The FIELD ARTILLERY Journal

IN THIS ISSUE:

Instruction

SEPTEMBER, 1942

MAJOR JOHN E. COLEMAN, ***Editor***
CAPTAIN A. V. RUTLEDGE, ***Assistant***
LENNA PEDIGO, ***Business Manager***

OUR NEW 81ST DIVISION takes all honors for membership. All new divisions have realized the importance of the JOURNAL and have cooperated thoroughly—but the 81st's artillerymen became 100% members promptly upon activation, and the Special Service Officer subscribed for 37 additional copies for distribution among other units. In view of formation of infantry cannon companies, this is a step that other divisions could well follow.

DISTRIBUTION OF MANUALS appears to be a problem. Officers, noncoms, and privates are constantly buying technical and field manuals, and frequently state that the regular issue has failed to catch up with their outfits.

The JOURNAL wants to cooperate in every way. Manuals which we can lay our hands on at all, are sent promptly. It should not be necessary, however, to spend personal funds in order that your battery can get much-needed information. FM 21-6 shows the official distribution of all manuals; if you fail to receive your copies, let us know—we'll try to locate and break the bottleneck. Understand, however, that this is not a plea against ordering anything you want; we just feel you are entitled to get what the official distribution calls for.

DISTRIBUTION OF THE JOURNAL remains a problem, and will as long as the war continues. Illegible signatures (why not print your name?) and delayed mailing of changed addresses are beyond our control, though. So too is a new one that has bobbed up: well meaning but somewhat misguided families who instruct us not to renew memberships because "Mr. Smith is now in the army and won't need the JOURNAL," or "Lt. Brown is so far away the magazine won't reach him." Wrong on both counts, for reasons too obvious to recount. We try to straighten out these cases, but if your JOURNAL stops in mid-air perhaps your family has taken such action.

TO REDUCE the trunkful of manuals needed for field reference by the best of us. the JOURNAL is preparing a condensed *Field Artillery Guide*. With this in his musette bag, the field artilleryman will need only firing tables and manuals on his particular weapon in order to function effectively. Details will appear in the October issue.

The Field Artillery Journal

"Today's Field Artillery Journal is tomorrow's training regulations."

SEPTEMBER, 1942 — Vol. 32, No. 9

Authors alone are responsible for statements made. No articles are official unless specifically so described.

Published monthly by the United States Field Artillery Association. Publication office 3110 Elm Avenue, Baltimore, Md. Business and editorial office, United States Field Artillery Association, 1218 Connecticut Ave., Washington, D. C. Address all communications to the Washington office. Entered as second class matter August 20, 1929, at the post office at Baltimore, Md. Subscription price $3.00; Canada $4.00; foreign $3.50; single recent copies to members, 25 cents; nonmembers, 35 cents. THE FIELD ARTILLERY JOURNAL does not accept paid advertising. It does pay for original articles accepted, but unsolicited manuscripts must be accompanied by return postage if they are to be returned. ***Addresses, and changes of rank, will be changed as frequently as desired, upon notification; not otherwise. Changes should reach the editor three weeks before date of next issue. Immediate notice should be given of any delay in the receipt of the magazine.***

British Press Service

HINTS FOR OFFICER INSTRUCTORS

LECTURES

There is little doubt that the lecture is the hardest form of instruction with which to hold the student's interest, but it has not been found possible to get away from the lecture altogether and a small crop of them almost invariably occurs at the beginning of a course. Thus the new member of the D.S.[1] may well find that his first task is the one in which success is hardest to attain, even though his position, being as it is comparatively free from assault by argument, may appear to him less alarming than those he will have to occupy later. Success is important, for if he can hold his listeners' attention thus early in the proceedings he will have achieved a flying start in the more intimate things to come.

The Title

An interesting and practical title will focus the attention of the audience beforehand, so that they will come into the room expecting, even if only subconsciously, to hear something of practical interest to themselves. Secondly, before he can compose his lecture, the instructor must have before him a title which clearly defines its terms. To take an example, too often on the program for a course appears such an item as "Lecture—Artillery." No lecturer can hope to cover such a subject in three quarters of an hour, and if he tries to—and people sometimes do—three quarters of what he says will be wasted on his audience. If instead, assuming a course at a Company Comanders' school, the subject of the lecture was shown as "Artillery Matters Which Company Commanders Must Know," the attention of the audience would be focussed from the start, while the task of the officer who has to compose the lecture would be made easier through his terms of reference having been clearly defined for him.

Use of the Blackboard

Illustrating a small example on the blackboard at intervals during a lecture is a great help for pinning the attention of the audience. For one thing it stops their eyes wandering 'round the room and permits these as well as the cars to take in the instruction; for another, it forces the lecturer to give a practical example. For instance, it is easy for him to say that anti-tank guns

[1]Directing Staff.

By LT.-COL. A. E. BAGWELL PUREFOY, p.s.c., R.A., in the *Journal, R.U.S.I.*, Feb., 1942

should have defilade from the front or that machine-guns may fire on a time program; what he is driving at will stick in the minds of his hearers far better if he draws, with half a dozen lines, a bird's eye view of the front line, a wood, a fold in the ground and a couple of anti-tank guns, or makes up on the spur of the moment a tiny fire plan which he shows in table form on the board. But as soon as he passes to another subject he should rub it out.

Diagrams prepared beforehand have similar uses, but these again should not be displayed till they are actually needed, nor should they be left exposed after they have served their purpose.

Delivery

Rehearsal is essential if the flow of speech is to be natural; this does not mean reading through the lecture sitting in a chair, but standing up with the written work in much the same position as it will be on the day, and making the same gestures towards the imaginary blackboard, diagrams, or audience. It always takes longer to deliver a lecture properly than it does to read it through, and it is therefore necessary to time this performance. If such a rehearsal is carried out once or twice, it will be surprising how free and spontaneous the delivery will become. No attempt, however, should be made to deliver the lecture without reference to the written matter. To do so is to risk either omitting some important point or, by forgetting one's words, expressing clumsily a carefully thought-out sentence. At the same time no appearance of reading must be given, and this is best avoided by having, where possible, one's papers nearly at eye-level, and standing with the desk slightly to one's left so as not to be hidden from the audience.

The Précis

There are two kinds of lecture précis: the kind which contains the detailed framework of the lecture, arranged in the form of short notes under the various main headings, and the kind comprising only the bare bones, or main headings, with gaps in between in which students may, if they like, make notes themselves. Which type is used is largely a matter of taste, but if a detailed précis is issued before the lecture care must be taken that it does not show too much, or the lecturer may expose himself to the criticism, sometimes heard, of having "simply read out his précis." It is often safer to issue such a paper afterwards.

In addition to that part of the précis which deals with the lecture itself, there is usually room for certain appendices showing such things as organizations, detailed procedure, specimen tables, and so on. The lecturer should always consider carefully what the possibilities are in this respect, and his aim should be to turn out a précis which will be of real value to the student later on. This may easily involve several hours of careful work, but the result will certainly justify it.

DEMONSTRATIONS

Only indoor demonstrations are dealt with here, but the same principles apply to all. There are three main types: the single-handed demonstration; the conversational type in which two or more take part; and the large scale play, which is not discussed here as no brand-new instructor would be called upon to run one. In each case it is necessary for one member, who may or may not be actually taking part, to act as showman, or compère.

Single-handed Demonstrations

These are of great value for teaching a subject which, while of importance to all arms, verges on the technical. Examples are the deployment of an artillery regiment or the system of supply in the field. Subjects like these are far better taught on a model than by lecture and diagram, and care must be taken that they are not turned into lectures. The demonstrator should make his preliminary talk as short as possible, his main object being to arouse a barrage of questions, the answers to some of which may be lecturettes in themselves. Near the end of the period the students should be allowed to crowd 'round the model, and the directing officer should have assistants ready to cope with the many more questions which will be asked during this phase.

The Conversational Type

This has much to commend it. It is a change from the monologue of the single instructor, the type lends itself to a very wide range of subjects, and it is much easier to stage than the more ambitious play. One great advantage is that it is comparatively easy to introduce some humor into the proceedings. To be able to be funny in a lecture is a gift, and those who do not possess it must not try, but two or three officers conversing together must be dull indeed if they cannot raise an occasional laugh. To do so is worth while for, no matter what the austere school may say, your teaching is a success if you can make your audience laugh. There is no need for any forcing; all that is necessary is for the participants to enter the fray in a cheerful frame of mind, and the laughs will follow—humor is infectious.

The instructor who is told off to run a demonstration of this kind has before him a wide field of possibilities. It can be used to show the planning stage of almost every type of operation, for exploring the possibilities of a new weapon or type of unit, the giving out of orders, and a host of other things. Methods which may be employed include the straight-forward conversation over a model, the making of a plan followed by the crestfallen commander explaining to his superior why the plan failed, the wrong way and the right way in word pictures, and many variations of these. Needless to say, careful rehearsal is essential, but it is rarely necessary for the participants to know their lines by heart, as memories can be refreshed by realistically consulting map or

notebook whilst another member of the team is speaking. The officer who is detailed to run such a demonstration must definitely take charge, and must remember two important points: first, that whether he makes a winding-up speech or not, some form of introduction, either verbal or written, is always necessary; and second, that the audience must always be given the opportunity to ask questions.

One other point is that, in order that various points which it is desired to bring out may be explained aloud, players acting as commanders have often to show a somewhat lamentable degree of ignorance. This does not matter very much when the audience consists of officers, but the reason for it should be explained when performing before other ranks.

TACTICAL EXERCISES WITHOUT TROOPS

T.E.W.T.'s form the hard core of the instruction at any school where tactics is the principal subject taught, and they are usually the items which the novice on the directing staff approaches with the greatest trepidation. This is understandable, for the successful conduct of a T.E.W.T. involves far more than the delivery of a prepared speech or carefully rehearsed part, followed by the answering of a few questions. The instructor has now to hear and take note of answers often long, involved, and quite unexpected; he has to perceive and expose weaknesses in those answers, and convince the offenders, who will certainly defend them stoutly, that they really are weaknesses; he has at the same time to recognize merit which may be contained equally in widely different solutions, and last, but not least, he has to "put over" convincingly the official solution, on which the rest of the exercise probably hangs. Add to this that, in the strictly limited time at his disposal, he has to give everyone a fair run for his money and also cope adequately with a torrent of argument, and it can be easily understood that the prospect appears formidable.

Actually, however, the T.E.W.T. is one of the easier forms of instruction to conduct, the main reason being that the attention and interest of the audience, who feel somewhat on their mettle, is easy to hold from the start. Practice naturally gives greater confidence and produces better results, but the novice, whether at a school or in a unit, need have no fear of his first attempt provided he is guided by certain principles.

Let the Students Do the Talking

In the case of lectures and demonstrations, most of the talking has necessarily to be done by the directing staff. In a T.E.W.T., the instructor should do his utmost to keep his remarks to a minimum until the time to sum up is reached. A useful hint towards achieving this is to try to frame such remarks as must be made, in the form of questions, rather than statements, thereby forcing students to think for themselves. For example, having discussed the composition of a mopping-up party, do not say: "One of its troubles will be prisoners; how will it deal with these?" Say instead: "What picture have you of this party while it is carrying out its work?" Prisoners will soon be mentioned and this will create the required opening for the question regarding their treatment. More often than not the same procedure should be followed when the instructor is asked a question; instead of answering it directly he should turn it over to another student to answer. Again, a solution having been given out by one syndicate, comments on and criticisms of it should come from other syndicates rather than from the directing staff, and it is in fact no exaggeration to say that the less the instructor says the more he teaches.

Keep Notes of Student's Answers

No matter how good the instructor may think his memory is, in order to make sure no point is missed he should take brief notes of the main answers given to all but the quickest of problems. Not only will these enable him to pick out faulty or controversial points to feed into the subsequent discussion; they will often provide the only anchor for keeping argument within bounds. It is highly advantageous if, when one member accuses another of having made some particularly outrageous statement and the defendant replies indignantly that, far from having done so, his plan was almost in exact accordance with the latest manuals, the instructor can, quoting from his notes with cold realism, remind the opposing parties of the exact words.

