must realize the importance of keeping the troops busy while on board, since each idle man may become disgruntled and such a state constitute a serious menace to morale, discipline and safety of the entire battalion.

In the foregoing it has been the purpose to point out a few of the more pertinent problems which will confront the battalion upon entering an alert status. Some attempt has



been made to suggest certain steps which might be used to meet these several situations. In many cases preparation for the overseas movement of a unit is delayed until sailing orders are received, and as a result much needless confusion follows. It has been the aim of this article to show how, by careful planning throughout the entire basic training period this condition can be averted and the battalion reach the theatre of operations in an excellent state of training and morale.

By Lieutenant Colonel G. B. Jarrett
Ordnance Department

One of the Afrika Korps' PzKw I's, "scratched" near Gambut in November, 1941. This one was hit where the armor was light.

GERMAN A.T. GUN TACTICS

The efficiency of the antitank gun is determined by the intensity of the velocity it achieves, by the ability of its projectile to withstand the shock of impact long enough to effect penetration of the enemy armor, and by the power of the detonation once sufficient penetration has been effected. Powder types and granulation are exceedingly important. The higher the velocity obtainable from a given powder, the shorter the life of the gun. Some compromise, therefore, is always necessary.

In actual practice the Germans have consistently developed towards higher velocities with little concern for accuracy life of the gun. Observations of gun life in the Libyan Desert campaigns showed comparatively few guns surviving battle operations wherein their effective life had been used up. Many were destroyed before ever being brought into action; and all destroyed guns I saw appeared to have been either wrecked by Allied action or deliberately blown up by

the enemy when he was preparing to abandon the position.

This is quite remarkable when one considers the German propensity for rechambering guns and sharply increasing muzzle velocity. Appearances would indicate that the tremendous increases thus achieved in muzzle velocities would remove entirely the safety factor. Concern over this element evidently does not trouble the German designer. If the gun holds together long enough to knock out two or three enemy tanks, it is considered to have done its bit.

German shell development has been consistent with the velocity advance. Effectiveness is the primary consideration: all other factors, including that of safety, are secondary. Examples of this may be found in the newly designed A.P. shells using cyclonite in small cavities as against T.N.T. in larger cavities used in the earlier shell patterns. Their fuze systems in both developments have always been simple yet efficient. The deadly record of destroyed Allied tanks in Libya will substantiate this.

In retrospect it is worthy of note that German A.T. defense has always gone hand in hand with their tank development. Whenever they provided a new tank idea, they proceeded to develop an antitank antidote at the same time.

PzKw IV (Special) with the long-barreled 7.5cm tank gun K.W.K.





The 76.2 super-high velocity Russian gun, mounted on a Skoda (Czech) tank chassis, and used as a mobile A.T. gun. The picture was taken near Daba, Egypt, in 1942.

Thus armor on their tanks kept pace with what known A.T. guns might do at each progressive stage in the long story of armor vs. high velocity A.P. projectiles.

HISTORY OF DEVELOPMENT

During the First World War the French produced an A.T. gun in 37mm caliber. This was a 1916 Puteux Gun, commonly known as a one-pounder, and affectionately labeled the "Pound Wonder" by the A.E.F. in 1918.

Before that, however, the caliber and basically the same projectile design was used as far back as 1900. Maxim made an oversize machine gun to fire this same type of 7mm round; and this type of weapon has seen use in several navies throughout the world.

In the rather unnoticed years immediately following 1918 the Germans took careful stock of their failings of 1914-18. Their analyses indicated many underlying mistakes which helped to add up to the final defeat of 1918. With the advent of Hitler came the call for an unbeatable army, lavishly equipped with excellent materials and weapons, and built on principles which were to avoid the mistakes of World War I. Much of the new German Army's power and success was later realized by use of the tank; each combat team was equipped with a powerful tank gun, which was of course an A.T. gun when facing enemy armor.

Any close observer must be struck by the manner in which German matériel represents maximum efficiency in operation or in destruction of their enemy, or both. German industrial preparations for munitions production always headed for those joint goals, providing equipment in lavish quantities. So it was that in the early days of World War II the German Army was able to roll relentlessly over every enemy. All the early advantages were with them when their lavishly equipped army encountered troops armed with insufficient and often obsolescent weapons.

Then too we must remember that Hitler used the Spanish Civil War as a proving ground for both matériel and tactics. In addition to developing the value of the Stuka, he learned the value of both his tanks and his A.T. guns. Among these A.T. guns was the new 37mm designed in 1936 to supplant the earlier 20mm. This new 37mm is probably the father of all modern high powered A.T. guns. It was sold all over the world by the Germans prior to 1939 when they were seeking to obtain foreign exchange. Our own 37mm A.T. gun follows this German type, but is today much more powerful than its prototype.

DEVELOPMENT IN WORLD WAR II

In the battle of France this German 37mm functioned well against all armor except the British heavy "I" tank, the

Infantry Tank better known as the Matilda. There were only twenty-two Matildas in France, but they proved many things for the German tacticians. Here was one piece of enemy armor which outmoded the standard 37mm A.T.

The French had experimented with a 47mm gun made principally by the Czechs, and no sooner did the Czech arms industry fall under German control than they seized upon this 47mm and produced it as a mobile A.T. gun. Shortly afterwards they produced it mounted on the early PzKw I—this vehicle was called by the Germans the Tank Hunter. This was the first of an eventual series of self-propelled high velocity A.T. guns. Meanwhile, the 37mm type had gone through usage in the PzKw III Tank and had been succeeded by the first of the 5cm¹ German tank guns (the K.W.K., *Kampf Wagon Kanone*).

The German Afrika Korps was formed to bolster Mussolini's unreliable colonial army then in the midst of much difficulty in Libya. The Korps armor carried a 20mm machine gun in their PzKw II's; the short barreled 5cm gun in the PzKw III's; the short barreled 7.5cm K.W.K. in the PzKw IV's; while the PzKw I was used either as a light reconnaissance or command vehicle, or to carry the 4.7cm Czech gun in the rôle of Tank Hunter.

Backing up the armor piercing possibilities of all these tank guns was the old 37mm A.T. gun plus the newly developed 5cm antitank P.A.K. 38—(the *Panzer Abwehr Kanone*).

The possibilities of attack or defense by these German Panzer units was formidable indeed. The ammunition used in any one of these weapons was such as to insure penetration with subsequent detonation at astonishing ranges. Long range battles became an actuality in the Libyan Desert; and when the bigger guns were in the tanks, battles often started at ranges of 4500 yards.

THE FLAK 18 AND OTHER HEAVY DEVELOPMENTS

Prior to 1940 the Germans had worked on developing a weapon which would demolish the then-formidable Maginot Line Forts. As the effective penetration of armor lies in giving the biggest shell possible the greatest velocity obtainable, only one really excellent weapon was then available. That was the German Flak 18 (*Flugzugabwehr Kanone*) gun. By the simple expedient of making a worthwhile armor piercing shell for this already excellent A.A. gun, the Germans produced the weapon they needed. They carefully worked out all the problems and proved the gun on sample Maginot Line Forts built to specifications on their own proving grounds. And so by the time the Libyan campaigns were underway the Afrika Korps had a new dual purpose gun: the Flak 18 with its excellent AP-HE, C and BC shell.

Now there is nothing astonishing in this weapon of itself; but the German adaptation together with clever tactical use made it a devastating surprise to the British 8th Army. It cost many Allied tanks to purchase the information that armor cannot protect against the Flak 18, but the gun must be mastered tactically. To armor against this weapon would produce a fort, not a tank. As 1941 neared its close the Germans realized that they would soon face bigger and better tanks. Never letting up in their unending drive for

the ultimate in tank destruction, they sensed the inadequacy of their smaller weapons both in and out of tanks. And so they turned to a new expedient.

In Russia the German Army had captured quantities of the fine 76.2mm combination A.T. and field guns, together with enough ammunition to equip several batteries for use in Libya. They also substituted their own satisfactory 7.5cm K.W.K. (short barrel) AP-HE, C and BC shell for the Russian shell, loading it in captured cases. Thus a new A.T. gun appeared in the Desert early in 1942. Later in the year this same gun appeared mounted on German half-tracks. Crude as this modification was, it still was a self-propelled A.T. gun which paved the way for the powerful tank destroyer of today.

As the early summer battles in the desert came to a close and the hard pressed 8th Army moved deep into Egypt, the Germans realized that in the new medium American tanks (the Grants and the Lees) they were facing good armor which represented a definite threat. Many of these tanks survived scores of hits while dishing out greater fire power than the Germans had ever experienced. The failure of these hits to stop the Grants and Lees was attributable to the use of the German short barreled 5cm K.W.K. When hits were registered by the 5cm P.A.K., penetration was usually effected.

Because of this experience, Rommel in his trial push along the edge of the Quattarah Depression in the late summer used PzKw III's fitted with the 5cm long barreled K.W.K. and PzKw IV's with a long barreled 7.5cm gun. These new guns put the German tanks back in the field as a serious threat. However, this was September, and the brilliant 8th Army, newly equipped and under a new commander, staved off attack. Another breathing spell now set in, with the 8th Army destined to pack a tremendous punch heavily augmented by new American Ordnance.

DEVELOPMENT OF THE P.A.K. 40

The Germans speedily appreciated the value of the Russian 76.2mm piece in its original design; and practically parallel with it they developed a new P.A.K. of 7.5 caliber called the P.A.K. 40.* So we see the progression from 3.7cm to 5cm to 7.5cm.

It is decidedly worthy of note that all these weapons developed about the same velocity: about 2600 feet per second; this despite the fact that the shell weights started at 1.5 lbs., went to 4.5 lbs., and then to 15 lbs.

Each weapon was adequate for the job it had to do in terms of existing tank armies at the time of development. The 7.5cm is able to destroy any tank attacking its position today, as has been amply proven in Tunisia and Russia. The 5cm P.A.K. is still able to penetrate heavy homogeneous armor at ranges up to 1000 yards.

Even while the 7.5 P.A.K. 40 was being developed, experiments were going on in the field of raising the velocities of other and even older patterns of weapons. Here the old Russian 76.2mm gun comes to the fore again, its chamber bored out to use the same case as the new 7.5cm. Obviously

*The long-barreled tank gun K.W.K. 40 is actually the tank version of the P.A.K. 40 A.T. gun. Projectiles for both weapons are the same save for slightly different rotating bands. The cartridge cases are quite different, but the resulting velocities are believed to be almost identical. The K.W.K. case is shorter, but thicker.

¹German calibers are usually stated in centimeters.



PzKw III, with short-barreled 5cm gun K.W.K.

with the calibers so similar, full advantage could be taken of production possibilities, one cartridge case serving two purposes. In this instance the velocity of the Russian gun was raised from about 2150 to about 2600 f/s. This stepping up of velocity, as in all such cases, improves the shooting somewhat. Trajectory is flattened appreciably and errors of range are not so serious. However, jump and stability are usually adversely affected. Here again compromise necessarily creeps in.

The Germans proceeded to mount this gun on the Skoda tank chassis, and it became their version of the Tank Hunter in the Alamein Battle period. To offset the over-exercised recoil system caused by the heavier charges, the muzzle brake was introduced. The gun had only a light, topless shield; and its pintle was attached directly to the Czech tank hull. These weapons did their full share of A.T. defensive shooting in the Alamein Battles, exacting a heavy toll in Allied tanks. Most of them died an ignominious death by fire—fire set by their abandoning crews.

TACTICS

The outstanding feature of the 8.8cm Flak 18 was the extreme range of its effectiveness. It easily outranged any A.T. gun, often destroying Allied tanks a mile distant. It must be stated, however, that many of the vehicles knocked out at extreme ranges were older, thin skinned tanks. A common trick employed by the Germans was to watch from 8.8 gun positions until ranges were not over 1000 yards. Most targets which came within this range went up in flames regardless of thickness or quality of armor. Here is clear cut evidence of the impossibility of effectively armoring against such high velocity, heavy caliber A.T. guns. These guns must be fought tactically. The 8.8 Flak 18 was transformed into this A.T. type by adding a shield and an excellent, quick focussing sight. The AP-HE, C

and BC shells when properly directed gave all the penetration needed to ruin the heaviest armor on wheels.

The tank would seem to have reached the zenith of its career, since mobile guns now exist which are capable of penetrating at increasing ranges any armor which can be moved about by an engine. Nor are huge, oversize tanks the answer.

Our Sherman is one of the finest tanks ever produced, and represents in the opinion of qualified observers about the acme in tank performance. Yet neither it nor any other tank can face the fire of high velocity, large caliber A.T. guns now in use. From all this one should not jump to the conclusion that the tank has outlived its usefulness. Far from it. But it unquestionably has reached the peak of its effectiveness.

We must not be misled by the results of the Alamein Battle. Aerial bombing of the most intense sort preceded the attack on Rommel's Army there; and the actual jump-off was possible because the front was cracked from end to end by an old fashioned artillery barrage reminiscent of the Somme or Verdun in World War I. Many of the toughest of the German positions were immobilized or pulverized by this overwhelming barrage; and when the 8th Army infantry and armor went forward under perfect timing, the air force and the artillery support went ahead of them. American Shermans firing the M61 shot without question won the big tank battle behind Sidi Rahman.

THE 8.8CM FLAK 41

The Germans quickly grasped the need for a still higher velocity gun to stop the big Russian and the new Churchill tanks. From this realization came the Flak 41, an 8.8cm in which the muzzle velocity was stepped up several hundred feet per second.

Again with the shell being required to survive this in-

creased velocity during effective penetration, the design was continued and improved. Small cavity cyclonite-loaded AP-HE, C and BC shells were developed specially for this new weapon. In the opinion of this observer, no armored vehicle able to move can withstand the shell from this Flak 41 at average tank battle ranges.

Thus again to destroy this gun requires tactical handling, not the optimistic courage of a few tank crews. For this reason a modern army requires the support of mobile artillery to remove A.T. gun opposition. Just prior to the introduction of the Flak 41 the Germans developed a special tank carriage in which was mounted a Flak 18. This mounting afforded a mobility to this weapon never before realized when on the dual purpose mount. This is the tank now called "The Tiger." A muzzle brake helped ease the recoil of the giant 8.8 gun.

ROUNDS OF OPPORTUNITY

In addition to the regular types of ammunition, the normal German artillery pieces always carry an A.P. round of opportunity. Such rounds are much like the smaller caliber A.P. designs, all being base fuze with adequate bursting charges. Thus if an artillery position is overrun by enemy tanks, gun crews if they stick to their guns and survive

have some chance of stopping or destroying these tanks. German A.T. doctrine insofar as a piercing projectile concerned has one principle of design which is not AP-HE, but a design wherein the projectile carries a special hard core. The core is usually tungsten-carbide, and is capable of tremendous penetration at close ranges. In most instances such projectiles weigh much less than the heaviest weight of shell which would normally be considered proper for the gun. Therefore a sharp advance in velocity is always realized. These hard cores are usually about one-half the diameter of the projectile. On impact only the hard inner core penetrates; and it is evident that at best comparatively small damage can be done; whereas a tank armor hit by a normal sized AP-HE in most instances means a burnt out tank and a dead tank crew.

This hard core type of ammunition, therefore, would clearly seem to be ammunition of opportunity. A captured German 37mm P.A.K. handbook seen in the Middle East cautions the gun crew on the use of this type of ammunition, stating that the rounds are expensive (scarcity of metal) and the flight of the projectile is ballistically unsound, especially over 400 yards. Very little damage was seen on Allied tanks which could be credited to this type of round. Damage from AP-HE on the other hand was al-



Captured German A.T. weapons. In the foreground is the 2cm Solothurn rifle; next, the 37mm P.A.K.; and in the background the 28/20mm M41 reducing bore A.T. gun.

ways positive. Eight times out of ten a burnt out tank was the result of a direct AP-HE hit.

The German idea in hard core ammunition, then, would seem to be to provide a last ditch opportunity to get at a tank by hitting the driver or the engine. This idea found expression also in the 7.92mm A.T. rifles, the 20mm A.T. rifle and 20mm MG (K.W.K.), the 28/20mm and 47/28mm Guerlich guns, the 3.7cm P.A.K., the 5cm K.W.K. and P.A.K. 38, the 7.5cm P.A.K. 40 and the 76.2mm P.A.K. guns. No such type rounds have been encountered for the 8.8cm Flak nor the long barreled 7.5cm K.W.K. guns. (A 75/56 Guerlich gun has been reported but not confirmed.)

The AP-HE rounds come with and without caps. Starting with 7.5cm, the larger calibers have in addition to the cap a ballistic cap or windshield. The following list shows the antitank ammunition by gun and caliber.

GERMAN	Hard Core	Uncapped A.P.-H.E.	Capped	H.E.
A.T. Rifle (pzb 39 7.92mm) . . .	x ¹			
A.T. Rifle (Solothurn) 20mm . . .	x	x		x
Tank M/G (K.W.K.) 20mm . . .	x	x		x
A.T. M/G (Guerlich)				
28/20mm	x			x
A.T. Gun (Guerlich) 42/28mm . . .	x			x
A.T. Gun (P.A.K.) 3.7cm	x	x		x
A.T. Gun (P.A.K.) 4.7cm	x	x	x	x

¹With tear gas pellet.

GERMAN	Hard Core	Uncapped A.P.-H.E.	Capped	H.E.
Tank short brld gun (K.W.K.)				
5cm	x	x	x	x
A.T. short brld gun (P.A.K.)				
5cm	x	x	x	x
Tank long brld gun (K.W.K.)				
5cm	x	x	x	x
Tank short brld gun (K.W.K.)				
7.5cm			x ²	x ²
Tank long brld gun (K.W.K.)				
7.5cm			x ²	x ²
A.T. short brld gun (P.A.K.)				
R 76.2mm	x		x ²	x ²
A.T. long brld gun (P.A.K.)				
R 76.2mm	x		x ²	x ²
A.A. & A.T. gun (Flak 18)				
8.8cm			x ²	x ²
A.A. & A.T. gun (Flak 41)				
8.8cm			x	x
How. (Divisional) (K18)				
10.5cm		x		x
Gun (Corp) (K18) 10cm			x	x

Doubtless later intelligence on these weapons will reveal other guns whose velocities have been increased for use as A.T. guns.

²Also with ballistic cap.

³Smoke.



Destroyed German "88" and prime mover.

TROOP LEADERSHIP

For Junior Officers

By Lieutenant John H. Thornton, Jr., Coast Artillery Corps

EDITOR'S NOTE: Many articles on the subject of Leadership cover the same ground with but a variation of phraseology. Lieutenant Thornton's article approaches the subject from a different angle—and in forceful, direct and simple language, as one lieutenant to another.

I

CHECK AND CORRECT

Today in the greatest of all wars the demand for junior officers far exceeds the supply of previously-trained troop leaders; the rest will have to be "made"—and in a relatively short period of time. Unless this training is successful, missions will fail. The tragic examples of armies taking the field without good, steady, "common garden" variety type of troop leaders are legion; and with every instance of disaster stemming from weak officers, follows a flood of additional literature on the leading of troops into battle. Most of it is fraught with generalities and frequent exhortations for junior officers to rise and assume the rôles of aggressive, intelligent commanders.

Such phrases are all too easy to repeat and their repetition adds but little to the rapid development of a battle commander. To the average junior officer, these publications serve to inspire momentarily, but offer little else. These eager second lieutenants are in the position of a man with the desire to enter the Olympic 100 yard backstroke finals without first learning to swim. Unless they are given some hard-headed, realistic procedure in the highways and byways of command, their lessons will be learned the hard way, often the fatal way and always at the expense of the organization.

What junior officers most frequently yearn for is some practical instruction in the technique of leadership. Perhaps a course in command, the application of military psychology or the development of a strong personality—it all adds up to the same. It is not enough that a young officer wants to lead; he must be shown *how* to lead. His appetite is geared for less caviar and more meat and potatoes.

Before considering some of the concrete factors which face a young officer in the various phases of troop command, there is one guiding rule which has to be burned into the consciousness of every lieutenant from the first day with his platoon until he is relieved from command.

The deciding factor in every battle ever won has been the ability of its commanders to be informed of each small detail of the situation. The ancient nursery rhyme, "For want of a nail, the shoe was lost; for want of a shoe, the horse was lost; for want of a horse the rider was lost . . ." is a tragic, burning reality to an officer in battle.

It is perfectly evident, for example, that General Sir Bernard Law Montgomery is not every minute with his men at the front in Africa, poring over each tiny scrap of information on the situation, through any personal whim or flair for the dramatic. This, his mighty Eighth Army will testify, is the recipe for success in war. And the strands of this success lead back from the front, back through the staging area and port of embarkation, back to the first day a unit began its training.

Cause and effect are usually difficult to relate, but in battle as in no other human activity, the difference between life and death is indissolubly linked to the performance of small details in training. Sudden death stalks every lazy act of a junior officer in garrison. Unless he is made to react subconsciously to the importance of attention to detail, then he is not qualified to direct the lives of other men in combat.

Check!

It means that no matter how distasteful or boring the task, no order is issued unless an officer follows it up personally to see that it has been carried out completely and precisely.

To tell a corporal that all machine guns will be cleaned and assembled; to warn the mess sergeant that the floor will be scrubbed and mopped dry; to admonish the platoon sergeant that each man will change his socks after a hike—it is *not enough*. The junior officer must personally, with his own eyes, check every detail during the day, and his officers' day is from an hour before reveille until long after bed check.

Nor is it enough that the work was merely done. How was it done? Was the floor still damp two hours after scrubbing? Were all the hoses and water chests tested with each machine gun? Did three men in the first platoon fail to change their socks? Did the young officer follow up these items? Unless he did, the chain of command has begun to rust. Eventually, when the strafing planes dive over the position, the guns in the first platoon won't have proper headspace adjustment. Next time, the slipshod corporal will check each gun. But half dozen shallow graves will then tell the story—there is no "next time" in war.

Correct!

The best inspection in the Army isn't worth a tinker's dam if the deficiencies located are not corrected. They must be remedied on the spot.

It is one of the hardest things in the world for a young officer to stand over a grizzled sergeant and make him keep his gun crew in the artillery park after hours. Usually it means that the officer himself will miss the movies. More

often his week end will be spoiled. The gun crew will mutter under their breaths and the sergeant growl. More than anything else the young lieutenant wants his men to like him. The first thing he realizes is that the men under him hate to be nagged about small things. What difference does it make whether the gun is out of orientation? Who cares if the latrine sinks or streaks? A lot of dead Frenchmen could tell him, but they can't talk.

The young lieutenant need not mince words about the solution to the problem. Some like to call it moral courage. Most Americans call it guts. It is the creed of a good baseball umpire. You call them as you see them, and you call them every time.

If an officer does not correct each mistake, no matter how small—the K.P. with dirty fingernails or the gunner who talks back to the gun commander—then he doesn't have what it takes to wear the bars on his shoulders.

The young officer might as well sit down and take counsel with himself the first day he goes into an organization. There are no compromises, no shades of meaning. He knows in his own mind whether a thing is right or not. When he tells himself that he is being an old maid he permits a private to pass him without saluting or perhaps his gun crew to chatter when they pass the ammunition, he's not kidding anyone else but himself. Except that it is not himself alone that he is hurting. A thousand men's lives can well depend on five unpleasant minutes of correcting a sergeant in the training center, five thousand miles away from the wrecked and blasted gun position.

It's a dirty job, an unpleasant job. Most of the time the officer will feel that he has not a friend in the world; most of the time he will be cold and tired and should have finished the job hours before. If he stops to show that guard how to challenge a man properly, he will miss his supper.

But if he doesn't stop to talk to that guard, some night he'll end up with the rest of his platoon—dead in a ditch somewhere in Buna.

When he is tired of it all, and the weary prospect of watching a crew emplace a gun three more times is the most distasteful task in the Army, that is the danger signal. The crew probably needs to do it four more times.

War in a training center is sometimes a dead, dull grind that stretches on interminably. But battles have long since ceased to be won on the playing fields of Eton. Grinding, bloody victory today is wrung from the weary hours in a gun park or a battered exercise field where numberless battalions have set up command posts and laid the wire. The first enemy line is taken when a numb, young lieutenant has the guts to call a gun commander down out of a prime mover and make him personally check the eyebolts and the breakaway chain, not once, but three times for forgetting.

II

ORGANIZATION

More than three quarters of a century ago one of the leading military writers stated that the success of military training is in the acquiring of the herd spirit—unit feeling. Napoleon put his finger on the tender spot, when he said

of his soldiers at Waterloo, "They had not eaten soup together long enough."

Ergo, a young lieutenant must find out in a hurry how many different ways he can sit down with his platoon and eat soup together. It is one of the most difficult phases of a young officer's task—the development of unit pride.

Esprit de corps! Once achieved, the dividends always come in at the time they are needed most. That last ounce of strength which is but a phrase on a printed page, until the final minutes of the fourth quarter when it is too late to take time out, is drawn as much from pride as anything else. If the outfit has it, when the heat is on and the chips are down, it will bend and bend and bend, but it won't break.

The young officer must remind his men constantly that they are members of the best battery in the battalion, that they have a reputation to uphold. He must nurture this loyalty to the herd all the time, using every opportunity to remind his men of the bond they have with their battery.

One way to do this is to dramatize the organization; to make every individual remember that he is not only a member of the 999th Battalion, but A Battery of the 999th. In A Battery the grass grows greenest in the front yard, the signs are neatest and brightly painted, the guidon is employed on every occasion. The men have a symbol which relates them to their outfit. Historical, regimental insignia were not developed just to give the jewelers more business.

The alert officer will stage as many parades as possible. He will let the men strut their stuff; get them out of fatigue clothes. He will make his Saturday inspections the toughest and most formal in the battalion. He will turn out in his blouse and best pair of pinks at inspection and he won't forget his old OCS slogan when he inspects his platoon. "Look proud of yourself, mister, you're in A Battery now." He will give them something to think about, something to talk about, and all this will further their pride in the outfit.

The noncommissioned officers are the lieutenant's most valuable training aids in developing unity in the organization. He must deal with them like a manager treats his highest paid opera star: pamper them, cajole them, reason with them, and then drive them for all they are worth. He will allot his noncoms definite responsibilities and remember to make these responsibilities clear and precise so he can accurately determine the manner in which duties are performed. He will nip "buck passing" tendencies in the bud. He will require that his noncoms actually direct the work. He will impress upon them constantly that they are more than high-paid privates. He will confer with them, confide in them, conduct schools for them.

Most young officers realize that they should never correct their noncommissioned officers in front of other enlisted men. They will check their work closely and make corrections promptly, but all corrections will be made in private. Every act will be toward the elevation of the noncoms' prestige in the eyes of their men. And when Corporal Ross turns his squad of mountaineers out with hair cut and shoes shined, then Corporal Ross is entitled to a public recognition of his achievement, which in its own way may have been equivalent to moving a mountain.

A final point on the subject of acquiring the "oneness"

so vital to victory in combat. It will come to haunt every young officer in the training of replacements. The only certainty in Army life is uncertainty. The lieutenant must rotate his crews, try out replacements, assign responsibilities to new men, practice operating without key personnel. If he does not, he will wake up at the port of embarkation and discover that his outfit has turned over completely within the brief training period. In fact, the chances are about even that the lieutenant will turn over with it. He cannot forget that the outfit which fires the first burst at an enemy plane will be vastly different from the one which knocked down the sleeve at the service practice.

III

MORALE

Good will has been defined as the "sum of an infinite number of favorable impressions." The problem, then, for the young officer, is how to build up the "favorable impressions" in the minds of the men of the command. Many approaches to the problem have been suggested.

The British, for example, urge young officers to remember the following eight commandments:

- (1) Give the men a sense of unity; all for one, one for all.
- (2) Put the men's interests first at all times.
- (3) Explain things to the men.
- (4) Do things with them. (British officers always take part in athletics with the enlisted men. One of the guiding principles of their leadership is the development of the spirit of the team.)
- (5) Be the champion of the men; fight for them; defend them always.
- (6) Know the men's names.
- (7) Make the salute a greeting between comrades and practice it religiously.
- (8) Be friendly with the men without being familiar.

Young officers find it most difficult in improving the morale of an organization to remember the paternalistic attitude which they must adopt; the same position as a stern father with his children. In this rôle they must be the father confessor of enlisted men. It is all-important that they be urged to come to their officers with important personal problems, knowing they will be guaranteed a sympathetic reception.

In the same respect, enlisted men must be instructed not to be afraid of bringing other complaints freely to their officers. Naturally, noncommissioned officers should weed out the complaints which are not important. But it is vital to the morale of any unit that the enlisted men know that they have a means of redress in matters of importance if they feel that they have been dealt with unjustly.

Orientation has come to be regarded as highly important in the maintenance of morale in the American Army, stemming from the natural questioning in the mind of a democratic citizen to know the reason "why" for everything he does. Frequent talks about "why" the fighting takes place, war aims, plans for a post-war world, are "musts" in any organization with a high morale.

In garrison and in the field, officers must fight continually

to secure prompt deliverance of mail. No other factor in a soldier's existence is so important as the prompt receipt of news from home. Officers often order home town papers when a substantial number of men come from a particular community. In the field, it is a great help if officers contact friends and relatives of men who are not receiving mail and request them to write.

After hours, the chaplain and special services officer should be utilized. An occasional party, social occasion where feminine companionship is provided, informal, organized musical entertainment are morale builders. The discovery of an enlisted man who can play a musical instrument or is possessed of theatrical talent is a gold mine to a young officer.

Athletic teams are always aids to the preservation of morale. Americans are the most sports-minded people on the earth. This quality is a godsend to officers confronted with a morale problem. The equipment for softball and football is inexpensive and can be improvised if necessary. One over-zealous special services officer suggested the jawbone of an ass for a baseball bat, if things got too tight.

Insistence by young officers that enlisted men present a good appearance at all times is also a definite morale booster. They should require that the men look like soldiers, with brass polished, hair cut, shoes shined; to wear good postures. It is no idle phrase that a good posture adds immeasurably to self-respect.

It is important that each officer guard the health of his enlisted men. Particularly stringent inspections must be made when the unit is in the field. Officers must not permit the enlisted men to go "to seed" once an outfit has moved into active position. Neatness, haircuts, daily shaving, regular bathing, must be insisted upon, if at all possible. Any detractions to self-respect will inevitably result in a lowering of morale.

Religious preferences of enlisted men will also be honored and facilities provided for their worship when possible. Officers must get to know and use the chaplain.

Like the sad clown, Pagliacci, it is always "smile, damn you, smile" for a junior officer. No matter how tough the going, or how hopeless the position, junior officers can exude nothing but cheerfulness and optimism under all circumstances. It remains for their spirit to "carry" the outfit along when the night is the darkest and the motor truck is stuck in the mud ten miles to the rear.

IV

DISCIPLINE

Discipline is the life blood of an Army. The degree of success in battle is directly proportionate to the state of discipline of the troops involved. Just as the test of a young officer is his ability to get results, so his ability to produce results is dependent entirely on the discipline of his men.

Successful battle discipline stems from self-discipline. Pride in organization, instant obedience to orders, vigorous health, all flow from self-discipline, and are founded on the individual soldier's self-respect. Thus, the goal of all officers—to create this self-respect.

Of vital importance to a young officer, however, is the aspect of discipline and its relationship to his dealing with the enlisted men. Success in this regard is more than

mental attitude, it is a technique to be carefully developed and constantly practiced. Junior officers may well take heed that one careless slip in the relationship between them and their enlisted men will invariably undo weeks of painstaking effort to build up discipline.

Certain features in the officer-enlisted man relationship have been carefully worked out by leaders with years of experience. They are well to consider.

a. Treatment of the Soldier by Officers. First to remember, of course, is that while an officer must adopt a certain mental attitude toward his men, at the same time he must not forget that they are to be treated as men. That is not to say that enlisted men will not be corrected for infractions of military rules. In fact, they must be corrected immediately. Any young officer who does not have the mental fortitude to insist on proper and precise attention to duty from each enlisted man is destroying the respect of that enlisted man toward him. First weeks are all-important. Officers must not be afraid to say "no." Unless this attitude is practiced, before a young officer realizes it, it will be a case of the tail wagging the dog, and his function as a troop commander will have been completely destroyed.

b. A Soldier's Self-Respect. No aid is so valuable to discipline as an appeal to a soldier's self-respect. It is one of the most prevailing human principles that a man will undertake nearly any dangerous mission to retain his standing in the eyes of his fellow soldiers. In battle, this factor will be needed by an officer, not once, but many times. It is one of the most successful antidotes of all to combat fear. In garrison, this same pride and self-respect must be carefully nurtured by officers. When appealed to in this manner, most soldiers will react favorably. New officers will find such an appeal the best means with which to deal with first offenders. Nine times out of ten, if an officer will approach punishment with an appeal to self-respect, instead of a sentence in the guardhouse, he will not be troubled with the offender again.

c. Criticism. One of the common practices of many young officers, whether it be in the club bar or around the mess table, is casual, indiscriminate criticism of higher authority. Invariably such disapproval is transmitted to the men. And it is one of the worst habits which a young officer can develop. Running the War Department from a battery office may be a pleasurable pastime, but it is not conducive to discipline and respect of the troops for their superiors. What most officers do not consider is that when they criticize higher authority they are striking directly at themselves as direct representatives of such higher authority.

d. Punishment. It is a certainty a young officer will deal with punishment sooner or later. The important factor is the manner in which such punishment is awarded. Perhaps no single item in the commanding of troops is so crucial to a new officer's success as the proper administration of disciplinary measures. The guiding rule for punishment in the Army is to make it *impersonal*. Each man punished by a superior officer must be made to feel that the penalty is a result of an infallible law which is over and above the officer. Just as the famous example of the stomach ache which follows the eating of a green apple, so must a soldier feel about his punishment when he has broken a military

law. The smart officer will picture himself as but a mouthpiece for a system of justice much greater than either he or the offending soldier. Justice and promptness are the two administrative rules which all young officers should remember. At the same time, nothing is so damaging to prestige as for a young officer to go off "half-cocked," without examining the facts. He is damaging his standing if he does not investigate each case; be sure of the facts before action is taken; then act fast!

e. Talking to Soldiers. Young officers must keep constantly in mind that there is a right time, a right place and a right way to talk to soldiers. They should not be lectured when fatigued. When talked to, enlisted men must be looked in the eye and get it straight from the shoulder. Above all, the enlisted men are not there to preach to; more damage is done by too much talking on the part of officers to enlisted men than too little. If they are constantly harangued, soon the words of the officer will be meaningless, and when he has something really important to say, it will have the same shade of importance attached to it as the chatter which preceded. The manner of an officer in awarding punishment is calm and dignified. A loud manner and a strident voice have no place in the make-up of a good officer. When he loses control and his reserve is gone, an officer stands pitiful and helpless. The enlisted man has the upper hand. He no longer commands the men; they direct him.

f. Relation of Officers and Men: The ancient phrase "familiarity breeds contempt" may have an overworked meaning in civilian life, but it is not to be underestimated in the military world. Probably the most common mistake which young American officers make in attempting to lead men is undue familiarity. It is a natural consequence flowing from the democratic process but it rarely produces results on the battlefield. There are, it is true, officers who can treat the men as complete equals and still command their respect and obedience. Unfortunately the number of such officers is very small. It is practically nonexistent among junior officers in the present war. In short, officers are forced to maintain a reserve between themselves and their enlisted men for their own self-preservation. It is difficult to judge the exact amount of such reserve which will produce the best results, but a certain amount of aloofness has always to be maintained. The distinction is not based on social barrier or any particular mental achievement, but is completely necessary for the preservation of discipline. Officers must remember that no matter how intelligent or entertaining their enlisted men might be, they must not treat them the same way as they do fellow officers. The entire careers of young officers hinge on the confidence and respect of their men. No matter how careful they are, this respect will be undermined unless a reserve is maintained. Again, it is not a social question but rather a life-saving measure for the preservation of discipline. When a junior officer gives an order it must receive instant obedience. A front line gun emplacement is not the place for a jolly discussion between pals. This practice may be unpleasant for a young officer to remember, but the terrible toll exacted when discipline fails is too high to ignore.