Prepare Thoroughly Beforehand

This maxim applies not only to the instructor's notes, but also, which is sometimes overlooked, to the actual narratives which are issued to the students. When discussing a problem it is disconcerting to say the least, to be pulled up by a student for basing one's argument on data different from that issued to the syndicates, and yet, strange though it may seem, it is quite an easy trap to fall into. For example, a narrative is issued in the form of orders for a battalion attack. The fire support includes a machine gun company less one platoon. During the course of an argument about the fire plan the instructor, if he does not know the narrative well, may forget the missing platoon and base his argument on a complete company. This may appear far-fetched but it does happen, and the moral is study the white paper beforehand at least as well as, if not more carefully than, the pink.

As regards the instructor's notes, while he should have studied these thoroughly, he should on no account attempt to do without them altogether when conducting a problem. If the scheme has been well prepared the notes will be very thorough, and if the instructor does not refer to them occasionally he will run the risk of missing some important point, thus detracting from the value of the instruction. If the notes are used quite

openly, for the obvious purpose of ensuring that no point is omitted, the instructor need have no fear of gaining the reputation of being "helpless without the pink paper."

Presenting the School Solution

This is the stage with which the beginner is likely to have the most difficulty. It is important that he should expound the solution convincingly, in order that his hearers may go on to the next problem, which will usually be based on the school's answer to the previous one, with the feeling that they have been given sound lines to work on. Nothing is so calculated to destroy interest as the thought in a student's mind that a sound commander would never have put him in the position where he is faced with the problem in question. The instructor must therefore marshal his reasons for the course chosen very carefully, and give out the final answer concisely and with conviction. If the answer consists of verbal orders or an appreciation, for the delivery of which there is a set sequence, this is easy to do. For other types of answer, such as describing action which would be taken under certain circumstances, the best way of expounding it must be carefully thought out, for the delivery of the answer should be instruction in itself.

Having heard the approved solution, students should always be allowed an opportunity of criticizing it. Some of these criticisms may be very sound ones, and when they are the directing staff must always be ready to admit the fact. The correct line to take is that it is by no means the only possible answer—the problem is a poor one if it is—but that in the opinion of the directing staff it is the best answer, because it best applies the principles needed to solve the problem.

DISCUSSIONS

Besides forcing students to read their books, discussions are a means of obtaining a general airing of views on a subject, and they provide useful practice in expressing those views clearly and concisely. They usually take the form of two or three questions on a particular subject, such as Attack, which are issued as agenda a few days in advance. Their value rests largely in the discussion which takes place within each syndicate of students in preparation for the main meeting. As far as the directing staff are concerned they are probably the hardest things of all to conduct, and the beginner should, where he can, watch an older hand manage one or two before attempting to take the chair himself. This may not always be possible, but the tyro should come through fairly creditably if he remembers certain principles.

To begin with, as in the case of T.E.W.T.'s, his aim should be so to handle matters that nearly all the talking is done by the students. When two of them express opposite views, they and their supporters should be made to argue it out between them. The great difficulty comes when either the views of nearly all the students coincide or when they are all unwilling to talk. It is then that the instructor with a gift for this type of work can start the wheels turning by a provocative remark or question, and the novice must try his best and in time he will acquire some skill, though the real experts are born, not made. Before starting the discussion, it is a good plan to announce that any one of the students may be called upon to sum up at the end; this ensures attention from all, and is also very good practice, since to give a fair summing up requires considerable skill.

If a question involves the giving out by a student of a series of points, such as, for instance, points for special attention when training for night operations, the chairman must take great care not to allow the first speaker merely to give out a long list of headings. If he does he will rum the discussion, as everyone will have an almost exactly similar list and there will be little or nothing to discuss. The only way to deal with such lists—if there must be questions which involve them—is to break them up by making the speaker enlarge upon and give reasons for each point in turn. Although all syndicates may have the same points on their lists the chairman is very unlucky if there is no divergence of views on the methods of implementing those points.

As in the case of lectures, the blackboard is a useful aid to holding students' attention and keeping their feet on the ground. The chairman should endeavor to make use of it continually in order to illustrate diagrammatically courses of action put forward during the discussion. It is sometimes a good plan to make a student illustrate his own thesis on the board; this frequently helps to keep the debate alive.

The school notes for a discussion usually take the form of a short summing up, with or without a conclusion. As in a T.E.W.T., they should be consulted in order to ensure that no important point has been left out, but during the actual debate the instructor will be well advised to put them aside, and concentrate his attention on the speakers.

CONCLUSION

The foregoing notes are not intended as an essay on how to teach. Their object is to help the officer newly posted to the directing staff to come creditably through the first few occasions on which he will be in charge of the instruction. There is of course much that he will have to learn for himself as time goes on, but given a good start he will gain confidence and gradually acquire a technique of his own. The same applies to an officer who is called upon to give similar instruction in a unit, and who has had little or no previous experience of the type of work involved.

Finally, the newly-joined member of the school staff may be reminded that his position resembles that of the prisoner at the bar, who is assumed to be innocent until proved guilty; the students will assume him to be a capable instructor unless and until he proves himself to be an incapable one.

CHECK LIST ON METHODS

General

Is the time of day suitable for the type of instruction?
Is theoretical instruction augmented by practical demonstration?
Are practical examinations given wherever possible?
Is the supervision effective?

Training Aids and Classroom Facilities

Is the area or classroom used for two or more groups, resulting in mutual distraction?
Is the instruction being conducted near other distracting activities?
If instruction is held outside, are the students seated to the best advantage (backs to the sun, close enough together to hear the instructor, no trees or other obstacles to prevent the students from seeing the instructor, the instructor standing up-wind, etc.)?
If inside, is the ventilation satisfactory?
Is the lighting adequate?
Are suitable writing surfaces available for instruction requiring writing, plotting, arithmetic, etc.?

Life

Are blackboards available to the instructor for explanations?
Are blackboards well-painted and clean?
Blackboards, charts, diagrams, etc., should be placed against a blank wall. If this is not practical, the windows adjacent to the blackboard should be covered to prevent light shining toward the students. Is this principle followed?
Are there proper seating facilities for all students and are they arranged for all to face the instructor?
Are the charts, diagrams, etc., large enough to be seen by the students in rear of the room without effort?

Students

Are the students attentive?
Do they sleep or doze during instruction?
Do they smoke during instruction?

Instructors

Is the instructor properly prepared for his period of instruction?
Does he make the instruction too academic?
Does the instructor digress from the scheduled subject?
Charts, diagrams, pictures, etc., which are used to emphasize or clarify a point or phase of instruction should be removed as soon as they have served their purpose. Is this done?
Does the instructor speak firmly and loud enough to be heard in the rear of the room without conscious effort on the part of the students?
Does the instructor write or draw on the blackboard large enough to be easily read by all students in the class?
Does the instructor know his subject or does he read from a manual?

Hints to Instructors

Remember that men learn by all five of the senses, and by actually *doing*. The real test is, how well can they do it?
If you are to conduct a demonstration, practice several times prior to the class period.
Know what you are to teach and how you are going to teach it before coming to class.
Avoid profanity.
Never use obscene language.
Never talk down to the class.
Never decide that the student is stupid.
Do not try to bluff. If a question is asked and you do not know the answer, tell the students that you will find out the correct answer and tell them later.
Remember that the instruction given has but one ultimate purpose—Victory on the Field of Battle.

To facilitate constant and efficient supervision of instruction, the FARTC at Fort Sill has prepared this excellent list.

INSTRUCTIONAL PROCEDURE IN THE GERMAN ARMY

Translated by

CAPT. M. C. HELFERS, Inf.

Life

TRANSLATOR'S NOTE: *These passages on German instructional procedure are taken from Reibert's "Der Dienstunterricht im Heere: Ausgabe fur den Pionier," Berlin, E. S. Mittler und Sohn, 1939. Taken in conjunction with FM 21-5, "Military Training," they have proved of great value to officers whose main duty is the conduct or supervision of military instruction.*

REGULATIONS FOR THE INSTRUCTOR

With the exception of such points as are strictly military, instruction in the army is not bound to any single distinct outward form. Instruction which resembles drill is to be avoided. Instruction should be alive and brisk, but not harsh.

Instruction must be given regularly. The instructor stands so far distant from his group that he can observe it well. As a rule, he does not sit down. neither does he walk about. Instead, he stands before the center of the group. A good posture, a neat uniform, and a keen eye especially distinguish the military instructor. Inattention is not to be tolerated.

The instructor should speak in a brisk manner, using short and clear sentences. A voice which is raised and lowered in accordance with the importance of the subject matter produces results. The bearing and voice of the instructor can do much to bring about the desired alertness during instruction. Shouting during instruction intimidates constrained pupils; a monotone fails to produce results; difficult grammatical construction and a bombastic manner of speech hinder the understanding. Short and clear sentences are military. Every unavoidable foreign (uncommon) word should be written on the blackboard and explained.

The instructor must instruct "personally," which means that not only his excellent manner of instruction, but also his personality forces the pupil to pay attention.

Basically, instruction must be carried on so that the pupils are forced to follow mentally. Instruction must be imparted spontaneously (without notes) as much as possible. If a script is needed for the difficult points of the subject, it must be placed aside immediately after use.

When a superior enters the classroom or approaches the group, the instructor reports to him at once. He then carries on immediately with that part of the instruction where he stopped.

REGULATIONS FOR THE PUPIL

The pupil must make up his mind that his mental cooperation is the decisive factor, whether the instruction consists of a stimulating discussion or of a military drill. The real soldier, therefore, studies all sections of his manual referred to and applies himself with great attentiveness. During the class he sits with his body erect, keeps his eyes on the instructor, and pays strict attention to the instruction. When he does not understand a point, he makes this fact known at once. This he does by increasing the erectness of his posture and by raising his head and chin, not by raising his hand.

When the pupil is asked a question, he at once comes to *Attention* and answers in a clear, loud voice, without repeating the question. He answers with a complete

sentence, or he makes a short comprehensive statement of his own. When the pupil is not certain of the correctness of his answer, he answers as much as he can. It is wrong, for example, if the pupil remains silent altogether because he is too much concerned with the correctness of his answer. He will, in most cases, know something, and if he is not quite successful in answering the question the instructor will surely help him. If the pupil does not know any part of the answer, he shall say: *"I do not know, sir."* This answer is much more becoming of a soldier than a stubborn silence. While answering, the pupil looks at the instructor and not on the floor or into space.

When the pupil is called to the front of the class to write or to explain something on a chart, he halts smartly, comes to *Stand at Ease,* and, as a general rule, carries out his instructions in this posture. He steps aside to call attention to anything on the chart or blackboard.

THE PRESENTATION

During the first part of the instruction period, the instructor must acquaint the pupils with the subject matter. To do this properly, the instructor must know the receptibility of his pupils. Pupils with or without previous instruction, or pupils of a higher or lower educated group, are not to be instructed in the same manner. Experience shows that often too much is presupposed of the pupils.

As a rule, an instruction period should be divided into the following parts:

1. *A presentation of the objective of instruction and an introduction*.

The stating of the objective of a course of instruction can take the form of an announcement (writing the theme on the blackboard), a question (who is the commander-in-chief of the army?), or a problem. The purpose of this is to tear the pupils loose from the thoughts which fill their minds and to direct their thoughts to the theme (subject being taught). Hereupon, the introduction is given, which is to be as short as possible. It is of great value when this introduction is tied to a generally known or a practical example. It should arouse the interest of the pupils for the procedure which is to follow.

2. *A presentation of the subject matter by means of a gradual development of the main points*.

It is best to transport the pupil mentally by means of short questions to the first of a series of systematically arranged points. While doing this, the instructor must make pertinent comments. Even the false answers of the pupils must be gone into without, however, using too much time for that and thereby losing entirely the thread of the instruction.

It is to be noted that in this manner of instruction the pupils are to be led. They do not direct the course which the instruction follows. In this manner, the complete theme is presented to the pupils by every systematically arranged point.