The .50 Machine Gun As a Subcaliber "40"*

This article describes the use of the Browning machine gun caliber .50 water cooled, as subcaliber for the 40mm automatic gun, M1, both for the Case I and Case III methods of firing. A short note is added to cover the possible use of other weapons for subcaliber purposes.

This subcaliber weapon is intended to serve several purposes. It is intended to compensate for the lack of 40mm practice ammunition, a lack which has necessitated the employment in practice of expensive HE ammunition that would otherwise have gone to troops in the field. In addition to saving ammunition, the use of the subcaliber mount will save wear and tear on the larger caliber guns and barrels that are needed for actual combat. Furthermore, the bursts from 40mm HE ammunition have often cut short towing missions by destroying targets. Caliber .50 ammunition will have this effect only under the most exceptional

circumstances. For these reasons, subcaliber firing will permit more extensive and economical firing during preliminary training. Moreover, it will permit more effective training during this period. Experience has shown that tracking will be more effective and a crew's confidence increased when its first firing is conducted without the distracting noise and flash of normal 40mm fire. Crews have regularly obtained more hits using this subcaliber mount. Crews must, however, become used to the noise and flash. For this reason, no subcaliber firing will be a satisfactory substitute for actual fire of the 40mm during the later stages of training, and no troops should be considered fully trained who have not had considerable experience firing actual 40mm ammunition at the appropriate targets. The caliber .50 machine gun was chosen as the subcaliber weapon for the 40mm because, among weapons for which tracer ammunition was available in quantity,

*Prepared at the Antiaircraft Artillery School, Camp Davis.

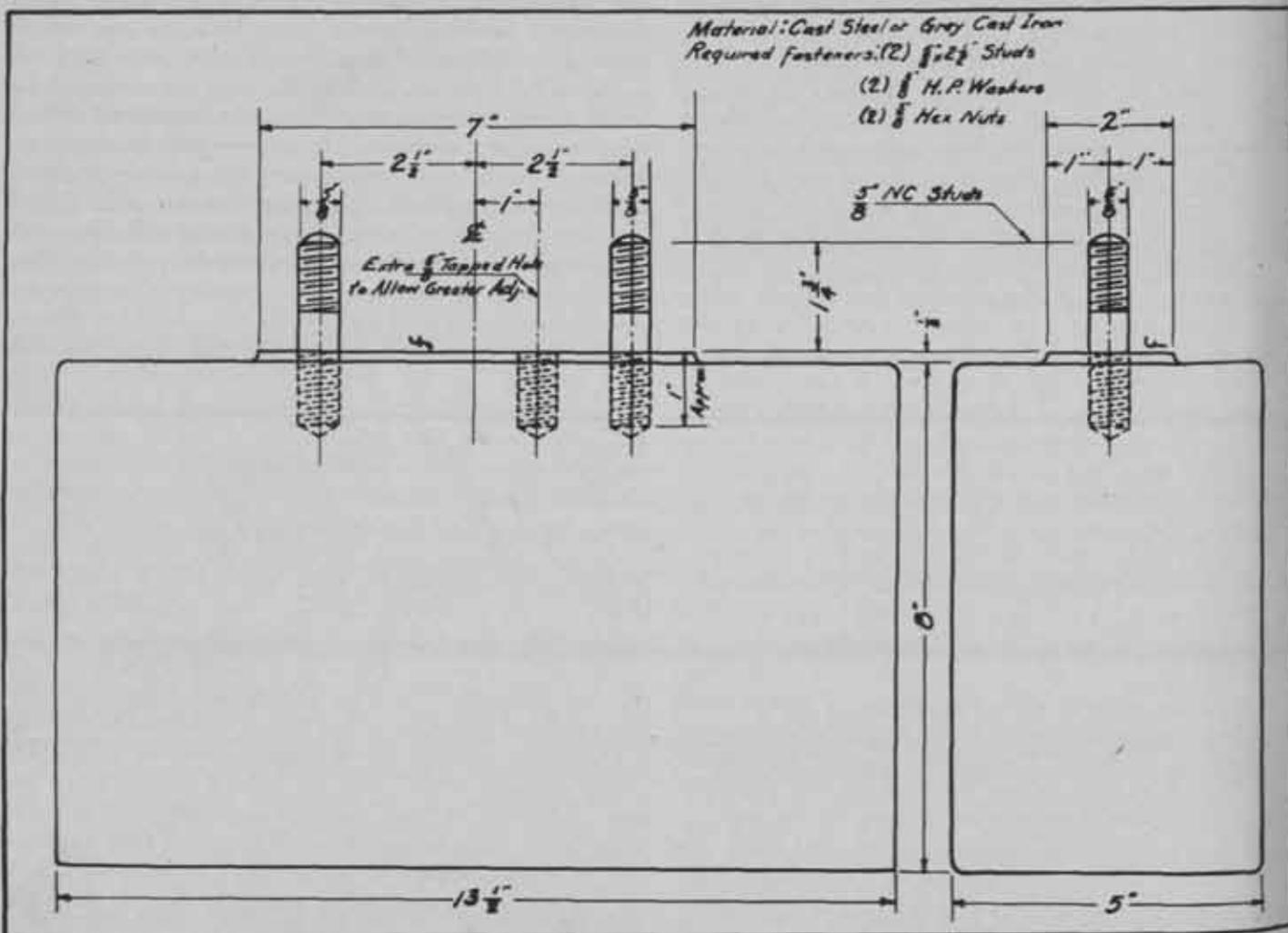


Figure 1

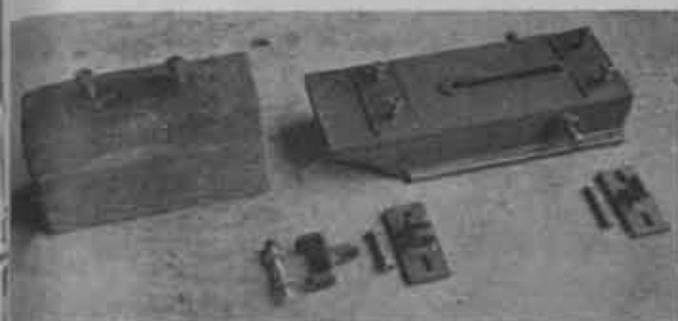


Figure 4

OTHER POSSIBLE SUBCALIBER WEAPONS

At ranges below 800 yards the caliber .30 rifle, M1, has proved a fairly satisfactory subcaliber weapon, although its tracer is less dependable than that of the caliber .50 and parallax errors have been pronounced when the director was not almost exactly in the rear of the gun. One minor weakness in the use of the caliber .30 rifle—the necessity of reloading during certain courses—can be counteracted by substituting the Browning automatic rifle, caliber .30, or the caliber .30 air-cooled machine gun. The caliber .30 water-cooled machine gun is not considered a satisfactory subcaliber weapon for the 40mm.

A subcaliber weapon with an extremely low muzzle velocity would have two important advantages. In the first place, it would permit safe firing on courses where AA firing is not now possible and on certain types of track-borne targets made to simulate low flying aeroplanes and mechanized vehicles. In the second place, it would permit greater realism in firing, both in relative speeds and appearance of the target. With a low velocity ammunition, for example, 700 feet per second, or one-fourth that of 40mm propor-



Figure 5



Figure 6

tionate reductions could be made in the range, size, and speed of the target, and conditions more clearly duplicating those met in firing on planes moving at combat speeds could be achieved. Realism in the appearance of the target could be achieved by the use of small radio-controlled planes. For example, almost any service condition of course and speed can be reproduced to a one-quarter scale when using the OQ radio-controlled target plane. Its size—12 foot wing span and 8½ foot length—corresponds on this scale to a 48 foot wing span and a 34 foot length, the average size of a light bomber. The speed, 85 miles per hour, would correspond to a 340 miles per hour speed which probably exceeds any that will be met during combat in the near future.

Experiments have been conducted with the .45 caliber tracer using a submachine gun as subcaliber, but this caliber had to be dropped when the manufacture of this tracer ammunition was discontinued. It is hoped that caliber .22 tracer will be made available for tests.



Do We Have Your New Address?

ANTI-AIRCRAFT



JAMAICA—Americans under a forbidding sky. ↑

→ ENGLAND—British soldiers man a twin Vickers .303.



▼ NEW CALEDONIA—A sandbagged position near Noumea.



ALGERIA—Infantrymen, too, scan the skies.

Around the World

American and British AA guns and gunners await Axis planes in widely separated lands, and in tropical and Arctic climates.

Signal Corps Photos.



ETO—Zero elevation, for a water-borne target.



ICELAND—A .50 crew stands alert.



↑ NEW GUINEA—Another .50 in a well-prepared position at the water's edge.



← AUSTRALIA—An AA director with a protective plate.



Signal Corps Photo

Not civil war—merely realistic training.

If You Don't Know --- You Get Killed

By Lieutenant Donald A. Carlson, Coast Artillery Corps

"If You Don't Know—You Get Killed."

That's the training slogan for hundreds of officers and enlisted men at the Camp Haan, California, Antiaircraft Artillery Training Center, who are mastering a new type of judo fighting designed to take care of Jap jiu jitsu in fast and deadly fashion.

Lieutenant Leslie F. Lawrence and a civilian instructor, Robert W. Seeger, started with judo, overhauled it and applied it to modern, hand-to-hand "quick death" fighting. They teach the Camp Haan antiaircraftman how to defend himself against bayonet, bolo, machete, knife, the two-handed sword or whatever the enemy uses. Barehanded he can render the Jap or Nazi unconscious in three seconds—kill him in fifteen!

Evidence of its originality and the immediate attention it commands have been the repeated visits of national newsreel cameramen, Associated Press photographers and the hearty approval of Major General Joseph A. Green of the Antiaircraft Command.

Mr. Seeger picked up many jiu jitsu tricks in Borneo, and after the first World War began trying variations of fighting with knives and bolos, machetes and bayonets. Consequently when World War II began and the need for such instruction was imperative, Seeger decided to interest the War Department in his method of hand-to-hand fighting. The AAATC Command at Camp Haan decided to try it.

By extensive research and practice Lawrence and Seeger developed a new and "fool proof" method of teaching a Judo bayonet drill. By applying the deft footwork and

agility of Judo, they have devised a bayonet drill the average soldier trainee can master within twelve hours. The entire Judo training period is but twenty hours.

Built on precision fighting, it differs from normal bayonet fighting in that at all times the soldier is in a position



Signal Corps Photo

Only one dummy in this picture.



Signal Corps Photo

The man on the right didn't know.

to handle any type of attack that can be made on him. He is taught to stick with the bayonet rarely unless he is in a position to throw his rifle through his adversary. Rather, the system is founded on fast footwork, slashing, using the butt stroke, and kicking. All is synchronized into swift attack movements that never take the soldier off balance or leave any part of him exposed.

A first sergeant, after six weeks of this new training, declared, "There is no comparison between Judo bayonet drill and the old G.I. I practiced G.I. training for nearly twelve years. This is tops as far as I am concerned and I am amazed at the confidence it builds up in the enlisted man who foresees actual hand-to-hand combat with the enemy."

The training program started with one officer and from two to four enlisted men from each unit of the AAATC. These men first were given a course of exercises to coordinate their muscles and teach them the necessary footwork. From there, they were taught elementary holds, where the most effective blows could be delivered and how to disarm every enemy.

The next step was bayonet training. A manually-controlled, faster-than-man dummy was invented to develop fast footwork and correct parries. The dummy is well-equipped to defend himself, he fights back and the soldier has to be good to lick him.

The soldiers and officers already trained as instructors do not learn a "nice, clean" method of fighting, but one that will prove the saving of many Allied lives in battle and make them more feared in combat. They are so enthusiastic about it during their training periods, in rain or dust storms, that they have to be cautioned constantly to avoid too much realism. The location of principal arteries and nerve centers is mandatory knowledge and a written examination is the climax of every course.

In the first classes, the Cal. .30 M1903 rifle was used, but after twenty or more were badly damaged a dummy rifle was designed and manufactured in the hobby shop for training purposes. This rifle, made from pipe and lumber, costs approximately 63 cents. The instructors train men daily who in turn can become instructors in their various units. And at Camp Irwin, the AAATC firing range, the Judo bayonet drill receives special emphasis.

At first, the average soldier is a little apprehensive about this rough, tough stuff. But with each succeeding hour of instruction his proficiency and confidence increase to the point that he knows positively that he can give a good account of himself against any foe, with any weapon. And that's what they pay off on in this war!



Signal Corps Photo

Without parachutes.



Stereoscopic Viewer

By Colonel Maurice Morgan, Coast Artillery Corps

A recent issue of *The Military Surgeon* contained an article¹ by Major Erwin E. Grossman, Medical Corps, formerly stationed at Camp Hulen, Texas, covering the relationship of the eye to anti-aircraft gunnery. In connection with the reproduction of certain portions of the article and at the request of the Editor of the *JOURNAL*, these notes have been prepared covering the trial use at Camp Hulen of a locally designed depth perception viewer in relation to automatic weapon fire.

Many readers will be more or less familiar with numerous methods, devices, and gadgets which have been used with varying success in the attempt to obtain and apply automatic weapon pointing corrections in firing at aerial targets. The writer must plead guilty to some "gadgeteering" in past years which contributed much of interest but little, I fear, of practical value toward the solution of the two principal gunnery requirements which have not yet in my opinion been adequately met.

- (a) Definite and certain knowledge as to the sense and approximate amount of deviations.
- (b) Ready means for applying an appropriate correction in time for it to be of value.

Having observed the continued difficulty encountered by range setters and others in attempting to sense "overs" and "shorts" during the brief period required by the tracer to traverse the presented area of a diaphanous flag target and the added uncertainty which accompanied the procedure when "line" shots were for any reason not obtained, it was decided to experiment with a home made adaptation of the stereoscopic height finder, omitting the element of calibrated range readings, in the effort to develop a means whereby range sensing could be accomplished with increased certainty.

There was nothing original in the design and the materials were "procured" locally. The instrument was designed to extend stereoscopic limitations of normal unaided vision by providing a bifocal separation of approximately five feet instead of the normal pupillary diameter of sixty-five millimeters, in conjunction with six-power binoculars issued to automatic weapon battalions. The viewer consisted essentially of a rectangular box (5' x 10" x 10") mounted on a metal tripod to permit tracking in azimuth and angular height. Two pairs of front-silvered mirrors (one 7" x 7" and one 5" x 5") were mounted inside the box so as to permit of a double right angle reflection into the objective ends of six-power binoculars which were fastened to the exterior of the box by a clamp and screw in rear of apertures fronting on the smaller (center) pair of mirrors. One of the center mirrors was connected by a threaded screw to an exterior adjusting knob to permit limited rotation of the mirror in azimuth and a separate but similar arrangement was provided to enable rotation of the other center mirror

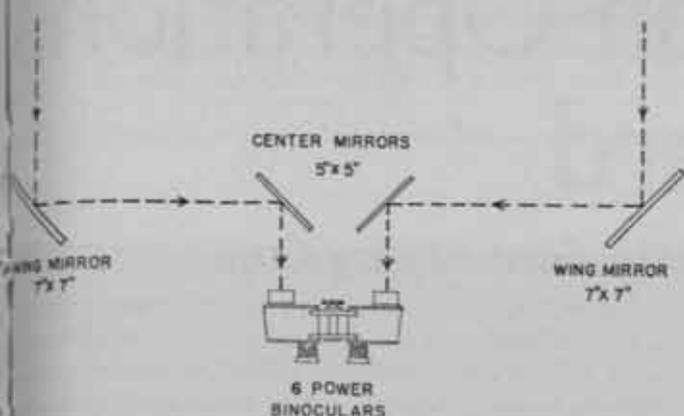
in a vertical plane. The adjusting knobs permitted setting of the mirrors for targets of different ranges and were necessary to prevent double images (lateral and vertical) which would otherwise be present due to parallax and rough methods used in mirror mountings. In adjusting the viewer for observation of AW fire it was found most advantageous to focus the binoculars for a distance of about 1000 yards, clamp them to the box and manipulate the azimuth and vertical adjusting knobs until a suitable object at that distance (1000 yards) produced a single, clear image. Further adjustment of either the binoculars or the mirrors of the viewer was generally unnecessary for targets at usual 40mm operating ranges.

A private of the Training Center Record Section was given opportunity to accustom himself to tracking the flag target. He received the usual coaching in the recognition of obscuration or silhouette applicable to the normal "line" shot. In addition he was impressed with the basic procedure required for attempted sensings on non-line shots, i.e., to note if possible the comparative distance relationship of target and tracer when both were most nearly in lineal conjunction or (as some prefer to state) to note the relative juxtaposition of target and tracer at the instant when the tracer appears to intersect the vertical plane containing the target path.

After the foregoing preliminary instruction a test was



¹Extracted in COAST ARTILLERY JOURNAL, May-June, 1943, issue.



undertaken to determine the practicability of the instrument in determining "overs" and "shorts" both as applying to so-called "line" shots and those in which neither obscuration or silhouette occurred. For this purpose the actual slant range of the target was periodically determined by the record section employing standard bi-lateral procedure. A separate record was maintained covering the slant range setting actually used in the director for the firing of the several shots of the course. The sensings on each shot as noted by the observer on the stereoscopic viewer were likewise made a matter of record. For the purpose of comparison it was assumed that if the slant range setting used in the director for a given shot was appreciably in excess of the actual slant range as determined by record section, an "over" would be reasonably expected and in all probability occurred. Conversely a "short" would likely result from an opposite situation. Analyses and comparison of the results for 10 courses, averaging about eight rounds per course, were made by the officers in charge of record section who reported that:

- In about 4% of the shots the range comparisons were not such as to permit of certain determination as to the cause of the shots and it could not be stated that the sensings of the stereoscopic observer were definitely correct or in error.
- 4% of the stereoscopic sensings may have been and probably were in error.
- 92% of the sensings by stereoscopic observer were in accord with the range result which might be reasonably expected from comparative values of director and actual slant range.

During 37mm fire on March 31, with *non-explosive* projectiles, the stereoscopic observer noted and called a "hit" with descriptive remarks as to its precise location. A similar sensing was made shortly thereafter with respect to a second "hit." His observations were indisputably confirmed when the target was dropped immediately afterward. Later on the same day the observer's sensings with respect to two other hits were similarly confirmed.

While results obtained in the conduct of this test (which was limited to some 4,000 rounds) cannot for a variety of reasons be considered as conclusive, it would appear that the observer having the advantage of both separation and magnification can distinguish with considerable accuracy between "overs" and "shorts" and in so doing is not dependent upon "line" shots as the only certain guide for

range adjustment. An observer having the benefit of aided vision can thus take full advantage of "line" shots to a better extent than he could without such assistance and in many cases can operate without the benefit of "line" shots which unfortunately do not in practice occur with the uniform regularity inferable from the text of certain training publications and instruction manuals.

It is known that consideration has been given to the adoption of equipment which would permit of instantaneous slant range determination and incorporating this data into the director operation thus eliminating some of the present difficulties of initial range estimation and subsequent range manipulation. Lacking such equipment it is believed possible to increase greatly the efficiency of range setters by providing simple depth perception mechanism as a part of the director. This could be connected in such manner as to follow the target through the normal operations of lateral and vertical trackers and the range setter could adjust the sense and magnitude of his leads with greater precision and promptness than is now possible. Such mechanism would not require determination of lineal ranges and lead adjustment, except perhaps for initial range setting, would lose much of its numerical significance and be handled in terms of trail or precession of shots. If the angular rates generated by tracers are correct (an assumption upon which we must proceed after sufficient crew training), an excessive lead is an indication of over range and vice versa. For any given angular rates an increase in the director range setting will result in increased angular leads and as a consequence the range setter can correct trail (a short) by turning his range wheel clockwise and can correct precession (an over) by counter clockwise movement, without knowing or being particularly concerned with the numerical values of the range set.

There should not be overlooked the often repeated injunction against the practice of "creeping the range," in which the setter attempts to approximate the progressively changing range which would be required for interceptions on different portions of a constant speed rectilinear course. This procedure is indeed hazardous, particularly so if attempted with unaided vision, and would be difficult even with the detectivity afforded by the suggested stereoscopic equipment. It is thought preferable to follow the present authorized procedure of range interception utilizing the capabilities of the instrument to detect readily any *sizeable* errors in either initial or subsequent range setting and seek for more frequent range interceptions than can be safely attempted on the basis of unaided vision. The procedure will in general permit range jumps in smaller increments with resultant decrease in dead areas in which (due to range divergence) no hits may be expected.

Some may claim that this procedure would call for a degree of artistry beyond the ability of the average range setter. This may be the case although equipment has not been available to test the possibilities. In any event, and without regard to the precise technique followed in range adjustment, the potentiality of the gun and ammunition has not been fully exploited due to lack of visual aids and can undoubtedly be furthered if the range setter be provided with equipment designed to meet his principal problems, — "knowing where they're going."

Barrage Balloon Operations Board

By Captain James S. Webb, Jr., Coast Artillery Corps

It is the night of the full moon, clear as the nose blister on a Mitsubishi 97 bomber and a likely time for our yellow "brethren" to be gluing their slant eyes to bombsights as they approach an American objective.

Twenty thousand feet below and a hundred miles ahead in a small building is the headquarters of the defending barrage balloon battalion. In the barrage control room the switchboard operator looks up from his copy of *Yank* and scans the balloon operations board.

"Air Raid Status—White. Operational Control—Normal. Weather Class—I. Condition of Readiness—Stand By. Balloons flying at 1000 feet." He muses to himself.

Unceremoniously the higher headquarters drop on his switchboard falls. His ear caresses the handset lazily and is quickly bitten off by the crisp message it spits out.

"Condition Two—ALERT. Fly all balloons ROH. Interceptor Control. Barking Dog. Corporal Misfit. 1944."

Almost instantaneously our hero has rung all subordinate units of the command and relayed the message. Then reaching under the desk in front of him with one hand he pushes a button which sends a buzzing sound throughout the building while with his other hand he begins to throw the little

switches clustered on the desk in front of him. The lights on the balloon operations board above him dance on and stop finally to indicate the new status of the barrage.

In an adjoining room the Commanding Officer and message center clerk look up at the sound of the buzzer—a replica of the upper portion of the balloon operations board which reposes on a mantle. These lights are changed too, in unison with those in front of the switchboard operator next door.

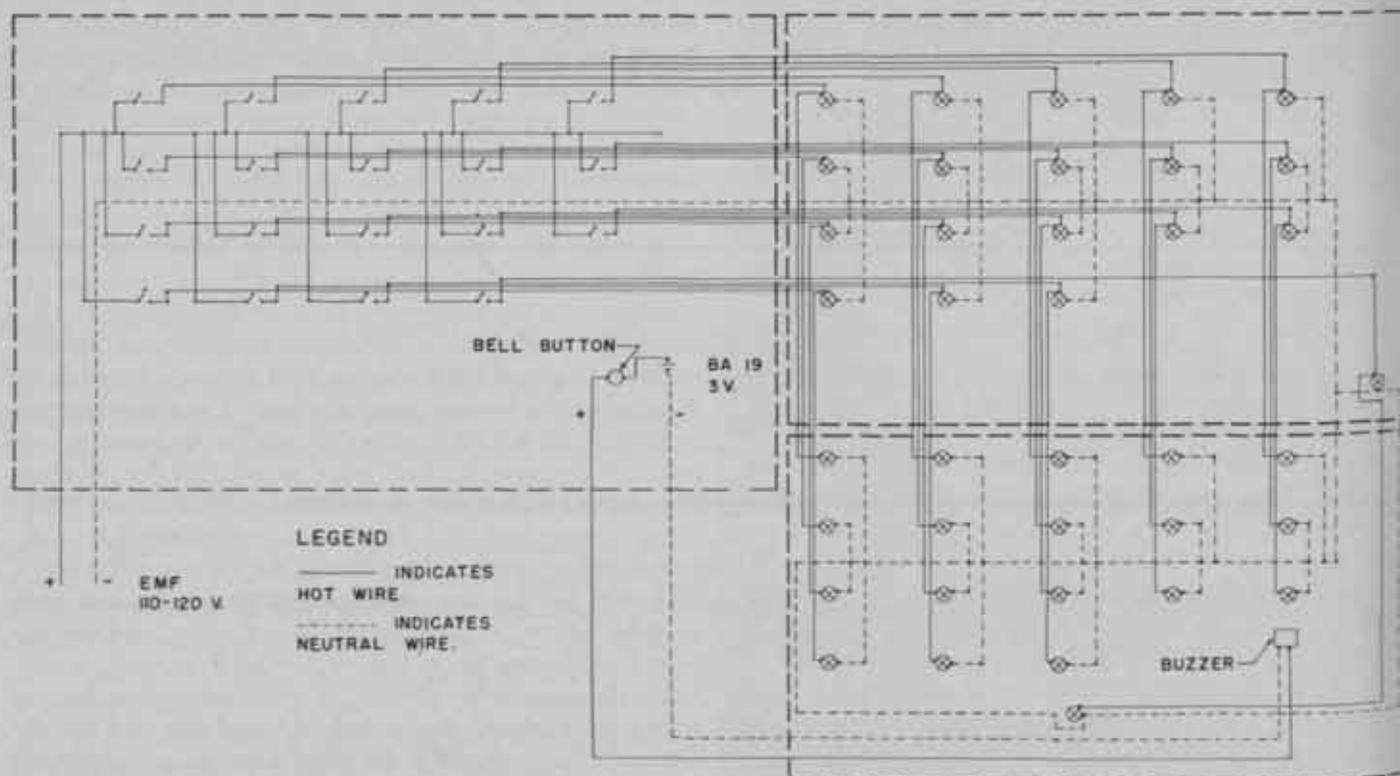
Everyone in the headquarters has in front of him a graphic picture of the situation immediately, dramatically illustrated by colored lights and forcefully commanding attention by the use of buzzers in event of change of status.

The balloon operations board then is the intelligent medium of the barrage, designed to keep all headquarters personnel constantly and accurately informed of the military situation in the defended area.

Construction of this board is a relatively simple and inexpensive project. Merely requisition, purchase or "otherwise procure" a few pieces of plywood, a couple of 2" x 4" fine piano wire, rubber bands, paint and paper. Then welcome home for your old Christmas tree light bulbs and string.

SWITCHBOARD

BARRAGE CONTROL ROOM



COMMANDING OFFICER'S BOARD

all in the battery carpenter and an electrician and you're practically equipped with a new balloon operations board. To be more specific, here is a bill of materials:

BILL OF MATERIALS FOR OPERATIONS BOARD IN BARRAGE CONTROL OFFICE

plywood	20 square feet
2 x 4's	30 feet
piano wire	5 rolls
wooden beads	55
rubber bands	110
screw eyes	110
christmas tree circuits	3 sets; 7 sockets in a set
socket	1-110V
bulb	1-7½W
switches	19

BILL OF MATERIALS FOR OPERATIONS BOARD IN OFFICE OF COMMANDING OFFICER

plywood	2 pieces 50" x 14"
lumber	2 pieces 13" x 6" x 34"
lumber	2 pieces 50" x 6" x 34"
christmas tree circuits	3 sets; 7 sockets in a set
socket	1-110V
bulb	1-7½W
buzzer	1
buzzer button	1
batteries	2-BA 19

Take a good look at the photograph. The top of the board consists of rows of lights operating on separate switches controlled by the switchboard operator. The lights are divided into four separate groups and the illumination of any one or any combination tells a story—the story of the immediate situation, enemy and friendly.

Below the lights is a series of vertical wires above which is a site number and on which slides a small wooden bead. Now these beads slide up and down the wire, manually operated, showing the altitude of each balloon. The two loose ends of the wire after passing through the board at top and bottom are joined in rear of the board by rubber



bands. And, this is the important part—for those bands maintain a tension on the wire that enables the friction of the bead against the board to hold each bead in any position. Large bead on far left of board indicates Ruling Operational Height.

Below the zero altitude mark on the board are spaces that indicate any trouble or operation other than flying, that is being performed on the balloon and the beads follow down the board into these spaces as necessary.

On the right side of the board is a legend and immediately beneath that a large red bulb which is habitually illuminated when the balloons are actually flying or ordered up. It is turned off when the balloons come down.

Choice of color in all lights is naturally optional. Bead colors which denote weather class are fixed by tactical consideration. Beads are lettered to indicate batteries to which balloons belong.

As mentioned before, the upper portion of this board, that is all the lights including the flying light, may be constructed in addition to the board itself, if it is desired to bring that information to any office other than the Barrage Control Room. Both boards may be wired in parallel and operated by the same switches in the Barrage Control Room.



Fellow Americans, this is our war, and our liberties, our homes, and our lives are at stake. It is folly to look for, or to seek, an easy way out. We must bear in mind that we can not win this war merely through the vast and mighty production that we have created. Production, as has been said with truth, represents the tools of victory, not victories themselves.—SENATOR DAVID I. WALSH.

CARTC Training Aids

By Warrant Officer Sam Horowitz

Improve and exploit!

This is the theme of the Coast Artillery Replacement Training Center for turning American civilians into well-trained recruits who soon will help explode the divide-and-conquer theory. Its development is the job of the Training Aids section of one of the Army's youngest training centers, located at Camp McQuaide on scenic Monterey Bay in California.

Idea center for the CARTC, the nominal SOP of Training Aids is: to gather training ideas from all parts of the world, select those particularly adaptable for its needs, add research and lots of it, and then go into production. Finally, distribution, according to instruction schedule time-tables, places ideas from near and far at the disposal of officers and noncoms for presentation in training newly arrived recruits.

Visiting teams of inspecting officers from the United States and British Armies and neighboring naval bases have pointed to the CARTC's Training Aids as among the most complete section of its kind in operation. Briefly, it consists of three main departments—the Library of Training Aids, a chart and model reproduction shop, and a well-equipped carpenter shop. Supporting all three is the front office procurement division.

The Library part of Training Aids provides each man in the CARTC, from the General down to the rawest recruit, with a source for every bit of issue or non-issue training literature, chart, model or device in the center. A simple sign-out library system allows issue for a ten-day period to all who apply. In addition to the training and technical manuals used chiefly for Coast Artillery training, a wide selection of supplemental manuals, Military Intelligence publications, publications of other branches and foreign nations and all charts in use at the CARTC are available.

And to prove the variety, the Librarian points to an 18-page typewritten inventory compiled last month. This is the department which comes in contact with the military public, so to speak. Its personnel is highly trained to recommend the proper literature for whatever problem either the

trainers or trainees meet. In addition, the Library schedules the requisitioning and distribution of all training literature and aids, other than ordnance material.

A new technique in military training is found in the reproduction shop. Commercial art is exploited, but kept from becoming too arty, in presenting clearly to ex-farmers, clerks and truck drivers, the intricate mechanisms of rifles, machine guns, 155mm guns, searchlights and many other army items. The use of colors and the pictorial is replacing the maze of schematic drafting, which heretofore left a large percentage of new recruits more befuddled than instructors.

Personnel of this department consists of commercial artists and draftsmen. Technique chiefly employed is that of silk screen poster printing, a grown-up stencil procedure.

Here new designing and originality in presentation is proving itself in such charts as an eight-color cutaway view of the 155mm breech mechanism, a three-quarter view of the recoil mechanism of the 155 in as many colors, services of the piece for the 155, seacoast searchlight sighting and aiming charts, and many others.

Direct black and white reproductions are an alternate method of reproduction. Two home made light boxes and a commercial developer allow quantity reprints of text, charts, maps, specifications and other aids.

The artists use their abilities in still another main field—that of papier-mâché. Several model terrains are circulated for teaching elementary map reading. Over two dozen principal natural and man-made features are depicted in miniature, light enough for one man to carry. Feature of the terrain is a removable mountain cap which reveals a series of removable wooden disks cut to contour shape, with contour lines painted along the edges. Another papier-mâché structure is made for position of gun batteries on a cliff overlooking a beach and sea, with a naval target riding the waves. This is used in position finding.

Products of the carpenter shop number in the thousands and range from simple wooden daggars to a miniature searchlight control station with a twenty-foot conveyor target range towing five different classes of naval war



Training aids in use. Recoil mechanism of the 155mm gun is explained by a team of cadre consisting of an officer and three noncoms—all pointing to the same part on identical charts.



An idea is completed. Printing eight-color recoil mechanism charts in the silk screen shop.

ships. Interspersed are such aids as hundreds of bayonet training sticks, sighting devices and firing dowels, as well as enough portable blackboards, easels and pointers to supply every training battery with four of each. Working models of the M1 rifle, and such Coast Artillery improvised aids as universal deflection boards, angular travel computers, wind component indicators, azimuth difference computer, set forward slide rules, prediction scales and many others have been turned out.

Between cycles, cadremen tour Training Aids, observing projects in development. New officers arriving at the center also are conducted through the shops, receiving information on how to obtain and use the aids already made, and how to offer ideas for additional ones.

The procurement division is backed up by Special Field Exercise funds. But it is only after the salvage yards, local civilian scrap heaps, regulation issue and other miscellaneous sources are exhausted is the SFE fund used—often under close S-3 supervision. Civilians in neighboring towns have been extremely cooperative. A juke box dealer supplied boxes of junk, which finds its way into many of the models. The Red Cross has assisted, especially in sewing. Examples are the repair of salvaged fatigues which became excellently camouflaged demonstration suits, or the sewing of salvaged canvas into chart cases. Such sources are welcome, for no one ever knows what Training Aids

will be called upon to supply. It has been anything—from chicken feathers to dynamite!

The front office carries on a wide correspondence with other replacement training centers and army school boards, principally to obtain publications and charts.

This story would not be complete without a notation of the appreciation the CARTC unit extends to the Training Aids of the Infantry Replacement Training Center at Camp Roberts, California.

It was a visit to the IRTC, commanded by Brigadier General Eugene W. Fales, and its excellent silk screen shop under Captain Sterling Ronai, by General Clark and Colonel Ruddell, which led to the development of the present CARTC section. Four enlisted men of the CARTC trained in the Roberts silk screen shop prior to starting operations at Camp McQuaide. During this training and a later trip to Roberts, the CARTC men produced many charts which cover general infantry subjects, allowing them to concentrate on charts for the 155mm in their home shop.

The two training aid shops exchange latest productions, and have arranged to produce a sufficient number of charts for each other should they express need for them.

In closing the story of the CARTC Training Aids shops, let us note that the shop in its present setup has been in operation only since the turn of the year—improving and exploiting to make short cuts along the road to victory.



ITALIAN MAT

Italian equipment captured in North Africa reveals that the junior Axis partner tried to get along with much outdated matériel.—

From collection of Lt. Col. G. B. Jarrett, O.D.



↓ 105/28 Ansaldo gun-howitzer, following the Schneider model.



A British 2-pounder AP shell ↑ did this to an Italian 75/28 gun.

ERIEL

Captured Italian guns, parked near Sollum. Note the preponderance of ancient equipment. ←



↑ A rather clean-looking AA gun, captured near Bardia. This is a 75/32, or according to Italian nomenclature, a 75mm gun 32 calibers long.



120mm gun captured at Bardia. There is no recoil mechanism—other than the ramps under the wheels. This piece is of 1890 vintage.



↑ Italian M13 tank, with 47mm gun in turret.



← 20mm Breda position, in Libya.

Individual Tracer Control

By Major George W. Race, Coast Artillery Corps

Individual Tracer Control may be defined as a system of machine gun fire control whereby the individual gunner places his fire on the target as a result of his own observation of the tracer stream. I.T.C. in its pure form takes no cognizance of the presence of sights on the machine gun. Firing must be continuous in order to provide an unbroken tracer stream; interruption of the tracer stream (firing in bursts) is destructive to this form of fire control, due to the fact that in such a case the gunner must begin his adjustment all over again at the beginning of each burst.

TRACER OBSERVATION

The science of efficient observation and evaluation of the tracer stream deserves discussion, without regard to the tracking, leading and firing based thereon. Efforts to this end are tremendously hampered by two factors; first, the total absence of depth perception ability (stereoscopic vision) at ranges exceeding 300 yards, and secondly, the curve, both real and apparent, of the tracer stream in space.

Depth perception has been defined as the ability of an individual to determine, by the use of his two eyes, which of two objects is the farther from him. Stereoscopic vision is actually only one of several factors in depth perception and depends entirely on the angle subtended by the distance between the eyes. At about 500 yards range, this angle becomes so small as to be useless; consequently, at longer ranges the relative position of objects is unconsciously determined through other factors, as comparative sizes, superimposition, amount of visible detail, etc. From this standpoint it would become necessary to compare the tracer and the airplane target, as seen together, in order to determine which was at the longer range, or to be more exact, in order to pick a point on the tracer's path having the same range as the airplane. This is obviously impossible; even at very short ranges it is doubtful whether or not depth perception is effective when applied to a source of light having neither sharp outline nor definite shape.

If the tracer stream were laterally straight in appearance the limitations of depth perception would have little effect on the problem, it being then necessary only to pass the line of the tracers through the target. Unfortunately, however, the tracer stream presents a definitely curved appearance, both in the lateral and the vertical plane. See Fig. 1.

The vertical curve of the tracer stream is a real curve. It is due to the actual gravity drop of the projectile below the line of bore and warrants no further discussion.

The lateral curve of the tracer stream is both real and fictitious. The real element of the curve is produced by traverse of the gun during firing. Tracers fired successively with a constantly changing azimuth are viewed simultaneously, each individual tracer being at a different range and azimuth from the others when viewed; thus by polar coordinates an actual curve is plotted in the sky. This curve is produced and clearly seen merely by traversing a

firing gun, without a target. The fictitious element of a lateral curve is produced by motion of the target; the target in space is the reference point upon which the eyes are focused; consequently the target appears stationary, its lateral motion manifesting itself as lateral motion of the individual tracers in a rearward direction. This optical illusion is apparent even in the case of a single tracer fired from a stationary gun, as long as a moving target is visible together with the tracer. Tracers from slow firing guns exhibit a lateral curve due entirely to this optical illusion, while the tracer stream from a machine gun invariably exhibits a lateral curve from both sources, provided that a moving target is used. Actually, when firing is done on crossing courses the vertical and lateral curves combine to give a diagonal curving effect as viewed from the gun. When firing is done on a constant altitude incoming course the two curves combine to give a very sharp curve in the vertical plane. On an incoming course that is diving on the gun, the only visible curve is the actual vertical curve due to gravity drop of the bullet.

LINE SHOTS

Line shots are properly defined as shots intersecting the line of sight from gun to target; line shots intersecting the line of sight at a point near the target also intersect the target's line of flight; therefore, for practical purposes, line shots are best defined as shots crossing target's line of flight at proper elevation. In general, tracers may be considered line shots when they appear to be (1) going into the target, (2) passing around the target and eclipsed by it, and (3) passing short of the target and superimposed against it.

In I.T.C. either with or without the aid of sights, the primary necessity is to make the tracers appear as line shots.

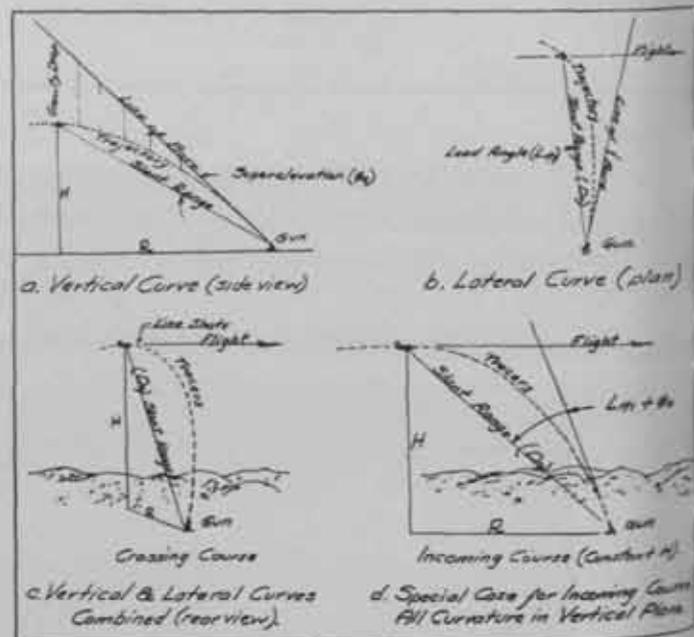


Figure 1

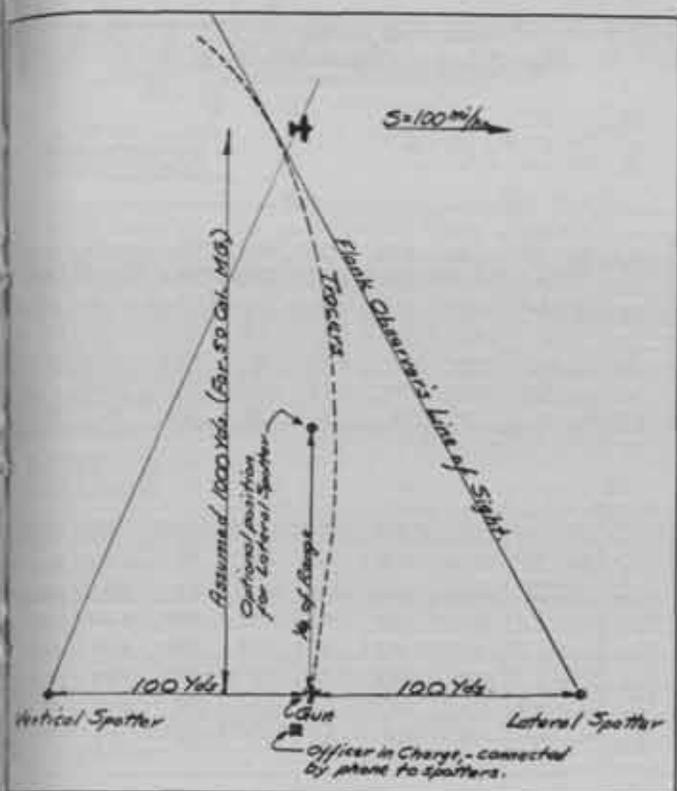


Figure 2

There are several reasons for this. First, in the use of I.T.C. the type of lead studied and applied is the *travel lead*, based on the line of flight of the target; obviously this type of lead can be adjusted only after line shots are obtained. Where travel leads are in angular values (mils), the lead angles are in the inclined plane determined by the gun and the target's line of flight. A second and rather obvious reason for line shots is that all hits must necessarily be line shots; in fact a hit might well be defined as a line shot to which has been applied the correct lead. A third significance of line shots lies in the fact that this is the only positive way in which shots can be sensed as ahead or behind, depending respectively on whether the tracer appears eclipsed by the target or superimposed against it. This type of sensing requires good eyesight and is rendered less effective by smaller target, increased range, and higher target speed. See Figure No. 1 c.

I.T.C. WITHOUT SIGHTS

The use of pure individual tracer control without help of sights has not produced fully satisfactory results in practice. Some of the reasons for this are as follows:

- a. Due to the fact that AA machine guns are mounted far below the gunner's eye height it is generally impossible to place the opening shots anywhere near the line of flight of the target. The additional time required to obtain line shots after fire is opened sacrifices precious seconds as well as much ammunition.
- b. There is no known method of applying an opening lead, either linear (target lengths) or angular (mils), if the gunner has nothing to indicate the exact direction in which his gun is pointed.
- c. The gunner is provided with no "tracking point" to enable him to follow the target's angular motion. Experi-

ence on other types of guns with telescopic sights has indicated the necessity for smooth tracking if hits are to be obtained.

d. On a bright day it is often impossible to see tracers against the sky with the naked eye.

e. Due to the many difficulties previously mentioned under *Tracer Observation* it has been found difficult to adjust fire intelligently, even after line shots have been obtained. Furthermore, it is difficult to apply small adjustments to the lead unless the target is being tracked with the aid of some form of sight; this is due to the fact that the gun has a basic rate of traverse due to the target's motion, and this rate varies throughout the course, being a maximum at the midpoint—the difficulty of applying a fine lead correction on top of this varying rate should be obvious.

It should be here remarked that, except for very brief courses at short ranges, the exclusive use of sights without regard to tracer observation will be found just as unsatisfactory as the opposite extreme here discussed.

I.T.C. AIDED BY SIGHTS

Sights must be mounted in the normal line of the gunner's sight and so designed as to permit a full field of view; creation of small dead areas by the mount or sight elements is not permissible. The sight must therefore be either a simple ring sight (front and rear) or the more advanced form of ring sight known as the *forward area sight*. This form of sight will be separately discussed in a later paragraph.

The extent to which the sights will be used is dependent upon the course, range, and time available for firing; it may depend also to some degree upon the eyesight and indi-

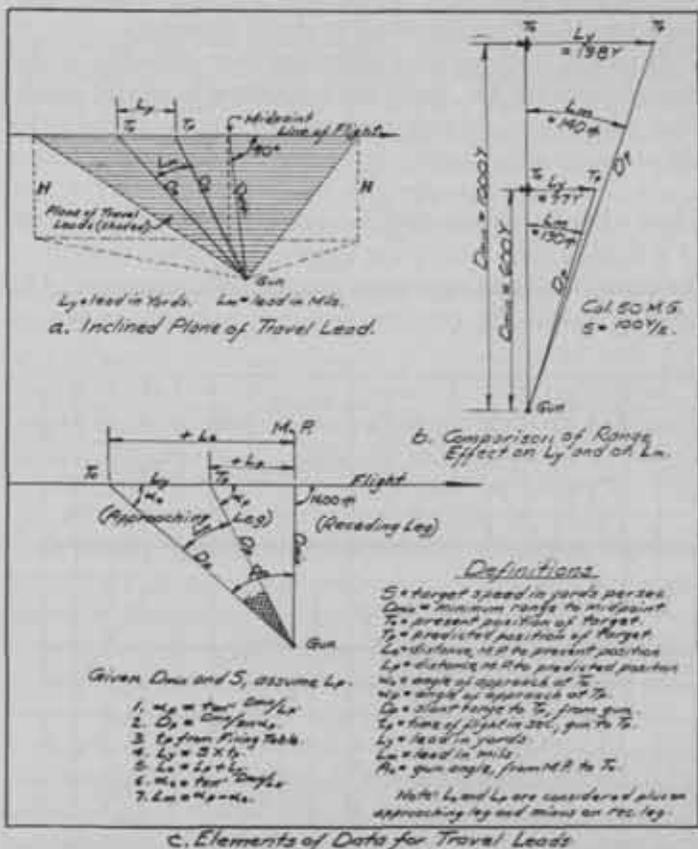


Figure 3

vidual talents of the gunner. In any case, the gunner is not handicapped by the presence of the sights.

The principal advantage of sights is generally believed to be obtained at the time of opening fire. The sights can be brought up to line and then swung ahead to establish an opening lead; the first tracers should then be line shots or nearly so, and very near the target from the standpoint of lead. Adjustments then made as a result of tracer observation should be fairly small. If a simple ring sight is used it will be necessary to establish the opening lead and apply it in *target lengths*; this type of lead varies directly with both range and target speed—the estimated number of lengths must be applied by further estimation against the open sky, there being no known form of successful sight for laying off apparent target lengths. (Due to the amount of estimation involved, plus the fact that no two types of planes have exactly the same length, it is doubtful whether or not such a device would be justified.)

If the forward area (multiple ring) type of sight is used the opening lead will be taken in angular value, in terms of *mils*. This type of lead also varies directly with the target speed; however the variation due to different ranges is almost negligible unless firing is done at extremely long ranges. The forward area sight also constitutes a template for projecting the target's line of flight and a measuring device for actually applying the desired lead. Since the necessary angular lead for any given angle of approach depends practically on target speed alone, the concentric rings of the front sight are designated in terms of target speed in miles per hour, usually 100, 200, and 300, for the three concentric rings. These values are correct for targets at the midpoint of the course and a reduction in lead is necessary for both approaching and receding targets. Forward area sights are discussed in detail elsewhere.

Although machine gun sights are most valuable at the time of opening fire, there are undoubtedly special conditions where the sight may produce hits quickly without the aid of tracer adjustment. Such may be the case when a target dives directly at the gun. Such may also be the case when a low-flying maneuvering plane approaches the point in a banked turn where the gunner is looking tangent to the turn, the target appearing momentarily stationary. On crossing courses the usual method is to look over or around

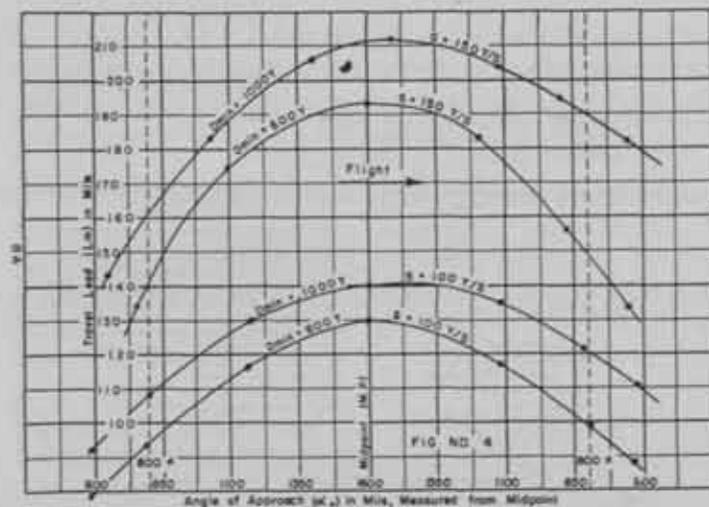


Figure 4

200 Mi. per Hr.
Travel Lead Computations
See Fig. No. 3 for Explanation.

Gun - 50 Cal. MG
F. T. - 0.50 - A.H. - E-4
R₀ - Fired, 10 mls.

$S = 100 \frac{Yds}{Hr}$
 $L_{00} = 600 Y$

	Formula	+200	+500	+800	-77	-400	-730	-1000
X_p	$\frac{R_0 \sin \alpha}{L_p}$	658	892	1272	1470	1000	700	520
D_p	$\frac{R_0 \sin \alpha}{\sin \alpha}$	1000	780	632	605	724	950	1168
t_p	From FT	1.37	1.01	0.80	0.77	0.93	1.29	1.69
L_p	56	137	101	80	77	93	129	169
L_0	$L_p \times L_0$	437	601	280	0	-307	-601	-931
X_0	$\frac{R_0 \sin \alpha}{L_0}$	580	799	1156	1600	1117	799	638
L_{00}	$X_0 - X_p$	78	93	116	130	117	99	80

$S = 100 \frac{Yds}{Hr}$
 $L_{00} = 1000 Y$

	Formula	+200	+500	+800	-128	-700	-1280	-1800
X_p	$\frac{R_0 \sin \alpha}{L_p}$	668	913	1303	1460	977	688	511
D_p	$\frac{R_0 \sin \alpha}{\sin \alpha}$	1640	1280	1044	1010	1235	1600	2060
t_p	From FT	2.76	1.92	1.45	1.38	1.80	2.66	3.89
L_p	56	276	192	145	138	180	266	389
L_0	$L_p \times L_0$	1576	992	445	0	-520	-984	-411
X_0	$\frac{R_0 \sin \alpha}{L_0}$	576	805	1173	1600	1112	810	628
L_{00}	$X_0 - X_p$	92	108	130	140	135	122	111

Figure 5

the sights immediately after fire is opened, in order to observe the tracers and adjust the tracer stream. However it is desirable that forward area sights be designed so that the tracer stream may be observed through the sights. This requires a front element with speed rings and other parts made as thin as structural requirements permit, and a simple ring or similar type rear element permitting unobstructed vision. Such a sight would enable the gunner to use definite leads and adjustments as a result of tracer observation.

SPOTTING

In the training of antiaircraft machine gunners the matter of efficient tracer observation is paramount; it is essential that the gunner be able to interpret as accurately as possible the meaning of his tracer stream; the difficulties here involved have already been discussed.

PRACTICAL LEADS FOR I.T.C.

The theory of leads for I.T.C. considers *travel leads*, that is, leads measured along the line of flight of the target. It should be clearly understood that this conception of lead is entirely set apart from previous conceptions which involve vertical and lateral lead considered separately. The travel lead is actually the resultant of the two above-mentioned components (lateral lead and principal vertical lead) and is the most direct solution of the problem. Fortunately also, the study of travel leads as well as their application is extremely simple; this is not true when the components are considered separately. In the study of travel leads, super-elevation is not considered; it must be pre-set into the sight for an average range, if a sight is used, and taken care of by "holding over" when adjustment is made from tracer observation. The gunner unconsciously does this when he obtains line shots. (Superelevation is the angular elevation

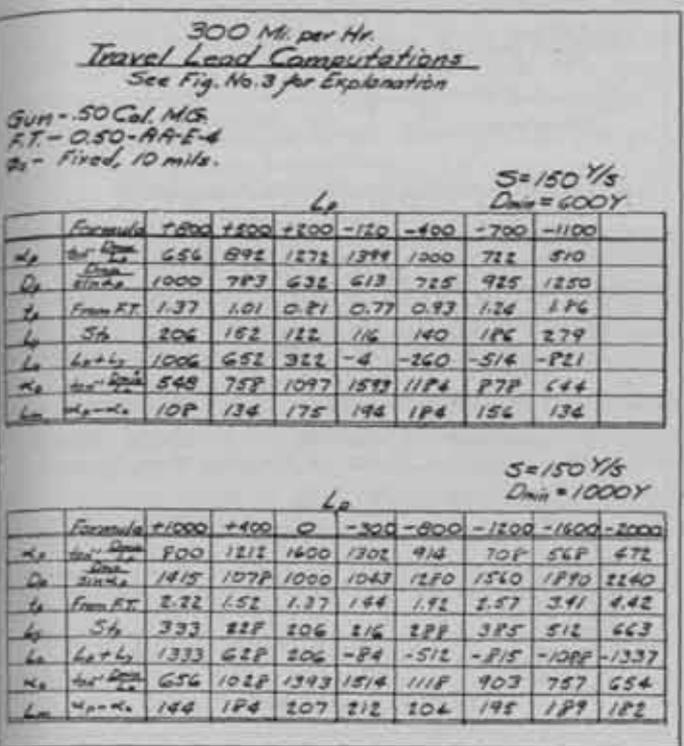


Figure 6

of the gun above the target. It is made necessary by the gravity drop of the bullet. See Fig. No. 1 a.)

A transparent plane may be considered determined by the straight path of the target and the gun position on the ground (See Fig. No. 3). This plane is the only one considered in travel leads. It may be considered as free to pivot around the gun and may vary anywhere between a horizontal and a vertical position, for different courses of targets. Travel leads are independent of such variations; in fact the same travel lead for a ground target crossing at 1000 yards (D_{min}) would be used for an airplane passing 1000 yards overhead, provided that the target speeds (S) were the same. Travel lead, therefore, is dependent on two factors only; first, the speed of the target, and second, the shortest distance between the gun and the target's path. The lead throughout any given course varies according to a rather simple rule, especially where angular leads are considered.

Length leads and mil leads have been discussed above. In the computation of leads it is invariably necessary to obtain the linear lead in yards (L_p) before the mil lead (L_m) can be determined. A complete set of lead computations for several conditions is here included. It should be apparent that L_p must always be divided by the assumed length of target (in yards) before it can be considered a length lead. It should also be apparent that L_p is always equal to the bullet's time of flight multiplied by the target speed in yards per second. (Speed in miles per hour divided by two gives yards per second.) Therefore L_p (or the length lead) will be different for courses crossing at different ranges; this makes the application of L_p always dependent on range estimation. On the other hand, the angular form of lead (L_m) is almost free of this variation. See Figure No. 3 b.

Figure No. 3 c shows a sketch of a target course with symbols and definitions for the elements of data. The seven

simple steps for the calculation of the angular lead (L_m) at any assumed future position (T_p) are shown. It must be clearly understood that this lead, when computed, must be applied to the present position (T_0) as located by the gun angle (A_0). In plotting or using leads, where computation is not involved, this present position is the only one considered.

For any given gun, target speed, and D_{min} a series of such leads may be computed for different assumed values of L_p ; when plotted as a curve, L_m against α_0 , the result is a lead curve for the course assumed. Four such sets of computations have been made, and the results plotted; Fig. No. 4. The two courses considered have a D_{min} of 600 and 1000 yards respectively; the two target speeds considered are 200 and 300 miles per hour respectively. The full computations are shown by Figures No. 5 and No. 6. It should be noted that, in these computations, the linear lead in yards (L_p) is also determined, and might be expressed in target lengths and used if desired. A curve might also be plotted for these linear leads (L_p against α_0); however, such a curve will be found to be typical only for the D_{min} considered—in shape it will be found to be the reverse of the angular lead curve, concave instead of convex.

Examination of the four L_m curves will reveal the fact that, with a given target speed, the angular lead (L_m) is almost independent of variations in the midpoint range (D_{min}), especially on the approaching leg of the course. In reducing the range from 1000 yards to 600 yards the midpoint lead is reduced from 211 mils to 194 mils, or only 8%, for a speed of 300 miles per hour (150 yards per second). This reduction becomes only 7% when a speed of 200 miles per hour (100 yards per second) is considered. In view of the fact that actual target speeds are never known exactly and that a target's apparent size increases as the range decreases (thus tending to absorb errors in lead) it seems permissible to base all angular leads on a midpoint range of 1000 yards. Further inspection of the curves will indicate the lead as varying almost exactly with the target speed, the midpoint leads being 211 mils for 300 miles per hour and 140 mils for 200 miles per hour. As might be expected, the midpoint lead for 100 miles per hour is 70 mils. As will be later shown, the "speed rings" of forward area sights are generally designed to subtend the above mentioned angles, corresponding to target speeds of 100, 200, and 300 miles per hour, at the midpoint of the course. It might be noted that the lead required (L_m) on either side of the midpoint is less than the midpoint lead. This proportion amounts to almost exactly $\frac{3}{4}$ for an angle of approach of 45 degrees (800 mils) on the approaching leg.

A closely approximate method for computing the midpoint lead by use of the "mil rule" for any gun and target speed is as follows:

- (a) Assume target speed, expressed in yards per second.
- (b) From firing table find time of flight for 1000 yards.
- (c) L_p equals time of flight times target speed.
- (d) L_m (in mils) has same numerical value as L_p .

Example: For Caliber .50 gun and target speed (S) of 150 yards per second.

Time of flight (t) is 1.37 seconds.

L_p is 1.37 times 150, or 206 yards. (Actually 210.)

L_m is 206 mils. (Actually 211.)

Where α_0 is 800 mils, L_m is $\frac{3}{4}$ (206), or 154 mils.
(Actually 161.)

The foregoing treatment of angular travel leads should be of interest to all officers dealing with the subject. However, from the standpoint of practical application, the principles here developed may be summarized as follows:

For machine guns developing muzzle velocities of 2600-2800 ft./sec. and for all target courses having midpoint ranges (D_{mid}) up to 1200 yards.

- (1) The angular travel lead (L_m) in mils at the midpoint is 14 mils for each 20 mi./hr. target speed; that is, 70, 140, and 210 mils respectively for speeds of 100, 200, and 300 miles per hour. It should be of interest to note that these values are likewise correct for "lateral" lead as required on Central Tracer Control equipment, since target travel at the midpoint is seen as horizontal. Although this similarity to lateral lead occurs only at the midpoint, it may provide a valuable check in using sight equipment where lateral and vertical leads must be set separately. (For guns having shorter times of flight than the Cal. 50 a similar constant may be determined, varying directly according to the time of flight for 1000 yards; for instance, the constant for the 40mm gun is 13 mils for each 20 mi./hr., and the midpoint lead for 200 mi./hr. is 130 mils.)
- (2) The angular travel lead (L_m) for an approaching target is $\frac{3}{4}$ of the midpoint lead when the angle of approach is 45 degrees (800 mils), and $\frac{1}{2}$ of the midpoint lead when the angle of approach is thirty degrees (533 mils). These rules are sufficiently accurate for practical use.
- (3) Leads for targets on the receding leg of a course are not generally considered important. However, a receding angle of approach of 45 degrees requires about $\frac{7}{8}$ of the midpoint lead, and a receding angle of approach of thirty degrees requires about $\frac{3}{4}$ of the midpoint lead.
- (4) The variation of lead between the main target positions considered above is a smooth curve, as indicated by Fig. No. 4. It may also be shown on the forward area sight, as in Figure No. 7 c. In using forward area sights the mil values are never considered, the lead being regarded in terms of speed rings (full speed values at midpoint) or fractions thereof.
- (5) If linear lead must be considered (due to inadequate sights, or in engaging ground targets) the above rule for midpoint angular lead still furnishes the clue. The lead in yards for 1000 yards range is equal to the numerical lead in mils, and linear leads at other midpoint ranges are in direct proportion to the range. For instance, a 20 mi./hr. target at 1000 yards requires a midpoint lead of 14 yards. If at 600 yards, the linear lead is $.6 \times 14$, or 8.4 yards. Approaching at 45 degrees, the linear lead is 1.5 times the midpoint lead. Receding at 45 degrees the linear lead is 2.0 times the midpoint lead. Ordinarily these linear leads are finally expressed in

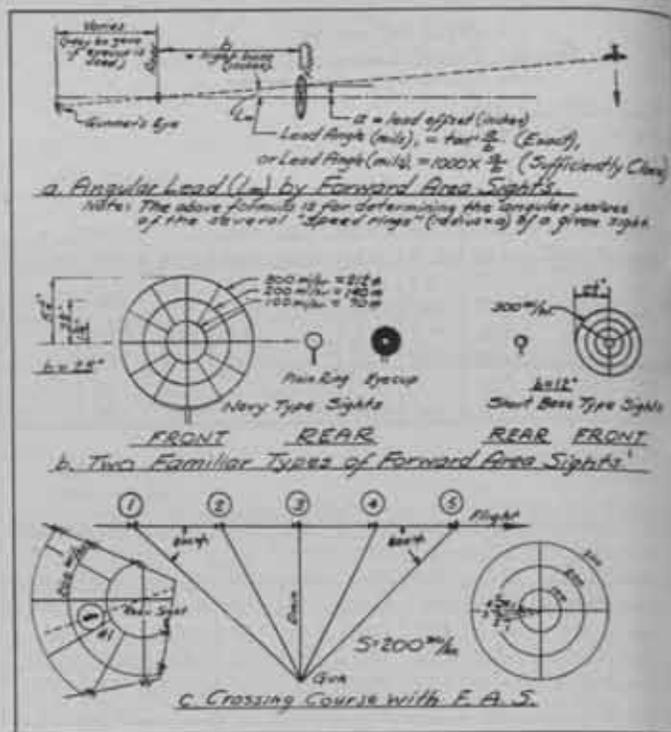


Figure 7

target lengths rather than in yards, the length of target being assumed. Obviously it is necessary also that the range be known or estimated.

It should be remembered that in the use of I.T.C. travel leads either linear or angular, are important largely from the standpoint of establishing an opening lead. Subsequent adjustments must be made on a basis of tracer observation; if the tracers cannot be seen through the sights it will be necessary to look around the sights.

FORWARD AREA SIGHTS

The forward area sight is at this time the only practical method known by which a gunner can instantly apply angular leads of known value to antiaircraft targets. Fig. No. 7 a indicates the principle by which angular leads are established by the sight. The target must be carried in the front sight as always appearing to fly towards the center of the sight; thus the lead is always established in the line of flight, or, to express it differently, the sight is always pointed at a spot directly ahead of the target. The better types of front sights have radial elements (Fig. No. 7 b) with which (or between which) the target may be aligned in order to accomplish the above purpose. The amount of angular lead is determined by the radial distance of the target image from the center of the sight, as measured by the circular "speed rings." The rear sight must invariably be aligned on the target, and not with the center of the front sight (See Fig. No. 7 c left). In cases where the rear sight is designed with rubber eyecup for application of the eye directly against the rear sight the problem is simplified and the target appears in the front sight as in Fig. No. 7 c, right.

Fig. No. 7 c, illustrates the principles of taking lead on any target not diving directly at the gun. (For this latter type of target no initial lead is necessary.) Since the use of forward area sights involves actually laying the sights on

the target's line of projected flight it is necessary to adjust all such sights with a fixed amount of superelevation in order to allow for the gravity drop of the bullet. With high velocity guns a value of about ten mils will be found satisfactory. This is applied as follows: Boresight the gun on a distant aiming point and bring the sights to center on the same point; then elevate the rear sight $\frac{1}{8}$ " for each 12" distance (b) between sights. Well designed sights often have a base of 24 to 25 inches and for these $\frac{1}{4}$ -inch of rear sight elevation will be satisfactory.

Principles of the use of forward area sights may be summarized by reference to the example shown in Fig. No. 7 c:

(1) The target speed is estimated from previous experience or from the airplane's type, appearance in

flight and apparent mission. In this case the speed is assumed at 200 mi./hr.

- (2) When at position No. 1 (800 mils on the approaching leg), the target is carried $\frac{3}{4}$ of the distance from the center to the 200 mi./hr. ring, and apparently flying towards the center.
- (3) When at the midpoint, position No. 3, the target is carried on the 200 mi./hr. ring.
- (4) When at position No. 5 (800 mils on the receding leg) the target is carried about $\frac{7}{8}$ of the distance from the center to the 200 mi./hr. ring.

If the course were a crossing course directly overhead ("coming course") the above mentioned leads would be taken on a vertical line through the center of the sight.



The people of France have already shown you their deep gratitude. They know that the defeat of Italy and Germany will not bring an end to the fighting. On the other side of the globe, another aggressor must learn the cost of violating the fundamental laws of humanity. I give you the following pledge: France will be at your side to liberate the Pacific from Japanese domination, even as she will remain with you to build a peace that will be lasting and just, but also realistic.

* * *

I want to tell you that France is living in the hope and in the confidence of Allied victory; with each passing day her resistance grows because of that conviction and in spite of grievous suffering and total exhaustion.

* * *

I have seen your soldiers under fire. As a soldier I observed them. I do not wish to flatter you, but I can tell you that their gallantry deserves all admiration. They are the worthy successors of their elders of 1918.—GENERAL HENRI GIRAUD.

Nebelwerfer 41

By Willy Ley

When the Red Army retook Veliki Luki the first specimens of a peculiar German weapon were captured and examined. This weapon, the existence of which was, of course, known to military men, was the *Nebelwerfer 41* which means Fog (or Smoke) Thrower Model 1941. The Russians referred to it as a six-barreled rocket mortar which is a good descriptive term.

The *Nebelwerfer* is mounted on a somewhat modified carriage of the German 37mm antitank gun and consists of six thin-walled launching tubes, 150mm in diameter and open at both ends. The six tubes are mounted around a central shaft in such a way that they can be spun around it and that the whole assembly can be elevated as a unit. A fingerlike projection at the rear end of the launching tubes prevents the rocket shells from sliding out backwards when the tubes are elevated. Inside the launching tubes there are three straight guide rails about $\frac{1}{4}$ of an inch deep.

The rocket projectiles, according to Russian sources, weigh 25 kilograms (about 55 lbs.) before firing. They are ignited electrically, the fastest rate of fire observed was the discharge of all six tubes in as many seconds. Full range seems to be around 6000 yards, the flight of the projectiles is fairly steady, the accuracy is also fair, although far inferior to artillery fire under similar conditions, as can be expected from projectiles with a steadily shifting center of gravity.

While the name *Nebelwerfer* indicates that the weapon was primarily developed as a chemical mortar for the laying of smoke screens, most of the shells used by the Germans at Veliki Luki and at Stalingrad seem to have been of the high-explosive variety.

And just as the name Smoke Thrower is not quite correct the designation 41 seems to be misleading too. The weapon may have been adopted in 1941 but it is much older. In fact it seems to go back in a straight line to the "aerial torpedoes" (*Lufttorpedos*) advocated by the Swedish Baron von Unge during the first decade of this century.

In Professor Otto von Eberhard's book *Freier Fall, Wurf und Schuss* (in vol. II of the *Handbuch der physikalischen und technischen Mechanik*, Berlin 1928) I find a mathematical development of the theory of rocket motion in the course of which Professor von Eberhard mentions that von Unge's *Lufttorpedos* "had a weight of 50 kilograms and attained a range of from 4000 to 5000 meters." These figures are the same as those given for the rocket projectiles of the *Nebelwerfer* and it is very likely that the one is merely a somewhat modernized rehash of the other.

It must be remembered too that von Unge's invention became the property of the Krupp works and that the latter spent some considerable sums on developing them without having any financial returns either during the period of the German Empire nor during the period of the German Republic.

Lieutenant Colonel von Unge spoke about his aerial torpedoes for the first time in 1900. He advocated rocket propelled shells patterned after the stickless war rockets invented by William Hale, with curved vanes in the exhaust nozzle which produced a spin around the longitudinal axis so that the heavy and cumbersome "guiding stick"³ became superfluous. In order to increase the range of these projectiles von Unge advocated firing them from a short howitzer with a muzzle velocity of only about 300 feet per second. Such a slight muzzle velocity, he reasoned, would give considerable ballistic advantages without necessitating too sturdy a construction of the rocket itself. The idea was not quite new since a similar method had been used occasionally in pyrotechnic displays for amusement purposes. Skyrockets launched in that manner seemed to originate from a point in mid air since the "ballistic ascent" naturally could not be seen at night.

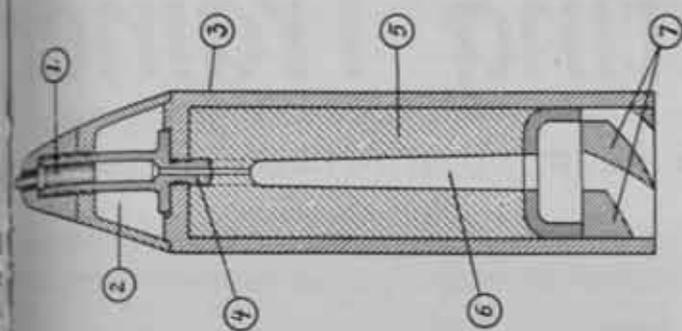
In 1901 a corporation with the name of "Mars" was founded in Stockholm to develop von Unge's principles. The results of these experiments were never published, but some facts became known later on in a roundabout manner. The propelling charge was the same in composition and method of manufacture as that of the line-throwing rocket used by coastal life saving units. It was a black powder mixture with an excess of coal, hammered into the rocket tube by hand. The shell was attached to the top of the rocket tube, its charge consisted of dynamite, the fuze was of the percussion type, set off without a delay ring by striking the target. Nitrogelatin was also tried, as were time fuses which were ignited by the propelling charge.

The weight of the high-explosive charge was two kilograms (4.4 lbs.). The overall length of the aerial tor-

³The stick of the ordinary Congreve war rockets of the early part of the 19th century was 16 feet long, the rocket tube 40.6 inches.



Nebelwerfer captured near Medjez-el-Bab by the British.



CROSS SECTION THROUGH ONE OF VON UNGE'S LUFTTORPEDOS

(1) Fuze. (2) Space for H.-E. charge. (3) Steel tube. (4) Tube carrying spark which ignites propelling charge through fine bore in its solid section. (5) Propelling charge (compressed gunpowder). (6) Bore in propelling charge (to increase area of burning surface). (7) Vanes in exhaust blast, causing spin around longitudinal axis.

torpedoes was 750mm, the diameter 10mm. The overall weight of the early models was thirty-five kilograms, the highest velocity attained along the trajectory was 300 meters per second (about 1000 feet/sec.) and the extreme range five kilometers, not quite 5500 yards. The mortar supplied an initial velocity of fifty meters per second (165 feet/sec.). This was found to be too small, but the design of the torpedoes apparently did not permit a higher propelling charge in the mortar. The accuracy of fire was admittedly "poor," it is said that experts estimated that it would require at least five times the expenditure of ammunition to hit a given target over a distance of about two miles as would be the case for howitzers firing comparable projectiles.

Lieutenant Colonel von Unge then decided to drop the launching mortar completely and to use an open guiding tube instead. When the two Swedish dirigibles *Svenska I* and *Svenska II* attracted much attention in his homeland, von Unge began to advocate his aerial torpedoes as weapons for aircraft (meaning dirigibles) either against ground targets or for aerial combat. He emphasized that his torpedoes did not produce a recoil which then seemed very important for aircraft armament.

This was in July, 1908.