Much stress is to be placed during every instruction on the practical value, on the reason (the "why"), and on the abundant use of charts and diagrams. The exact following of these requirements forms an excellent foundation for the interesting and convincing period of instruction.

3. *Review of the Main Points*. At the end of the period of instruction or at the end of a section, the main points of the subject should be collected by the instructor and, by means of questions, once more impressed upon the pupils. Also, a short written or oral examination can take place. At the close of this reviewing of points, the instructor must be certain that the pupils have possession of the practical use and the significance of the material covered. In case there is doubt in the mind of the pupils, they should be given opportunity to ask questions.

The taking of notes while the instruction is going on is of little value. Notes, if used, are best dictated at the close of the period or at the end of a section.

During the review instruction period, the instructor must stick to the originally presented objective and give the pupils an opportunity to talk in a short comprehensive form on the assigned lesson. During this discourse, the instructor should allow the pupil to speak freely. He should see to it that the pupil is on the right path, that he builds up his thoughts in the proper procedure, and that he expresses himself in a brief, clear, and soldierly manner. The instructor interferes only when extremely false statements are made. Misstatements should be corrected when the pupil is through speaking (this is best done by the other pupils.) It is of great value to have pupils come to the front and address the group. Their ability to appear before a group and to speak freely is thus enhanced.

At no time should the instructor allow a question-and-answer play to take place. Nor should a thoughtless response with answers learned by heart occur. The instructor should not ask his questions by turn. The name of the pupil to answer the question should not be given until the question has been stated. In this manner all the pupils are forced to pay attention and to think. In every question, the instructor should emphasize the fact that the pupil must decide on the correct answer. Instruction is good when each question is tied to the preceding answer.

It is wrong:

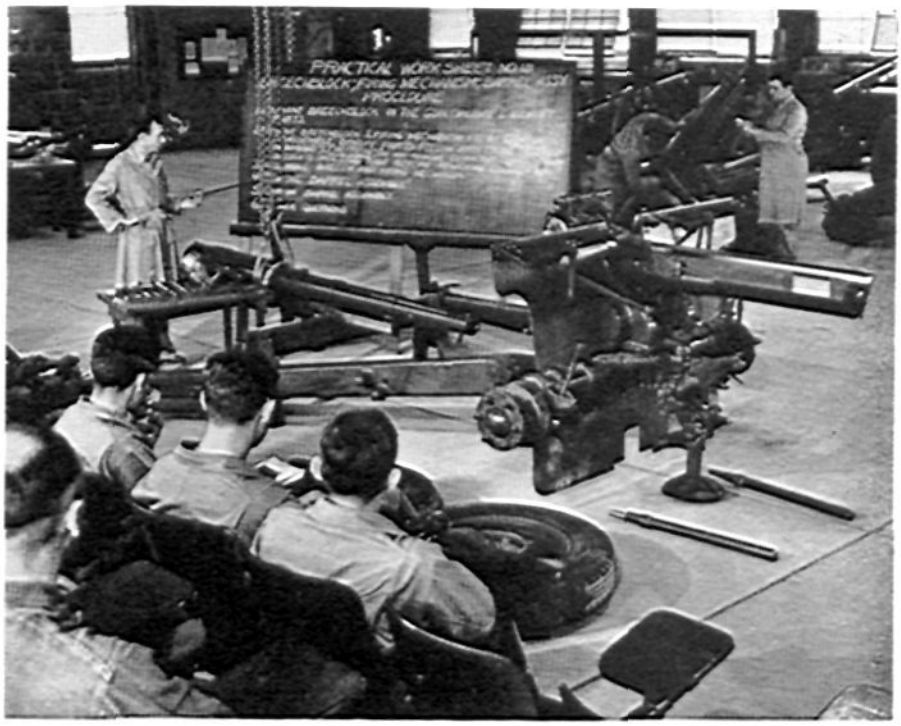
a. When the instructor begins the sentence and allows the pupil to end it, or *vice versa*.
b. When the question already contains the answer.
c. When the instructor repeats the answer or answers the pupil with the question.
d. When the instructor rudely rejects a false answer without attempting to draw the right one out of the pupil.
e. When the instructor becomes impatient.

f. When the instructor allows the best pupils only to answer or concerns himself with only one pupil.

g. When the instructor uses expressions such as *next, continue*, without giving a clear order.

4. *The Examination Period* (*Inspection*).

This period consists of a general review, in case no other objective is given. Although, during the examination the instructor is in the background, the spiritual connection between the instructor and the pupils must be noticeable. Instruction, with the exception of explicit questions, is to be foregone. In order to accustom the pupils to the presence of more than one superior officer it is the duty of the instructor to request his superior or comrades to attend the classes.



Life

CONCLUDING COMMENTS

After every instruction period, the instructor should analyze (judge) his instruction. For example, he should ask himself, "Have I reached my objective? Were the methods and outward form of the instruction proper? What result did I achieve?" This self-criticism is an unending duty which benefits instruction. If it is carried out seriously and properly, it is the best stimulation to bring about improvements.

Dull pupils can hinder instruction very much. Because of lack of time and other reasons, the instructor cannot concern himself entirely during the instruction period with them. They should be placed in the front rows and asked questions oftener. Besides that, the instructor must take the trouble to further prepare them by private conference or similar means. On the other hand, a proper adjustment is to be made for the more intelligent and clever pupils. For example, they can be required to give talks on difficult sections of the subject, or they can be used to help the more backward pupils. In any case, the first thought must be to carry out the main principle of instruction in the army, namely: *THE TEACHING OF EVERY ONE*.

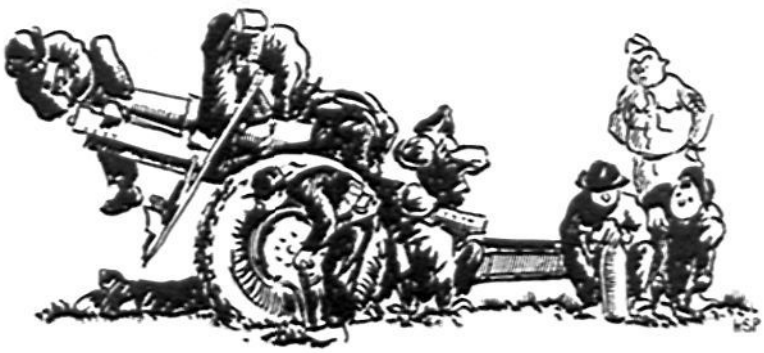


Figure 1—See board for description. All photographs are by Lt. R. B. Rigg except Figure 2, which is a U. S. Army Air Corps photograph.
Figure 2—Rear view of Japanese medium tank M2594 (1934).
Figure 3—The armor thickness of the front surface of a Japanese M2594 is shown by diagram on the actual surface.
Figure 4—The Japanese M2594 (1934). This medium tank used in Burma campaign. Full sized model of the vehicle shown here.
Figure 5—See board for description.

TEACHING ENEMY TANK IDENTIFICATION

By Lieut. Robert B. Rigg, Cav.

The teaching of enemy tank identification is not suitable for classroom instruction because the student cannot grasp various vehicle proportions. Photographs and sketches are valuable in teaching details, but nothing short of full sized models or silhouettes can teach the soldier to immediately recognize enemy tanks from a distance. This is one subject which must be taught with the idea of obtaining practical results — the average photo of an enemy tank is a close-up, 'though it is most likely that the average soldier will first see these tanks from a distance.

It is of utmost importance to know not only whether or not it is an enemy tank, but also what type it is so that this information can be reported—accurately. In its Intelligence training the 106th Cavalry (Mecz) found it worthwhile to construct a series of "three-quarterview" full sized enemy tank models. The accompanying photographs are of these tank dummies.

METHOD OF INSTRUCTION

Such tank models should be placed in positions where the unit personnel can have maximum opportunity to observe them; in most cases this will be on or near the drill field. If possible it is well to park a U. S. tank or vehicle near the enemy ones to establish a known medium of comparison.

Each enemy tank should have a data board (see Figure 1) upon which is listed the tank's foreign name, its size, weight, caliber of guns, etc. Armor thicknesses need not appear here, as it is a better practice to label them right on the surfaces they apply to (Figure 3). Note that the thickness is not given in terms of linear dimension but by an actual diagram, as it is extremely difficult to grasp the dimension of a section of armor plate unless the thickness can be seen.

In order to teach complete and practical identification

German Pz. Kw. II, now used mostly for reconnaissance, liaison, and flame throwing. This model is built over a jeep, for realistic movement.

a special course of instruction is necessary. This can be short and dynamic and should follow after the personnel have had a few weeks to observe the models. Instruction should begin with the Signal Corps training films *Know Your Enemy* (11-382) and *Friend or Foe* (11-383). The latter was made by the British, and we have adopted it. It shows many English tanks, but its main value is its showing *what to look for* in identifying a tank. Both motion pictures will create interest and provide an excellent foundation from which the instructor can proceed with a discussion of the full sized models.

The tank mock-ups shown here make this instruction easy because the officer need only point to the portion of the vehicle he is talking about in order to impress the subject on his students. Instruction in enemy tank identification should be of the demonstrated lecture type. Groups of men sent through the course gain maximum knowledge in a minimum of time as compared with teaching the subject by any other means. The instructor, thoroughly familiar with the details of each tank, should state only the known facts about each vehicle and not branch off on any imaginary tangents. He should begin with the tank's identifying and characteristic features, such as large bogie wheels, low profile, etc. Following that he should point out its guns, their caliber, and compare them with our own weapons. Vulnerable areas of the tank should be illustrated next, followed by an accurate description of the various armor thicknesses. This is the point where the lecturer should cite the German practice of applying additional armor strips to various surfaces, for protection over and above the normal; also, the Italian and German "plastering" of turrets with concrete for the same purpose. A good training aid here is a set of various pieces of wood or metal which are cut to the exact armor thickness of the tanks demonstrated; thus when a surface is described, a section showing its thickness can be passed about for the group to examine. Where possible it is well to explain the effect of our guns and ammunition on these surfaces and thicknesses.

It makes for more interesting training to have a "crew" of proper number come out of each tank and stand beside it. The old Chinese proverb, "A picture is worth a thousand words," is well worth considering here. Placards placed on the crewmen should state the job of each man, such as "gunner," "driver," etc. After coming out of their respective turrets the crew should hold position long enough for the class to be impressed with each individual's exact position.

Instruction on a particular tank should conclude with the vehicle's cross country capacity, radius of action, and a simple statement as to its tactical use (combat, liaison, reconnaissance).

Upon conclusion of a lecture on these tanks with the soldiers grouped about each model, the student body should move away from the tank and view it from successive distances. Later each tank should be approached from a considerable distance in order that its size may be seen in relation to the terrain. In such cases it is expedient to set off a small amount of smoke as a background screen in rear of the tank: this will let it be seen in sharp outline, and also lends more realism to models which do not move. If desired, the tank dummies can be camouflaged and made objects for dismounted scouting. At all times the "tanks" should be placed where they would logically go; as these models are light they can be carried by not more than a squad to various positions in the training area.

CONSTRUCTION

Construction of full sized enemy tank models requires only scrap lumber, nails, canvas, and paint. Any scrap pile will supply such additional props as headlights, pipe for guns and exhausts, and bottle caps which make excellent bolt or rivet heads to give the "tank" a realistic appearance close up.

Canvas is stretched over a simple framework. All ports and actual door openings should be real and not painted, although there is much which the paint brush can portray once the hull is built. Black, white, and OD are the only colors needed. One may go as far as desired in making the details on such models. Those pictured here represent a good happy medium. All dimensions should be accurate as concerns the major portions. Smaller details, to save time, can be estimated by eye and still produce a good effect. One very important dimension is the vehicle height off the ground; this should be carefully checked.

Sources for the details upon which to base construction are; TM 30-450, *Handbook on German Military Forces;* TM 30-480, *Handbook on Japanese Military Forces;* FM 30-42, *Identification of Foreign Armored Vehicles;* MID Bulletins; and photos appearing in various magazines.