In 1909 it became known that the firm of *Friedrich Krupp, Aktiengesellschaft*, in Essen had purchased the Unge patents and had also bought the existing supply of aerial torpedoes, about a hundred, as well as a launching tube and other equipment. The equipment was transported

from Stockholm to Krupp's proving ground at Meppen and extensive experiments were carried out.

In 1910 Krupp announced, however, that the experimentation with von Unge's invention had been discontinued because it had been found that accuracy of fire could not be achieved.

This announcement was disbelieved, of course, but its truthfulness was borne out by the facts. No weapon which bore any resemblance to von Unge's aerial torpedoes made its appearance during the first World War. Krupp's had probably tried to develop the Unge weapon into short range heavy artillery and had, after failing to accomplish this, turned its attention to other means of throwing heavy shells over short distances. The famous German *Minenwerfer*² were the result.

There exists only one report from World War I which was construed to indicate the development of the Unge torpedoes. This report can be found in the French aviation magazine *l'Aérophile* (1915, page 75) in an article *Bombes, Grenades et Torpilles des Avions et des Dirigeables ennemis* by A. Cléry. Monsieur Cléry, in this article, claimed that German Zeppelins had used rocket propelled shells against attacking French fighter planes and asked: "Depuis, on n'avait plus entendu parler des torpilles Unge, acquisés par Krupp. Ne seraient-ce pas elles, plus ou moins modifiées, que nous venons de voir aujourd'hui employées par les Allemands?"

This sentence prompted me to search through all the files of German and French aeronautical magazines I could find, but I failed to discover any additional reference to these "Zeppelin torpedoes." I suspect that the reference was mistaken. It is known that French aviators tied large naval rockets to the struts of their biplanes, discharging them electrically against German captive observation balloons and Zeppelins in order to ignite the hydrogen in the gas bag, often with success. The Germans may have tried the same on an experimental scale and may have used such stickless Hale rockets as described by Cléry. At any event it was not a standard weapon of German aircraft.

But while the Unge torpedoes remained dormant during the first World War it seems likely that the present German *Nebelwerfer* is essentially a revival of the old experimental weapon; resurrected from Krupp's files for a specialized application where density of fire is more important than accuracy.

²See Major James E. Hicks: *Notes on German Ordnance* (Stoeger Arms Corp. 1937) and Willy Ley: *Shells and Shooting*, chapter "Trench Artillery" (The Viking Press, New York, 1942).



We have secured a basis for unity of action as to strategy, operations, shipping, matériel, and virtually every phase of this warfare, in a manner without precedent in history . . . the way will be far from easy, the losses heavy, but the victory certain.—GENERAL GEORGE C. MARSHALL.

Practice Spotting Trainer

By Lieutenant Colonel Joseph S. Piram, Coast Artillery Corps

Most Coast Artillerymen realize that spotting training and fire adjustment training for Seacoast Batteries present many problems and that accurate spotting with green men is very difficult of attainment.

Various methods of training spotters have been devised and published in pertinent regulations, manuals, and the *COAST ARTILLERY JOURNAL*, and actual training has been given by use of aids previously described and published, some of which have consisted of firing on a small pond or lake with a rifle or other small caliber weapon; use of a toy boat and a piece of cotton suspended by a string; and actual training by spotting the splashes of other batteries firing on a target.

All of these methods are excellent for the training of spotters, but, unfortunately, in many cases, due to conditions, lack of facilities and cost, certain of these methods cannot be employed.

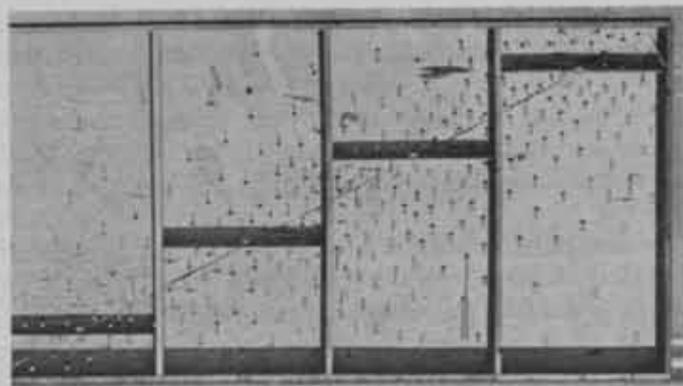
In a desire to construct some trainer which could be built cheaply and serve the purpose under any conditions, the spotting trainer described below was devised. This trainer utilizes principles previously employed and coordi-



or sense(s) overs and shorts. A screen of porous cloth painted green is placed around the board to keep the spotters from determining the instant or approximate location at which the operator will push up the swab.

For initial training of green men the model target can be placed at any stationary position on the board and, by use of the numbers stenciled below the board, the swab can be pushed up in several numbered positions previously determined by the instructor and upon which accurate spotted deviations or sensings by an experienced spotter have been made to check the accuracy of the student spotters. Further, by use of the Dispersion Tape and Scale outlined in Appendix I to FM 4-10 and the numbered holes of the board, a predetermined spotting problem can be set up for coordinated drill by the entire battery.

The trainer may be used to train spotters individually, or a system can be used wherein a small baseline is set up in front of the battery (length of baseline between spotting instruments and distances from the board to the trainer is dependent on the length of the model boat used), with the trainer placed in front of the instruments. A field line connects the B.C. station with the operator handling the cotton swabs, and field lines connect the spotters to the spotting section in the plotting room. By use of a stop watch in



nates them into a simple board capable of being used either indoors or outdoors at very little cost.

This trainer is capable of being knocked down for transportation, into the board proper, components of the "A" frames, detachable fishing reel and bracket, curtain, and other small parts. The board is designed so that it can be adjusted for tilt and height.

The plywood board has $\frac{3}{8}$ inch drilled holes bored into it, is painted a blue green with occasional whitecaps, and is numbered on the under side. A slit is constructed for the course of a model vessel which acts as a target. By means of a fishing reel, fish line, pulleys and a weight, an operator under the board places the target on a moving course. Another operator connected to the B.C. station of the battery (or other convenient location when the board is used alone) pushes up cotton swabs to represent the splashes at the appropriate times, and two spotters, using M1910 or M1910A1 azimuth estimates (or a single spotter) read(s) either the spotted deviations with reference to the target



connection with other elements of coordinated drill, splashes may be synchronized with the drill of other elements of the battery, the spotters reading the deviations or sensings to the spotting section in the plotting room. Corrections are made there, and the problem continues. All this goes on while the other elements of the battery are tracking an actual target and conducting dummy gun drill.

This board or a modification of the board may have application in training of battery observers where such training cannot be accomplished by use of an actual waterborne target such as the training of a 155mm seacoast battery in the interior when water areas are not available for use of a towed waterborne target. In setting up the board and determining distance of the spotting instruments from the trainer, cut and try methods will have to be used until the panorama presented through the instrument is such as would be seen by tracking an actual target at a desired range. Care must be taken to remove as much of the parallax as possible from the instruments before undertaking spotting training.

A list of materials used in construction of this trainer includes:

1—piece 3 Ply plywood 1/4 x 4' x 8'	\$ 3.20
11—pieces 1" x 3" x 10' cypress	3.02
2—pieces 2" x 4" x 10' cypress	.42
2—lb. 8d finishing nails	.10
1—fishing reel, direct drive	.29
1—pt. O.D. paint	...
1/2—pt. light blue paint	.25
1/4—pt. yellow paint	.10
1—teaspoonful white paint	...
2—doz. screw eye hooks for curtain	.10
6—applicator swabs (Medical Corps)	...
Cigar box lumber	...
1—Model boat (wood or metal)	...
Piece of fishing line	...
Cloth curtain (porous cloth painted blue green)	.60
1—12 oz. fishing lead weight	.10
Total	\$ 8.18



"The young Filipinos and Americans who died on Bataan and elsewhere were brothers-in-arms in a battle that will live forever in the annals of gallantry. Their courage and their sacrifice will shine the brighter in the course of the years as we realize more and more how much they meant to us who have been left behind to carry on; especially, when we remember that they were fighting for democracy, peace and tranquility of existence.—MAJOR GENERAL BASILIO J. VALDES.

Solving Trial Shot Problems

By Major John Parmakian, Coast Artillery Corps

The necessity for firing trial shot problems is discussed in detail in gunnery manuals. Briefly the problem consists of assuming a muzzle velocity for the particular combination of ammunition and gun, of correcting for the effects of meteorological conditions and of conducting fire with the necessary ballistic corrections set into the director. The deviations of the burst from the flank and battery are then used to determine the actual developed muzzle velocity of the ammunition and gun from which the necessary ballistic corrections for fire for effect can be determined.

The method of solving trial shot problems indicated below is one in which the developed muzzle velocity is determined very accurately and rapidly without the use of a trial shot chart or special slide rule. It is believed that this method approaches the ultimate in simplicity inasmuch as the difference between the developed and assumed muzzle velocities is obtained by multiplying the observed deviations by suitable factors which are easy to obtain. Inasmuch as the solution is based on the small triangles that exist in space between the trial shot point and the bursts, the muzzle velocity can be readily determined to the nearest foot per second provided that the spotted deviations can be considered to be dependable for such accuracy.

A recapitulation of the necessary formulas for solving trial shot problems is as follows:

- Let σ_1 = average vertical deviation of bursts from O_1 in mils.
 δ_1 = average lateral deviation of bursts in the slant plane from O_1 in mils.
 δ_2 = average flank deviation of bursts in the slant plane from O_2 in mils.
 ΔMV = difference between the developed and assumed muzzle velocity in feet per second.
 $d\phi$ = vertical correction in mils required to move bursts to the muzzle velocity line.
 dA = lateral correction in mils required to move bursts into the plane of the target.
 $d\%H$ factor and $d\phi$ factor are taken from the graphical firing tables for factors for ballistic corrections.

(a) Muzzle Velocity Correction

The required formula for determining the muzzle velocity correction is: $\Delta MV = \pm C_1\sigma_1 \pm C_2\delta_1 \pm C_3\delta_2$

where

C_1 is a factor given in the accompanying tables: Table I is for 90 mm AA guns and Table II for 3 inch AA guns.

$$C_2 = \frac{C_1}{\sin \epsilon_1 \tan T}$$

$$C_3 = \frac{C_1}{\sin \epsilon_2 \sin T}$$

In the above expression for ΔMV

- (1) The sign to be used with the term $C_1\sigma_1$ is plus if

the observed deviations are aboves and minus for belows.

- (2) The sign to be used with the term $C_2\delta_1$ is given by the following table:

	TL less than 1600 mils observed deviations.		TL greater than 1600 mils observed deviations.	
	Left	Right	Left	Right
When facing field of fire and O_2 is on the left	-	+	+	-
and O_3 is on the right	+	-	-	+

- (3) The sign to be used with the term $C_3\delta_2$ is plus for overs and minus for shorts.

(b) Vertical correction

The formula required for the vertical correction is: $d\phi = -\sigma_1 + (\Delta MV)(d\phi \text{ factor})$

In the expression for $d\phi$ it is necessary to use the proper algebraic sign for ΔMV as obtained above and the $d\phi$ factor is always taken as positive.

(c) Lateral correction

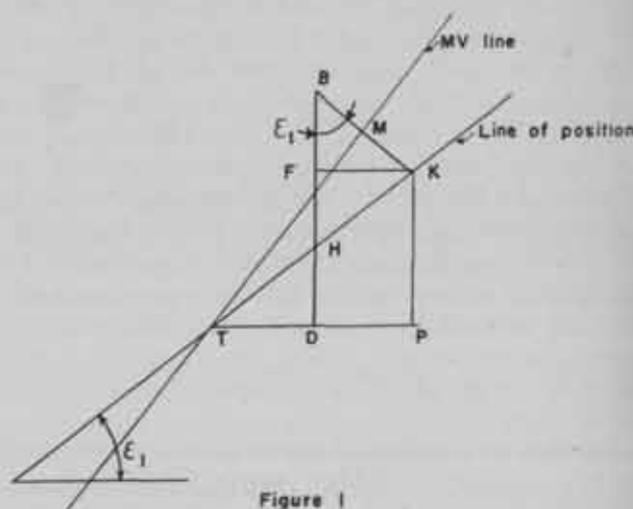


Figure 1

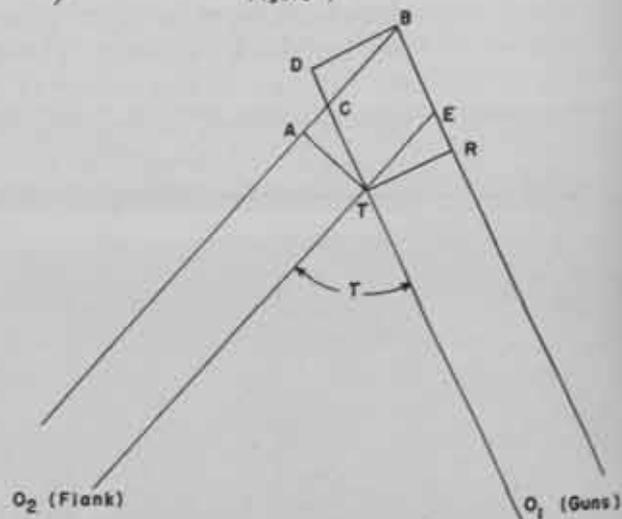


Figure 2

1 foot per second would be $(d\% H \text{ factor}) \frac{R_1}{100}$. To determine the difference in muzzle velocity between the assumed and the developed muzzle velocity it is only necessary to determine the horizontal range deviation TD of the burst, then add to this the horizontal range effect DP of the vertical deviation, and divide the resultant length TP by $(d\% H \text{ factor}) \frac{R_1}{100}$.

$$\text{Then } \Delta MV = \frac{\text{Length of line TP}}{(d\% H \text{ factor}) \frac{R_1}{100}}$$

Referring to figure 2 which is a horizontal projection of the problem.

The horizontal range deviation due to a lateral deviation from the battery and flank is TD. $CD = ER$.

$$\text{but } TD = TC + CD = \pm \frac{\delta_2 D_2}{1000 \sin T} \mp$$

$$\frac{\delta_1 D_1}{1000 \tan T} = \pm \frac{\delta_2 H}{1000 \sin \epsilon_2 \sin T} \pm \frac{\delta_1 H}{1000 \sin \epsilon_1 \tan T}$$

The horizontal range deviation due to a vertical deviation from the battery is DP. Referring to figure 1:

$$DP = \pm \frac{D_1 \sigma_1 \sin \epsilon_1}{1000} = \pm \frac{\sigma_1 H}{1000}$$

Then $TP = TD + DP$
and $\Delta MV =$

$$\pm \frac{\sigma_1 H}{1000} \pm \frac{\delta_1 H}{1000 \sin \epsilon_1 \tan T} \pm \frac{\delta_2 H}{1000 \sin \epsilon_2 \sin T}$$

$$\frac{(d\% H \text{ factor}) \frac{R_1}{100}}$$

By the process of factoring,

$$\Delta MV = \pm C_1 \sigma_1 \pm C_2 \delta_1 \pm C_3 \delta_2$$

where,

$$C_1 = \frac{H}{10R_1 (d\% H \text{ factor})}$$

$$C_2 = \frac{C_1}{\sin \epsilon_1 \tan T}$$

$$C_3 = \frac{C_1}{\sin \epsilon_2 \sin T}$$

The sign to be used with these factors is given above. To simplify the computations, the values of C_1 for the 90mm and 3 inch AA guns are given in Tables I and II.

The vertical correction required to move the bursts onto the muzzle velocity line is equal to minus σ_1 corrected by the vertical angle from O_1 which is subtended by the length MK. This correction is equal to ΔMV multiplied by the $d\phi$ factor given in the graphical firing tables. Then

$$d\phi = \sigma_1 + \Delta MV (d\phi \text{ factor})$$

The lateral correction is equal to the minus δ_1 converted to the horizontal plane.

$$\text{or } dA = \frac{-\delta_1}{\cos \epsilon_1}$$



Individual Protective Cover



→
Shaking
out the
cover.

The ever-alert Chemical Warfare Service has designed a handy little gadget to protect American soldiers from the effects of vesicant gases.

↓ Still shooting, with
or without mustard.

↓ 1943's soldier gets better pro-
tection than his father did.



↑ The cover expanded.



Shadowgraph for Recognition Training

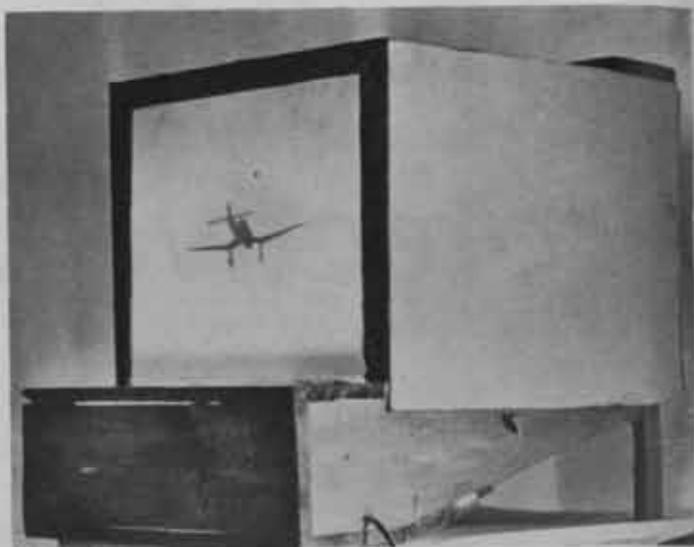
By Lieutenant J. F. Carson, Coast Artillery Corps

One weakness of most systems of aircraft recognition instruction in which projected pictures are used is the fact that too much detail is exposed to the student in pictures of planes which he is required to identify. As a consequence, the student will, perhaps unconsciously, memorize certain detailed features peculiar to each plane. These features will be used as a crutch at first and if the tendency is not checked, all other features of the plane will slip back out of memory. The student has then lost all contact with the goal of recognition training; the learning and retention in the mind of the total form of the aircraft.

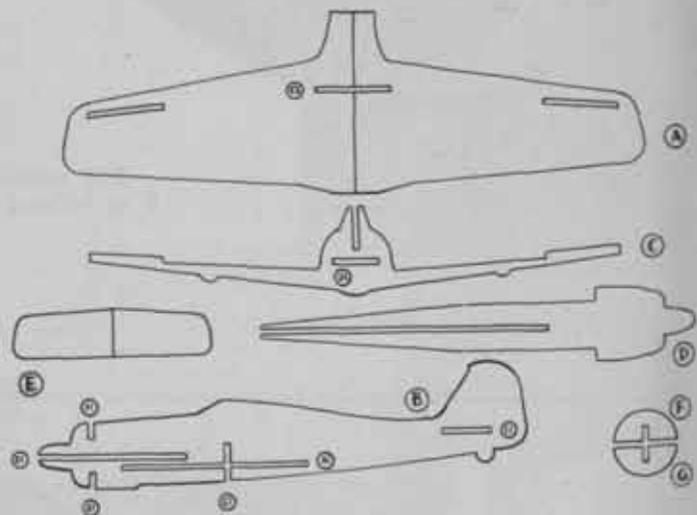
To assist in the correction of this deficiency, a simple device has been constructed which will, to a large degree, simulate the appearance of an aeroplane in the sky. It is not used to replace any of the present methods of recognition training but rather as a supplement to current equipment. It has been found to be an effective adjunct to learning and it adds interest to the classroom work. This device is known to most as a Shadowgraph and can be constructed in a number of ways. A successful construction, devised at Camp Edwards, is shown in the accompanying picture.

DESCRIPTION

The box is 18" wide by 24" long and 16" high at the rear where it rests on two 6½" legs. The front is deeper, 22½", due to the sloping bottom of the box. At the bottom front is a 6" by 6" light chamber which extends all the way across the front and houses a socket with a 200-watt bulb. Between the light chamber and the inside of the box is a tin bulkhead. A 2" round hole is cut in the bulkhead to allow the light from the bulb to enter the main box. The bulge of the light bulb should be placed immediately in front of this hole and as close to the bulkhead as is possible without touching. The dimensions of the hole and the placement of the bulb are most important as they provide the point source of light required to prevent a double image. Within the main box and directly over the bulkhead, a baffle is installed to prevent light from shining di-



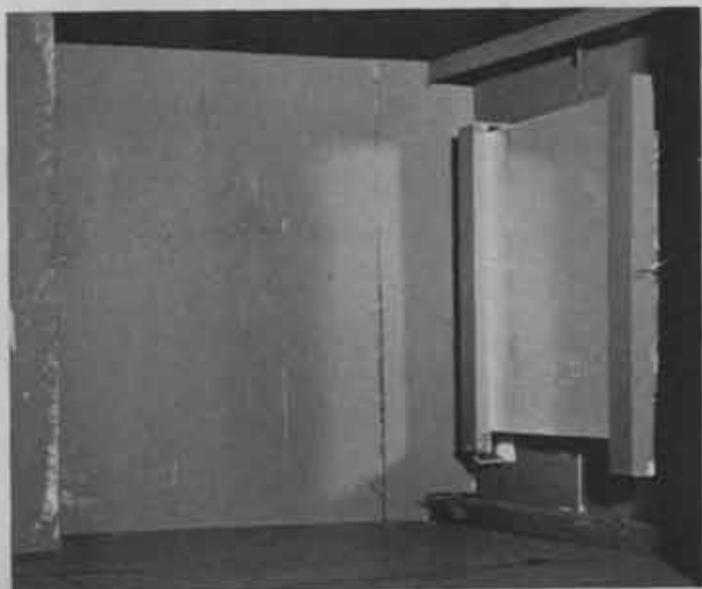
rectly upon the screen. This baffle is 6" deep and extends across the full width of the box at the front. An 8" high by 10" wide mirror is centered in the rear of the box and is hinged at the bottom. A stiff wire is attached to the top rear of the mirror frame and projects through the rear of the box so that the angle of the mirror may be readily adjusted as required. The mirror reflects the light from the light



THE FOCKE-WULF FW 190A3

Assembly Instructions

1. Bend wings (A) at the center line and insert sideways in the fuselage (B) through slot (A1).
 2. Take cross-section (C) and insert in slot (C) of the fuselage and slot (C2) of the wing section.
 3. Bend forward the wing supports of (C) so that the tabs slip into the appropriate slots at the extremities of the wings.
 4. Insert section (D) in slot (D1) of the fuselage and through slot (D2) of cross-section (C).
 5. Insert tailplane (E) in slot (E1) of the fuselage.
 6. Insert cross member (F) in slot (F1) of the fuselage.
 7. Insert cross member (G) in slot (G1) of the fuselage.
- Note: In certain front and rear aspects of the assembled model better results will be achieved by bending section (D) upwards so that it touches the tailplane.



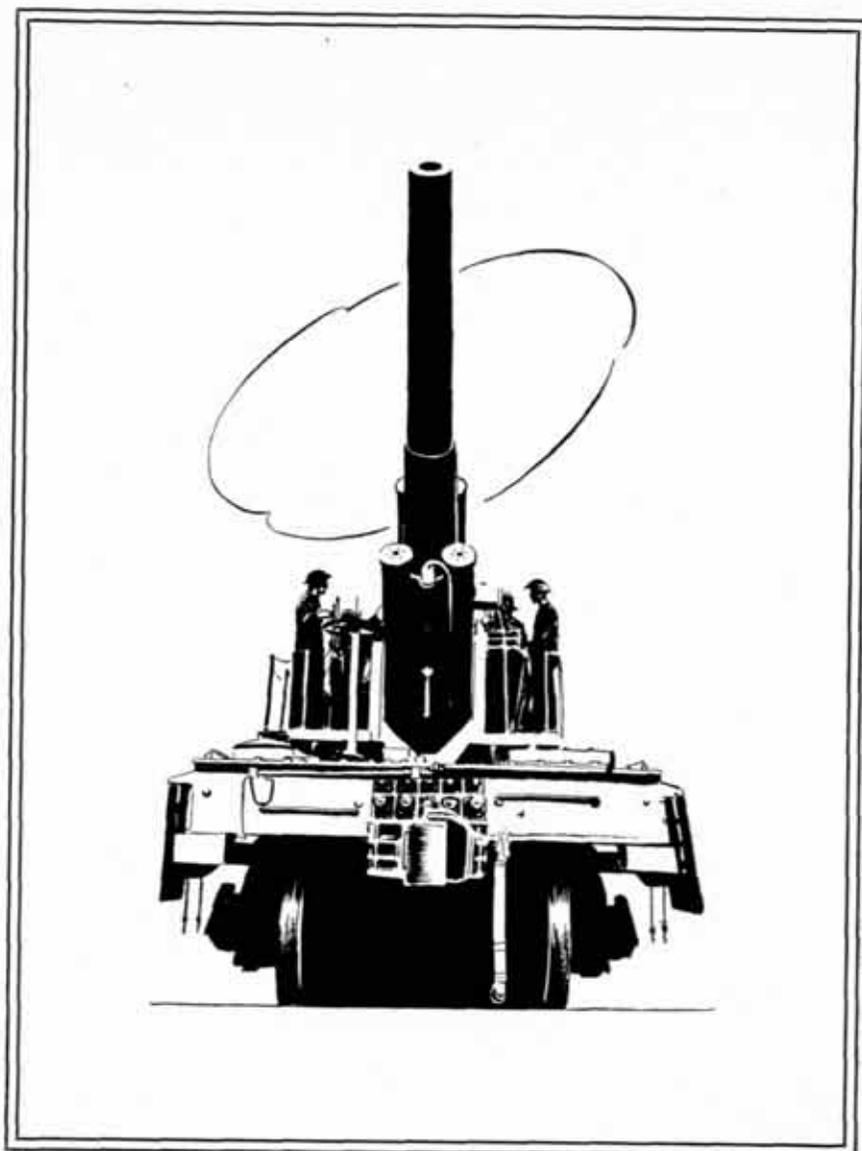
source forward down the length of the box and onto a $4\frac{1}{2}$ " wide by 13" high translucent screen which is installed in the front of the box. The screen is made of good quality tracing paper. A full top is not needed, but it is well to cover the rear half of the box to protect the mirror from dust and dirt.

OPERATION

To use the Shadowgraph, a model plane is suspended within the box directly behind the screen. When viewed from a few feet away, the image cast on the screen very closely reproduces the appearance of a plane against a gray-blue sky. If the model is suspended from a puppet stick by

threads attached to wing tips and vertical fin, the movements of the plane can be controlled accurately and with a little practice the operator will be able to maneuver the model realistically.

The regular metal or plastic scale airplane models can be used or excellent models can be made from cardboard. A plan for these cardboard models, reproduced from *Aircraft Recognition*, February, 1943, is shown. Similar plans for other planes can be prepared quite readily. These paper models have been found more convenient to use than the metal ones as they can be more easily controlled and can be built to one uniform size.



Improvised Depression Position Finder

By Captain David J. Caldwell, Coast Artillery Corps

EDITOR'S NOTE: The method of obtaining approximate range as described in the following article naturally involves certain assumptions. Under some atmospheric and tide conditions, large errors may be expected.

The method herein described may be used as an emergency range finding system to serve when the normal range finding equipment of a battery is not being manned, or may be used as an expedient when other range finding equipment is not available. Frequent use may be made of this device in equipping observation posts with a simple yet dependable range finder, thus enhancing the value of intelligence reported. The system is not adapted to stations of low elevation, 150 feet above sea level being the practical minimum. Tests by the writer over a six months period at a number of different installations, varying in height from 220 feet to 850 feet, have proven its accuracy.

Use is made of either a 1910 A1 or an M1918 azimuth instrument. The 1910 A1 instrument, being of heavier construction and more stable, is preferable. The azimuth instrument must have a very stable mounting so that it will continuously remain level and be free from vibration. Its height above sea level must be accurately determined.

The operation in brief is as follows: The instrument is focused on the target and the target water-lined with the horizontal cross wire. (The 1910 A1 instrument has no horizontal cross wire; however, the tops of the horizontal scale graduations may be used as such). Care being taken not to change the depression angle at which the target was water-lined, the instrument is refocused on a previously calibrated range pole located in the vicinity of instrument, turning the instrument in azimuth if necessary, and the range to the target read on the scale of the range pole with the horizontal cross wire as an index.

Preparation and Calibration of the Range Pole: This range finding instrument makes use of the law of similar triangles. In figure 1, *I* represents the instrument at a height *b* above sea level *E*. *T* represents the target, *R* the horizontal range to the target and *h* the combined vertical effect of curvature and refraction; *r* is the horizontal distance (fixed) from the instrument to the range pole and *h'* is the vertical distance on the range pole from a point level

with the instrument when the telescope is horizontal to the point on the range pole where the line of sight from *I* to the water-lined target cuts the range pole.

From the law of similar triangles we have the following relations:

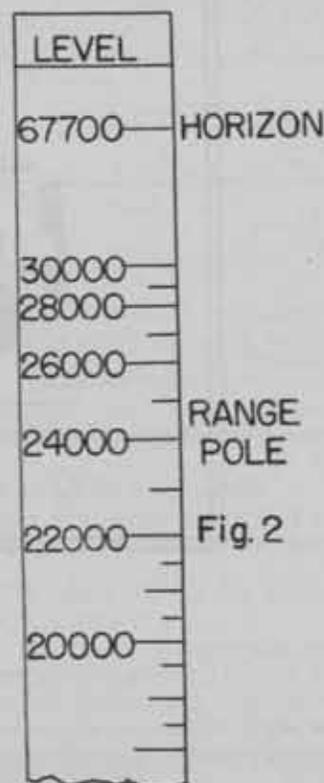
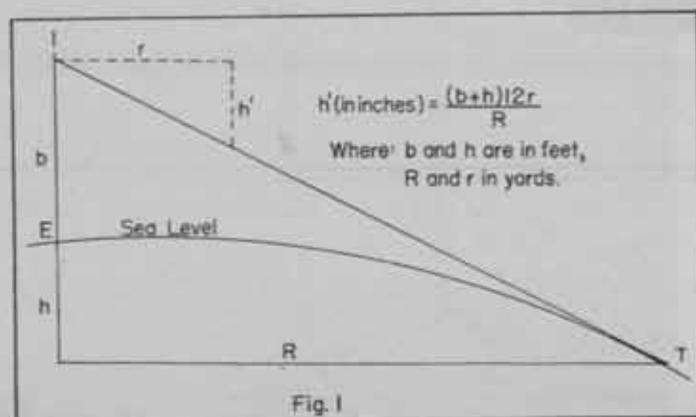
$$\frac{r}{h'} = \frac{R}{b+h} \text{ or } h' \text{ (in inches)} = \frac{(b+h) 12 r}{R}$$

where *r* is expressed in yards, *b* in feet, *h* in feet and *R* in yards.

The value of *h* for any one particular range may be obtained from Table I, Appendix VI, FM 4-10, or may be obtained approximately by substituting in the formula *h* in feet equals .185 x *R*² where *R* is expressed in thousands of yards. Either method is sufficiently accurate for this purpose.

Various values of *R* are chosen for substitution in the formula and the corresponding value of *h'* determined for each range. The range pole is then calibrated using the values of *h'* so determined and labeling with the corresponding range. The distance to the horizon for the particular instrument height involved (this is the case when *b* equals *h*) should be determined by use of the table or formula for vertical effect of curvature and refraction, and the value of *h'* determined so that a "range to horizon" mark may be placed on the range pole.

After the range pole has been calibrated it is placed at the correct horizontal distance from the instrument (the distance used in the calculation), and adjusted vertically until, with the instrument water-lined on the horizon, the line of sight through the instrument intersects the range pole.



at the graduation placed thereon for distance to the horizon. The range pole is then fastened in place and will read accurate ranges as long as its location is not changed and the base of the azimuth instrument is kept level.

ILLUSTRATIVE EXAMPLE

$r = 27.2$ yds.

$b = 847$ ft.

range to horizon—67700 yds.

Range	$b + h$	h'
67700	1794.0	8.66"
30000	1013.2	11.02"
28000	991.8	11.56"
26000	971.8	12.20"
'	'	'
'	'	'
'	'	'
5000	851.6	55.60"
4000	850.0	69.42"
3000	848.7	92.39"

NOTE: Values for intermediate ranges should be determined or marked in by interpolation where the distance is small.

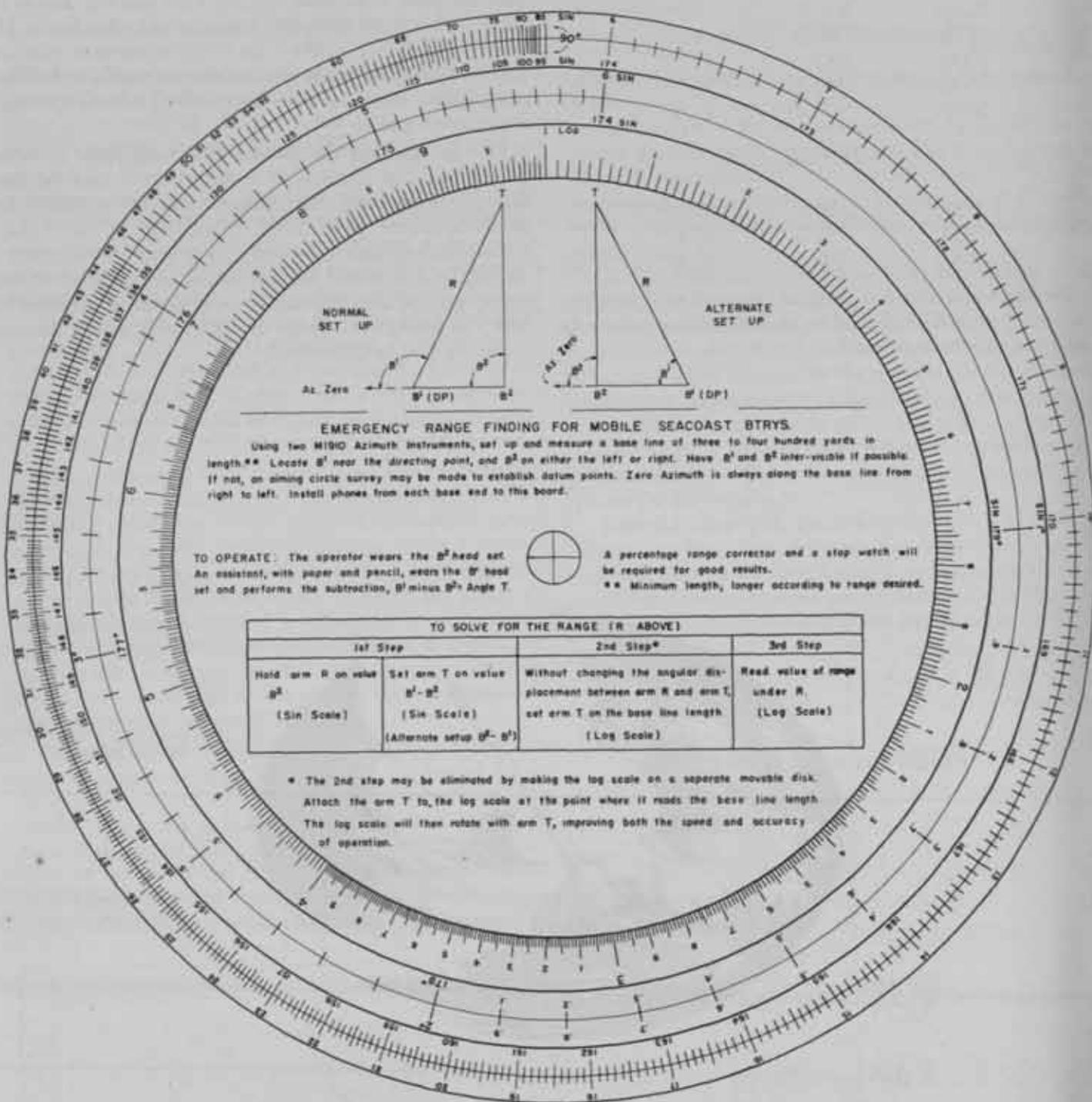
General Hints:

- (1) The azimuth instrument must be kept level.
- (2) The azimuth instrument must be adjusted so that vertical parallax is eliminated with the instrument focused on either the target or the range pole. This can be accomplished with the M1910 A1 instrument by adjusting the eye piece by trial and error until there is no parallax with the instrument focused on the target or on the range pole (the eye piece adjustment remains fixed and the change of focus obtained by using the focusing nut. See figure 17, page 42, FM 4-15). With the 1918 instrument, parallax may be eliminated when viewing the range pole by holding a small disc, into which has been drilled a small aperture, over the eye piece.
- (3) In choosing the distance the range pole is to be placed from the instrument, several factors must be considered. Frequently the distance will be governed by available towers, poles, trees or buildings in the vicinity upon which to fasten the pole. In general, the distance r should be determined for the particular height of instrument involved that will result in h' equal to between 90 and 120 inches for a range of 3000 yards, and a location chosen in that neighborhood.