In the 106th Cavalry these models were constructed by a six-man detail in an average of four days apiece. In many instances the working drawings were based only upon photographs which were scaled from a knowledge of a few over-all dimensions. Dummies were made to give a full front and side view, but in some cases it is well to construct the rear part fully in the event it contains a special feature (see Figure 2).

The model of the German Pz. Kw. II illustrated here is mounted on a Bantam, making a good target for anti-tank gun aiming exercises. This treatment does, however, require sturdier construction.

It is difficult to decide which models to construct when it is not known which Axis enemy the unit will oppose. For that reason it is necessary to build both Japanese and German. Construction should begin with the first vehicles which will be seen in action—reconnaissance ones. There is another reason, too: experience gained in building these smaller models leads to short cuts in the construction of larger ones.

They Too Speak English

By Wells Church

American Advisor to the British Broadcasting Corporation

Babies' masks include supporting slings, with stout handles for basket-like carrying. (*British Press Service photos*)

I don't know much about guns—except that a tiny .22 Remington single shot was one of my first toys and my father could roll a can down the street with a six shooter.

I don't know anything about guns—except that I was handed one by the First Officer of a Norwegian freighter every time an alert sounded while crossing the Atlantic about a month ago from England to home in America.

I don't know anything about guns—except that I was told that, after the fall of France Englishmen towed the half dozen or so antiaircraft guns they had in London around to strategic points and took pictures of them to prove they had more than that.

But I do know fairly well what men of the Field Artillery—who know all about guns, and therefore have no need of my puny knowledge of them—can expect if and when they take the long voyage to the "U.K." as it is called, to take part in what surely will prove to be the greatest offensive of all time, and somehow or other find a moment of spare time in which to visit London, England.

Military men of the U. S. A. too rarely realize that, in reality, their trips to foreign fronts have a two-fold purpose; one is offensive and the other is defensive. The offensive purpose is obvious—to batter the enemy; but the second is not always so apparent. The second is to prove that Americans are not as we are pictured in the movies, that we all don't have swimming pools, we don't all talk out of the side of our mouth or with a Southern accent. That is a defensive job; if it were not such a far-fetched comparison, I would say it might be something like the job of Major James Patrick Sinnott Devereux at unforgettable Wake (a batch of five-inch guns out there dropped a Japanese cruiser with probably 8-inchers to the bottom of the Pacific), for he had to wait till he knew the range favored him, and when you talk to foreigners you will have to wait till you know what he thinks of you before you can show him what Americans are really like. I'll talk a bit about that point—after I tell you how I got to England and why I went.

On November 30, 1941 (B.P.H.—before Pearl Harbor), I flew to Montreal and from there via Newfoundland to England. It was a bitterly cold trip. You have no idea what a helpless feeling you get when you are some thousands of feet in the air over water, with nothing but wheels under you and no gun in your hand or even one nearby.

The solid earth looked good that morning we made our landfall—as good as London looked battered to me a few mornings later when I entered it during a blackout. But I must take that back; London did not look battered the first time I looked at it. You high explosive men will know exactly what I mean when I say that on the surface it looked to me as if a mighty big chunk of London was still standing, despite what I had heard about the terrible battering it had received at the willing hands of the Luftwaffe. But some time later I knew the truth. I never once walked into a home, a restaurant, any building whatsoever in London without seeing some

evidence of the wrecking ability of high-explosive bombs. Here would be a chunk out of the ceiling, here a door blown off and not replaced, there a floor board missing and there a new bit of plaster—and the building on the other side of that wall gone into thin air. London has been cleaned up well—but a close eye can see the real damage. A field artilleryman who knows his shells will find much to study in London. There the story of directed blast (if that be the proper expression) is open for all to see.

An American accent is an open sesame in London. Despite what you hear, the British are avid for news of America and things American. They want to know what we think—and are embarrassed when asked what they think. They want to know the real truth about American production but it took a violent wave of anti-British feeling in America to persuade them that they HAD to tell the story of their own magnificent productive effort. They will want to know about the attitude of American labor toward the war—and will nearly blush when they tell you that for the duration British labor has foregone its rights and now works from 60 to 65 hours a week. They will want you to tell them about the growing American armies of fighting and producing men and women—and you will have to drag it out of them with a six-mule team that out of 33 million men and women in Britain between the ages of 16 and 64 years, more than 22 million are in active war service either on the fighting line or the production line. But that's the way the English are, the worst self-publicists (and we are the best) in the world. It's one of the first things one must learn about them, otherwise you will be almost sure to judge them stuck-up, unnaturally reticent, secretive and perhaps downright unsociable. The solution to the problem is to answer any question they ask with as little flourish as is possible for an American, and ask the natural question which comes to mind at least a week later. For, once they lose their amazing dislike of talking about themselves to strangers, they will answer in full. At times they will show just a faint trace of bitterness at the failure of others to understand the problem they faced after the fall of France, the failure of so many to understand that, but for the grace of God, the Germans could have swept their island as grasshoppers sweep a field of beans. But that bitterness comes to the surface only rarely. Above all, it will be necessary to learn to recognize that fine point in the British personality which is the dividing line between modesty and snobbery. Unless you know your Englishman, too often you will suspect him of being a snob rather than simply a person who has been taught for generations not to talk about himself.

Field artillerymen will understand another important aspect of the British much more easily than others. It has to do with their mis-named ability to take it. Saying that they can "take it" is as though one said they never "gave it." That's not true. I would rather say, after watching Englishmen for seven months, that they can stand the gaff when the going is hot. Americans have the same trait, so it is easy for us to see. But, bringing the matter down to a fine point, the British have that something which a field artilleryman must have when his position is being battered by shells from every direction and he never loses his own sense of direction or action. That is a precious national characteristic and it's doubtful if there was ever a good field artilleryman who didn't have it. It's the answer to the failure of the German air force to break the morale of the British in the air raids on London. There were those men and women in London who, in unguarded moments, said to me that if the Germans had kept it up a few more nights they might have been ready to call it quits. But, for some reason, you never quite believed them when they said it. It was as though a man you knew would never leave his piece short of being blown away from it were to say, "Boy, if they threw stuff at me like we're throwing at them I'd run a mile." You know damn well he'd stay sot till doomsday. Whenever you hear anyone repeat that crack about Englishmen fighting to the last American, just take it from one who knows that England will go down when the last Englishman goes down. That aspect of the British is so strong that there is difficulty in telling about it. One must think of Nelson and Trafalgar, Churchill and his cigar, the British men and officers who died at Hongkong with their hands tied behind their backs, and the men and women—yes, women—who dug old guns of every description out of attic drawers in London to fight in the streets if possible and necessary after the Dunkirk disaster. People of that kind don't ask anyone to do their fighting for them.

With the last paragraph in mind, may I make a suggestion which probably ill becomes one who has never stood behind one of the big babies as she let go with the roar you all know so well. The suggestion is born of a remark made to me by a gun expert one night in the lonely stretches of Newfoundland before we were in the war and when there was no need for the remark to be made except as an expression of friendship. He said that unless the United States fitted its gunnery manufacture more closely to the battle action of the times, and if we got into this war unexpectedly, our losses would be perhaps 20 per cent greater than they need be. He illustrated the point with a story. He was in this country, it should be explained, to give detailed instructions to American manufacturers as to the exact nature of the war-time gun needs of the British. He used the case of a 20-millimeter cannon which had been ordered for the R.A.F. Against their better judgment, they accepted trial on a gun which required a special wrench to set it up and tear it down. The factory promised that a representative would be on hand when the sample gun arrived to prove that it was what they really wanted. The representative duly arrived and telephoned the airdrome; the assembly chief asked him if he would come out about

ten oclock that evening. At that time, of course, the blackout was in effect. On arrival, the assembly chief said to the factory representative, "I'm terribly sorry to get you out on this wretched evening, old man, but I really wanted you here. Now, we've had a bit of a time here this evening and our tool shed has been blown about a bit and the truth of the matter is we only have ordinary tools available. I wonder if you could handle it without that special wrench?"

Well, you know what happened. The American threw up his hands and cabled his home factory to change the specifications to eliminate the special wrench. I was told that afterward, with the change, the gun became a standby, it being one of the best guns the British used. It was simply a case of the finest gun makers learning a lesson in the use of guns under attack pressure from those who needed the gun and had been under that pressure. I tell the story only to make this uncalled-for suggestion—that when an Englishman hems and haws about a piece of equipment, you can bet your boots that he has a good reason for it and the good reason will usually be that he has used the piece under fire and found a weak spot. He's a good man to listen to in such a spot.

London streets, flooded from hose and broken mains as well as rains.

Now, a few words of what you may see on leave in London. First off, the blackout is a blackout—no dimout stuff there. Here and there a tiny light shows at a curb or on a traffic light but otherwise not a light shows. These lights are shaded, of course. You will want to walk down the middle of the street, keeping to the middle by looking up and staying between the dim lines of shadow which mark the tops of the buildings on either side. An occasional taxicab may come along, and one of the odd things about this is one's inability to judge either its speed or its distance. You simply feel your way to the curb and wait till it passes.

Southern towns and London—all are alike. But why don't more chimney pots fall?

With the exception of a mere handful of all-night restaurants—I found only one myself—there is no place to eat at night. The old American habit of a bite before going home is out. Movies start in the afternoon and close up about ten o'clock. They have good movies, too, mostly from America. Newspapers are just four pages, like our front and back pages. And they handle news differently than we do here. (Just this morning on page one of a Washington paper, I saw two stories emanating from Berlin, one spreading the rumor that Timoshenko was to be relieved of his post, and the other telling the story of how a new submarine supplied to the Turks by the British had foundered with the loss of all 57 hands on its first voyage. These stories are obvious Nazi invention. One of two courses would have been followed in British newspapers. Either the stories would have been tossed into the wastebasket with a snort of derision, or they would have been tied together in a story saying here were two examples of how the Nazis try to break down the morale of the United Nations.)

You can get filled up in a British restaurant, but you will always have a hungry feeling. It comes, I think, from an unconscious desire for the good food of the United States—eggs, fresh fruit, a good roast of beef, etc. Those things hardly exist over there. Don't ever let anyone tell you powdered eggs are good: I was never able to eat all of one. One man's butter ration for a week is one-eighth of a pound—about as much as a big butter user puts on his toast in the morning.

(*Turn to page* 674)

GLOSSARY OF U. S. AND BRITISH ABBREVIATIONS

(Especially Pertaining to Field Artillery)

The JOURNAL is indebted to Lt. Col. Alfred H. Burns, editor of* The Gunner Magazine *(London), for furnishing the British portion of this glossary.

U.S. Abbr.	*U. S. Meaning*	*British Equivalent*	*British Abbr.*
Pvt	Private	Same	Pte.
Cpl	Corporal	Bombardier	Bdr.
Sgt	Sergeant	Same	
1st Sgt	1st Sergeant	Troop Sergeant Major	TSM
Ch of Sec	Chief of Section (NCO cmdg. a gun section)	Number One	No. 1
NCO	Noncommissioned officer. Warrant officer is above all NCO's, below all officers.	Same	NCO
			WO
Gnr	Gunner—the man who lays the piece for elevation and deflection	Same	Same, or Gr.
Tech	Technician—a specialist rating (new); technical, as "Technical Sergeant"	Specialist	
Mech	Mechanic	Same	
EM	Enlisted men	Other ranks	OR
Cmdr	Commander	Officer commanding	OC
CO	Commanding officer	Same	Same
CG	Commanding general	General Officer commanding	G.O.C.
C of S	Chief of Staff	Same	Same
S-1 (G-1	Personnel section (or officer) of staff	Adjutant General	A.G.
S-2 (G-2)	Intelligence section (or officer) of staff	Intelligence	I
S-3 (G-3)	Training section (or officer) of staff	General Staff	G.S.
S-4 (G-4)	Supply section (or officer) of staff	Quartermaster General	Q.M.G.
Adj	Adjutant—officer charged with administrative matters (glorified secretary)	Same	Same, or Adjt.
Sec	Section (1 gun)	Sub-section	Sub-Sec
Plat	Platoon (2 guns)	Section	Sec. or X
		Right section	RX
		Left section	LX
Btry	Battery (4 guns)	Troop	Tp.
Bn	Battalion (12 guns)	Battery	Bty.
Regt	Regiment (now passing out of the picture)	Same	Same
Brig	Brigade (a relic of World War I)	Same	Bde.
Co	Company (Infantry)	Company	Coy
BC	Battery Commander	Troop commander	T.C.
Bn C	Battalion Commander	Battery commander	B.C.
Ln O	Liaison officer	Same	
FO	Forward observer; also Field (combat) Orders	Forward Observing Officer	F.O.O.
Btry Ex or Exec	Executive	Gun Position Officer	G.P.O.
Com O	(Commo) Communication officer (charged with telephone and radio installation and operation)	Signals Officer	Sigs. O.
HCO	Horizontal control operator	None	
VCO	Vertical control operator	None	
	(Both members of Fire Direction Team)		
FDC	Fire Direction Center	No English equivalent—a set-up for massing fire of the battalion or group.	
OP	Observation post	Same	Same
Rad	Radio	Radio Telephony	R/T

U.S. Abbr.	*U. S. Meaning*	*British Equivalent*	*British Abbr.*
Tg	Telegraph	Wireless Telephony	W/T
Tp	Telephone	Line Telephony	L/T
Sb	Switchboard	Same	
MC	Message Center	Report Centre	None
CP	Command post	Same	C.P.
Msg	Message	Same	None
Mtcl Msgr	Motorcycle messenger	Despatch Rider	D.R.
How	Howitzer	Same	Same
	Aiming circle	Director	Dir.
Rn	Range	Same	Rg.
Rd	Round (of ammunition)	Same	Same
Trk	Truck	Lorry, tractor, truck	
Tk	-Tank	Same	Tnk
RSOP	Reconnaissance, selection, and occupation of position—an amusing ring-around-the-rosie which we do in times of peace—very seriously of course. Bears little resemblance to actualities of war.	Drill Order	D.O.
Div Arty O	Division Artillery Officer. No one is quite sure whether he actually commands, or only advises.	Commanding Royal Artillery	CRA
FM	Field Manual—an official drill regulations, usually several years out of date.	Field Service Pocket Book	FSPB
AR	Army Regulations—usually even more obsolete.	King's Regulations	K.R.
Am	Ammunition	Same	Amn.
AM	Morning	Same	Same
PM	Afternoon; also Provost Marshal	Same	Same
MP	Military Police	Same	Same
Pk	Pack (as pack artillery)	Same	
Prk	(Gun) park	Gun park	None
AWS	Aircraft & Warning Service		
AA	Antiaircraft	Same	
AAA	Antiaircraft artillery	Light Anti Aircraft	L.A.A.
		Heavy Anti Aircraft	H.A.A.
AT	Anti-tank	Same	A.Tk, or A/T
OPL	Outpost line	Same	None
MLR	Main line of resistance	Foremost Defended Localities	F.D.L.s
BRL	Battalion reserve line	None	
RRL	Regimental reserve line	None	
CWS	Chemical Warfare Service	Chemical Warfare, Royal Engineers	C.W.R.E.
Rd	Road	Same	Same
CR	Crossroads	Same	X Rds.
RJ	Road junction	Same	Rd. June.
DP	Distributing point (for supplies)	Supply Point	S.P.
OO	Ordnance officer (he isn't always a double cipher)	Same	Same
HE	High Explosive	Same	Same
Hwy	Highway	Main Road	
IP	Initial Point (for coordinating the beginning of a march)	Starting Point	
JA	Judge Advocate (the commander's lawyer)	Judge Advocate General	J.A.G.
LD	Line of departure	Starting Line	
L of C	Line of communication	Same	
T of Oprs	Theater of Operations	Same	None
Com Z	Communication Zone	None	
Z of I	Zone of the interior	None	
MSR	Main supply road	None	
MG	Machine gun	Same	Same
MI	Military Intelligence	Same	
T/O	Tables of Organization	War Establishments	W.E.
T/BA	Tables of Basic Allowances (of Equipment)	G 1098	
QM	Quartermaster	Same	Same
WD	War Department	Same	Same
AP	Aiming Point	Same	A. Pt.
	Angle of Site	Line/Angle of Sight	A. of S.
	Angle of Fall	Angle of Descent	
	Angle of Impact	Angle of Arrival	
	Rotating Band	Driving Band	
	Massed Fires	Concentrations	

As you know, traffic travels on the left side of the street; it is most confusing at times, especially when you are making a crossing at the intersection of two main thoroughfares. Your sense of directions blows sky high momentarily. Busses are dark inside at night. Stepping from a lighted lobby into the street is like binding up your eyes to blackness. If you think there are uniforms on the streets of American cities, wait till you get a load of London. I should guess that four out of every five men are in uniform and probably two out of every three women. British Home Guardsmen, regular troops, and Canadians all look pretty much alike. You can tell an American Army officer a mile away, as you can an Australian. You can tell an American enlisted man instantly by the odd shape of his gas mask. You will be pleased at the fine type of man you see wearing the uniform of the R.A.F.—the cream of the British Empire. You will be amused at the sight of some of the Scottish regiment uniforms: skimpy coats and plaid trousers, not kilts, although they are occasionally seen. All officers are saluted, regardless of nationality. You will soon get to know the red-topped cap of the Pole; the shoulders-back, toes-out, nose-in-the-sky walk of the regular Tommy, contrasted with the toe-in, head-slightly-down, determined walk of the Yank.

When I left, meals ordered in restaurants had been cut to three courses. You can have soup (pretty awful as a rule), a main course consisting of perhaps a small slice of veal, some potatoes, usually some Brussels sprouts (if I ever see one again I'll pass out), and a final course called a sweet which means dessert in American. But, it's rarely sweet—just a toothful to polish off the meal. In clubs you can't smoke in the dining room, everybody who can afford it drinks wine with meals, as it is like pulling teeth to get water, and the so-called beer is pretty bad stuff. It's known as bitter, or old, or mild, or some kind of ale. The general routine is "have one with me," then you have "the other half," then "the odd," and then "a binder," next a "final," and then you wind up with "one for the road." By that time you are ready for the road!

I was ready for the road, the road back to America, just about a month ago. Traffic on clippers is crowded, so I decided to take a chance on a freighter. It was a nice ship, as ready for action as any freighter can be, I should say. The First Officer aboard was a graduate of the naval gunnery school of Norway. (He hadn't seen his wife for three years, nor had the Captain seen his; they escaped to England but had to leave their wives behind. If you want to talk to one who hates the Nazis with as fine a hatred as you want to see, talk to a Norwegian.)

Americans are too prone to talk out of turn about war matters, so I won't describe the equipment of the ship in any detail. It is sufficient to say we had well-trained gun crews, all the life boats were slung with a clever batch of hitches which broke out with the slipping of one knot, the food was so rich it made me sick, we played deck shuffleboard in the full knowledge that any moment might bring a mine against our hull, and she was one of the best-kept ships on which I ever rode. Fog favored us substantially, and I must say as the son of a sailor, that I felt mighty funny several times standing well forward at night unable to see my hand in front of my face because of the darkness and fog, and realizing that I was jamming along at well over 15 knots—jamming into God knows what—other ships, icebergs, mines, anything that floats.

At home, the silliness of the newspapers irritated me first. Next in irritation was meeting too many men in responsible positions, usually commercial, who thought this war would be a pushover (it won't be). I see folks scrambling for jobs, when in England you are told what to do and you can't change that job, or even quit, without the permission of the wartime authorities. I had to keep a close tongue in my mouth at such little things as seeing folks waste pats of butter. I saw three plates of food but half eaten carried away from a compartment on the train between New York and Washington, and thought of the many friends I had in England who would have given an arm for what was left—a fried egg, half a slice of fine ham, a piece of well buttered toast, and a full dish of marmalade! They were throwing that away!

But it's good to be home. I can think back to seeing the first batch of Americans come ashore at Belfast—as clean and quiet a bunch as you ever saw; to the night I sat high on Shakespeare Cliff at Dover, watching the R.A.F. winging over, watching them hit the searchlights and the brilliant antiaircraft fire, watching the bright, white flame burst with the crash of bombs, feeling the earth shake beneath me; or to a dozen other things I hope we never see here. Thinking back is enough, though. It's pretty fine to be an American.

The British version of the German attitude:

"The Nordic race is man.
The rest, from Celt to Chink,
Black, yellow, white or tan,
Compose the Missing Link."

—RUSI *Journal*

WHY HITLER ATTACKED RUSSIA

Until the invasion of Russia on June 22, 1941, it appeared that Germany was pursuing assiduously the strategy of "one enemy at a time." She attempted, and with considerable success, to isolate her chosen victim, use all her force to destroy him, and then move on to the next objective. Yet, while Germany was still engaged against England, she suddenly attacked and brought into the lists against her another major enemy, Russia.

More than idle curiosity is served by the knowledge of why Germany attacked Russia. If we understand why the Nazis felt it necessary to attack Russia, we will comprehend the German situation and thus be better able to make our own decisions. Furthermore, the attack on Russia provides a case-study of the German military mind; knowledge of how our enemy thinks is especially valuable. It is well known, now, that the tactics and techniques used in the Battle of France were outlined years before the war in German military journals. A British officer, Lt. Col. de Watteville, in the October, 1940, *Army Quarterly* pointed out that in the pre-war standard German work on tank warfare is a description of an imaginary battle of August, 1940, which is practically a description of the actual battle which did take place in that year.

There is considerable evidence that the German General Staff did not believe that Russia would be an easy victim and, therefore, that the reasons impelling Germany to attack must have been very powerful. Prior to the war, the German General Staff advised Hitler that Germany's chances for victory in a general war depended on keeping Russia neutral. According to the official *French Yellow Book*, the French Ambassador at Berlin, M. Coulondre, reported to his Foreign Office on June 1, 1939, that he had reliable information from a senior official of the Wilhelmstrasse that:

The Fuhrer has asked General Keitel, chief of the General Staff, and General von Brauchitsch, C.-in-C. of the Army, whether in their opinion, under existing conditions, an armed conflict would turn in favour of Germany. Both replied that much depended on whether Russia remained neutral or not. In the first case General Keitel replied "Yes" and General von Brauchitsch (whose opinion has greater value) replied "Probably." Both declared that, if Germany had to fight against Russia, she would not have much chance of winning.

Proof of the high estimate put on Russian military power by the Germans can be deduced from the heavy price which was paid to keep Russia neutral. The German Army had to turn over to the Red a large part of Poland's western territories. The Reichswehr had to stand by while Russia marched into the Baltic states and transformed them from an easy German highway to Leningrad into fortified Russian defense-bulwarks. When Russia took over Hangoe from Finland in the Russo-Finnish war and thus barred the sea route to Leningrad, the Germans again had to acquiesce, although the Russians were thus improving their strategic position against future German pressure.

The German General Staff clearly understood that the Russians were strengthening themselves against possible German attack. Hitler said in his June 22, 1941, speech that when Russia was acquiring the Baltic states and the territory from Finland she motivated these actions by the fact that she had to forestall an outside menace:

This could only be meant to apply to Germany, for no other power could even gain entrance into the Baltic area, let alone go to war there.

Colonel Barrows of the U. S. Army similarly pointed out in the October, 1941, *U. S. Army Command and General Staff School Military Review* that Russian territorial gains in the first years of the war were all designed to form a buffer strip to absorb German blows while Russian mobilization was completed.

It is not often remembered that the German Army was probably in a better position to estimate the correct strength of the Russian Army than were any other observers. German generals developed their theories of mechanized warfare in cooperation with the Russians, prior to the taking of power by Hitler. Before 1933 the Reichswehr officers spent long tours of duty with the Russian Army. As for the German air force, here is what a British air magazine* has to say:

During 1937 and 1938, long extracts from . . . (the Russian Regulation for the employment of the air force in the field,

**The Acroplane*, July 18, 1941; Russian Air Power: The Strategic Plan.

The Real Significance of the German Attack

By LT. ANDREW M. KAMARCK, FA

published in 1935) were published by German military and aeronautical journals together with the comments of Russian experts. The curriculum of the German Air Warfare Academy contains a number of lectures on the Regulation, which was described as the first of its kind to lay down the principles for the use of the air weapon.