A Method of Emergency Range Finding

By Captain George E. Ellard, Coast Artillery Corps



Unless something new has been added that we haven't heard of on this side of the ocean,* it is still desirable to have some improvised method of emergency range finding ready for use in a seacoast battery. In a mobile battery of 155's that is really mobile, a situation is bound to arise

where it is not possible to use the standard Horizontal Base System nor even the Emergency One-Station System. This situation is especially liable to occur during the first exciting days or hours ashore on some strange and dubiously charted coast. In the case of a separate battery attached to a force of other arms, it may be days, weeks or possibly months before

*Captain Ellard was in the Pacific area when this article was written.

fore any accurate survey data are available for base lines. In any case a modified Crichlow rule such as the one shown is recommended as a useful device to have in the battery.

The rule may be made any convenient size depending on the range and accuracy desired. This particular one was purposely drawn $1\frac{1}{4}$ inches in diameter for mounting on a standard circular ply-wood disk that can be found in the vicinity of certain portable type army buildings. The log scale is the same as that of the Crichlow, but the angular scales is in degrees and represents the sine rather than "one over the sine." The angular scale is plotted with reference to the log scale, using a table of natural sines. This method avoids the use of reciprocals or cosecants and seems to be more practical in this instance. The two arms can be made of a strip of X-ray film if nothing better is available. The center screw device must be manufactured or borrowed from a standard rule. One of the arms is labelled R and the other T.

To use the rule, a base line of three or four hundred yards, or longer as desired, is laid out and measured to the nearest yard. The B^1 station should be in the vicinity of the directing point; with the B^2 station on the right or left according to terrain conditions. The two base end stations should be intervisible if possible to simplify the orientation.

Zero azimuth is down the base line from the right hand station to the left hand station. If the two stations are not intervisible, datum points will have to be established. A pair of phones connects the B^2 reader with the operator of the rule; and another pair, the B^1 reader with an assistant operator, who performs the subtraction, B^1 minus B^2 (angle T). The directions for the manipulation of the arms, though simple, should be recorded on the face of the rule. Tracking may be coordinated in the regular manner using either a TI system or stop watch. A percentage range corrector will also be required for conversion to mils and for the application of corrections.

An improved version of the rule designed for more rapid and accurate operation is suggested where manufacturing facilities are available. Make up the log scale on a separate disk capable of rotation about its center, and devise a way for mechanically locking the arm T to the disk at any desired point on the scale. The reading line of the arm can then be fixed at any point so as to coincide with any length of base line. The log scale would then rotate with arm T, and by holding arm R on the value of B^2 , and setting arm T on the value of the target angle ($B^1 - B^2$). The range could be read immediately on the log scale under arm R, and the possibility of error caused by slippage between the two arms would be eliminated.



A tremendous, costly, long-enduring task in peace as well as in war is still ahead of us.

But, as we face that continuing task we may know that the state of this Nation is good—the heart of this Nation is sound—the spirit of this Nation is strong—the faith of this Nation is eternal.—FRANKLIN D. ROOSEVELT.

COAST ARTILLERY



BOARD NOTES

Any individual, whether or not he is a member of the service, is invited to submit constructive suggestions relating to problems under study by the Coast Artillery Board, or to present any new problem that properly may be considered by the Board. Communications should be addressed to the President, Coast Artillery Board, Fort Monroe, Virginia.

THE COAST ARTILLERY BOARD

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Eight-inch Chamber Sponge. The Commanding General, Army Ground Forces, has approved the recommendation of the Coast Artillery Board that the Chamber Swabbing Sponge T10 be adopted as standard accessory equipment for use with the 8-inch Gun Mk VI, Mod. 3A2, on Barbette Carriage M1 and Railway Mount M1A1.

The Chamber Swabbing Sponge T10 is built of four brush sections, the distance of the section from the center line of the sponge and staff being regulated by leaf springs; consequently, the diameter of the sponge head will always conform to that of the powder chamber. The sponge can be easily handled by one man, and is superior in all respects to the old type sponge.

Modification of 12-inch Shot Trucks. Information has been received to the effect that a number of 12-inch batteries with Barbette Carriages M1917 have modified their shot trucks to provide a powder tray on the left side. This modification eliminates the separate powder tray and the six men required to handle it, reduces the time required to service the piece between rounds, and minimizes confusion and interference at the gun and in the magazines and corridors.

Although the provision for power ramming for batteries of this type, ultimately to be made, will necessitate the provision of a new shot truck, in the interim it may be practicable for other batteries to modify the shot trucks now in use to provide a powder tray.

Spraying of Powder Chamber in lieu of Sparging. A report has been received by the Coast Artillery School that a seacoast battery is spraying the powder chamber after each shot with a fine water spray from a hose in lieu of sparging the chamber. Since some guns are so designed that considerable water will remain in the chamber if this method be used, possibly resulting in a misfire, hangfire or serious flareback; since also the possibility of damage in battle to the equipment necessary for continuous supply of water under pressure would necessitate immediate availability of a sponge as standby equipment; and in the interest of uniformity of method, it appears undesirable that any battery should use a water spray as an alternate method of sparging of the powder chamber after each shot.

Combination Sponge Rammer for 155mm Guns. The Ordnance Department has been authorized to design and

manufacture for test, pilot models of a combination sponge rammer for the 155mm Gun M1917 similar in type to that used by the British. This combination sponge rammer consists of a rammer head, behind which is a sponge in two sections with a circular brush, of diameter larger than the chamber, in rear of them. The sparging solution is carried into the chamber by the sponges and distributed over its surface by the circular brush.

Covers for the 90mm Fixed Gun Mount M3 (T3). The following accessories are to be furnished by the Ordnance Department for use with the fixed 90mm Gun Mount M3:

Breech cover
Telescope and mount cover
Muzzle Cover, M324.

A gun port cover is being developed to aid further in keeping drifting sand and snow out of the moving mechanisms.

Dispersion with the new 8-inch Guns. The new 8-inch gun fires the 260-pound target practice projectile with either the normal charge or the supercharge. The supercharge should always be used in battle as the normal charge was designed for use in practice firings to reduce erosion of the bore.

Practice firings conducted in 1942 indicated that the probable errors being developed in the field, with the normal charge for the 8-inch gun, were much larger than expected and in general were a great deal larger than the proving ground firing indicated should be expected. A special firing of eighty rounds of the practice projectile was conducted by the Board and all available reports of calibration firings and target practices were studied and analyzed.

As a result of the test and studies it was concluded that neither the design of the projectile and rotating band, the system of gravity ramming, nor the design of the loading tray was the primary cause of the large dispersion obtained when using the normal charge. It is believed that the round-to-round variations in the developed powder pressures, combined with the low density of loading, are the principal causes of the large deviations.

The Board recommended that all calibration and practice firings with the new 8-inch gun be conducted with the supercharge. The Chief of Ordnance is investigating the

problem and such remedial action as may be practicable will be taken. The Commanding General, Army Ground Forces, has approved the Board's recommendation.

Subcaliber Guns. The Ordnance Department has under development 75mm subcaliber guns for all modern seacoast fixed and railway artillery of 6-inch caliber and above. These subcaliber guns are to be delivered for test during July and August. It is expected that production will follow test shortly. The guns for 16-inch batteries are to be issued first. All of these guns are in the form of tubes to be inserted in the chamber. The ammunition to be used with these guns is the 75mm Shell, M48, inert loaded and with ignition primers. Normal charge only is provided. Thus the standard firing circuit and breechblock are used when firing the subcaliber, and the training of the gun crew will more nearly simulate actual service conditions.

A 37mm subcaliber gun is under development for use with the 90mm Gun on Fixed Mount. This gun is in the form of a tube also. The ammunition to be used with this gun has not been specified to date.

Coast Artillery Memorandums. Coast Artillery Memorandum No. 22, 1 June 1942, covers thoroughly all important features arising in 1941 target practices. Due to the relatively higher importance of other reports and tests, a Coast Artillery memorandum covering the target practices fired during the calendar year 1942 will not be published. The principles discussed in Memorandum No. 22 are as appropriate as they would be if based on 1942 practices, and this memorandum should be continued in use as a current guide. The results of the 1942 practices, it is expected, will be combined with those of 1943 reports in a memorandum to be published in 1944.

"Warm-up Effect"—90mm Guns. Limited experience in firing 90mm guns on the fixed mount indicates that a "warm-up" effect exists with these guns comparable to that frequently found with 3-inch seacoast guns. Data to date point to the fact that the so-called "warm-up" effect is really a "clean gun" effect. In other words, the excessively short deviations occur on the first rounds fired from clean guns only.

It is suggested that particular attention be paid, when firing the 90mm gun on the fixed mount at waterborne targets, to determining whether or not a clean-gun effect exists. Assuming a clean-gun effect, the solution is to disregard the first salvo fired if it is short. If the first salvo is over an adjustment of down one fork should be made and thereafter the first salvo should be disregarded.

Training equipment. At the present time, most harbor defenses are authorized one Spotting Set PH-32 or PH-32-B. The next published change in Table of Basic Allowances No. 4 will authorize the issue of this set to all harbor defenses.

When firing rapid fire armament, the determination of accurate deviations is practically impossible using the customary method of observing lateral deviations from the vicinity of the battery and photographing each splash from the towing vessel. The two-station camera spotting unit has been used successfully to determine the lateral and range deviations of each splash when firing the 3-inch and 90mm batteries. The method of computing data and forms to be used will be covered in a change to TM 4-235 which should

be published shortly. Forms may be obtained from the Coast Artillery Board. TM 11-434 covers the description and operation of the spotting set. Due to the time factor and the nature of the data required, coordinated training of the personnel involved in record taking is of great importance.

Ammunition Allowances. Pending the publication of appropriate changes in AR 775-10 dated 13 March 1943, the War Department has granted authority for the expenditure of additional Coast Artillery ammunition. Eight-inch railway gun batteries are authorized a total annual allowance of fifty-six rounds and 16-inch gun batteries are authorized an allowance of twenty-eight rounds. The increased allowance for railway units was made to permit the firing of four guns.

Drill Plugs for 155mm Gun Matériel. The following information, from Weekly Directive No. 19, Headquarters Army Ground Forces, will be of interest to 155mm gun battery commanders. Many 155mm gun batteries are not equipped with brass dummy plugs to replace firing pin housing, firing pin, and firing pin spring, during gun drill. Failure to employ this dummy plug results in excessive wear on percussion hammer and firing pin. Plug, drill, A130622 is listed on page 121, of Standard Nomenclature List D30, Gun 155mm, M1917 and M1918 M1; and Carriage, Gun, 155mm, M1917A1, M2, M1918A1, and M3, 10 October 1942. The basis of issue of this item during peacetime for drill purposes only is one per gun. It is listed in Standard Nomenclature List D-24, Gun, 155mm, M1 and M1A1 and Carriage, Gun, 155mm, M1, on page 104. It may be requisitioned on this basis for 155mm Guns, M1 and M1A1.

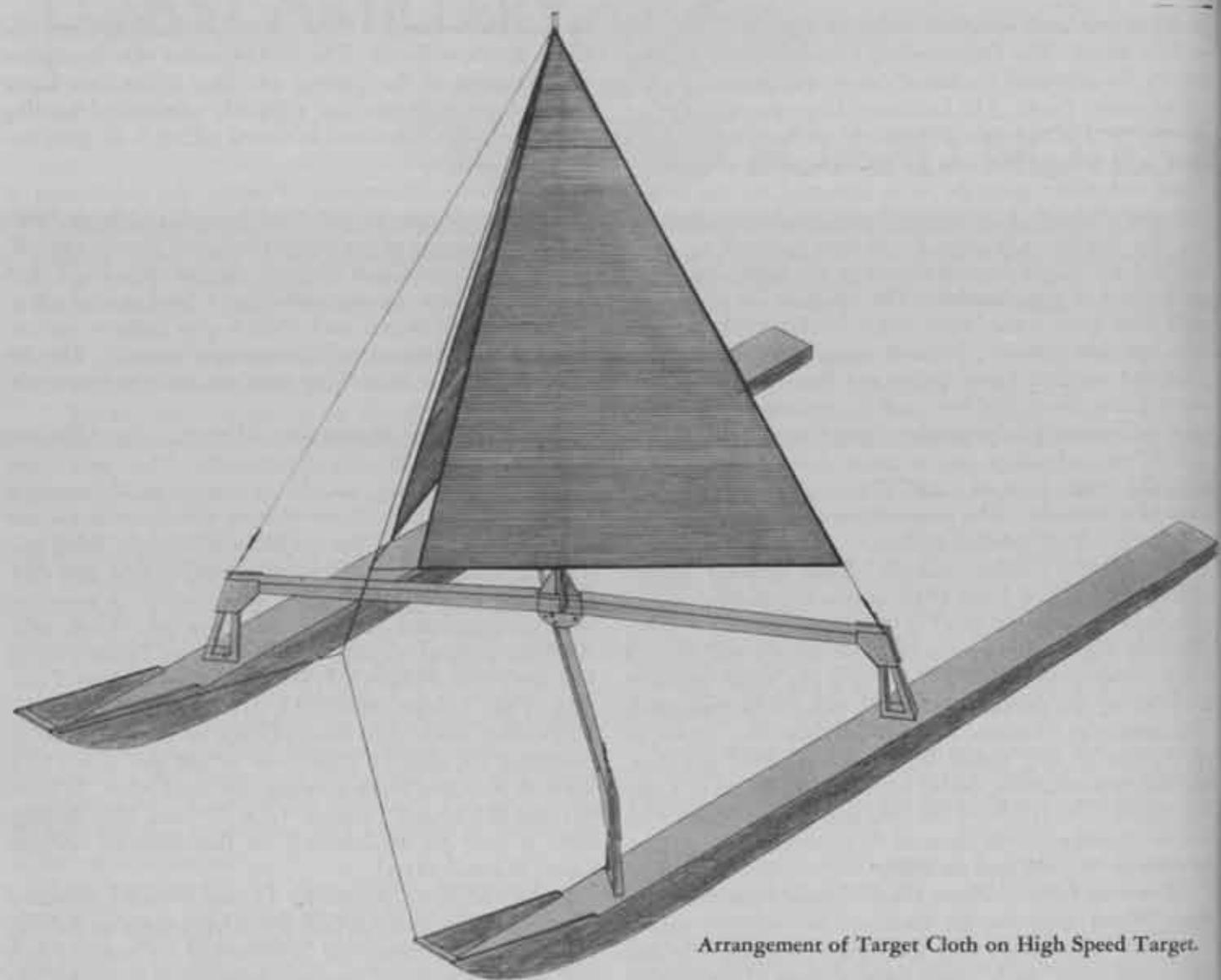
Sights and Sight Mounts for 12- and 16-inch Casemated Batteries. The Coast Artillery Board has recommended that sights and sight mounts not be furnished for those 12-inch and 16-inch casemated batteries so sited as to preclude Case II fire, and that the shields for batteries so sited not be provided with sighting apertures. The Board has recommended also that those 12-inch and 16-inch batteries already installed, so sited as to preclude Case II fire, have the sights removed and apertures in the shields closed.

The Commanding General, Army Ground Forces, has approved these recommendations and has recommended that the necessary action be taken to put them into effect.

Dummy Charge Extractor M1911. The dummy powder charges used for drill on all models of 6-inch guns are single section and can be removed more easily from the chamber without the use of a dummy charge extractor. The dummy charge extractor has no other use in these batteries. The Chief of Ordnance has changed the lists of tools and accessories for all types of 6-inch batteries to eliminate the Dummy Charge Extractor M1911.

Improved Means of Measuring Powder Temperatures. Action has been initiated to provide seacoast artillery batteries with Powder Temperature Thermometers M1 or Powder Temperature Indicators M12 or M13, whichever is applicable to the particular battery. These thermometers and indicators provide improved means for determining the temperature of powder charges in that the temperature inside the charge is indicated.

The recommended basis of issue is two Powder Tempera-



Arrangement of Target Cloth on High Speed Target.

ture Indicators M12 per 3-inch seacoast or antiaircraft battery in a harbor defense; two Powder Temperature Indicators M13 per 90mm motor torpedo boat or antiaircraft battery in a harbor defense; two Powder Temperature Thermometers M1 per firing battery of 6-inch caliber or larger, HD, TD and Ry.

Circuit Diagrams for M-1 Mine Planters. Steps have been initiated to procure for each of the M-1 mine planters the electrical circuits and ratings of components for the four following units:

- Cargo Winch Control Panel CR-5437-A2.
- Dual Windlass Control Panel CR-5437-AC.
- Cable Reel Control Panel CR-5437-A5.
- Capstan Control, Direct Current, 115 Volt, CR-5437-A3.

Replenisher Gauges for 155mm Guns. The Ordnance Department is investigating the practicability of providing replenisher gauges for 155mm guns (all types). These gauges will simplify the service of the piece in that no measurements will be necessary except that the gauge on the 155mm Guns M1917, M1918, and modifications, will have to be measured when oil is being drained. The elevation setter and the gun pointer will watch the gauges on the M1917 type and the M1 type guns, respectively. These

gauges will eliminate the number five man from the gun crew of the M1917 type gun *during firing*, and will relieve the gun commander of the M1 type gun of the responsibility of measuring the replenisher after every tenth round.

Coast and Geodetic Survey Charts. Coast and Geodetic Survey charts on a scale of 1/80,000 have a wide variety of uses in harbor defenses. Such charts are required by battery, group and higher commanders to depict the field of fire, with limiting azimuths and ranges, and dead areas. They are needed to show the grid used in identification and indication of targets. At present these charts may be obtained by requisition on the service command but no definite basis of issue is prescribed. The Army Ground Forces is taking action to include the charts in Corps of Engineers Allowance of Expendable Supplies, Series A.

Replaceable Spindle Plugs for Seacoast Artillery. Comments appearing in the reports of target practices indicate that considerable trouble is being experienced in extracting fired primers. While the basic cause is probably improper cleaning of the primer seat and vent, it is considered likely that new obturator spindle plugs are required in a number of guns.

The Chief of Ordnance has advised the Coast Artillery Board that spindles with replaceable obturator spindle plugs are available at Watervliet Arsenal, and can be obtained

by sending the unmodified spindle to that arsenal with a request for exchange. The replacement of obturator spindle plugs is possible locally by the field maintenance company, provided the spindle is of the modified type so that the spindle plug can be used.

High Speed Targets.

There are many training situations where a high speed maneuvering target is desirable, but the high probability of destruction precludes the use of boats. In order to secure the advantages of high speed tracking and firing without the danger to the boat, a target has been designed which can be towed. The Commanding General, Army Ground Forces, has authorized the distribution to each harbor defense of the plans, and that distribution has been made.

The Coast Artillery Board will be interested in comment and recommendation resulting from use of the high speed target, with a view to incorporating such changes in the design as appear to be warranted, prior to standardization of this target.

The target consists of the following components:

- (1) Two hollow pontoons which are designed to move through the water with minimum resistance.
- (2) A hollow X-frame and four supports which hold the two pontoons in position and support the mast.
- (3) The mast and five stays which support the target cloth.
- (4) A towing bridle which is attached to the two forward uprights.

To aid in the fabrication of the pontoons and the metal parts which will be more difficult to make, full size templates are included in the plans. It is not anticipated that any organization having access to a carpenter shop will experience difficulty in constructing the target. Because at high speeds the air resistance is such a large part of the total resistance, it is of great importance that the target cloth be arranged according to the illustration. An attempt to arrange the target cloth in the manner employed with the 1917 pyramidal target (*viz.* with flat surface to the front), will seriously overload the towing craft, and should be avoided. The smallest possible amount of target cloth,

consistent with the visibility required, should be employed.

It is of importance that certain procedures be followed in order to minimize mechanical difficulties with the towing boats. More maintenance work and repair will undoubtedly be required.

Based on experience, the following suggestions are made:

1. Have the boat in excellent mechanical condition at all times. Do not tow a target unless all parts of the craft function satisfactorily.
2. After each towing mission, make whatever adjustments are necessary to maintain the clutch in the best possible adjustment.
3. Allow ample time for motor to warm-up and *cool down*; 800-900 revolutions per minute for periods of ten minutes are considered suitable. Check valves to insure correct amount of cooling water.
4. Change oil at the regular periods in accordance with engine instructions.
5. Do not tow the target at speeds in excess of twenty-five miles per hour—tow at slower speeds if conditions of wind and tide cause the target to impose a heavy load on the towing craft.
6. *Do not tow the target on tracking missions. Use it only on firing courses.*
7. Wash the boat after each mission to remove any scum which might adhere to the hull.
8. Make a daily inspection of the target and keep pontoons pumped out. Check wires and braces.
9. Install target cloth according to plans furnished and maintain in a taut condition.
10. Use 3/16-inch wire rope towing cable (similar to that used in towing sleeve targets) with approximately seventy-five feet of 1½-inch to 2-inch (circumference) manila rope to absorb shock loads. Tow line length of 400 to 500 feet should be ample. The Board will furnish additional information on tow line as soon as available.
11. Take particular precautions to keep the tow line free of the propeller.
12. Take up slack in the tow line slowly to avoid breaking the line.
13. Try to keep the tow line off the bottom to eliminate snagging and possible destruction of the target.



Victory in war results from no mysterious alchemy or wizardry, but depends entirely upon the concentration of superior forces at the critical points of combat.—GENERAL DOUGLAS MACARTHUR.

Coast Artillery Journal

Fifty-second Year of Publication

COLONEL FREDERIC A. PRICE, Editor
LT. COL. ARTHUR SYMONS, Associate Editor
MASTER SERGEANT CHARLES R. MILLER,
Circulation Manager



The JOURNAL prints articles on subjects of professional and general interest to officers of all the components of the Coast Artillery Corps in order to stimulate thought and provoke discussion. However, opinions expressed and conclusions drawn in articles are in no sense official. They do not reflect the opinions or conclusions of any official or branch of the War Department.

The JOURNAL does not carry paid advertising. The JOURNAL pays for original articles upon publication. Manuscripts should be addressed to the Editor. The JOURNAL is not responsible for manuscripts unaccompanied by return postage.

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The purpose of the Association shall be to promote the efficiency of the Coast Artillery Corps by maintaining its standards and traditions, by disseminating professional knowledge, by inspiring greater effort towards the improvement of matériel and methods of training and by fostering mutual understanding, respect and cooperation among all arms, branches and components of the Regular Army, National Guard, Organized Reserves, and Reserve Officers' Training Corps.

News and Comment

The Journal

The war needs of the Nation for many raw materials in huge quantities are now curtailing the use of such items in many industries. These restrictions have been imposed in countless activities, and the limitations on the use of paper are now felt in the composition of our own JOURNAL.

The May-June issue carried a reduction in the weight of inside pages from a basic sixty to a basic fifty. This reduced weight of paper will continue with the total number of pages also being cut from 112 to ninety-six per issue.

In order to retain our previous amount of reading material in future issues even with the reduction in total number of pages, each reading column has been widened and lengthened by reducing the margin around each printed page.

It will also be necessary to reduce the heads for news letters from our principal commands so as to give their account of activities as much space as possible.

We wish to take this opportunity of expressing our appreciation of the loyal support being received from subscribers to the JOURNAL. It is a source of gratification to see the evidence of the value placed upon the JOURNAL by officers whose length of service has convinced them of its importance as a training aid.

Battery, battalion, and regimental commanders in increasing numbers are sending in block subscriptions. The number of units reporting 100% subscription lists is constantly growing. Certain units in which professional interest has been energetically aroused now number many subscribers among their noncommissioned officers also.

Commanding Officers realize that when their officers read of the problems of the other fellow and of how that other fellow has solved them, that their own officers then have an added incentive to work out their own solutions.

When you have done this in the technical or tactical field, write it up and let us have it. Such articles are worth their weight in gold to those who may not have quite the initiative or inventiveness that you have.

To attain its maximum value to our personnel the JOURNAL must reach every individual. A good percentage of our commissioned personnel are subscribers—but the magazine should be on every one's desk.

Every unit should make it available to its enlisted personnel by having it on file in every day room or reading room.

Keep current in your present profession—subscribe now.

Longer OCS Courses

A recent War Department directive ordered all OCS courses to be lengthened to a minimum of four months.

Group Subscription Orders

The 198th Coast Artillery is not the unit to permit difficulties to stand in its way. Although it is occupying scattered positions at an APO address, this wide-awake regiment, through Lieutenant Colonel Herman W. Cook, Executive, sent in sixty-nine individual subscriptions and fourteen unit subscriptions, to attain a real 100% record—every officer, warrant officer, and subordinate unit a subscriber. Colonel George J. Schulz commands the regiment.

Lieutenant Colonel Thomas A. Baker, commanding the 833d AW Battalion (AA), submitted thirty-five subscription orders to place the unit in the select 100% circle, and a few days later forwarded six more to *keep* the 833d where it belongs. Colonel Baker is a real JOURNAL booster—his letter expressed satisfaction that his former battalion, the 2d of the 204th CA, is still in the 100% class where he put it originally.

Battery H, 369th CA (AA), commanded by Lieutenant Alder F. Watts, mailed in a group order for eight subscriptions, all for noncommissioned officers in the battery. Another unusual order came from Major Earle D. Button, of the Coast Artillery School. Major Button showed the JOURNAL to a class of officers—fourteen subscriptions resulted. It seems the JOURNAL sells on sight.

The 120th CA Battalion (AA), Lieutenant Leonard De Vita, Adjutant, and the 398th AAA AW Battalion, commanded by Lieutenant Colonel Albert A. Moren, are new 100% units. The 120th sent in thirty-one to make the grade, and the 398th thirty-seven. Colonel William P. Bray, another long-time friend of the JOURNAL, now with headquarters of an AAA group at Camp Hulen, submitted thirty-eight subscriptions to bring Lieutenant Colonel Frank R. Sack's 788th AAA Battalion into the 100% Society.

Other orders included fourteen subscriptions from the 601st CA (AA) (Lieutenant John A. McMichen, Adjutant), and twelve from the Harbor Defenses of San Diego. Colonel P. H. Ottosen, Commanding HDSD, gave credit to Captain Howard B. Breeding for the initiative and effort expended to bring his organization's percentage up to 90½.

Major Carl E. Schnetz, Adjutant of the 249th CA, came on under the wire for this issue with an order for seventeen subscriptions.

As we go to press, the mail brought us two more gratifying orders: the 85th CA(AA), came through with a group order for seventy-nine subscriptions, forwarded by Captain C. H. Du Val, and that charter member of the JOURNAL Boosters, Colonel W. C. McFadden, of the 69th Coast Artillery sent in eleven subscription orders. Long ago we lost track of how many subscriptions Colonel McFadden has sent us through the years.

Wanted—Liaison

From October 4, 1918, to January 3, 1920, the COAST ARTILLERY JOURNAL—or as it was then called, THE JOURNAL OF U. S. ARTILLERY published another magazine called *Liaison* which was devoted to furnishing newly commissioned officers with various items of pertinent information.

Liaison also carried articles on the operation of Coast Artillery regiments overseas in World War I and so provides a primary source of information for certain phases of historical research.

We are very anxious to complete our set of this publication so that we may place bound volumes in our library and make them available for historians to consult.

The JOURNAL needs the following numbers:

No. 1 (October 4, 1918) through No. 9 (November 30, 1918)

No. 26, Volume I (June 14, 1919)

No. 1 Volume II (July 5, 1919) through No. 26 Volume II (December 27, 1919)

No. 1 Volume III (January 3, 1920) through No. 13 Volume III (March 27, 1920)

It is hoped that some of our older officers may have some of these copies in their private libraries and that they may be willing to furnish them to the JOURNAL. The Editor will be glad to make any necessary arrangement.

AAA Units

Under date of 6 January 1943, the War Department approved the recommendation of the Commanding General, Antiaircraft Command, that the designation of anti-aircraft units in the current revision be simplified by using the title AAA instead of the title, CA(AA).

In compliance with the above, antiaircraft units organized under Tables of Organization in the 44 series have been designated as, for example Hq & Hq Btry, 61st AAA Brig; Hq & Hq Btry, 55th AAA Gp; 139th AAA Gun Bn; 660th AAA MG Btry; 577th AAA AWpns Bn.

AAA Scores in North Africa

Achieving a two-a-day record average, American anti-aircraft units fighting in North Africa accounted for a total of 180 enemy airplanes destroyed or probably destroyed during one period of 90 days, according to a report received by the War Department. Of this number, 131 were listed as definitely destroyed.

"It is believed," the report stated, "that the figures are conservative."

One gun crew reported that "pieces of 'glasshouse' and two machine guns were found after the engagement, indicating the improbability of safe return." But that enemy plane was recorded as probably destroyed.

There was no doubt, however, in another instance. The report noted that destruction of the plane was "confirmed by fact that the pilot was last seen walking."

Antiaircraft units, highly mobile, operated in coordination with infantry and field artillery organizations, providing not only protection to them but a potent offensive threat to the enemy. Their activities covered a wide area of combat against all types of enemy aircraft.

"Many of those 131 planes were fast Messerschmitts and Focke-Wulfs which are hard targets for any gunners, while others were JU 188s on reconnaissance and Stuka dive bombers," an Army Ground Forces observer stated. "What-

ever the nature of the attack, our AA units went into action and fired, and I believe the results justified our methods."

One unit fighting at El Guettar, shot down nine planes in one day. Crews at Sidi bou Zid achieved a score of eighteen in three days. Throughout the 90-day period, which began January 5, 1943, one unit destroyed seventy-four definitely and nineteen probably, while another unit in that time had thirty-five shot down and fourteen probables to its credit.

During the period, American antiaircraft gunners destroyed fifty-two ME 109s definitely and fourteen probably; fifty JU 87s definitely and twelve probably; twenty-seven JU 88s definitely and twelve probably; two FWs definitely and ten probably, and one unidentified plane probably shot down.

Self-Propelled AA in North Africa

The effective part played by self-propelled antiaircraft artillery in the North African campaign is detailed in a report by Brigadier General Joseph E. Harriman, Antiaircraft Brigade Commander of the II Army Corps.

General Harriman reported that antiaircraft artillery of the II Corps, mounted on half-tracks, achieved a score of seventy-four German planes definitely downed, and nineteen probables, in the three months' period beginning in January.

AA half-tracks operated in Tunisia in conjunction with armored units, and played a vital rôle in keeping open important stretches of road which Allied supplies traveled.

On one occasion, General Harriman said, eight half-tracks threw up a cover of fire over supply trains along a considerable stretch of road where the movement had attracted the attention of German Messerschmitts. The movement was uninterrupted and the fire so strong and accurate that the eight half-tracks were able to maintain their own positions along the road, holding the Germans to a respectful distance.

These half-tracks were of significant value when used to protect medium tank units, as protecting units attached to Field Artillery armored units, and when operating in conjunction with tank destroyer units.



Paramount from Bonfata

Rockets, believed H.E. loaded, pounded the Germans at Stalingrad.

Correction—Gun Casting

Major A. E. Voysey, CAC, on duty at Watertown Arsenal, has written to modify a statement that appeared in *News and Comment* last issue concerning centrifugal casting of gun tubes. The article, taken from a press association release, indicated that this process was being used for guns up to 400mm. Major Voysey, quoting from the statement that was made to the press representatives, indicates that this process is used for guns of calibers from 37mm to 105mm only.

Christmas Packages for Overseas

Christmas packages may be mailed to American soldiers serving overseas without presentation of a request from the soldier, during the period from September 15 to October 15, which has been designated as Christmas mail month for soldiers overseas.

These Christmas gift packages will be accepted for mailing only within the present limitations of weight and size—five pounds in weight, fifteen inches in length, and thirty-six inches in length and girth combined.

Christmas packages mailed during this period should bear the indorsement "Christmas Gift Parcel." Only one such package will be accepted for mailing by or on behalf of the same person or concern to or for the same addressee during any one week.

Under the relaxation of the overseas mail restrictions during this period it will not be necessary for the mailer to present either a request or an envelope bearing an APO cancellation at the time of mailing. Perishable articles will not be accepted for mailing, and every effort will be made to discourage the mailing of fragile articles.

The Army Postal Service of the Army Service Forces reports that only through the whole-hearted coöperation of the mailing public in complying with the above mailing rules and dates will it be possible to deliver on time the tremendous volume of Christmas mail to American soldiers overseas which is expected this year.

AA Snipers in England

A new type of gunner—the "sharpshooter"—has been produced by the Antiaircraft Command to meet the daylight fighter-bomber raids on English coastal areas. Army life has been entirely revised for the sharpshooter. His food and even his recreation have been specially selected to give him the split-second mental and physical reactions necessary to deal with 300-m.p.h. targets.

Unless he can range, sight and destroy his target within five seconds, he is useless for the job. The fast, low-flying fighter-bombers, leaping off from bases only a few minutes away from the coast, presented an entirely new problem to the Command.

If you live near the coast you can see the difference in technique well illustrated by the angle of the sharpshooter's guns. They are still antiaircraft guns, but hardly ever do they point towards the sky.

They usually fire almost horizontally. Often they even point downwards. There is no other way of getting the

"zero feet" raider. This, of course, has meant raising the guns to towers and similar places.

The Commander-in-Chief, AA Command, General Sir Frederick Pile, has personally directed the battle with the sneak raiders. It has not been an easy one.

The first steps taken were to increase to the utmost possible extent the period of warning given of the approach of raiders, and to increase the number of guns along the coast-line.

It must be obvious even to the Germans themselves that much progress has been made in both of these directions.

The next step was up to the gunners themselves. And that brought the development of the sharpshooters.

Everything these men do on the Light AA sites is now planned to the last detail. The traditional Army habit of having the main meal of the day at midday has been abandoned.

Instead the gunners get a light snack, to reduce drowsiness in the afternoon.

Route marches or any form of drill done in large groups have been ruled out to avoid sluggishness and maintain individual alertness.

Special forms of physical training have been devised—many of the exercises are done by the crews as they actually sit or stand at their guns.

The guns are manned continuously. If a man at his post should drop something—say, a coin—he must not bend down to pick it up because while his head was bent an F.W. 190 might sneak overhead unnoticed.—*Daily Mail*, London.

Small Arms Against Planes

Rifles and automatic rifles are somewhat effective against planes up to ranges of about 500 yards. When they are employed, it is necessary to take a lead in exactly the same way as is done with the machine gun. To do this, the battle sight is used.

The positions used in antiaircraft firing are those which can be assumed rapidly, afford the maximum flexibility to the body for manipulation of the rifle, and do not require undue exposure of the riflemen. These positions usually will be either the kneeling or the standing. The kneeling position best meets the requirements listed above as it is less vulnerable than the standing position.

Antiaircraft firing positions differ from those used in ground target firing in that:

- (a) The sling is not used.
- (b) The arms are not supported, but move freely in any direction with the body.
- (c) The hands grasp the piece firmly, the left hand near the lower band.
- (d) The butt of the rifle is pressed firmly against the shoulder with the right hand, and the cheek is pressed firmly against the stock.
- (e) In the kneeling position the buttock does not rest on the heel, and the left foot is well advanced to the left front. The weight is slightly forward.

The positions must be such that the rifle, the body from the waist up, the arms, and the head are as one fixed unit.

When leading a target, the rifle must be swung with a smooth, uniform motion. This is accomplished by pivoting the body at the waist. There should be no independent movement of the arms, shoulders, head, or rifle.

Fire should be opened as soon as possible and delivered at as rapid a rate as is consistent with accuracy. The trigger should be squeezed aggressively and decisively. Once started, the squeeze should be continued until the cartridge is fired. Squeezing the trigger while the rifle is in motion requires considerable practice and should be emphasized in training.—*Coast Artillery Training Bulletin*.