A survey of the German air operations of the present war suggests that most of them have been modelled on the Russian Regulation whether they were independent air force operations or collaboration with the ground forces. This is not surprising if one keeps in mind that most of the prominent Luftwaffe generals . . . learnt their first lessons in aerial warfare in Russia before 1933, when the German and and Russian High Commands worked closely together on building up their armed forces.

The second part of the Regulation is the more interesting. The great battles of this war launched by the Germans seem to have been modelled on it; and examples of its operation are the break-through at Sedan and the German thrust towards the Channel ports.

It therefore is evident that the German General Staff was fully aware that the Red Army was a formidable opponent. Carried away by their easy victories in Poland and France, the Nazis may have under-rated the Russian Army, but they certainly never believed that it would be an easy mark. The German propaganda, peddled so effectively abroad, that "the German Army could go through the Russian Army like a knife through butter," of course did play an important role even though the Germans themselves knew better. This propaganda depreciated the estimate the democracies had of the alliance-value of Russia and probably delayed by months the sending of supplies to the Russian Armies.

Two lengths of channel iron enable mechanized troops to cross although the bridge has been blasted. (*Dever from Black Star*)

Any explanation for the German invasion based on the premise that Hitler is a psychopathic case must be discarded. Hitler may well be mentally unbalanced, but no one has yet been able to demonstrate that the German conduct of the war has been governed by other than sound military grounds—and the invasion of Russia is not an exception.

The most generally accepted theory for the attack is that Germany attacked Russia to secure needed supplies. This theory is simple, appealing, and, unquestionably, is part of the truth. Yet the desire to secure Russian supplies can not be, by any means, the whole story of the motives behind the Nazi assault.

Hitler was receiving some supplies from Russia prior to the invasion. It was not much, we now know, but still it was something. At the same time, some strategic materials did trickle through from the Far East via Japan and the Trans-Siberian. An invasion of Russia would cut off these supplies for at least some months. The hope that Russian resources could be secured by invasion was at best a risky one.

The German General Staff knew from experience the Russian tactics of fighting and their scorched-earth policy: this is not the first time the Germans have invaded Russia. In 1918 the German Army took the Ukraine with very little fighting, as a result of the collapse of the old Czarist state; even so, grain had to be imported from Central Europe to feed the army of occupation. In 1941, the Germans knew that there was no German fifth column alive in Russia. That they also knew that they could expect no popular support of any kind is shown by the absence of attempts to set up puppet governments in occupied territories.

The German experience with the occupied countries of western Europe was no inducement to take on new territories to administer. Because of shortage of manpower, it is clear that the Nazis have failed to organize their occupied territories successfully. As the war has continued and resistance of the conquered peoples has grown, the contribution of occupied Europe to the German war effort has been decreasing rather than increasing.

Not only was there the risk of losing the imports from Russia without gaining any new resources, but the largescale fighting necessary would constitute a heavy drain on German resources and reserves. The German Army for a Russian campaign had to be at least twice as large as the army used in the French campaign (300 divisions as against 100-plus in the west). German production would unquestionably suffer from lack of manpower. In the Balkans, too, mobilization of Romanian, Hungarian, and Bulgarian soldiers would deplete the working forces and reduce production in the German granary of the Balkans.

If the primary motivation of the German invasion of Russia was to secure the Russian resources, and since:

(a) the Russian campaign has been a tremendous drain on German resources, and (b) no substantial gain in resources has been derived from Russia, then the German Army's supplies must be well - nigh exhausted. This conclusion, while pleasing, is a fit companion to and as dangerous as the Chamberlain-Daladier theory of 1939-40 that Germany had a bad supply situation and could, therefore, be whipped by an economic blockade alone and no fighting would be necessary. It is true that now in the summer of 1942, the German supply situation is arriving at the point where one can begin to characterize it as "bad." But this deterioration is mainly the result of the war in Russia which has drained reserves, resources, and men off to the East to be consumed on the Russian front. Practically all students of the German economy agree that had it not been for the Russian war, Germany could stand the war almost indefinitely without any unbearable hardships. Let us have no illusions on this point.

Observation is well organized in the German Army in Russia. The German caption reads: "All observed details are reported by 'phone of every B-position to the commanding officer's observation post of the division. Here the entire scenery of the situation forms herself which is deciding for the future operations." Possibly this can be interpreted as follows: "The division OP. Here are received, also, reports from other OP's. Thus the various pieces of the puzzle are fitted together. This is most useful to the commander in formulating plans and making decisions relative to future operations." (*Dever from Black Star*)

From the record, it is clear that Hitler must have had some powerful motive other than the desire to secure Russian resources to impel him to bring such a dangerous enemy into the field against Germany. This second and probably more important reason why Germany attacked Russia was carefully explained by Hitler in his speech on the morning of the invasion:

While our soldiers from May 10, 1940, had been breaking Franco-British power in the west, Russian military development on our eastern frontier was being continued to a more and more menacing extent.

From August, 1940, I therefore considered it to be in the interest of the Reich no longer to permit our eastern provinces, which moreover had already been laid waste so often, to remain unprotected in the face of this tremendous concentration of Bolshevik divisions.

Thus there resulted British-Soviet Russian cooperation, intended mainly at the tying-up of such powerful forces in the East that radical conclusion of the war in the West, particularly as regards aircraft, could no longer be vouched for by the German High Command.

In other words, Hitler was invading Russia not to create a new front against himself, but to eliminate an already existing second front. Churchill's analysis of the causes of the German attack on Russia is similar. On the day of the German invasion, Churchill unhesitatingly ranged England on the side of the Soviet Union, giving his analysis of the reasons for the German action in the following words:

. . . when I spoke a few minutes ago of Hitler's blood lust and the hateful appetites which have impelled or lured him on his Russian adventure. I said there was one deeper motive behind his outrage. He wishes to destroy the Russian power because he hopes that *if he succeeds in this he will be able to bring back the main strength of his army and air force from the cast* and hurl it upon this island, which he knows he must conquer or suffer the penalty of his crimes.*

His invasion of Russia is no more than a prelude to an attempted invasion of the British Isles. He hopes no doubt that all this may be accomplished before the winter comes, and that he can overwhelm Great Britain before the fleets and air power of the United States will intervene; he hopes that he may once again repeat upon a greater scale than ever before that process of destroying his enemies one by one, by which he has so long thrived and prospered, and that then the scene will be clear for the final act without which all his conquests would be in vain; namely, the subjugation of the Western Hemisphere to his will and to his system.

The Russian danger is, therefore, our danger and the danger of the United States. . . .

Churchill plainly pointed out in this speech that Hitler was attacking the Soviet Union to eliminate Russian military power in order to be free to concentrate upon and destroy his British enemy.

The analysis that Hitler attacked Russia in order to eliminate an already existing front means, of course, that Hitler has had a war on two fronts from the beginning of World War II. Only a few penetrating military analysts such as Captain W. D. Puleston of the U. S. Navy recognized prior to June 22, 1941, this salient fact

*My emphasis.—A. M. K.

as a characteristic of the present war. But when we look back over the history of the war since September 1, 1939, it becomes evident that only this analysis brings out the significance of developments and completely explains what otherwise appear to be incomprehensible events.

If one now applies the Clausewitz definition of war as "the continuation of policy by means of force," the German attack on Russia is seen to be merely a violent continuation of the silent struggle which had been going on by diplomatic means since the beginning of the war.

Actually, the history of this war has not differed markedly from the history of the last one, despite surface appearances. Germany has had the same problem in both wars (enemies on two fronts) and has attempted to solve it in somewhat similar manner. (The Polish, Norwegian and Balkan campaigns in this war, like the Mesopotamia and Salonika campaigns of the last, while not unimportant are subsidiary to the main outlines of the strategic picture.) In 1914 and in 1939 it was clear to the German General Staff that victory could be won quickest on the western front. While the enemy in the west was being defeated, it was planned to purchase the necessary time by selling space to the enemy in the East. Thus, in 1914 the Germans were ready to give up East Prussia, if necessary, while in 1939-40 they gave up half of Poland, the Baltic States, and strategic positions in Finland, Bessarabia, and northern Bukovina.

Note how Goering describes these Russian acquisitions in military terms in his speech of May 20, 1942:

Slowly the (Russian) columns penetrated, first in the north against Finland. In the south they took over Rumanian positions. And they would have pushed on farther and farther to the north and to the south, on the Balkans, over Scandinavia, in order then in these pincers to give the final blow to Germany, which was involved in a hard struggle against the other powers.

In 1914 the Battle of the Marne, which should have knocked out the French, failed partly because three Army Corps were withdrawn from France to meet the Russian invasion in the East. In 1940, the Germans succeeded in knocking out the French before the Russians could influence the battle, partly because the tempo was so fast, partly because the Russians overestimated French resistance, and partly because the hang-over of Munich had so soured Russian relations with the French that there was no joint plan of action. After the defeat of France the Germans made ready to attack England, which was practically disarmed after Dunkerque: for example, it has been revealed that after Dunkerque there were less than 100 tanks in the whole island of Britain, and seventy destroyers were out of action as a result of damages during the evacuation.

At this point, when the British were preparing to sell their lives as dearly as possible, an informal alliance sprang into action which has only recently been formally recognized. Both the United States and the Soviet Union felt their interests were bound up with the continued resistance of the fortress of Britain, and both gave aid. The United States poured weapons into the British Isles to arm the British, the transfer of 50 destroyers being only the most spectacular aspect of the assistance given. At the same time the Russians made an armed demonstration in the East to draw as large German forces as possible away from the Channel coast. As Hitler stated, "Thus there resulted British-Soviet Russian cooperation, intended mainly at the tying up of such powerful forces in the East that radical conclusion of the war in the West, particularly as regards aircraft, could no longer be vouched for by the German high command."

The Germans tried, nevertheless, to win the Battle of Britain with the remaining available portion of their air force. They came very close to success and the British had to rob their flying schools for pilots to beat back the German threat, but the skill and the courage of the British had the edge and won the Battle of Britain. There can be no doubt now but that the Battle of Britain was the Battle of the Marne of this war, and that its outcome was shaped by some similar strategic forces.

In the following winter of 1940-41, Hitler attempted to conquer the fortress of Britain by cutting her supply-lines by air, submarine, and surface action. This attempt failed, due to the vigorous British defense and the assistance of the United States. When the United States on April 30, 1941, announced it would patrol the American defense zones in the western Atlantic, the Germans had the choice of crippling their submarine campaign or risking bringing the United States into the war. In 1917, the risk had been taken; in 1941, the Germans balked. Hitler admitted this openly last April 26: "I have already previously stated that the paralyzing of German submarine activities in the past year was solely due to our efforts to avoid any conflict with the United States." (For a more complete discussion of this phase of the war, see my article, "The Unknown British-American Victory" in the August, 1942, issue of the *United States Naval Institute Proceedings*.)

It runs counter to all German military thinking to remain passive: something had to be done to bring the war to a decision. Only one way out was open: an attempt would have to be made to eliminate the Russian front.

An attack on Russia possessed many attractions for the Nazis. They hoped they could use the Communist bogey-man again to cause confusion in the democratic camp. The bulk of the German Army could be concentrated on Russia. The British had been pushed back across the Channel and, for the time being, it was likely that they would make no attempt to re-cross and open up a new land front in the West. The old Munich sleight-of-hand might be repeated to neutralize the British by diplomatic means while the Russians were being crushed. Hess was sacrificed in the experiment. Even

though this attempt failed, the German General Staff hoped to destroy the Russian Army before Britain was strong enough to invade the continent. Once the Russian front was eliminated, German military forces would be free to swing around and attack England with all their concentrated power.

The Nazi invasion of Russia reveals as in a lightning flash the dilemma confronting Hitler. That is, Germany is conducting a two-front war with a one-front army and a one-front air force. When the German military forces were on the offensive in the West, they could do nothing in the East. Last year, when the German military forces were on the offensive in the East, they were forced to remain passive in the West.

The German attack on the Soviet Union was a desperate attempt by the Nazis to escape from their terrible predicament by eliminating one front in a surprise offensive. The failure of the Reichswehr to eliminate the Russian Army last year before the Western Allies were ready to take the offensive means that the German dilemma has become insoluble.

Hitler can no longer win this war, although we can still defeat ourselves by a passive strategy. If we pursue the correct aggressive strategy, Hitler's fate is sealed. It is obvious what we must do: when Hitler attacks in the East, we must strike him in the rear in the West; when Hitler is forced to turn around to meet our offensive in the West, our Russian ally must attack in the East as she did this last winter. Under this Allied strategy, the German problem is hopeless and admits of no possible solution.

"I've heard he's an old artillery officer."

What to take

Officers of units bound for overseas duty receive lists of needed clothing and equipment on reaching their staging areas. Many, however, want to give the matter thought and attention beforehand, and possibly start assembling some items to minimize the last-minute rush. According to the *Bulletin* of The Adjutant General's School, the following is the list currently distributed in the staging areas; although subject to minor changes, it is an excellent guide.

CLOTHING (Must be bought)	On person for all	In personal baggage by air	By express and water for air passengers	Personal baggage for water passengers	Late freight for all*	Minimum total
Belt, cloth waist or Sam Brown	1					1
Blouse, woolen	1					1
Underwear, cotton	1	2	9	11		12
Underwear, woolen			2	2		2
Handkerchiefs	2	10	12	22		24
Jacket, field		1		1		1
Overcoat or trench coat with removable lining	1					1
Bathrobe, cotton			1	1		1
Pajamas		2		2		2
Slippers		1		1		1
Shirts, khaki	1	5	6	11		12
Shirts, woolen		1	1	2		2
Trousers, woolen	1		1	1		2
Trousers, khaki		4	2	6		6
Socks, cotton, tan	1	5	6	11		12
Socks, woolen					4	4
Ties, black	1		1	1		2
Ties, tan		2		2		2
Raincoat		1		1		1
Muffler, wool			1	1		1
Cap (overseas, wool)	1					1
Cap (overseas, cotton)		1	1	2		2
Gloves, wool	1		1	2		2
Insignia, sets	1	2	1	3		4
Leggings		1	1	2		2
Shoes, high, tan, with 2 extra pr. laces	1	1	1	2		3
Shoes, low, tan, with 2 extra pr. laces			1	1		1
Overshoes, high, rubber, arctic			1	1		1
Boots, rubber, hip (optional)			1	1		1
EQUIPMENT (Articles of issue)						
Bag, musette-bag field canvas	1					1
Belt, web	1					1
Canteen, cup & cover	1					1
Meat can, knife, fork, spoon	1					1
Wash basin, folding canvas			1	1		1
Case, dispatch	1					1
Helmet, trench		1		1		1
Tags, identification	2					2
Mask, gas	1					1
Pistol, .45	1					1
Magazines, filled	3					3
Ammunition (ball pistol cal. .45)	21					21
Suspenders, officers' type	1					1
Pouch, first aid	1					1
Watch	1					1
Compass	1					1
Field message book	1	1	1	2		2
Packet, first aid	1					1

CLOTHING (Must be bought)	On person for all	In personal baggage by air	By express and water for air passengers	Personal baggage for water passengers Late freight for all*	Minimum total
MISCELLANEOUS (Must be bought)					
Locker trunk			2	2	2
Suitcase or zipper packs		1		1	1
Books—professional, etc.					
Maps					
Polaroid sun glasses	1				1
Brush, shoe			1	1	1
Brush, clothing			1	1	1
Cleaning materials (shoe and brass)			1	1	1
Flashlight, 2-cell comp. w/ex. bat. & blb.	1				1
Knife, pocket	1				1
Cigars & cigarettes (cartons or boxes)		1		1	11	12
Lighter	1				1
Fluid and flints			1	1	1
Matches, packages of 12		1	5	6	6
Whistle	1				1
Mirror (steel)		1		1	1
Comb & Brush		1		1	1
Repair kit (housewife)		1		1	1
Shaving equipment		1		1	1
Razor blades		10	100	100	100	200
Soap in container		1		1	1
Towel, face		1	6	7	12	19
Towel, bath		1	5	6	6
Toilet preparations (misc. units: toothbrush, etc.)		1	1	2	12	14
Medicines (misc. units)		1		1	6	7
Nail file		1		1	1
Fountain pen & pencil	1				1
Articles of Issue					
Tents, shelter halves—poles & pins			2	2	2
Blankets		1	2	3	3
Sleeping bag and/or bed rolls			1	1	1
Bar, mosquito			1	1	1
Headnet, mosquito			1	1	1

*This allowance to be ½ weights ind. Par. 3 Chg. C AR 30-969

MORE ON THE DOL-LUC MOUNT

The August JOURNAL (page 645) gave details for attaching a rifle to the 105-mm. howitzer for subcaliber practice. Lt. Col. W. S. Nye, G-3 of one of our new divisions, writes:

We were particularly interested in the subcaliber mount for the 105-how. I can testify that the subcaliber device (.30- or .22-cal.) for a howitzer is valuable for indirect fire (the author of your article didn't know). It is necessary to use a sloping bank for the impact area so as to get your factors to work out approximately as they do for curved trajectories. The main drawback is that there is very little disperson, the factors work too well, and the firing is a little too easy. However, it surely gives wonderful drill to an officer, who can fire hundreds of rounds and perfect himself in the routine mechanics of conduct of fire.

PERSONAL PROBLEMS: *Iceland*

By Major John W. Haines, FA

Desolate lava valleys of western Iceland are accessible only by pony track. These R.A.F. engineers are on a salvage mission. (*Air Ministry Photo*)

Iceland itself isn't too bad as to cold weather—but there is lots of rain (frequently on very short notice), high wind, and mud. Rubber and wind-proof clothes are more to be desired than an excess amount of fur, which is not usually needed. The hardest job when leaving your tent is to figure just what to wear or take; the weather can change completely several times during the day, so luck is a big factor in staying comfortable.

The two most disturbing factors are the lack of exercise (on many jobs) and recreation. A man with a hobby such as reading or writing is fortunate and had better come well equipped. Photo bugs are out of luck—cameras are 100% verboten. The principal exercise is hiking and swimming at the public pool at R-vik. Anyone bringing private firearms must devote great care and tenderness to keep them in shape; any oil, etc., required had better be brought along. Pipe smokers had better come well equipped, also. There is little use bringing skates and skating clothing for duty in most posts of the island. That last is the most difficult factor in deciding what to bring—an isolated post with troops is greatly different from staff duty at headquarters. Remember that anything not issue is expensive and scarce (except candy, cigarettes, etc.), and it takes two months to get anything on order from home.

Comfortable shoes, such as issue or similar, including one pair with hobnails, are an absolute necessity. One can hardly get along with less than three pairs—they take quite a beating. Personally, I have not yet worn wool underwear, though the weather has been quite cold at times, but in other parts of the country it is a necessity, and most people wear it (usually light weight ¾ length) here.

The climate is not what one might expect it to be. It is very damp, and I mean damp, with rains and overcast skies being the general rule, although the north and east are dryer and colder. Very occasionally there is a clear day. Winds are strong and occur frequently, at times reaching gales—the strongest wind we have had so far reached a steady gale of 90 miles per hour with gusts as high as 133. The country is volcanic and void of trees except for a few stunted ones in the north and northeast. The interior is not inhabited and has a number of large glaciers. So much for a general picture of the country.

As to personal equipment and clothing, there is little to add to that prescribed in Section III, Cir. No. 11, WD, Jan. 15, 1942. Boots and breeches are not worn—we wear woolen trousers, leggins, shirts, field jackets, overcoats, sheep-lined coats, parkas, fur caps, raincoats, etc., depending on the weather. At dinner we wear blouses and slacks. Sleeping bags are desirable, and are issued to each officer and most of the men if they don't have their own.

USEFUL ITEMS

1. CLOTHING

a. *Uniform and Equipment*

NOT ALLOWED

Campaign hat
Service cap
Breeches
Leather boots

Identification marks or distinctive insignia not permitted, i.e., shoulder patches, regimental insignia, regimental numbers on arm or service insignia, etc.

OPTIONAL

Low shoes
Field jacket (useful)
Leather gloves
Wool OD gloves
Rubber boots

Leather jackets, knitted sweaters not permitted as outer garments—light warm sweaters are very useful underneath.

REQUIRED

Garrison cap (overseas cap)
Shirts, OD, wool
High shoes
Canvas leggins
Web belt, w/suspenders (issued)
Overcoat, short or long
Blouse

Can be drawn from Boston Quartermaster Depot (see later note):

Outer winter clothing (wool lined cap, alpaca lined parka, wool lined mittens)
Rubberized clothing (sou-wester, parka, breeches)
Ski goggles, polarized (can be worn over most spectacles)
Overshoes (galoshes, heavy)
Sleeping bag

Bring plenty of plain insignia (arm and rank plus rank insignia of next higher grade if there is any likelihood of a promotion), good ties, buttons for shirts, etc. (all hard to get).

b. *Other clothing and equipment*.

Civilian clothes are not permitted. It is advisable to bring rubber overshoes, lighter in weight than issue overshoes (which are very heavy galoshes); sweaters; wool socks, both heavy and light; OD muffler; and any needed light wool underwear (QM issue is too heavy for most seasons and occupations).

Members of this R.A.F. Ski Club wear a variety of clothing . . .

2. OTHER GENERAL EQUIPMENT

a. *Sports Equipment*

Winter sports equipment (skies and snowshoes) and bathing trunks might be useful. There is duck shooting and fishing (especially for salmon) in some places. Climate is hard on guns, unless well protected by fleece-lined

. . . for some May exercise near Reykjacik. (*Air Ministry Photos*)

holsters, etc., and well oiled. No golf, tennis, or the like on the island.

b. *Miscellaneous*

Book supply limited, except FM's and other texts. People who like to read should bring books with them.

Cameras absolutely prohibited.

Pipe tobacco scarce—cigarettes cheap and plentiful.

Portable radios useful—good broadcasts from British Isles.

Animals of all kinds prohibited.

Special toilet articles (such as Kleenex, Mentholatum, hair tonic) scarce and difficult to obtain.

3. PRIOR ARRANGEMENTS

a. *Winter and Rubberized Clothing*

Arrange if possible to draw it from QM in Boston and have it shipped to PE—it will just fill an ordinary footlocker without tray. Winter cap, parka, and mittens are useful on the boat. Clothing and Equipage Division, OQMG, will requisition this equipment.

b. *Finance*

Needed on arrival:

Transcript of pay a/c.

Orders to active duty and extension thereof (for Reserve officers).

Longevity statement (statement of service).

Statement of release of quarters, from last post (if post was not Washington or other large city).

Transfer orders.

Receipt for any mess bills paid on ship.

(All copies should be made prior to arrival—local facilities limited.)

Prior to departure:

Allotments (restriction on base pay and longevity only does not apply).

10% Foreign Service Pay on base pay only from day of sailing.

c. Baggage

Usually only one footlocker plus hand baggage allowed in a stateroom, the rest goes into hold for duration of trip (very seldom any "baggage room"). "Hand baggage" might well be a Val-a-Pak (which is very handy in Iceland) or suitcase, and musette bag. It is recommended that the footlocker contain a plentiful supply of socks, shirts, underwear, handkerchiefs, etc., since voyage might (probably will) be protracted and laundry service of course non-existent.

Electric razor is handy—electric current likely to be more readily available than shaving water on the ship.

It is also recommended that the footlocker contain a few books or playing cards or other recreational material, and the winter parka, mittens, and cap.

4. GENERAL DOPE

There is no official calling in Iceland—calling cards unnecessary.

There are no military tailors available, so blouses should be brought and any other tailored clothing should be relied on to last until more can be ordered from the U. S. It takes two months to get anything from the U. S.

Cable address: through War Department if urgent—or Western Union.