Home Guards for AA Guns

Many more Home Guards will be used on the AA defenses of Great Britain in the immediate future. The increasing shortage of man-power has made it imperative that Regular soldiers employed on static gun sites shall be released for other combatant service.

Home Guards have proved highly successful with the operational batteries, and General Pile, Commander in Chief of the AA defenses of Great Britain, is pleased with them. His demands are insistent for more Home Guards to replace Regular gunners who have been drafted elsewhere.

Some antiaircraft batteries, almost entirely manned by Home Guards, have been in action against the enemy with splendid results.—*London Daily Mail*.

Barrage Balloons Over New York

SOMEWHERE ON LONG ISLAND, N. Y., June 30—The first anchored balloon entanglement in the New York metropolitan area was unveiled by the Army yesterday as thirty of the silvery gas-bags soared into a cloudy sky.

Maj. Gen. Sanderford Jarman, whose antiaircraft units extend from Maine to Florida, gave the command which sent the barrage on its baptismal flight, "Raise all balloons to R. O. H." (ruling operational height).

This unit, with operating headquarters in a clubhouse just off the first tee, protects an important objective.

There are some 50 balloons, scattered several miles over the area, each manned by a crew of 13 men. The balloons go aloft only during air raid alerts.—*United Press*.



A truck-mounted version of the Russian rocket gun shown on the previous page.

Paramount from Sovfoto

Model Plane Targets

After extensive tests, the Antiaircraft Artillery Command has approved the use of a new type of model airplane in the training of machine gunners for ground combat against low flying enemy planes, the War Department has announced.

The model plane is revolutionary in design. It is a folding wing type craft that is launched from a catapult. The plane is designed so that when it leaves the catapult and until it attains its maximum altitude the wings remain folded. This feature allows the plane, due to lessened resistance and drag, to reach a greater altitude before the wings open for the glide on a zig-zag and extended flight back to earth.

The model is a low-cost product that uses a minimum of essential war material and labor in construction.

Meanwhile, the Camp Hood, Texas, Tank Destroyer Center is using model planes in new ways in its training program. Antiaircraft gunners fire at the miniature planes, while other gunners fire over their heads at balloons. The gunner who qualifies under this roaring confusion demonstrates the requisite ability to react calmly under battle conditions.



The Locators

The Locators, a volunteer group, organized to assist army wives to keep in touch with each other during the numerous and sudden transfers in wartime, are celebrating their first anniversary. During this first year they have performed much valuable work in locating the addresses of army women, and in thousands of cases their files have assisted in bringing together friends and relatives who have been "lost."

To make their files even more useful and complete. *The Locators* ask that army wives submit the following information:

Officer's name _____

Rank, Branch _____

Wife's name _____

Wife's address _____

_____ Temporary

_____ Duration

The address of *The Locators* is P.O. Box 537, Leavenworth, Kansas. There is no charge for the service, but stamps for reimbursement of postage will be appreciated.



Foreign Notes

Coastal Defenses:

Four coastal batteries ordered by Chile from the United States were delivered a few months ago. Along with them Chile also gets, for a short time, trainers for their crews.

Frankfurter Zeitung.

AA Defense:

According to an article in *Ali di Guerra* of 10 September 1942, English AA cruisers possess ten 102-mm AA cannon, sixteen 40-mm eight-barreled AA cannon, eight 40-mm four-barreled AA cannon and a large number of AA machine

guns up to 20-mm caliber. Ordinary merchant ships have 40-mm AA cannon with six or eight barrels. These multiple-barrel weapons are Vickers guns which fire a projectile weighing 1 kg. (about 3/4 lb.) automatically. The barrels have funnel-shaped muzzle brakes.

In the English Channel, when the weather is favorable, kites or balloons anchored by steel cables are released. These kite or balloon barricades, are towed by the convoy boats. Low-flying torpedo planes are warded off by barrage fire during which the 38.1-mm projectiles of the ships' artillery on striking the surface of the sea, send up columns of water to a height of 300 feet, against which the torpedo planes may run as a barricade.

Militär-Wochenblatt.

Coast Artillery:

In addition to various types of coastal guns with the calibers of the English railway guns (234-mm, 304.8-mm, 355-mm, and 457-mm) there is also in the coast artillery an especially large gun of 534-mm (21 inches) which, according to "Wehrtechnische Monatshefte" with its 2500 kilogram shell (5,500 lbs.) possesses a maximum range of 16,000 meters (about 10 miles). It is the largest caliber gun in the world, followed next by the French 520-mm railway howitzer.

Artilleristische Rundschau.

Russian AA Matériel:

Quadruple machine guns are used for AA defense. Four machine guns of 7.62-mm caliber (Maxim model) are coupled together on a pivoted base. They are fed from cartridge boxes each containing 250 rounds. Sighting is by means of a "floating" circular front sight. Rate of fire, 2000 rounds per minute; maximum range, 1000 meters (about 3,300 feet) height. Transportation by truck.

The special heavy Hotchkiss machine gun is replaced by the 12.7-mm Degty machine gun on wheeled mount. It is a gas operated weapon gun with muzzle brake, articulated metal band for feeding cartridges and an effective range of 1500 meters (about 5,000 feet) height.

The 37-mm Model 39 AA cannon is constructed as a four-wheeled trailer with outrigger gun platform and is effective up to a height of 3000 meters (about 10,000 feet) with a shell weighing 0.72 kg. (about 1 lb.).

The 76.2-mm AA cannon (L/50) is also built as a four-wheeled trailer with outrigger gun platform, likewise with complete traverse and elevation up to 80 degrees. The tube, equipped with muzzle brake, fires a shell of 6.5 kg. (about 4 lbs.) to a vertical height of 9.5 kilometers (about 6 miles).

An 85-mm AA gun is also used by the Russians.

Militär-Wochenblatt.

TRANSLATIONS IN C. & G. S. S.
MILITARY REVIEW.



More CAC General Officers

On 1 July, the following Coast Artillery Corps colonels were nominated for promotion to the rank of Brigadier General: Oliver B. Bucher, Cortland Van R. Schuyler, Edward W. Timberlake, Robert W. Crichlow, and Paul B. Kelley.

British AA Battery Arrives

A special battery of the Royal Artillery, British Army, designated as the First Composite Antiaircraft Battery, has arrived in this country to demonstrate methods of training, drill and tactical employment adopted by the British Army, and to exchange ideas on antiaircraft matters.

Sent to the United States by the British War Office at the request of the War Department, the unit consists of seventeen officers and 329 other ranks, most of whom served in Great Britain during the protracted air attacks on the British Isles during the past three years. Several of the officers, noncommissioned officers and men have seen service with British antiaircraft units in such theaters as the Middle East, Malta and India.

Although the battery as a whole is a non-tactical formation, it has three component troops (equivalent to platoons in U. S. Army parlance) which are standard British tactical units—one of four 3.7 inch (94mm) antiaircraft guns, one of six 40mm Bofors automatic weapons, and one of six searchlights. All of the equipment is standard antiaircraft equipment of the British Army.

It is contemplated that the battery will visit military establishments in all parts of the United States. While here, it will be accompanied by an escort detachment of the United States Army, provided by the Antiaircraft Command, Army Ground Forces.

Major General Joseph A. Green, U. S. Army, Commanding General, Antiaircraft Command, Army Ground Forces, said that the purpose of the escort detachment is to facilitate in every way possible the visit of the British unit.

"As guests of the United States Government, every opportunity will be afforded the personnel of the British formation to observe our antiaircraft training and to become familiar with American customs," General Green declared.

"It is expected that this opportunity for an exchange of ideas between British and American antiaircraft troops will result in mutual benefit to the antiaircraft forces of the two nations united in a common cause.

"The visit of this battery," continued General Green, "will not only give the Army an opportunity to see the latest British antiaircraft methods, drills and equipment, but will afford an opportunity to the American public to see something of the British soldiers whose families in Great Britain have extended such cordial hospitality to American soldiers in the British Isles."

The British antiaircraft unit is not a picked body. It represents a cross section of the British population and is drawn from all parts of the British Isles. Few, if any, of the officers and men are professional soldiers. They are typical British subjects coming from all classes of the population who have in the past four years taken up arms.

The 3.7 inch (94mm) antiaircraft guns brought to the United States by the battery are the British equivalent of the American 90mm gun. For their 3.7 inch AA guns the Royal Artillery uses the American Sperry Director, modified for British requirements. For Field Force purposes the Royal Artillery also uses the British Vickers Director. The 40mm gun troop also has with it a variety of special equipment used by the British antiaircraft artillery which differs in detail from the equivalent American equipment.

The Bofors troop of six guns will use in the United States American Bofors guns and directors which differ only in detail from the British. This troop also has with it for fitting to the American guns various items of British equipment which are not standard in the United States but for which the U. S. Army has equivalents.

The searchlight troop will use American searchlights, some of which are being employed in the British Army. It has brought with it one British searchlight and a variety of special equipment which is used by the British both on British searchlights and on American searchlights in the British service.

* * *

Reprint

Models in Semi-Technical Exposition, a book published by Harcourt, Brace and Company for use in Composition classes in technical schools of college level, reprints *Identification of Merchant Ships*, by Dr. Kenneth L. Brown of the Coast Artillery School, which appeared in the January-February issue of the JOURNAL.

Twenty-four selections are included in the book, one of which was Dr. Brown's article. Other authors include Antoine de Saint Exupery, Fletcher Pratt, Thomas H. Huxley, Charles Darwin, John Dewey, and Franklin D. Roosevelt.

* * *

The Journal "Gets Through"

Colonel William G. Brey, CAC, at a Pacific APO, writes, "Your publication seems to be one of the few that gets through." The moral of this story seems to be that Colonel Brey is very conscientious about keeping the JOURNAL informed about changes of address. The JOURNAL will do its part, and the Post Office Department and the Army Postal Service will do theirs, so if you want your JOURNAL delivered no matter where you are, you must keep us informed concerning changes of address.

* * *

Seacoast Defenses

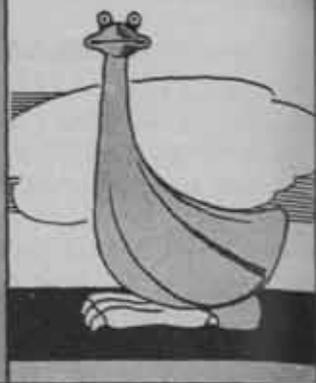
The appropriation act for the military establishment for the fiscal year ending June 30, 1944, carries an item of \$29,632,000 for "all expenses incident to the preparation of plans and the construction, purchase, installation, equipment, maintenance, repair and operation of fortification and other works of defense, and their accessories, including personal services, ammunition storage, maintenance of channels to submarine-mine wharves, purchase of lands and rights-of-ways as authorized by law, acquisition of leaseholds and other interests therein, and temporary use thereof."

* * *

New Insignia for AAF Planes

A new type of insignia for United States Army Air Forces planes—consisting of the present white star on a circular field of blue, a white rectangle attached horizontally at the right and left of the circle, and a red border enclosing the entire device—has been adopted to improve identification of Air Forces aircraft.

Coast Artillery Activities



BRIGADIER GENERAL BRYAN L. MILBURN, *Commandant*
By Lieutenant Colonel Charles H. Scott

Early in June, Brigadier General Bryan L. Milburn succeeded Brigadier General Edgar H. Underwood as Commandant of the Antiaircraft Artillery School at Camp Davis, N. C. General Milburn came to the school with a record of Coast Artillery Corps service going back to 1917.

A two-day visit by Lieutenant General Ben Lear was spent in witnessing many parts and activities of the AAA School. In his round of inspections, General Lear was joined by Major General Joseph A. Green, commanding general of the Antiaircraft Artillery Command. Shortly after his arrival, General Lear witnessed the setting up and operation of various AA guns, automatic weapons and searchlights by troops of the 108th Group of the AAA School. The inspecting general asked many questions of officers and enlisted men. Later he watched officer candidates of the school going through their regular schedules.

On the second day of his stay, General Lear watched many types of firing at Sears Landing. It is understood he voiced approval of all he had seen. The schedule for the general's visit was arranged by the Operations Section of the AAA School.

Production of a feature film concerning the experiences of officer candidates at the AAA School is now nearing completion. The Hollywood firm, which will distribute the film through local theaters throughout the country, has been shooting the picture in the school area. Many of the officer candidates now taking the course will appear in the motion picture. The film has been approved by the War Department and the fullest cooperation to the project has been given by General Milburn. The film came about through the suggestion of the School's Public Relations office. The script is based on a story by Captain Arthur C.

Fitz-Richard who is engaged in writing scripts for training films at the School's Division of Training Publications.

Recently the first class of officer candidates to go through the new seventeen week course was graduated and commissioned at the AAA School. Until the recent order of the War Department that all officer candidate schools be extended to a minimum of seventeen weeks, the AAA School's course had the distinction of being the only one beyond the regular thirteen weeks. Acknowledged to be one of the most difficult of the officer candidate courses due to the great amount of technical material that must be digested by a student, the AAA School saw fit to lengthen the course so that more specialization could be made. During the course now, officer candidates are separated into various branches of Antiaircraft Artillery and obtain a concentrated education in one particular field. During the early weeks of the course, candidates are given a good background in all parts of AAA.

While the primary aim of the Army is to prepare soldiers for combat, still what service men are learning in the Army Schools prepares them for better civilian jobs when peace comes. General Underwood told one of the graduating enlisted specialists classes at the AAA School recently. Due to the highly technical nature of modern warfare, a great deal of what they learn in the Army will be applicable



Officer candidates borrow an idea from the football squads to develop teamwork.

to peacetime pursuits. The skills acquired will not only make soldiers eligible for higher paying positions but will also make them better members of society. He said further:

"Here at the Antiaircraft Artillery School we have a good example of what is being done on a large scale throughout the Army. The officer candidate course has been likened to an electrical engineering college curriculum. Perhaps an even better illustration is possible in our enlisted specialists courses. What these soldiers are learning in the automotive, communications, surveying and mechanical fields will definitely hold them in good stead when they take up again peacetime trades."

Two hundred and forty cadets of the First Class of the United States Military Academy were at the Antiaircraft Artillery School for instruction late in June. Divided into groups of 60, they rotated among four phases of training: 90mm gun firing, automatic weapons AA firing, automatic weapons antimechanized firing, and radio.

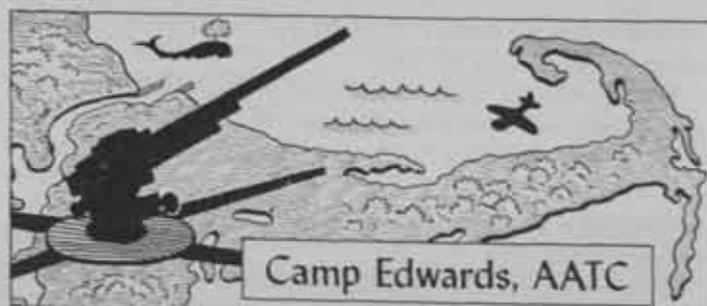
The 108th Group of the school put on night firing demonstrations of guns, automatic weapons and spread beam searchlights. The Cadets also witnessed a balloon barrage demonstration by a unit from Camp Tyson. While here they visited the AAA Board to see latest developments in Antiaircraft Artillery.

New and larger quarters have been occupied by the School's Division of Training Publications. The work of this division in producing film strips, training films, and field and technical manuals concerning Antiaircraft Artillery, has steadily increased, requiring a larger building. The new building has three wings in addition to the main body of the structure. One of the wings houses the Division's art department, another is for stenographers and the third is being made into a photographic laboratory.

Based on lessons learned in the combat areas, the Target Recognition Section has been greatly increased lately. Many newly commissioned officers are kept at the School to take a special course which prepares them as instructors in this subject. Not only do they learn target recognition but also methods by which it can be taught to large groups of enlisted men. In addition a special set of slide films selected by this section is being distributed to every AAA Battalion. Only those operational planes which have been seen in actual combat are covered. The basis of the recognition method used by this section is "Repetitive Practice." Views of the target from every conceivable angle are given repeatedly until the student gets to recognize the target as a whole even though only one small glimpse is given. It is much like the unstudied method by which people recognize one another.

For the first time in the AAA School's history, a Special Service section was created. The huge number of enlisted men who come here as students in addition to the great number of men stationed at the school made this a necessity. A recreational program to take care of the welfare and morale of these soldiers has been started and soon will be in full swing.

During July the headquarters of the AAA School was moved to larger quarters in the area adjacent to Camp Davis headquarters. The School headquarters was formerly situated close to the extreme Northern end of the post. Now it is near the center of camp close to the main gate.



BRIGADIER GENERAL MORRIS C. HANDWERK, *Commanding*
By Lieutenant John H. Thornton

Wars are often won or lost before the shooting starts. When the Germans added up the score at the conclusion of World War I, they realized that they had lost the battle not only in the trenches, but also on the psychological front. Ample insurance that the United Nations would not do likewise in World War II was taken in good time, one of the most far-reaching policies being the institution and constant improvement of the Army Classification system.

At the Antiaircraft Artillery Training Center, Camp Edwards, Mass., the Classification Section of Brigadier General M. C. Handwerk's staff has long ago shifted into high gear in the scientific "weeding out" process which feeds new men into units for jobs particularly suited to their aptitudes and skills.

In an antiaircraft artillery outfit there is no sadder picture than a prospective range setter trying to get enthusiastic over a job on the ammunition detail or a radio maintenance man cutting fuzes. Long ago American industry recognized the fallacy in the hit or miss method of personnel selection and the Army wasn't far behind in instituting its own classification system.

Today every antiaircraft artillery battery commander is familiar with his unseen assistant, the WDAGO Form 20. When he first takes a look at his new outfit and the enlisted men of his battery stretch out just so many khaki clad figures, this yellow classification card is the most valuable lifeline to keep his head above water during the first few critical weeks in a newly-activated organization. The battery commander is desperate for time. He has a new organization to build and he has to build it in a hurry. What about these new men? Is there a single qualified gun commander in the cadre? The artillery mechanic is fresh from civilian life. Had he ever seen a monkey wrench before he entered the Army?

Designed expressly to assist a battery commander in the solution of his critical personnel problems early in the life of his outfit is the "extract" card developed by the Classification Section, AAATC, at Camp Edwards.

The WDAGO Form 20 contains the full history of a cadremen or filler in an antiaircraft artillery organization, from his height and weight and date of birth through his hobbies, intelligence and previous occupation. This is the very information an organizational commander needs early in the training period. But it was learned at Camp Edwards that a good officer has more use for this vital data about his men than a few hours spent on perusal of the classification cards borrowed from a battalion personnel officer. A battery commander must know his men, not only

by name but by history, by past performance and by potential future performance.

To furnish all of its antiaircraft artillery batteries with this all-important data on the men of the Command, the AAATC Classification Section at Camp Edwards developed the "Form 20 Extract Card." In reality, there are two cards in use, one blue for cadremen and one white for filler replacements.

The feature of the "Extract" card which has met with such favor by officers in newly-activated units at Camp Edwards is the fact that they are permanently retained in the battery office, as part of the restricted file.

Information on the blue 8-inch by 5-inch "Extract" card for cadremen includes educational history (highest grade, specialization, and highest mathematics), civilian occupation, main and second best, physical qualifications and particular disabilities, AGCT and Radio Operator's aptitude test scores, enlisted specialist school, military service (date, arm, type battalion, type weapon, job title and highest rank) and alternate cadre assignments on the basis of historical data.

On both the cadre "extract" card and the filler card, it is noted by the training center Classification Section whether or not the enlisted man is an OCS prospect.

Another welcome entry for newly-activated units is a line denoting leadership potential. When the filler or cadremen is reinterviewed on arrival at the AAATC, Camp Edwards, the interviewer is careful to determine whether or not the enlisted man has ever had any experience in directing or controlling other men. If his civilian background included a position in which he was responsible for the work and conduct of as few as two or three others, this fact is noted and becomes increasingly valuable to the battery commander in the selection and development of noncommissioned officers. The problem of NCO selection is critical in new organizations and again the time factor weighs so heavily on the officer charged with the responsibility for this selection, that to be given complete and detailed case histories of all the men of his command for reference in his files at any hour of the day or night, has proved one of the most valuable adjuncts yet devised at the AAATC for successful leadership choices early in the unit's history.

The only difference in the white "Extract" card furnished all units on filler replacements, is the omission of alternate cadre assignments, for obvious reasons, and the inclusion of a more detailed breakdown of civilian experience or abilities.

For filler replacements, entries are made whether the enlisted man has any particular mechanical, electrical, or radio repair ability; typing skill, truck driving experience, automotive operation or has done hunting to any extent. It was believed to be of value to list the "ability" background in greater detail for fillers than cadremen, since the latter by virtue of experience have been subjected to critical scrutiny by the Army Classification system and have been more or less crystallized in certain antiaircraft artillery jobs.

The closest of follow-up is maintained by the AAATC Classification Section, first, to determine whether the valuable school-trained specialists are being utilized properly or to insure that none of these technically trained men have slipped into other duties unnoticed, and second, to effect the most efficient liaison with unit personnel officers in

classification problems. Suggestions for the improvement of techniques in the handling of new men in units are constantly being received, reviewed and if merited put into effect.

At Camp Edwards, the theory which brought such success in American industry is being followed, revised and improved with the following rationale as its motivating force—

"If large concerns whose primary interest is profits find that it saves them money to hire industrial psychologists whose entire task is the placing of employees in the type of work for which they are naturally fitted—then how much more important is it for the Army, responsible for the safety of the nation, to adopt some such procedure."

All of the advanced personnel procedures are being intensively employed at the antiaircraft artillery training center, Camp Edwards. The Special Training Unit has several times been enlarged and is working in close conjunction with qualified personnel consultants for the rehabilitation of enlisted men, a large percentage of whom have been returned to units, proficient antiaircraft artillery men.

To assist units further in becoming one hundred per cent efficient so far as the condition of personnel is concerned is a standard operating procedure recently developed at Camp Edwards to expedite greatly the preparation of all personnel in field units for combat service early in the training period. The possibility of not discovering a soldier who is not mentally or physically fit for combat until late in training is at present being reduced to an absolute minimum.

Throughout the energetic program of the Classification Section of General Handwerk's command at Camp Edwards the complete recognition of the importance of applied psychology to the development of untrained men into proficient toughened antiaircraft artillerymen has already paid enormous dividends in the salvage of otherwise expended personnel, in rapidly-formed organizations and in overall combat efficiency.

Southern California Sector

Sports continue to be the chief extra-curricular interest of soldiers at Fort Rosecrans.

The post baseball team, though without a diamond of its own on which to practice, has for months won every game it has played in the San Diego County sandlot league. Its record of twenty-seven wins and no losses was broken May 2 when it tackled the Santa Ana Army Air Base team at Navy Field in San Diego. Unable to solve the slow curves of the Fliers' pitcher, Joe Jacobs, the Cannoners came out on the short end of a 3-to-2 score. Joe DiMaggio, ex-Yankee clipper, played center field for the SAAB's, and managed to sandwich in two brisk singles between auto-graphs.

The first field day to be held here brought a throng of soldier athletes and comedians to the Lower Level Parade ground. The usual jumps, runs, hurdles, and throws held the attention of the more serious-minded muscle men. Former armchair Sampsons contented themselves with

chariot races, tugs-of-war, and like events in which the individual is not too conspicuous. Practically everyone seemed to have a good time, with the exception of the baseball team's star pitcher, who watched an "unknown" just throw him in the baseball throw.

Private Lew Feldman, once recognized by the New York State boxing commission as featherweight champion of the world, is assisting fight promoter Private Jack "Battlin'" back in keeping the station cards entertaining as well as instructive. Fight shows are held on the post every two or three weeks, and boxers of this command fight on Camp Callan, Naval Air Station, and Consolidated Aircraft Corporation programs between times.

Though outsiders may not compete for post championships, they keep signing on for matches with our boys. Opinion is divided as to whether it is glory, love for the sport, or the chance of a steak dinner afterwards that brings them. In any case, they invariably make the shows more interesting for the local inmates, most of whose own scrapers have faced each other in the ring at least once.

A young soldier named Woodrow Wilson reported here on duty about two years ago. Said his folks were in the movie theater business in Los Angeles, and couldn't be allowed to work in one of the two post theaters. They made him manager of Army Theater Number Two, which he immediately instructed the hired help to refer to as "Your favorite theater."

All of his pay, and more too, has gone back into "Your favorite theater" in the form of equipment and various promotional schemes. The U. S. Army Motion Picture Service's original idea of a cinema palace was Spartan at best. Waffle-iron benches, no stage curtain, no dancing electric signs to lure the customers. The customers came, or they didn't, to the USO, and nobody seemed to care much which of Private Woodrow Wilson did.

Before long he had a remotely controlled curtain in place. Through friends in the trade in Los Angeles, he obtained an electric sign, and was broken-hearted when the provost marshal made him douse it for the dim-out. Neon lighting in the lobby was okay, though, so he installed that, along with photographic exhibits of post celebrities. The house has its own public address system.

And it has an organ, played by ex-professional bandsman Private "Red-Robe" Volpe who earns a dollar a night for the fun of tickling the ivories for Woody's patrons. This is the only house in all of the USAMPS's several hundred posts that does boast an organ, so far as is known here.

Private Earl Dickson, formerly a member of K Battery here, was the only child of Mrs. Marie Dickson of Grovia, Calif. He left the organization several months ago for aviation cadet school at Montgomery, Ala. He was discharged the day after completing his training there.

And so on Mothers' Day, Mrs. Dickson was the guest of the Battery. She asked to see her son's room, meet his buddies, and, for that day, was a cheerful mother to the battery of soldiers who were away from their own.

Miss Norma Lee Taunt, former showgirl now employed in the post engineer's office, gave the men of the command a surprise treat recently when she presented them with a show composed of professional volunteers from San Diego night clubs. Miss Taunt herself sang three numbers, one

in the clutches of a very bewildered private. Her pleasing, sultry voice brought her back for numerous encores.

Fort Rosecrans claimed one of the tallest soldiers in the Army in Sergeant Lyle C. Walker, six-foot nine-inch giant who arrived here early in March from duty in Alaska.

Six quiz kids from here were unable to overcome six of the same from the San Diego Marine Corps base on a recent USO program. "What famous baseball team is known as 'The Gashouse Gang?'" stopped the Rosecransers cold. The Marines proved their superior intelligence, too, by knowing how many cigarettes there are to a package.

Two recruit detachments presented their own revue, "In The Army," at a Rosecrans service club in April. Outstanding from the point of eye appeal was the lineup of chorus "girls," who delighted the audience with their high kicks, their naughty glances, and their uncertain shoulder straps. One in particular had a remarkable resemblance to Bette Davis. Most professional of the group was Private Pinky Silverman, who had an assured sense of showmanship, whether he be the crude, faded soubrette who sings "I'm A Gone Wrong Gal," a blustery German officer who has difficulties with his unruly line of soldiers, or a Greek restaurant owner with a Groucho Marx look who is willing but can never fill the menus that he advertises.

All of the music in the show was original. Credit for most of it goes to Private Dick Wolton, who also wrote and directed the production. Miss Kate Lawson came from Hollywood to design the costumes, and Army wives on the post "whipped them up."



Chesapeake Bay Sector

BRIGADIER GENERAL ROLLIN L. TILTON, *Commanding*
By Lieutenant Alonza F. Colonna

With the arrival of summer and favorable weather conditions, training in all elements of the command has been intensified, and the tonic of the North African victory has given new zest to both training and operations.

In a recent communication to the men of his command Brigadier General Rollin L. Tilton commended them for their excellent morale and spirit during the past two months, but cautioned them that now more than ever a constant vigilance is necessary.

During the past several weeks Fort Story, headquarters of the Harbor Defenses of Chesapeake Bay, has had many distinguished visitors, most notable among them Lieutenant General Hugh A. Drum, Commanding General of the

Eastern Defense Command and First Army, who made an inspection May 5, as well as visiting other installations in the area, including Camp Pendleton and the defense force of Cape Henry.

Adjacent training centers have been using the facilities of Fort Story for maneuvers and tests. One of the most interesting of these consisted of several night landings by specially trained units utilizing the latest equipment and methods for this form of attack.

Men of the Provisional Brigade at Camp Pendleton, in addition to manning the big guns, have been undergoing some strenuous basic training in the fundamentals of the school of the soldier and as a part of this training recently completed firing the M1 rifle. One unit qualified 94.08 per cent of their number, topping a previous record of 89.14 per cent marked up by a different unit.

Among the outstanding events which have taken place within the Brigade's camp is the entertainment of Virginia's governor, Colgate W. Darden, Jr., and the troops of the Virginia Protective Force. The troops staged a retreat parade and were reviewed by Governor Darden, Brigadier General David P. Hardy, Provisional Coast Artillery Brigade, Brigadier General Don E. Scott, Internal Security Force, and Brigadier General E. E. Goodwyn, VPF commander.

Identification courses by the Renshaw method and movements into the field involving the employment of battle tactics have helped to make the training program for the brigade concentrated and thorough. Despite this intensified program morale and relaxation have not been neglected.

One effective training aid developed by coordination of the camp fire department's program with that of the coast artillery units is the employment of a stream of high-pressure water against a fast-moving target in simulation of a tracer stream for anti-aircraft machine gun training.

The entire Mobile Force of the Chesapeake Bay Sector has been on the firing range during the past two months, using all the infantry weapons, and a large percentage have given a good account of themselves. Training recently has been placing special stress on functional swimming and water safety. In addition to the men enrolled in the ASTP, the Mobile Force has a large number who are taking advantage of the courses offered by the U. S. Armed Forces Institute.

One of the greatest aids to training at Fort Monroe is a new assault course, which provides ample opportunity for realistic battle conditions, as although lacking natural obstacles the course has been so constructed that a man is required to undergo almost identical handicaps with those encountered in the field.

While individual training is stressed at Fort Monroe, the battery teamwork has not been neglected, and in recent firing for record, a battery of Colonel Wilmer S. Phillips' regiment won the "E" for excellence, achieving one of the highest scores in the Army for its type of weapon.

Much to the delight of the garrison at Fort Monroe a post boxing team has been formed and cards presented in the open-air arena as well as engagements booked with other camps. Baseball, too, has again come into its own at the post and every afternoon from two to three games are in progress on the parade ground.

The Harbor Defenses of Beaufort Inlet have been pursuing an intensive program of training in all phases and have made marked improvement. Artillery practice and gun drills have been the order of the day, with special classes for officers and enlisted men following the actual operations.

One of the prized additions in the Beaufort Inlet area has been the war dogs furnished to assist in the patrol of the long stretches of beach. These dogs will be used in addition to the sentries and are expected to prove a boon to the men.

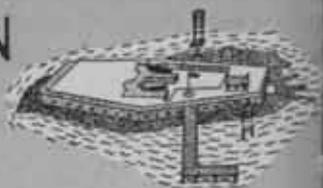
Simulated bombing and strafing conducted by planes also been included in the training program, and the men have been taught defense against these as well as gas attacks from the air.

The training program was tested June 19 and 20 by special exercises with umpires from Headquarters Chesapeake Bay Sector.

The men at Fort Macon are looking forward to the completion of a large recreation hall which is under construction and which will feature a talent show for the opening.

With the advent of summer months swimming and fishing have highlighted the recreational program for both officers and men of the command.

SOUTHERN SECTOR



Eastern Defense Command

BRIGADIER GENERAL H. F. LOOMIS, *Commanding*

By Captain John Lindsay

"No Tourists Allowed" signs have not been displayed, but, doubtless, the commanding officers at Fort Moultrie and Fort Taylor would welcome their erection. These flight strongholds which the near-present old-timers member as deserted ghost towns, inhabited by a few white men, have become in the short space of a few years boom crowded cities, complete with their own public utilities and tremendous industrial activity. Even the "official tourist" will find it almost as difficult to obtain accommodation as a normal sightseer would in reserving a cot in the basement of the Willard Hotel in Washington. Wars, gold runs and oil booms often cause quick growth, but Southern Sector development has actually been phenomenal.

Things are slowing up. Certain soldiers are taking it easy now. Officers are pleased. As Southern Sector vehicles keep within the 35-mile per hour speed limit and do not obey army regulations, the number of accidents has increased radically and much gasoline and rubber have been conserved.

The constant training of all troops not only continues but has been intensified. In order to help all officers throughout the Sector and especially commanders of small units, a junior officers and noncommissioned officers, training memorandum No. 13 was published. This is one of the

comprehensive, clear helps to training printed and has for its purpose the desire to: (a) Indicate the sources of securing training literature and aids; (b) amplify and reiterate the provisions of FM 21-5; and (c) indicate the objectives of training in the various subjects and phases. No matter what branch, whether infantry, coast artillery, field artillery, medical, quartermaster truck unit, signal, engineer, or tank, this memorandum tells you what to look for and where to find it. It has rapidly become the streamlined bible of the Southern Sector which every officer has not only read but keeping on his desk for easy reference.

The Coast Artillery units of the Southern Sector who have had the opportunity of a preview of the Practice Spotting Trainer, developed by Lieutenant Colonel Joseph S. Gram, C.A.C., have all tried to "borrow" the original board with the movable toy boat and realistic splashes. Without doubt, a technical description with complete details and photographs will shortly appear in print* so that all units may construct their own trainer and improve the efficiency of their spotters by the use of this ingenious device.

The Florida Subsector Noncommissioned Officers School graduated its first class on May 9, 1943. The course was of one month's duration and forty-six students, or eighty-four per cent of the original fifty-five men enrolled, satisfactorily completed the curriculum. The experience of this first class indicated that the length of the course should be extended to six weeks in order to cover adequately the work prescribed. This was done, and the present class began on May 14, 1943, and will terminate on or about June 25, 1943. At the onset, fifty-seven students were enrolled in a group. The unanimous vote of the graduating class at the school had given them a solid foundation in the basic military subjects and developed leadership abilities to a marked degree was extremely gratifying.

Necessary construction continues throughout the sector. The first chapel in the history of Fort Sumter was dedicated on Easter Sunday, and a new day-room was turned over to the men. This latter is regarded as one of the best equipped in the Charleston area. New day-rooms have also been built for the Coast Artillery Medical Detachment and for the Army and Navy personnel working at the Harbor Entrance Control Post. Three TO type infirmaries have been estab-

lished in the sector—one at Atlantic Beach, one at Carolina Beach, and the third at Miami. These take care of a long felt need for the troops at their own camps. Minor cases which are not serious enough to send to a hospital but which might be contagious in quarters are adequately handled by these new facilities.

As a gift of Wesley Memorial Church, a lounge and recreation room was completed for service men at Headquarters Southern Sector in the Realty Building at Jacksonville. The lounge contains comfortable and upholstered chairs and davenports, pictures, rugs, tables. Colorful drapes complete the furnishings which make the room a "home away from home" for the men.

The Florida Subsector held an unusual tactical problem of five days' duration. In this maneuver an amphibious command endeavored to make landings, while the combat team and Coast Guard defended the beaches and inland waterways of the area involved. The results were good and the experience afforded valuable practical training for all elements.

Gulf Sector

COLONEL L. B. MAGRIDER, *Commanding*

Fort Barrancas, one of the historic Coast Artillery forts in the United States, was built in 1842, and still plays an important part in the defense of the nation today as a unit of the Gulf Sector. In its one hundred and one years of existence, the Fort has been both a training ground and important bastion of the Union during the Civil War. The Federal government held Fort Barrancas during the entire Civil War—only Fort Monroe, among the Southern posts, holds similar distinction.

The two 15-inch mortars pictured below, which may be seen at Fort Barrancas, are much older than the fort itself. The mortar shown at the left is of Spanish manufacture, cast in 1806. The one in the foreground of the picture at the right was surrendered by the English to the Spanish in 1781. It was probably brought to Florida about 1763. Both were surrendered to General Jackson at Pensacola when Florida was ceded to the United States. The Confederates used them in the Civil War to shell Fort Pickens. They were moved to Fort Barrancas after the war.

*See page 44.





Corregidor



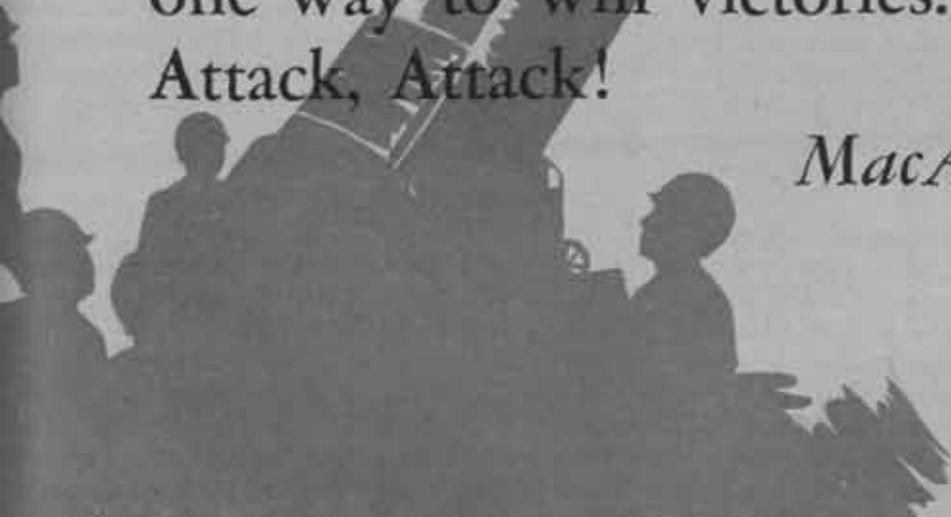
I SHALL RETURN!

MACARTHUR

The Way Back

It doesn't matter how much you have, so long as you fight with what you have. It doesn't matter where you fight, so long as you fight. Because where you fight, the enemy has to fight too, and even though it splits your force, it must split his force also. So fight, on whatever the scale, whenever and wherever you can. There is only one way to win victories. Attack, Attack, Attack!

MacArthur

The bottom of the page features a dark silhouette illustration. It shows several soldiers in profile, some looking towards the right. In the center, there is a silhouette of a tank or a similar military vehicle. The background is a light, textured grey.



New England Sector

MAJOR GENERAL K. T. BLOOD, *Commanding*
By Lieutenant Charles T. Prussian

In a recent radio address to the New England Sector troops General Blood said, "These New England States gave the young and struggling colonies many great soldiers: General Israel Putnam, Ethan Allen, Paul Revere, and the Minute Men—those brave farmers who left their plows and their homes to fight for political and religious liberty. As they won our freedom for us, by sacrifice and suffering, so must we be prepared to defend it now. Remember that the price of Liberty is eternal vigilance."

With the view of maintaining the tactical and physical condition of its components up to a combat pitch, New England Sector has inaugurated a combat school for small units. The location combines varying terrain features suited for the intensive training of the troops involved. The program is absorbing, vigorous and aggressive, and includes a battle course run under realistic combat conditions.

An all-soldier cast has toured the Sector playing the various parts in *Room Service*, successful Broadway farce-comedy of a few seasons back. Under the direction of Lieutenant Richard C. Weiss, former actor and director, the troupe is appearing at every camp and station. Hospitals and stations with limited stage facilities are not overlooked. The production carries a variety revue for appearances in such places.

Spotlighting an all-soldier cast at its talented best *The New England Sector Soldier Show of the Air* has begun a series of weekly radio broadcasts. Arranged, prepared and conducted entirely by troops of the New England Sector, the feature has attained a high entertainment value with both the military and civilian audiences.

Spring weather has brought no marked differences in the activities in the Harbor Defenses of Narragansett Bay except to step up their tempo. The Coast Artilleryman's fancy in this area has turned to the same things he's been thinking about all winter; namely, target practices and local defense measures.

Many batteries of the Harbor Defenses of Narragansett Bay have been conducting tests, either on their own or in conjunction with other batteries on the soundness of their respective SOP's. Particular emphasis is being placed on their effectiveness in an all-round defense of their areas and on cover and concealment of these local defenses. One battery simulated a night landing attack and by use of blank ammunition injected added realism into their problem.

The personnel of the Harbor Defenses of Boston are responding well to the Red Cross blood bank drive now in

progress. A system has been established whereby twenty-five volunteers go to the Red Cross Center, Boston, weekly and each donate a pint of blood for the much needed plasma.

The harbor athletic program is in full swing, interest having changed from basketball, boxing, and bowling to baseball and softball. A representative team from the harbor competed in the First Service Command tournament and was eliminated in the second round by the Camp Edwards team.

The harbor defense boxing team was defeated by Fort Devens in the second round of the First Service Command tournament after winning the first round match with the Guard Squadron, East Boston Airport.

During the month of May the Harbor Defenses of New Bedford have increased their outdoor activities as a result of more favorable weather. Small arms firing for officers and enlisted men has been conducted during this period. Sub-caliber and service practice tracking missions have been held by the batteries that are scheduled to fire in the near future.

Officers and enlisted men are participating in a well-organized athletic program each week, consisting of baseball, volleyball and softball. Some of the officers have taken advantage of the courtesies extended by golf clubs and athletic associations located on the outskirts of New Bedford to take their exercise. The Fort baseball team is represented in the city of New Bedford twilight league, showing the natives that they can play the national pastime.

The Harbor Defenses of Portland have been hard at work with their duties and a continuous training program. In addition to that, time was found for basketball and boxing.

Army Day was celebrated by "work as usual." An interesting article about this appeared in the Portland newspaper with pictures showing a kitchen preparing dinner, an office with its clerks hard at work, and a bugler blowing reveille.

Easter was observed by special services, an outdoor sunrise service at Fort Williams and a special service at Fort McKinley, both broadcast by local radio stations.

In the Harbor Defenses of Portsmouth, special emphasis has been placed on the training of troops in accordance with the mission of the Harbor Defense.

Troop training schools in the Harbor Defenses are always in operation. The Administrative School has been resumed. Schools in Intelligence, Radio, Bomb Reconnaissance, Chemical Agents and First Aid are continuous, and as one school is completed, another is started immediately.

Preliminary instruction firing in small arms for newly assigned men has just been completed and plans are underway for small arms qualification firing in August and September.

On two occasions, officers who have just returned from the Pacific Theater of Operations have given informal talks to the officers stationed in the Portsmouth Harbor Defense. These talks have proven very popular and efforts are being made to get others who have returned from foreign theaters to give talks on actual conditions in combat.

The Harbor Defenses of Portsmouth had another successful basketball season. The Regimental baseball team is looking forward to a successful season, having entered the Sunset League, Portsmouth, N. H. To date, the Harbor Defenders have two wins against no losses.



Camp Wallace

COLONEL HAROLD R. JACKSON, *Commanding AARTC*

By Captain John D. Moore

Already well known to O.C.S. graduates here is Colonel Harold R. Jackson, the new Commanding Officer of the Antiaircraft Replacement Training Center, Camp Wallace, Texas. Colonel Jackson assumed command on June 23, 1943, succeeding Brigadier General Homer Case, who had been temporarily commander of the AARTC since the latter part of May. Colonel Jackson also succeeded Brigadier General Hugh N. Herrick, who was the last permanent commander of the AARTC. General Herrick had been on temporary leave of absence due to illness. Colonel Jackson is director of the Officer Candidate Division of the Antiaircraft School until March.

So you won't cry, eh? Well you will at Wallace if you don't know how to use your gas mask. Men at Wallace are learning that they do know how to use the gas mask properly. While the men are hiking, Captain M. C. Gelman, the Chemical Warfare Staff Officer, may ride by in a jeep and drop down a barrage of tear gas. The tear gas is blown out of the exhaust pipe. These unexpected alarms have created much interest in gas training here. The men learn that when they are carrying the gas mask, they must be gas conscious, and organizations have proved that their gas training was adequate by effectively reacting to an unexpected attack.

The contraption (invented by Captain Gelman at Camp Wallace and now recommended for general use by the Antiaircraft Command) making this possible is a five gallon container attached to a rubber hose by a valve with the



Captain Gelman's gas sprayer.

hose connected to a "T" extension added to the exhaust pipe. When the valve is turned on, the tear gas liquid drains down into the exhaust pipe by the force of gravity, and the exhaust pipe scatters the tear gas to the four winds. If you don't believe it, ask a Camp Wallace trainee.

"The beauty of the thing," says the Captain, "is that they cannot tell if you are spraying gas or having a 'dry run' as there is no cloud formed." When the men wear their gas masks on hikes, they are gas conscious, for they know they are subject to attack.

The serious "dry run" problems caused by no airplane towing missions is believed to have been eliminated by the assignment of a Tow Target Squadron to Camp Wallace. First Lieutenant James L. McDaniel, Air Liaison Officer for the camp, informs us that he has been able to fulfill all airplane missions through cooperation with Captain Johnson R. Warren, AC, Commanding Officer of the Tow Target Squadron. The first mission was flown on May 10, 1943.

This Tow Target Squadron has Venturas (B-34's) for all towing purposes; night flying is furnished by the Squadron's AT-11's; and tracking missions are flown by Owls (O-47's).

There has been a spirit in the squadron to fly all missions, regardless of the hour, to insure the proper training of the men in this camp. That spirit has been greatly appreciated by the members of Camp Wallace.

To aid instruction in orientation, synchronization, and nomenclature of equipment, First Lieutenant Arthur J. Skinner has made a model of a searchlight section to scale. The section includes control station, searchlight, sound locator, and power plant. These models were made from scrap lumber to a scale of one to five. All parts are movable to the extent that they can be used for orienting.

Lieutenant Skinner originated the idea and drew up the plan of this miniature unit. These models may be used to teach searchlights on rainy day programs effectively. Furthermore, the students grasp the fundamentals of a unit more quickly because of the reduced size, for the student can see the unit as a whole. They were constructed with everyday hand tools of the Camp Wallace Utility Repairman's School in about two weeks.



Not toys—valuable training aids.



Fort Bliss



BRIGADIER GENERAL DALE D. HINMAN
Commanding AAATC

Since our last news letter, the AAATC at Fort Bliss, Texas, has been brought to an even higher peak of development. With the completion of Camps Hueco, Oro Grande and Dona Ana, desert firing points located within fifty miles of the Center itself, AAATC now boasts as complete training facilities as any other training center in the country.

Enjoying as it does, unusual advantages of climate and location, AAATC is able to proceed with a tightly packed schedule which is never interrupted by bad weather. In fact it has rained but twice during the first six months of this year. Aside from periodic dust storms the climate of the El Paso area is perfect for the purpose of AA training.

Camps Hueco, Oro Grande and Dona Ana have been organized on a semi-permanent basis. Troops remain at these desert camps for periods as long as several weeks, engaging in exercises which lack only a live enemy to make them completely real. The Infiltration Course at Camp Hueco,



Among many practical training aids at Fort Bliss AAATC is this pair of simulated freight cars. Technical Sergeant John M. Devlin of S-4 is credited with the idea of dummy flat cars for loading exercises.

directed by Lieutenant Stacy F. Graham, is the nearest thing to actual battle AAATC men encounter before going overseas. Crawling under criss-crossed barbed wire with dynamite "land mines" exploding and machine gun bullets whizzing a few inches overhead, the men are subjected to the same conditions as actual battle. To add to the general effect, recordings of combat sounds—dive bombers, explosions, whistles and shrieks—are broadcast over a loud speaker system as the troops squirm along under the wire. Some eight thousand soldiers have made the course, with only three minor mishaps.

Conversion of several AA units to "half-track" outfit took place here in the last few months. Officers and men of the half-track units are invariably enthusiastic about this comparatively new development in AA artillery.

Among recent aids to training at AAATC are a debarkation tower and the mockup freight cars. The debarkation tower is the brain child of Captain LaVere Brooks, an architect in civil life. A set of safety rules, prohibiting more than four men on the net at one time, has been posted.



Infiltration Course at Camp Hueco Firing Range. A loudspeaker blares forth battle noises, while machine gun bullets wing overhead and land mines explode.

Signal Corps Photo

The mockup freight cars are the design of Technical Sergeant John M. Devlin, of the S-4 Section, and are said to be the only ones of this exact nature in the country. Prior to the building of these simulated freight cars, rolling stock was rented from the railroads for the purpose.

Schools of all sorts continue to function here. Subjects taught include everything the AA Artilleryman should know and the instructors make use of every known device to get their messages across. The Aircraft Identification School, which is a continuous course, has turned out several thousand graduates. There is a School of Medical Science, a Radio School and others which run more or less constantly. Other schools, such as the Intelligence School, give unit members eight hours per day of intensive lectures for one week at a time.



Camp Stewart

BRIGADIER GENERAL E. A. STOCKTON, JR., *Commanding*
By Captain Walter H. Dustmann, Jr.

Outstanding highlight of the past two months at Camp Stewart was the brief visit during the latter part of June of Lieutenant General Lesley J. McNair, Commanding the Army Ground Forces.

Despite the fact they remained at Stewart less than three hours, General McNair and his party managed to cover a large part of the 281,000 acre reservation and witnessed a lot of antiaircraft training.

General McNair showed keen interest in the antiaircraft training and watched AA soldiers go through their paces against towed targets and also against ground targets in time-mechanized firing. He also watched some half tracks in action against towed targets and even climbed into one and rode into action with it.

One of General McNair's staff said the Commanding General of the Ground Forces was "well pleased and very favorably impressed" with his brief view of training activity and also with the appearance of the post itself.

Camp Stewart's antiaircraft training program has received several novel and efficacious twists during the past two months, with varied training contests dominating the program.

These contests, all of which proved highly efficient training adjuncts, included a colorful Transportation Show, a unique "track meet" for all physical fitness champions, an "X for the Axis" preventive maintenance contest, another model airplane contest to foster aircraft recognition, a tug-of-war tourney and the use of "speedball" to facilitate physical toughening.

Stewart also intensified its Centralized Troop School training program; and opened a specialized "Camouflage Area."

The gigantic Transportation Show, held early in May, was witnessed by a majority of the camp's military and civilian personnel. Lieutenant Colonel John P. MacNeill's antiaircraft battalion took top show honors with two first and two second place wins. Its "most original entry," a "jeep float" showing the evils of neglect of vehicles, and the same battalion's ambulance won firsts; and its ½ ton and 2½ ton trucks took second places.

More than 100 vehicles of all types lined up in ten separate lanes before the reviewing stand. Brigadier General Spiller spoke briefly to the entrants, stressing the immense value of preventive maintenance of motor vehicles. Colonel William V. Ochs, Post Commander, also spoke briefly, commending the show staff under Lieutenant Colonel Larry Graham on its work.

The unique "track meet," held early in June to emphasize the Stewart physical fitness program—believed to be one of the most intense and thorough of any training camp—pitted the champions of Stewart's nine obstacle courses against each other for the grand championship of the camp; and also selected the champion miler of the post, G.I. style, which included running with G.I. shoes, fatigues, full war pack and rifle.

The obstacle course champions ran on one of the toughest courses anywhere, consisting of thirty-five super-difficult obstacles stretching over a quarter of a mile. Winners were selected in three categories, those negotiating the course without equipment, those making it with equipment, and those taking the hurdles with a gas mask, while tear gas enveloped them on the course.

The "X for the Axis" preventive maintenance contest, a follow up on the Transportation Show, started off with a flourish in late May and its first phase will end on July 3. Originated by the AAATC Automotive Section, the contest consists of an expert spot-check inspection team that stops vehicles indiscriminately on the reservation and gives them the unsavory X's for all deficiencies discovered. At end of the first phase the units with the least deficiencies or X's will receive prizes and three-day passes.

Each time a unit receives X's it is advised by the Automotive Section that those X's are aiding the Axis. The contest has proved such a success, the Automotive Section said, that it will be continued indefinitely, each phase running for a six-weeks period.

Stewart's second model airplane contest is set for the end of June, when 32 antiaircraft units will compete for prizes and passes in a tourney designed to foster the AAATC Aircraft Recognition Program. Latest types of British and American warplanes will be built to a scale of 1 to 10 mounted on jeeps and paraded around the camp so that all troops may familiarize themselves with the salient points of the craft. Enemy and allied planes were featured in the first such contest, held in March, 1943, which was won by Lieutenant Colonel A. B. Barrett's battalion.

The tug-of-war tourney started early in June, as a physical conditioner and sports stimulator of the Physical Training Section of the AAATC. All antiaircraft units, with eleven-man teams, are at present in preliminaries. Finals of

the tourney will be held sometime in July to determine the tug-of-war champion of the post. Teams must pull their opponents half the length of a fifty-foot rope two out of three times in order to win a round. Four officers, two from each competing unit, act as round judges.

Speedball is the latest physical innovation added to Stewart's strenuous physical training program. It's three games rolled into one, with the fastest and best features of each. It is an amalgamation of soccer, basketball and football—and the troops are finding that it is aptly named. Only well-conditioned troops can stand its pace, the AAATC Physical Training Section points out. As a rule there are eleven men to a side, although it can be played with fewer men to a side if desired. Its value is in the interest it maintains throughout and in the varied skills it calls for, such as kicking and running—as in football; heading, dribbling and trapping—as in soccer; and passing and guarding—as in basketball.

The Centralized Troop School, virtually a University in itself, early in June expanded its judo and bayonet instruction, enlarged its motor transportation courses and added additional courses in ordnance.

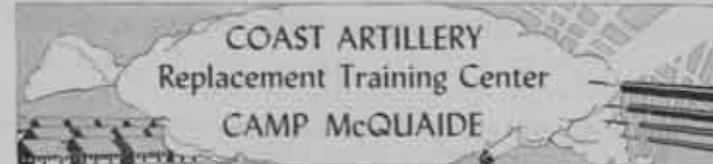
The "Camouflage Area" also opened early in June. Involving a quarter of a square mile, it contains numerous exhibits that capably demonstrate all the latest techniques and tactics of antiaircraft camouflage, for the edification and instruction of Stewart's thousands of antiaircraft troops.

It also features valued exhibits on booby traps, road blocks, and dummy mine fields.

Insofar as possible salvage materials were used in all exhibits, even to use of dummy AA guns, so that critical materials might be left free for more vital uses.

In June the airborne battalion under Major William P. Pope won the hearty commendation of General Spiller for its superb physical efficiency rating, highest ever made at Stewart. The battalion made 98 per cent on its advanced physical conditioning tests.

A colored battalion received three citations in one day, one for its excellence in antiaircraft firing, one for its superiority in antimechanized firing and one for its tidiness. Lieutenant Colonel Lawrence A. Strobel is its commanding officer. The battalion under Lieutenant Colonel L. A. Corkan was commended for its "superior firing" on the antimechanized range. On the antimechanized range, the colored unit made 29 per cent of hits, and Colonel Corkan's battalion had one battery which registered 47.5 per cent hits and another which made 35 per cent hits.



COAST ARTILLERY
Replacement Training Center
CAMP McQUAIDE

BRIGADIER GENERAL C. D. Y. OSTROM, *Commanding*

The Army's Coast Artillery Replacement Training Center completed its first year of operation on 12 July 1943. Since that day in early July one year ago when its initial cadre consisted of only a few officers and enlisted men, the Center's personnel has been greatly increased, its

HQ CARTC

STRIVE FOR PERFECTION

There is but one goal of training at Camp McQuaide.

facilities have been expanded and improved considerably, and thousands of trained replacements have graduated from its courses of instruction to take their places in the several Coast Artillery organizations far and near, or to continue their military training in specialized or advanced fields. Major General Hazlett, Commanding General Army Ground Force's Replacement and School Command, visited the center to note its progress during this first year of its existence. This was the General's first visit since assuming command, and numerous outstanding features of the Camp's training program were observed.

In keeping with the training center's motto, *Strive for Perfection*, is the introduction here of many adjuncts to training. Between training cycles, all officer and enlisted training cadre attend a comprehensive refresher course, the purpose of which is to review and standardize methods of instruction, to educate instructors in current practices in the Mobilization Training Program subjects to be taught, and to afford an opportunity for applicatory training on the part of new instructors.

The construction of training areas for demonstrating basic principles in some of the subjects taught has been a major aid to training. In a Camouflage Area, students see common installations properly and improperly camouflaged; here they also use standard tools and materials for camouflage operations. In another area devoted to antimechanized defense, many different types of antitank obstacles and road blocks have been constructed for purposes of illustration. Field fortifications for seacoast installations and for individual protection are demonstrated in another appropriate area.

A Special Order commending the outstanding accomplishments of WOJG Sam Horowitz as Officer in Charge of the Library of Training Aids was published by General Ostrom. Newest of the Library's contributions to the training program is a series of colored charts on map reading, showing various conventional signs and symbols greatly enlarged to make classroom instruction in the subject more impressive. The library has also provided all elements of the Command with a large scale map of the reservation which is of particular assistance to the administrative staffs and training batteries. Frequently used training areas are clearly outlined and identified by a code number, so that in the preparation of training schedules and directives, reference to appropriate areas can be made briefly and accurately by code number. A grid system has also been provided, so that those locations which cannot be described adequately by code may be identified rapidly by the use of a small overlay.

More than a hundred officers and enlisted men who have returned from overseas duty have been assigned to the various units of the CARTC. As a result of their obser-

sons and experiences in other theaters, they have been able to add greatly to the training here.

Activities of the Center's administrative sections have been completely revised. Battalion personnel sections have been consolidated into a Center Personnel Office and moved into a large building with the Classification, Assignment, and Mental Hygiene sections. These offices are manned by technicians skilled in the special fields of payrolls, court martials, discharges, interviewing and classification of Army specialists, and in solving soldiers' personal problems. An operating procedure which embodies many efficient "assembly line" methods for the processing of large numbers of enlisted men is now functioning smoothly, and will be greatly facilitated by two annexes to the administrative building which are now under construction.

In June, Captain King Stacy, Music Officer of the Ninth Service Command visited Camp McQuaide to introduce the Army's new Overseas Recreation Music Program. Instruction in the leading of group singing and the use of pocket musical instruments was given to officer and enlisted representatives from each training unit. Soldier Sings were inaugurated in the Camp Theater, being conducted just preceding the showing of the moving picture. A unit consisting of a song leader, field organ and player, and a sound truck now accompanies men into the field on marches and bivouacs to stimulate group singing and playing of pocket instruments. It is felt that this introduction to an outlet for self entertainment and diversion will assist in the maintenance of high morale among troops later situated in isolated localities.

marked by a continuance in high gear of all the various intensive training activities.

During the period the camp was toured by Lieutenant General Ben Lear, former commanding general of the Second Army, who made a special trip from Washington. Later, Major General William Bryden, commanding general of the Fourth Service Command, visited Camp Davis and related posts.

General Lear arrived by Army plane on May 28 and remained through Sunday, May 30, exhibiting especial interest in the progress of troop training at the Antiaircraft Artillery Training Center, major activity at this camp. Joining General Lear, Major General Joseph A. Green, commanding general of the Antiaircraft Command, came down from Richmond to take part in the tour.

In chronological order, General Lear on May 28 viewed an exhibition of various antiaircraft artillery troops of the 108th Group, including 90- and 40mm antiaircraft guns; searchlight equipment, trucks and other matériel. General Lear not only asked numerous questions of commissioned personnel, but frequently singled out enlisted men at random to interrogate them regarding their knowledge of their duties.

Following the demonstration of antiaircraft artillery, General Lear went to the Antiaircraft Artillery School where he witnessed an exhibition of hand-to-hand combat methods by officer candidates. The officer candidates also staged an exhibition of their prowess on the obstacle course for the visiting general. Concluding the day's activity General Lear reviewed a retreat parade of three Antiaircraft Artillery Training Center Battalions. He was the guest of honor at a dinner given in the evening by Brigadier General James R. Townsend, commanding general of AAATC.

On the following day he toured various messhalls, barracks and other buildings of the AAATC. He then motored to Sears Landing, firing point on the nearby Atlantic Ocean, where he observed firing at plane-towed sleeve targets.

In the afternoon General Lear and General Green visited historic Fort Fisher, accompanied by General Townsend and other AAATC officers. Antiaircraft artillery troops stationed at Fort Fisher demonstrated their skill on the antimechanized range, firing 40mm cannon at cable-towed targets simulating tanks and other mechanized matériel.

General Lear's visit was concluded on Sunday when he inspected camouflage work at Folkstone, some four miles from Camp Davis.

Camp Davis

BRIGADIER GENERAL JAMES R. TOWNSEND

Commanding AAATC

By Lieutenant Roger B. Douless

As this camp passed into the first stages of its third year operation, the late spring and early summer period was



First Classmen from the Military Academy observing barrage balloon operations.

Among other training innovations at the Antiaircraft Artillery Training Center was the use of simulated .50 caliber antiaircraft machine guns, firing a plastic missile propelled by a compressed air charge. The machine guns are fired at small armadas of model airplanes which zigzag backwards and forwards on wires strung between high poles. A backdrop of heavy canvas catches the missiles which are gathered for re-use. Training officers were represented as well pleased with the new phases of training gunners. Realistic effects are further attained by recorded firing by an actual .50 caliber machine gun over an amplifying apparatus.

On June 20 approximately two hundred and seventy-five members of the First Class of the United States Military Academy arrived at Camp Davis as part of a tour of large Eastern Army camps of the various branches of the service. They were headed by Major General Francis B. Wilby, Superintendent, and Brigadier General Phillip E. Gallagher, Commandant, of the United States Military Academy.

The cadets arrived by special train and attended services at various camp chapels in the morning. In the afternoon they witnessed a demonstration of barrage balloon tactics by a detachment from the Barrage Balloon Training Center which was sent for the purpose from Camp Tyson, Tenn.

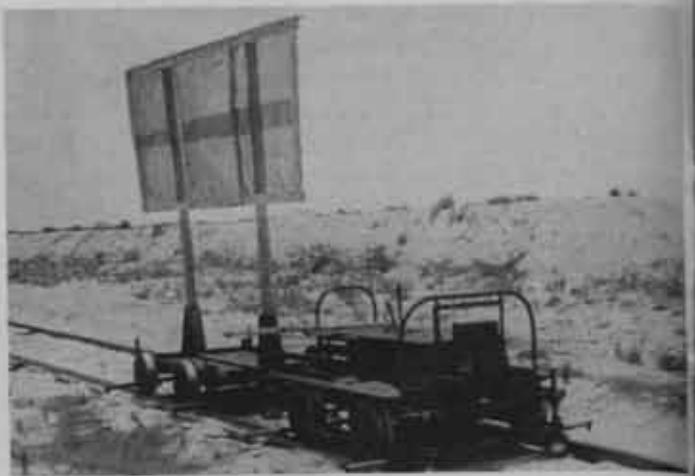
In the evening, the cadets were guests at a dance and reception held for them at the Officers Club. In the following three days the cadets were occupied with a study of training methods at the Antiaircraft Artillery School.



BRIGADIER GENERAL H. C. ALLEN, *Commanding*
By Major Prime F. Osborn

This Training Center has come into the hotter months with a fine record of achievement behind it. Firing records have been made and broken, conditioning-march times have been cut, and more units are qualifying all personnel on the obstacle and infiltration courses. The Camp itself is undergoing a face lifting treatment with the erection of several new buildings and spring-cleaning of grounds and areas.

Redecoration of the Guest House lounge has been completed with the painting and varnishing of the walls and wainscoting. This completes the change begun some time ago with the addition of comfortable, brightly upholstered



The car and target.

rattan chairs and sofas, and several small tables. And Camp Huilen officers are at last to have a club of their own. Scheduled to be completed in July, the new building will be 71 feet wide and 173 feet long. Fronting on Tres Palacios Bay and the Gulf of Mexico, the new quarters will include such badly needed features as a capacious lobby, containing telephone booths, check rooms, and rest rooms. The lobby will lead into a forty by sixty polished maple dance floor surrounded by a balcony, the northeast end of which is to open to a large game room and storage area. A separate restaurant, complete with steam table and soda fountain, will also fill long-felt wants. In addition, a paneled taproom opening on a screened porch will take care of the throngs who do not choose to patronize the soda bar.

Among the training improvements this summer have been the completion of the antimechanized ranges at the Indianola firing point. These ranges have been carefully laid out and constructed to provide the firing units with the finest practice on any target, under various conditions, and all types of courses. The antimechanized range is a figure-eight shape with the target car pulled around the mile-long course by a section-hand car equipped with a remote control braking device and automatic acceleration and deceleration mechanism. A dirt embankment thrown up parallel to the tracks protects cars, power unit, and rails against the automatic weapons fire. Curves are sharply banked to permit a maximum speed of thirty miles an hour to be maintained throughout the course. The target itself, built up from the car, projects above the embankment and approximates the silhouette of a tank. The shape of the range allows gunners at any position to track and fire at a target continually changing its direction; thus one circuit includes crossing, incoming, and outgoing courses. Several emplacement areas have been built, permitting the siting of .50 cal. machine guns and 40mm guns at their effective ranges for fire on the target as it darts among trees and bushes. The target car can be controlled from the nearby safety tower making it unnecessary to approach the range during firing. The car has a fuel capacity sufficient to run the target continuously for approximately three hours thereby permitting about a half-day of uninterrupted fire. However, the target is usually destroyed or badly torn up by well-directed gun fire in a much shorter period.



The antimechanized range.

The entertainment calendar has been agreeably filled during the summer months with the appearance of many shows in the Camp theaters. For the more serious minded there were the Houston Symphony conducted by Ernest Ingham and American Symphony orchestra under the direction of Laszlo Halasz. The high quality of lighter entertainment set during the winter was continued with USO shows presenting *Hellzapoppin*, *You Can't Take It With Me*, *The Band Wagon*, and *Show Time At The Roxie*. Buckstone baffled the camp with his mystifying accomplishments. Taking no back seat to any of these excellent presentations, the AAATC Band put on *GI Jubilee*, and attracted capacity crowds at the Camp War Department theater. A variety show with the musical portions devoted to light classic and modern pieces, it proved the bandsmen's contention that they, too, are "entertainers" in the same fine way as their more professional colleagues.



Camp Tyson

COLONEL W. H. DUNHAM, Jr., *Commanding
Barrage Balloon Training Center*

By Captain F. R. Alexander

The Barrage Balloon Training Center at Camp Tyson was honored by a visit by Major General Joseph A. Green,

Commanding General of the Anti-Aircraft Command. He was accompanied by Colonel Cortland Van R. Schuyler, Colonel William H. Dunham, Lieutenant Colonel Joseph H. Moore and Lieutenant Warren E. Decker of his staff.

The purpose of the visit was to discuss with Brigadier General John B. Maynard, Commanding General of the BBTC, plans and policies related to the barrage balloon training program. General Green and his staff observed the operation and control of a barrage of some 160 LA and VLA balloons. The officers visited various balloon sites and saw the training being carried on there as well as on the Physical Proficiency Course and in the Barrage Balloon School.

General Green expressed himself as being highly pleased with what he saw at Camp Tyson.

A practical demonstration of the value of VLA balloons in protecting troops from air attack was given to the 12th Armored Division units at Camp Campbell, Ky., recently. The exhibition was staged by a detail operating three VLA balloons from Camp Tyson. The balloons were used as a barrage over a regiment in reserve consisting of both supply and armored components and formed a protective "umbrella" against simulated air attacks by seven planes from the Campbell Army Air Base.

The tactical use of barrage balloons in conjunction with anti-aircraft artillery, automatic weapons and searchlights, was demonstrated in June at Camp Davis, N. C., birthplace of the barrage balloon service. The demonstration was observed by a class of cadets from the United States Military Academy at West Point.

The entire 101st VLA Battery took part in the Second Army maneuvers in Tennessee and within a short time



Signal Corps Photo

A scene from *Balloonatics of 1943*.

after returning to this post, was ordered to Louisiana to take part in the Third Army maneuvers.

With the rapidly shifting war picture, more and more emphasis is being placed on the mobile VLA balloon barrage. Battery A of the 316th Battalion has been converted from Low Altitude to VLA balloons.

The fourteenth class of Enlisted Men to be graduated from the Barrage Balloon School received their graduation certificates during ceremonies held June 19. The members of the class heard General Maynard speak on "Leadership and Responsibility of Noncommissioned Officers." The subject of Leadership is being generally stressed in the training of this command. Among other steps which are being taken to impress this important quality upon officers and non-commissioned officers, have been impressive talks to the personnel in each category by General Maynard himself, and the inclusion of appropriate instruction both in the Barrage Balloon School and in the unit Troop Schools.

The fifteenth class started a special course of study on the VLA balloons June 21. This class is the first to include both officers and men drawn from the same units and pursuing identical courses simultaneously. By this procedure the men and their later platoon leaders will have opportunity for closer cooperation and understanding of one another; they will go through the School as a team rather than as individuals.

All units of the BBTC are being given an opportunity to refire the small arms course. The camp average of 40% qualification established during rigorous winter conditions has been raised to approximately 85% with some batteries running as high as 95% of their personnel qualifying.

Nearly 1,000 acres of land have been added to the Camp for the purpose of building a new rifle range. This will be ready for use by mid-July and will permit firing at ranges up to 500 yards. Better qualification scores are anticipated when this new range is put into use. Present records were

established on the present 1,000-inch protected type range.

Along with lessons in handling and maneuvering the highly mobile VLA balloons, BBTC units are learning combat lessons under fire. A new Infiltration Course was opened in June for the purpose of disciplining troops mentally and physically to battle-sounds and shocks. Both officers and men are required to make three trips through the course.

The first trip is a "dry-run" without fire but in which the men crawl over broken ground, under barbed wire and through shell holes. The second is a daylight run with machine guns cross-firing overhead, land-mines being detonated, and hand-grenades being simulated. Full field pack helmets and rifles with bayonets attached are carried by the men. The final run is at night in darkness with machine guns using tracer bullets.

Critiques indicate that the course is proving highly effective training and that the men are learning to act calmly and use sound judgment regardless of noise, confusion, surprise and obstacles. The course is 125 yards wide and 7 yards long and ends with a bayonet charge up a steep hill from a trench.

An intensive effort is being made to have all military personnel at Camp Tyson protected by the maximum amount of government insurance. Results of a recent survey show that 92.5% of the enlisted men and officers are now participating in the plan and that nearly \$80,000,000 worth of insurance is in force here. A concentrated education campaign, started late in June, is expected to revise the figures to an even higher total.

Camp Tyson was officially commended by the Provost Marshal General through the Fourth Service Command, Atlanta, for having the highest number of hours worked without a reportable accident in any War Department operated facility in the Fourth Service Command during the month of February, 1943. The commendation was published in June.

Improvements to be noted at Camp Tyson include a new building for bowling alleys affording facilities for 10 alleys, a locker room, a check room, an office and a store-room. The new building measures 60 feet by 136 feet and when put to use will add much to the recreational facilities of the garrison.

Two new athletic fields have been constructed and are in daily use. Each field has a baseball diamond and bleacher seats. Athletics have received renewed emphasis at Camp Tyson. During off-time periods intrabattery games in baseball, soft-ball and volley ball are played within battalions and two official leagues are playing schedules involving battalion teams. The entire Post is following the fortunes of the official Camp Tyson Baseball team which has been playing a home-and-home schedule with such opponents as Camp Campbell, Fort Knox, Camp Breckridge, Union City AAFTD, and others. The first week of July the locals participated in a MidSouth Service Baseball Tournament held in Memphis.



BOOK REVIEWS

The JOURNAL can supply any book in print,
at the usual Association discount.

Professional Interest

Prophet With Honor

GIANT TERRY BULL: HIS IDEAS ON WAR AND FIGHTING IN GENERAL. By Terry Bull. Washington: The Infantry Journal, 1943. 174 Pages; 25¢.

Colonel William H. Triplett, Infantry, who has been writing Terry Bull stories for the *INFANTRY JOURNAL* for years, is primarily a humorist, but a top-notch instructor. The Terry Bull stories, although good for many a chuckle, are really pieces of instruction in the tactics of small units, and recommendations concerning the development and use of many. Terry Bull is the incarnation of what we think we mean when we say "grizzled old sergeant," but he has young ideas. His tact when dealing with green junior officers is exceeded only by his effectiveness in instructing those same officers, and his unflinching man within view. Only Terry could tell a pacifist recruit, "Alright, Sonny, we won't make you fight—just take you to where the fighting is and let you use your judgment."

This paper-bound book has nine of Terry's best stories—some of the titles are: *Bayonet Fever*, *Mungo Mortillery*, and *Reaving Boys of 1949*. This is worth two bits of anybody's money.

"Berlin Papers Please Copy"

DEFENSE. By Marshal Wilhelm von Leeb. Harrisburg: Military Service Publishing Company, 1943. 159 Pages; Maps; \$4.00.

This treatise was originally published in 1938 in the *Scientific Military Review*, a publication of the German war office. It has been translated by Dr. Stefan Possony and Daniel Vilfroy, who have added a chapter of their own, and expanded the original with a long translator's note.

Marshal von Leeb writes of the defense as a means to an end, when the means for attack are not immediately available. He writes, "The armies numbering millions and the corresponding requirements in ammunition, it is impossible to resort to constant

the plan Hitler used in his attack on Russia was defeated because of his plan of defense—which was von Leeb's plan, adopted in principle by the Red forces. Hitler rejected von Leeb's plan and was defeated in this book. It appears that von Leeb was right.

Blitz Basis

SURPRISE. By General Waldemar Erfurth. Translated by Daniel Vilfroy and Stefan Possony. Harrisburg: Military Service Publishing Company, 1943. 200 Pages; Maps; Translators' Notes; \$1.00.

General Erfurth wrote this book before the beginning of the present war. That the Wehrmacht used many of the ideas and principles outlined in the treatise is undeniable, but it is also undeniable that there are many erroneous conceptions in the work. The book is a new departure in military thinking, however, and as such deserves to be read by any person who considers himself literate in a military sense. The chapter notes by the translators often point out the obvious, but just as often open a new trend of thought to the serious reader.

The Military Service Publishing Company is to be commended for its Military Classics series, of which *Surprise* is one of seven titles either published or soon to appear.

Naval Encyclopedia

FIGHTING FLEETS. By Critchell Rimington. New York: Dodd, Mead & Company, 1943. 307 Pages; Illustrated; Index; \$4.50.

Revising a book of this type during a world-wide war must be a heartbreaking task, but Mr. Rimington has done well. To attempt to portray the naval strength of the world in fact, figure, and picture, through the fog of enemy censorship and within the bounds of our own security measures, the author must have performed prodigies of research. Naval enthusiasts, war correspondents, and others whose duties or interests lie in the direction of the fighting fleets will find this book an invaluable aid.

The book contains over 340 pictures, comments by naval authorities, statistics and characteristics of the fleets and fleet units of the world, drawings and descriptive matter about naval weapons, a list of all ships sunk in the present war corrected to January 15 of this year, and a checklist of 2,000 principal combatant ships of the world's navies, among other things.

The section of comments by naval authorities, in contrast to the usual platitudes and space-filling wordage that we might expect to find, contains valuable résumés of naval actions in this war, with the losses of both sides where known. Paul Schubert, Gilbert Cant, Fletcher Pratt, Bernard Brodie, and Rear Admirals John S. McCain and G. J. Rowcliff are represented.

War-Important

BOOKS

Defense

by MARSHAL WILHELM von LEEB

☆ First translation of the now world-famous treatise, *Defense*, originally published in 1938 in the *Scientific Military Review* of the German War Office. Von Leeb, as a military thinker and scientist, offered his government a plan for the next war in which Germany might be engaged. Von Leeb's recommendation was that the war be opened with active defense, as a preparation for the offensive later. The plan was rejected by Hitler—it might have saved Germany.

157 pages; illustrated \$1.00

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☆ "*Surprise* is a major contribution to modern military literature. In this timely and authoritative treatise General Erfurth has revived and adapted and elaborated for contemporaneous study and enlightenment the principles and expositions of a host of preceding military writers . . ." from Frontinus through Machiavelli, Clausewitz, and others.

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Deluxe edition \$3.75

Number 36 on the Journal Booklist

Allowances

CASH ALLOWANCES FOR THE FAMILIES AND DEPENDENTS OF SOLDIERS, SAILORS AND MARINES. By Otto E. Pfeiffenberger. New York: William Frederick Press, 1943. 60 Pages; 50¢.

A short pamphlet explaining the Soldiers' Allowance Act in non-legal language.

Charting the Course

THE WAR IN MAPS (Revised and Enlarged Edition). Text by Francis Brown; Maps by Emil Herlin. New York: Oxford University Press, 1943. 167 Pages; Illustrated; \$2.00.

Soldiers and military "fans" over the entire country have learned to appreciate the clear and complete war maps of the *New York Times*. The maps are designed specifically to illustrate a particular phase of a military operation or situation, and perform the purpose admirably, with no distracting detail, but with all the necessary information, illuminated with well-conceived art.

This book contains seventy-eight of the *Times* maps, with explanatory text, to present a clear picture of what has happened thus far in the present world struggle, with background from World War I.

Life on "The Rock"

I WAS ON CORREGIDOR. By Anea Willoughby. New York: Harper and Brothers, 1943. 249 Pages; \$2.50.

This is probably the first eyewitness account of the fighting on Corregidor by a civilian with no pretensions to military knowledge. Mrs. Willoughby, wife of the financial adviser to General Sayre, was taken off The Rock by submarine in February, before Bataan fell.

Mrs. Willoughby's story is told in a straightforward manner without striving for effect and without criticism, suggestions, attempts to explain tactics or high policy. She tells what she saw, as she saw it, and tells it well. The book is, as a result, full of the little scenes that explain clearly how life went for General Sayre's party. Mrs. Willoughby explains why bombs were more welcome than shells (they didn't seem to have the addresses plainly marked), how the soldiers reacted at first and as the outlook grew bleaker, and gives the best description of life in the tunnels that the reviewer has seen.

Not All Glory

COMBINED OPERATIONS: THE OFFICIAL STORY OF THE COMMANDOS. Foreword by Lord Louis Mountbatten. New York: The Macmillan Company, 1943. 155 Pages; Illustrated; \$2.00.

Although "official" stories are usually unsigned, it has been well known that Hilary St. George Saunders, assistant librarian of the House of Commons, and world-famous author, wrote an unemotional, revealing, and intensely interesting account of the Commandos' instructions were to tell as much as possible within the bounds of military security, and he has followed those instructions faithfully. He tells not only of the triumphs of the Commandos, but of their failures, too. In some operations the Commandos lost more men and material than the results warranted, and in still others the results were far short of what was planned. On the whole, their work has been gratifying, not to Britain but to her Allies. In recommending this book

source of the unvarnished story of Combined Operations, we should pay tribute to Britain's courage in telling the whole truth, both of failures and successes.

“Unaccustomed As I Am —”

SPEECH FOR THE MILITARY. By Cole S. Brembeck and Albert A. Rights. Harrisburg: Stackpole Sons, 1943. 205 Pages; Index; \$1.20.

The ineptitude of many army officers at public speaking has been a serious drawback to their careers. There are few born speakers—most of the good ones have taken instruction in the subject at some time or other. This book, designed for self-study or classroom use, should assist those who desire to improve their ability to speak and instruct. Most of the material is the tried and true art of the public speaker, with military applications and situations.

This War

Colliers' Man

WHAT SOLDIERS WONDERED WHY. By Frank Gervasi. New York: Doubleday, Doran and Company, 1943. 266 Pages; \$2.75.

Frank Gervasi, *Collier's* roving reporter, has long been one of our favorite war writers. His genius for picking the act or the phase that best describes the whole picture is one that is lacking in too many of his colleagues. This book, however, is most peculiar as a Gervasi product, but it is still worthwhile. Skipping from South America to Africa, and then all around that continent, Gervasi presents a series of pictures that hang together as a series only because they are all about the same war. British-American civil air competition, the campaigns in northern Africa, the Madagascar landing, De Gaulle vs. Darlan, air power—the continuity is poor, but the material is good. With much to get off his chest, especially complaints about ineptitude in high places, the book is controversial enough to be enjoyable.

AP's Man

MOSCOW DATELINE. By Henry C. Cassidy. Boston: Houghton Mifflin Company, 1943. 367 Pages; Index; \$3.00.

Henry C. Cassidy is the AP reporter to whom Mr. Stalin addressed the two letters that created newspaper sensations last year. The first letter indicated Russia's displeasure at the quantity of aid she was receiving and at the absence of a second letter, the second letter was congratulatory in tone, indicating that the African campaign had given the Soviet government a different view of the capabilities and efforts of the Allies.

Mr. Cassidy tells the story of the two letters, and of Russia's changing participation in this war. Seemingly he has no axes to grind; he tells the truth as he sees it, the unpleasant with the good, and the shortcomings of both Russia and her Allies in their long suits. His admiration for the Russian spirit is boundless, but he emphasizes that in many ways our allies do not react as we do in like situations.

The high points of the book include the slightly embarrassing moments of Churchill's visit to Moscow, the Harriman mission to Moscow, and the Willkie visit.

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Four Books for Army Women

THE ARMY WIFE. By Nancy B. Shea. Officers' Guide for the army wife. Every army bride, and the wife of every officer from the citizen components should have a copy of this. Number 151 on the Journal booklist. \$2.50

THE ARMY WOMAN'S HANDBOOK. By Clella Reeves Collins. Instructs the army wife on how to handle financial affairs during the absence of the husband, and tells not merely *what* to do, but *how* to do it. \$1.50

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HANDS OFF! By Major W. E. Fairbairn. *Get Tough!* for women. How to protect yourself in physical encounters. When war work takes women to tough sections of town, or the swing shift lets out at odd hours, the wise woman will know how to turn the tables on any attacker. 75c

Now and Later

MEN IN MOTION. By Henry J. Taylor. New York: Doubleday, Doran and Co., Inc., 1943. 296 Pages; Index; \$3.00.

Henry J. Taylor is a peculiar combination of financier and foreign correspondent. His book is a peculiar combination of autobiography, travelogue, war reporting, and estimate of the world situation. The autobiography is superfluous, the travelogue is not boring, the war reporting is superb, and the estimate of the world situation is both enlightening and provocative.

The importance of the book centers around Mr. Taylor's interpretation of world affairs. He believes that the German desire for world domination is not the exclusive lunacy of the Nazis, but something that has tainted the German mind for centuries, and that after the Nazis are history, Germany will get under way with World War III. He believes that the United States cannot be a world relief organization, because Europeans neither think nor react as we do, and feeding and pampering Europe will weaken us without strengthening our possibilities of peace. He finds the four freedoms unworkable and the New Deal dangerous.

There are inconsistencies in this book, and *non sequitur* reasoning, and anti-New Deal prejudices, but there is also much sound sense, some excellent observations, and some very fine reporting.

♦ ♦ ♦

Our Unknown Allies

MOTHER RUSSIA. By Maurice Hindus. New York: Doubleday, Doran and Company, 1943. 395 Pages; Illustrated; \$3.50.

Mr. Hindus has called the turn on many Russian events. Probably his most important feat was predicting the fact of Russian resistance against Germany when all the experts were rehearsing funeral speeches. Mr. Hindus says he has no gift of prophecy—just talent and opportunity for finding out what the "little people" of Russia think and feel. Knowing this, he says it is no trick to predict what they will do. His system has worked so far.

Mother Russia tells the reader what our Soviet allies (the little people) think, feel, and *do* in wartime. He describes deeds of heroism, both of the mass and of the individual. He tells in what ways the Russia and the Russian of today differ from the Russia and the Russian of the twenties, during the shake-down after the Revolution. According to Hindus, their views on morality, the family, the Nazis, education, and many other things do not differ vastly from our own ideas on the same subjects; they may differ in the intensity with which the views are held. Hindus is qualified to write on his subject, and his views seem honest. We should know the Russians better, since we will live with them in a smaller, air-linked world.

♦ ♦ ♦

Travelogue

JOURNEY AMONG WARRIORS. By Eve Curie. New York: Doubleday, Doran and Company, 1943. 488 Pages; Index; \$3.50.

Miss Curie, as the representative of a newspaper syndicate, made the trip by air from New York to Brazil, across to Africa over Africa to the Near East and Russia, on through India and China, and returned over much the same route. She saw many of the same things that the other newspaper representatives saw and wrote about them very well. As the daughter of her illustrious parents, a few more doors were open to her than to

verage reporter, and as a result she is able to give more detail about her interviews. Miss Curie writes well, but rather superficially about military matters.

From the number of books written by reporters and others who have made much the same trip in the past eighteen months, and figuring 175 pounds of plane cargo weight per writer, it might not be amiss to compare the worth of resultant books vs. displaced war materials.

Prisoners of War

THEY WHO WAIT. By Robert Guerlain. New York: Thomas Y. Crowell, 1943. 206 Pages; \$2.00.

Robert Guerlain is the pseudonym of a French soldier who escaped a German prison camp, finally to come to America and join the Fighting French. He has written a restrained story of his life in the PW camp. Probably the most important point in the story is the fact that the French soldiers who are being held and mistreated in contravention of all the rules of war and decency, are in the main far from broken in spirit. In spite of propaganda, starvation, and slave work, most of the Frenchmen, and the Poles, live for the day of liberation. Few have gone collaborationist."

A most revealing anecdote was that of the treatment of British prisoners, who are very much privileged beings in the German prison scale. Guerlain says it is partly because the Germans are prone to accept a man at his own valuation, and the British value themselves highly.

Scandinavian Underground

QUEL FOR THE NORTHLAND. By Kurt Singer. New York: Robert L. McBride and Company, 1943. 212 Pages; \$2.75.

If both German and Russian espionage and sabotage have been as extensive as Mr. Singer's account indicates (there is no reason to doubt it), the inhabitants of the three Scandinavian countries have had no easy row to hoe, and the Swedes are little better off than the Norse and the Danes. All three nations were caught between the two forces, and in spite of deep desires for neutrality and peace, have been swept into war. Sweden's neutrality is a tight-rope affair.

The stories Mr. Singer tells of Quisling and the quislings, both of Norway and the other Scandinavian countries, make the reviewer wonder if it couldn't happen here. High officials and other influential citizens of those countries aided the Nazis, some for money and some because they believed in the Nazi principles. The thoroughness of Nazi espionage methods directed against the Russian brand, which is more brilliant than enough, makes exciting reading.

School of Hard Knocks

WHY JAPAN WAS STRONG. By John Patric. New York: Doubleday, Doran and Company, 1943. 313 Pages; \$2.50.

At last somebody has discovered a foolproof method of finding out how the great masses of a foreign country live. Literally thousands of writers have lived in the rarified air of diplomatic, government, and press groups, with an occasional trip to the wrong side of the tracks, and then written the latest word on what makes the people of the nation tick.

Mr. Patric took the proper course, but the tough one. He actually lived with the common people of Japan, ate in their

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restaurants, slept in the native hotels, rode third class, learned enough of the language to exchange ideas, and did it all on a budget that was considerably less than he could live on in the United States. Patric didn't ask a high government official how it was possible to live on a few *sen* a day—he tried it himself.

As a result of his wanderings in Japan, Korea, and parts of China, Mr. Patric finds the secret of Japan's strength in the fact that the people have lived for centuries on a diet and with a lack of comforts that make the rigors of campaigning seem even preferable, in many cases, to life at home. The government, too, is accustomed to a tight belt, and to working without the things the Democracies cannot seem to do without. In short it is hard to take enough away from the Japs to ruin their war potential, when they never had very much anyway.

Reporter's Contacts

SECRET SOURCES. By Wythe Williams and William van Narvig. New York: Ziff-Davis Publishing Company, 1943. 326 Pages; \$3.00.

Wythe Williams' radio programs, in which he has made some startling predictions that came true, are favorites of millions of listeners. In this book, Mr. Williams tells something of the sources of the information that made the broadcasts possible. Van Narvig, a former Czarist officer who became a United States citizen, made the contacts in Europe (especially Germany) with the informants, who were in most cases minor cogs in the higher headquarters. The larger part of the book is taken up with the actual reports, as received by Williams, with explanatory paragraphs telling what portions of the reports were used and what parts were rejected, and why.

The Man in the Burnous

THE ARABS: A SHORT HISTORY FOR AMERICANS. By Philip K. Hitti. Princeton: The Princeton University Press, 1944. 216 Pages; Index. \$2.00.

This book is a short version of Mr. Hitti's book, *The History of the Arabs*. It relates, in condensed form, the ancient and medieval history of the people whose conquests and scientific discoveries had much to do with geography and science as we know it today. Now, with Americans meeting Arabs in Africa, the Middle East, and in other parts of the globe, it is important that we learn something about these Moslems, whose importance in the tangled world picture seems all out of proportion to their numbers. In this book, the "wog" of our soldiers becomes one of the sources of modern civilization.

The Day After the Duration

A FIVE-YEAR PEACE PLAN. By Edward J. Byng. New York: Coward-McCann, 1943. 184 Pages; \$2.00.

The very fact that Dr. Byng's proposals are not nebulous generalities, but definite proposals, with names and dates makes this a book to be taken a bit more seriously than the usual grist of peace plans. Dr. Byng is definitely a realist, for instance. "It is perfectly obvious that the changing fortunes of war may temporarily cause some of the ideas or suggestions advanced in this book to look dated, premature, or even nonsensical." Agreed. "The principal killers and thieves who seized power in Germany on January 30, 1933, must be severely punished, without sentimentality. . . . Then, having decontaminated these centers of Nazi, fascist, and militarist infection, the victors

democracies must not allow the just anger of the liberated masses to degenerate into wanton, indiscriminate cruelty and brutality on the Nazi model."

But it is when he names places and methods, down to the number of occupying troops, that Dr. Byng is at his best. There is much to quarrel with in this short book—but there is much to think about, and it is a concrete plan.

* * *

How to Start a War

THE ORIGINS AND BACKGROUND OF THE SECOND WORLD WAR. By C. Grove Haines and Ross J. S. Hoffman. New York: Oxford University Press, 1943. 643 Pages; Maps; Index. \$3.25.

Combining the wealth of historical information in this volume with the complete bibliographies at the end of each chapter, we have as good a starting place as any for future historians. The wide variety of sources used, as well as the factual and temperate approach to the subject, place this book high in the scale of reference works on this present war.

* * *

Thursday Night Quarterback

EDGEHEAD TO VICTORY. By L. V. Randall. New York: Doubleday, Doran and Company, 1943. 183 Pages; \$2.00.

There must be a reason for people to write books like this, and for other people to buy them. The author himself, in his preface, calls writing the book "an ungrateful task," and he is exactly right. The book itself is a melange of fact and fancy, theory and reality, about the coming Allied invasion. There is a little point in analyses and soul-searchings about the invasion pattern, when only our General Staffs know what is going to happen, and all this thought about something that is wasted in the minds of the Staffs is wasted.

* * *

Next!

BY ONE. By Gaspar G. Bacon and Wendell D. Howie. Boston: Old Corner Book Store, 1943. 262 Pages; Appendix; Bibliography. \$2.50.

The authors detail Hitler's divide-and-conquer moves, point out the errors of those in France, England, and America who thought Hitler could be appeased or trusted, and plead for a realistic view of America's responsibilities and capabilities to fight for world peace after the fight for victory.

* * *

Africa's Other End

THE UNION OF SOUTH AFRICA. By Lewis Sowden. New York: Doubleday, Doran and Company, 1943. 271 Pages; Illustrated. \$3.00.

South Africa has long been a land of struggle and strife, against Englishman, black man against white man, and Nazi against those who believe in Democracy. Mr. Sowden presents some of South Africa's history, and much about its future. The author believes that the only solution to the problem of this nation is to open the doors once more to white immigrants—a course that is much opposed by the Afrikaans, and English white settlers.

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Air Arm

Debaters' Handbook

COMBAT AVIATION. By Keith Ayling. Harrisburg: Military Service Publishing Company, 1943. 253 Pages; Illustrated.

It would be a good thing if there were some way to make reading this book a prerequisite for amateur and informal debaters on air power and air tactics and strategy. Mr. Ayling set on paper some of the clearest explanations the reviewer has seen for, among other things, the need for varied types of fighter planes, the advantages and disadvantages of formation flying, the reasons for varied types of plane armament, and the types of tactics that have been adopted.

The book is packed with anecdotes of famous and not-so-famous flyers, to illustrate the points the author makes. Some World War I flying heroes do not show up so well in the light of what we know now about the need for teamwork in the air.

All in all, Mr. Ayling has produced a fine "high spot" discussion of air tactics, and airplane limitations and power that should be most helpful to anyone who wishes really to understand why Air Forces work as they do.

✓ ✓ ✓

Plane Facts

WAR PLANES OF ALL NATIONS. By William Winter. New York: Thomas Y. Crowell Company, 1943. 409 Pages; Illustrated. \$3.00.

With the addition of identification silhouettes of all planes mentioned, this book would have been the answer to an antiaircraft artilleryman's prayer. As it stands, however, the book is one of the finest of its kind we have found. Mr. Winter, editor of *Air Trails* magazine, provides us with both fact and educated opinion on the planes of the world, written in language we survivors of the automobile age can understand. Mr. Winter has not emphasized the figures, which are of purely technical interest in most cases, but has stressed the facts, such as why the plane was built, what it is used for, how successful it has been when used for that purpose, and how it was developed. Pictures and drawings appear for many of the aircraft. It is refreshing, also, to know that the author admits that there may be errors, due to the magnitude of the task he set out to perform, and the caginess of the governments concerned in telling as little as possible about their latest matériel.

✓ ✓ ✓

The Early Days

HOW OUR ARMY GREW WINGS. By Colonel Charles deF. Chandler and Brigadier General Frank P. Lahm. New York: Ronald Press Company, 1943. 320 Pages; Appendix; Index; Illustrated. \$3.75.

Colonel Chandler performed most of the research for the history of American military aviation, and General Lahm completed the work after Colonel Chandler's death. Both officers were important figures in the Army's first efforts at heavier-than-air flight, and General Lahm was a free balloonist in addition.

The book covers the Army's work in aeronautics up to the Civil War work with balloons, and the balloon work of Juan in the Spanish-American War, are touched upon, but the main emphasis is on the young officers who experimented and died to provide the basis for the Army Air Forces of today.

No Phoney War

WILDCATS OVER CASABLANCA. By M. T. Wordell and E. N. Seiler, with Keith Ayling. Boston: Little, Brown and Company, 1943. 309 Pages; \$2.50.

The French fought at Casablanca, and most of them fought with courage and purpose, even though many did not believe they were doing the right thing by fighting the Americans. The French pilots who opposed the American naval fighters on the carrier Lieutenants Wordell and Seiler were assigned and died bravely. Their ships were obsolete and undergunned, and the air battles were no walkaway for the Americans. The French ships (some of them of American manufacture) could make tighter turns, even though they were slower. In the air, the French pilots were skilled and dangerous opponents, although many of them refused to take to the air. The story the pilots of the "Red Ripper" Wildcat squadron told to Mr. Ayling is straightforward and vivid—and more than interesting when compared to newspaper reports of the fighting. Mr. Ayling deserves commendation—the book is a running account of the pilots' stories, rather than a vehicle on which the author hung his own version.

Nothing Trivial, We Hope

THE LUFTWAFFE: ITS RISE AND FALL. By Hauptmann Hermann. New York: G. P. Putnam's Sons, 1943. 294 Pages; \$3.00.

It is always difficult to evaluate the authenticity of a book when the author is not known; Hauptmann Hermann is the pseudonym of a man who claims to be a German aviator in World War II, and an executive in the German aircraft industry after the war.

His story of the personalities and events that built the Luftwaffe until it was almost, but not quite, good enough to win the present war is interesting, even important. The Luftwaffe, he says, was built primarily for bluff, and secondarily for a quick, devastating stroke like the 1940 breakthrough. It was not meant for a long war, and the British air thrusts at Dunkirk, and the later defense during the Battle of Britain, were the heart out of the prime Nazi tool. The Luftwaffe is the German arm, as differentiated from the army and navy, which was German, rather than Nazi. Like the Nazis, the Luftwaffe was built for lightning strokes, and a long war with no periods of respite have sounded its death knell.

According to the author, the Luftwaffe is short on engineering skill, since engineering is "not soldier's work"; and absolutely lacking in the planning and staff work necessary to keep the damaged planes in operation, because none of the top talents in the air force were competent to develop the systems and procedures necessary to keep the planes flying. The British in 1940, and the Russian drain since, with the added plastering of Germany by bombers, have all contributed to the decline of a force that was never designed to encounter opposition.

Action Pictures

AMERICA'S FIGHTING PLANES IN ACTION. By Reed Kinert. New York: The Macmillan Company, 1943. 143 Pages; Index. \$2.50.

Mr. Kinert is a primary flight instructor at Ryan Field, an aviator, and a writer. He has combined his talents to produce a book full of drawings and paintings of American fighting, training and transport planes, with a page of descriptive material

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Miscellany

Three Cadets

LOVE AT FIRST FLIGHT. By Charles Spalding and O. Carney. Boston: Houghton Mifflin Company, 1943. 160 Pages; Illustrated. \$2.00.

SPIN IN, DUMBWHACKS. By Lieutenant Richard M. Ryan. Philadelphia: J. B. Lippincott Company, 1943. 192 Pages; \$1.75.

Both books take cadets from their first decision to fly to the presentation of their wings. The first book is about a naval air cadet, the second about two army air cadets. The Navy book is evidently fictionalized, although this is nowhere stated; the Army book is apparently autobiographical.

The striking thing, in reading these books, is the similarity of the training in both services, and the difference in attitude of the trainees.

Royal Navy

THE SHIP. By C. S. Forester. Boston: Little, Brown & Co. 1943. 291 Pages; \$2.50.

This is far from what we have learned to expect in a novel by C. S. Forester—it smacks too much of something that has had the stamp of approval, if not the inspiration, from the public relations section of the Royal Navy. But even though it is not Forester at his best, it is a splendid account of a British cruiser in action—an account of both the ship and the men who man it.

H.M.S. Artemis is the ship (the name is fictitious) that is the unit of a force guarding a convoy to Malta. The Italian battleship is sighted, and the light cruiser and her crew do their duty and more besides. Mr. Forester uses an effective literary device—taking a line or two from the captain's report as the heading for each chapter, the chapter tells the exciting story of what that line meant in blood and steel.

War Anthology

AMATEURS AT WAR. Edited by Ben Ames Williams. Boston: Houghton Mifflin Company, 1943. 494 Pages; \$3.00.

Here are thirty-two stories of Americans at war—stories written by participants in the actions, or observers who were right on the spot. From a brush between Indians and colonists in Maine in 1725 to Guadalcanal and North Africa, we see how Americans, amateurs at war, fought—and usually won. In the preface, Mr. Williams says that the amateur soldier, as typified by the American, is too ignorant in warfare to know when he is licked, while the professional soldier, as typified by the German, accepts defeat when the rule books tell him the jig is up. Mr. Williams admits that amateurs will suffer heavier losses through their very ignorance, but that they will get results for their sacrifices. All of which is very debatable, but there are some fine stories of military and naval action in this satisfactorily long volume of true short accounts.

War Fiction

THE FIGHTING AMERICAN. Edited by F. van Wyck Mason. New York: Reynal & Hitchcock, Inc., 1943. 747 Pages; \$4.50.

Where *Amateurs at War* is an anthology of eyewitness accounts of all our wars, *The Fighting American* covers very much the same ground with fiction stories based on fact. *The Fighting American* is much better reading, but is not as valuable as a source of actual incidental history.

Colonel Mason has included forty-five selections, from Brad Pitt's campaign against Fort Duquesne to World War I. Names Fenimore Cooper, Inglis Fletcher, Stewart Edward White, Zane Grey, Herman Melville, John W. Thomason Jr., McKinlay Kantor, and many other favorites have portions of their work in this book. The book is a fine gift for a soldier who likes to read of soldiers at war.

* * *

The Unvanquished

CHINA. By Kwok Ying Fung. New York: Henry Holt and Company, 1943. 191 Pages; Illustrated. \$5.00.

The sort of person who enjoys a good photograph for photography's sake will treasure the eighty-four pictures in this book, for the pictures are much more than mere examples of the art of the camera expert. Combined with the restrained and unobtrusive text, the photographs present a conception of China that is so little known to most of us. We have learned to think of China as a nation of squalor and suffering—China depicts the beauty both of the land and of the spirit of the people. The pages of the book are 9½ by 12 inches, which permits the pictures to be reproduced large enough to bring out their full effect.

* * *

Nathan Hale Was First

THE SPY IN AMERICA. By George S. Bryan. Philadelphia: J. B. Lippincott Company, 1943. 234 Pages; Supplement; Bibliography; Index; Illustrated. \$3.00.

From Nathan Hale to Pablo Waberski, America has been a background for spies, our own as well as those of our enemies. George Bryan's research has enabled him to describe the work and personalities of the better known or more important spies who operated in this country from Revolutionary War times to the days of World War I. During the Civil War spies for both sides were most active. The story of Albert S. Rowan is taken from the Elbert Hubbard version, as are most of the other stories in this book different from the popular versions.

* * *

No More Mata Hari

WHAT YOU SHOULD KNOW ABOUT SPIES AND SABOTEURS. By Will Irwin and T. M. Johnson. New York: W. W. Norton, 1943. 219 Pages; Index; Illustrated. \$2.50.

This is easily the most interesting, and probably the most readable, of the entire Norton "War Services" series. The authors have done a superb job of presenting the theory and practice of espionage and sabotage, with its ramifications. They have worked conscientiously to strip the subject of its glamor, but have not let interest suffer in the process.

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it does Hollywood brilliance. There is danger, of course, there is also drudgery. The little people, at the bottom of the scale, who do the "leg work," as it is known in the newspaper field, are usually underpaid, and slightly dull. Our own F.B.I., G-2, and O.N.I., are included in the book, with much about their work.

In this war, considering the handicaps of law and lack of funds, our own secret services have not done too badly. And the most effective counter-espionage work, of course, is that which doesn't reach the papers.

✓ ✓ ✓

River Lore

PILOTIN' COMES NATURAL. By Frederick Way. New York: Farrar and Rinehart, 1943. 271 Pages; Illustrated. \$3.00.

This is a book for anybody who has ever seen a paddle-wheel steambot chuffing her way along the Mississippi or one of its tributaries. Captain Way was captivated by the romance of river boating when he was very young, and made it his life, although with his background and advantages he might have made more of a conventional success in other fields. Steamboating as Captain Way loved it is dying, if not dead, but the Captain, a young man still, is not a beaten man—not by a long shot. He is at heart a packet man, and towboats are a necessary evil to him, even though towboats carry ninety-eight per cent of river traffic.

In this book, written with an absence of literary art that makes it an example of a new and effective style, the author tells how the romance of the river entered his being at an early age. After various jobs as "mud" clerk and steersman, he finally earned his pilot's license—the story of those years sprinkled as it is with boats, pilots, captains, financial shenanigans, and Dutch Henry's cat, makes some of the most pleasant reading possible in this wartime world. And if you care one whoop about steamboats, don't miss this.

✓ ✓ ✓

The Eternal Triangle

PLANE TRIGONOMETRY. By Donald H. Ballou and Frederick H. Steen. New York: Ginn and Company, 1943. 214 Pages, including 5-place log tables and natural trigonometric functions. \$2.00.

This book has an excellent arrangement of the theory of plane trigonometry with an adequate number of illustrative exercises and problems. An appendix lists the answers. Most of the problems are taken from modern uses of trigonometry in solving problems in surveying, navigation, and aviation.

A chapter on the theory and use of logarithms precedes the five place tables.

✓ ✓ ✓

Personal Experience

KHAKI IS MORE THAN A COLOR. By Sergeant M. H. E. Marsden. New York: Doubleday, Doran and Company, 1943. 282 Pages; Illustrated. \$2.00.

This is an unusual book among the many "first days of selectee" efforts. Sergeant Marsden writes straightforwardly about things as he sees them. There is no attempt to be funny—humorous situations, unburlesqued, do creep in. The sergeant doesn't attempt to solve any problems, offer advice to recruits, or tell his superiors how to run an army. He tells what happened to him, on duty and off, and how it affected him.

If you want to know what your enlisted men think of you, and of things in general, this book might help. Sergeant Smoot is an Engineer, but the book could apply to any arm.

Sterling Sergeant

THE ORDEAL OF SERGEANT SMOOT. By Louis Paul. New York: Crown Publishers, 1943. 220 Pages; Illustrated. \$2.00.

Esquire readers will recognize the name—Smoot was a private in Esquire stories for several years before the army got growing. In these stories, he is an unwilling sergeant, but a good one, assisted and abetted by Corporals Ortwing, Smith, and Miller. The fourteen short stories are rather broad burlesque, but at least they skip entirely the tried and true humorous situations that are no longer considered humor in military circles. Mr. Paul obviously knows the army and how enlisted men react. This is good light reading, especially welcome after a lot of books on "Why France Fell" and "How to Keep Peace in the Pacific."

A British Slant

STEPS AND JESTS. By Bruce Bairnsfather. New York: G. P. Putnam's Sons, 1943. \$2.00.

One hundred and three Bairnsfather wash drawings, with American soldiers and sailors as subjects, make the contents of this book stand head and shoulders above the usual run of humorous military cartoons. Bruce Bairnsfather, creator of Old Bill, spent some time with our troops in Ireland, and he has captured for posterity the little things that soldiers like to remember with a smile. The reviewer's favorite depicts Old Bill himself (in Home Guard uniform) leaning against a bar with an American sailor, saying, "I only got one war aim, mate, and that is: To make a world unfit for Nazis to live in."

After Retreat

THE ARMY FUN BOOK. By Lawrence Lariar. New York: Crown Publishers, 1943. 477 Pages; Illustrated. \$2.00.

Mr. Lariar has collected a varied assortment of puzzles,

quizzes, cartoons, games, jokes, and other material to help while away the soldier's free time—if any.

Sea Story

THE ENEMY SEA. By Abraham Polonsky. Boston: Little, Brown and Company, 1943. 288 Pages; \$2.50.

Mr. Polonsky has written a corking good tale of a tanker on the Gulf-East Coast run, with submarines, American Nazis, a beautiful red-headed photographer, and a desert island contributing to as plausible and exciting a story as the reviewer has read in years. The tanker, with fifth-columns among the officers, meets the subs, the subs refuel, and action fills the rest of the book. It is a bit unfortunate that the author had to clutter up his fine story with an assortment of stilted speeches decrying fascism—these days fascism is like sin; the few who are not already against it will not be likely to have their opinions changed by the labored conversations in the book.

MANUAL FOR INSTRUCTION IN MILITARY MAPS AND AERIAL PHOTOGRAPHS. By Norman F. MacLean and Everett C. Olson. New York: Harper and Brothers, 1943. 136 Pages; Index; Illustrated. \$1.75.

Based on official manuals, this book is, as the title suggests, an instructor's manual. It organizes the work of the course, gives teaching hints, refers to the official manuals for the details, and all in all, will save an instructor in map and aerial photograph reading many hours of labor, as well as assisting him in presenting the work of the course in logical and planned order. In addition to covering the elements of map reading, it includes also needed mathematics, compass reading, and explanation of foreign maps.

AIR POWER. By the Editors of *Look*. New York: Duell, Sloan and Pearce, Inc., 1943. 97 Pages; Illustrated. \$2.75.

The men and the planes of the Army Air Force are portrayed in this picture book, which was produced by the editors of *Look* in cooperation with the AAF. Large pages, action pictures, and a liberal use of color make this a volume for any air enthusiast's library, and a positive delight for an air-minded teen-ager. All royalties go to the U. S. Army Air Forces Aid Society.

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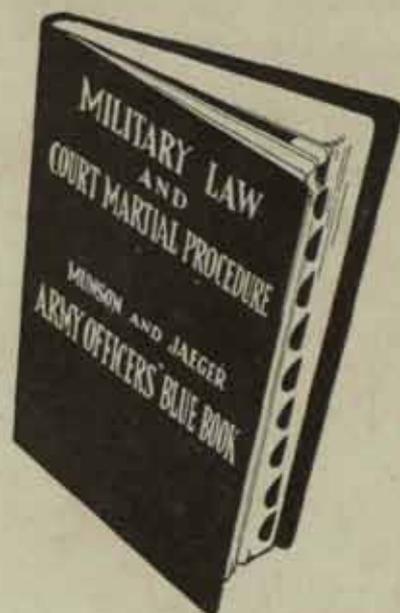
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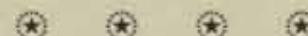
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