Blouses and slacks (pink or OD) usually worn for evening mess, with cloth belt (must be brought from U. S.) or no belt. A Sam Browne is almost never seen.

A pair of shoe-soled fleece-lined slippers is an asset.

Laundry and dry-cleaning take about ten days to return.

"Hey, what country is this?"

PERIMETERS in PARAGRAPHS

By Colonel Conrad H. Lanza

BURMA

Early in April, 1942, British and Chinese forces held a line extending east and west through Prome and Toungoo. The British covered the Irrawaddy valley with the Imperial and India Divisions, the Chinese the Sittang Valley with their 6th Army.

The British had been fighting since January and were battle worn. After every engagement they had retreated; their morale had suffered. When they lost Rangoon on March 8th they lost their base, and thereafter could obtain no more supplies and ammunition other than limited quantities sent by air from India. Burma south of the British line contains the great rice areas which are the most productive in the world, but the country to the north as far as Mandalay was poor, sparsely settled, producing oil, peanuts, and cotton, little food, and no military supplies other than oil.

British headquarters at Mandalay decided to withdraw the troops to the vicinity of that city. There was another food zone north of Mandalay, and it would simplify supply problems to have the troops nearby; it would also be better for the Chinese troops, whose line of communications extended through Manadalay and Lashio into China.

The British were commanded by General Harold R. L. G. Alexander, a four-star general recently promoted who considered himself by reason of seniority as commanding all United Nations' troops in Burma. The Chinese "army" had about 15,000 men but little artillery, no tanks, no mechanized equipment, and few technical services. The "army" as a combat unit was inferior to a Japanese infantry division.

The Japanese were believed to have three divisions in Burma, of which two were in line and one in corps reserve near Rangoon. All divisions were mechanized, and were supported by a strong air force and gunboats on the Irrawaddy River. The Allies had no gunboats and but few planes.

The territory to be traversed in the proposed retreat was generally barren and nearly treeless, covered with scrub about two to two and a half feet high which gave cover to deployed infantry but none to vehicles and guns. Main roads were not near rivers and there was little water elsewhere. Roads were unpaved and dusty; in the hot, tropical sun marches were exhausting. Through this inhospitable country the retreat started, properly covered by rear guards. As expected, the enemy followed so closely there were daily rear-guard actions. The total distance to be covered was around 400 miles.

On April 3d the Japanese bombed Mandalay in a severe four-hour attack. Great fires broke out, depots (especially of food) were destroyed, and about 2,000 people were killed and 6,000 wounded. Mandalay was left a city of crumpled palaces and wrecked bazaars. In addition to being military headquarters, it was also the capital with the usual administration centers; civilian employees were mostly natives, who considered the bombing ample excuse for quitting their jobs and fled, thus disrupting all official business. Similarly the railroad employees and truck drivers left their posts, so for some time it was impossible to forward supplies to the troops, still far to the south. Large numbers of citizens jammed the roads, fleeing on bicycles, buffalo carts, automobiles, on foot, any way at all. Some were infected with cholera and other communicable diseases, or wounded and in need of care.

On April 5th Generalissimo and Mrs. Chiang Kai-Chek arrived at Lashio by plane. The General and his party proceeded next morning to Maymyo, about 40 miles north of Mandalay, where the American Baptist mission and British Country Club were operating as usual. A conference was held between General Chiang, Lieut. Gen. Joseph W. Stilwell of the U. S. Army, General Alexander commanding the British forces, and various Chinese generals; Mme. Chiang participated as interpreter.

General Chiang announced that he was there in his capacity of Generalissimo, to which office he had been appointed on January 3d by President Roosevelt and Prime Minister Churchill, sitting jointly in Washington. According to the Washington communique issued at that time, his authority extended over

"all land and air forces of the United Nations which are now, or may in the future be, operating in the Chinese theater, including initially such portions of Indo-China and Thailand as may become available to troops of the United Nations."

He had heard that some, particularly his own Chinese generals, were in doubt as to who was in command in Burma—Stilwell or Alexander. He now wished to make it plain that he was *Generalissimo*, that he and nobody else was in command. He had assigned General Stilwell to command the Chinese troops in Burma, reporting directly to him, and he similarly looked upon General Alexander to command the British troops. It was agreed that the British should operate on the west part of the front, the Chinese on the east. Arrangements were further made to make Chinese detachments available to reopen the railroad, temporarily halted by lack of employees. Somehow, possibly through the "fifth column," the Japanese decided to bomb Maymyo that very afternoon; the conference broke up, its members rushing for the golf course to take advantage of its cover. No important persons were injured, but among the humble people 40 were killed and 40 injured.

British Newsreel

During the day Mrs. Chiang Kai-Chek drove to Mandalay to see the ruins of the now nearly-deserted city. It was not a pleasant sight, for the dead were still in the streets; it was contrary to native religious ideas to bury the dead except by special castes, not now to be found. In the great heat, sanitary conditions were bad.

Next morning General Chiang and his party returned to Lashio. Just as they arrived, so did reliable information that the enemy air force was coming north. More "fifth column" stuff. There being no reason to stay longer at Lashio, General and Mrs. Chiang promptly disappeared over the high mountains to the north. The local staff just had time to reach cover in the adjacent hills before the Japanese planes duly arrived and savagely bombed the town.

Thereafter the Chinese and British armies operated in liaison. General Alexander frequently complained that he was unable to find out what the Chinese army was doing, except by reading the newspapers publishing the Chungking communiques. General Stilwell reported daily to Chungking, and General Alexander to superior British authority.

Until April 16th the retreat of British and Chinese forces proceeded without special incident. The British were then approaching Yenangyaung on the Irrawaddy and the Chinese were across the mountains in the Sittang valley on about the same line. They were in the oil country, and in accordance with prescribed "scorched earth" policy demolition details were in Yenangyuang that afternoon to destroy the power plant, oil wells, pumps, and similar objectives. One of the last places scheduled to be demolished was the ice plant, north of the town; when the detail approached, it was fired on by Japs in the plant. How they got there nobody knew, but they were there! Patrols were sent out and discovered a line of hostile troops stretching east and west across the only two roads leading north from Yenangyuang, on the far side of a stream flowing into the Irrawaddy; attempts to approach the enemy met strong machine gun fire. The retreat was at once stopped, and the commanding general notified of the situation. Night was falling.

The general opinion was that the enemy had circled around the British on both flanks, but later it appeared that he had arrived by boat and had also landed troops on the west side of the Irrawaddy. The British found Japanese to the south, west, and north; there were neither roads nor trails leading east, so every exit was in enemy hands. The CG decided to wait until morning before making any decision. The main body was turned off south of Yenangyuang, and billeting areas assigned for the night.

The troops had marched 25 miles that day under a blazing sun in waterless country. They were exhausted and considerably mixed up, trains, artillery, infantry, animals. Everyone was covered with dust. The men were crying aloud for water. The rear guard had had some wounded, and no transportation for these.

On the morning of the 17th the CG decided to break through to the north. Reconnaissances were ordered to locate the enemy's exact position and best lines of approach thereto. There were oil derricks all through this country, and in some of them the Japs had OP's. The country was covered with the usual low scrub, which gave no cover to the artillery or to troop movements. Deep dust everywhere. No water, and very, very hot. Reconnaissance parties reported that the enemy had dug in along the far bank of the Piu Chang, where he had a strong line with numerous machine guns and mortars; prospects of an attack were not so good.

An SOS was sent to the Chinese in the Sittang valley to come and attack the enemy on the following morning from beyond his position, driving south. At the same hour the British would attack from the south. The Chinese expressed misgivings that the British troops would mistake them for the enemy should they come; on being assured that this would certainly be avoided, they agreed

to come. British officers explained to the infantry how to tell a Chinaman from a Jap; all had the plan explained, and all were cautioned to be on the lookout for their China comrades.

During the day enemy planes harassed the British frequently without air opposition, so in the absence of cover the artillery and trains had to move constantly to avoid destruction. It was very tiring. Water was available from the river, but as the supply line was cut no rations arrived. A reduced rice ration was all G-4 could issue. The last ammunition was issued. Some ravines leading to the Irrawaddy were found to offer some cover, and in the afternoon the troops crowded into them; when the movement was ordered, tanks, guns, trains, men, animals all rushed in at once, choking with dust, suffocating from the heat.

On the 18th, troops formed before dawn for the breakthrough to the north; the usual rear guard kept off the enemy from the south. If the attack was successful, the trains would rush through to the north, followed by the combat elements in usual rear-guard formation.

Nothing happened during the entire morning. The deployed troops sweltered in the broiling sun and exhausted the water in their canteens, but no Chinese appeared. Finally word came that the Chinese would be ready at noon; they requested some sign that the British would support their attack. So promptly at noon the artillery fired a five-minute preparation. Due to shortage of ammunition it could not last longer, but nothing at all then happened; everybody waited for someone else. At 12:35 PM Chinese machine guns and infantry mortars opened fire, whereupon the British artillery resumed fire. Soon the British attack started, the soldiers dog tired, out of water, exhausted. No progress. At 1:30 the attack was discontinued and the tanks were ordered to start a new attack going over a little trail to the east; infantry were to follow. No one knew where the trail went but it was headed in the right direction to lead around the enemy's left.

This attack was not ready until 4:00 PM. Once more the artillery fired a preparation against supposed locations of enemy machine guns and mortars. The tanks got away, infantry jeeps following at a reasonable distance. The tanks dashed down slopes to the small stream, found little opposition, got across, and swung up on the far side to a small plateau—where the trail ended! The trains had been waiting all day and when they saw that the tanks and jeeps had apparently broken through they followed. Soon the small plateau became jammed with trucks, bull carts, Scotch infantry, batteries, Indian troops, field hospitals, trains. Incidentally it was now found that the enemy was encircling the plateau.

The senior officer present, a brigadier, consulted with the chief of staff who had gone forward; they decided it was too late to break through today, and the troops were ordered back to their billets. The CG radioed to Mandalay, "Position desperate," and General Alexander replied that the attack to break through must be renewed in the morning, and that not only the troops but the trains must be saved. The troops got next to no food this night. There was little ammunition left. It was found that the enemy was being reinforced by a stream of gunboats and steel barges operating on the Irrawaddy.

Next morning, the 19th, the agreed plan was that the Chinese would attack at 4:00 AM going south, following the two roads as axes. The British were to follow the same roads, but going north and starting at 6:00 AM. Everybody was late. The Chinese attack started at 6:10 and could of course be heard by the British, who started their attack at 7:00. Once more the tanks swept forward along the two roads, to find that the Japanese now had light artillery. With OP's in oil derricks, it stopped the tanks, and machine guns and snipers (also 'way up in derrick tops) took toll of the infantry. Remember, there was no cover except the two-foot scrub.

The last food had been eaten for a meager breakfast. Water in canteens was becoming exhausted. It was dreadfully hot—no shade of course. A new attack was ordered for 9:00 AM, and this time the tanks got across the small stream but were then promptly put out by enemy artillery. As this could not be seen from the south side, the trains thinking the way had been opened dashed forward into the stream. Japanese mortars fired

British Press Service

into the column. Tanks, ambulances, trucks, became blazing wrecks, and the road was now more blocked than ever.

By 11:00 o'clock the attack had failed. Men were panting. Someone noted a pipe line across the battlefield coming from oil wells. It was presumed to contain oil, but a genius took a chance and fired his rifle into it. Water gushed out immediately in a strong stream. Details were made, new holes shot into the pipe, canteens refilled. The day had been saved.

Around noon the Chinese attack started once more. It was now decided to abandon the roads and try again that old trail to the right. The Royal Yorkshire and the Enniskilling Infantry were properly deployed this time; they started off, and as before they reached the small stream without opposition. Instead of continuing on up to the plateau, the commander changed direction nearly 90° to the left and headed for what he believed from the firing was the Chinese left. He made it. The way out had been found, and the British lost no time in escaping the trap which had so nearly succeeded. But losses in personnel and equipment had been serious.

The retreat north up the Irrawaddy and Sittang valleys was renewed, and during the succeeding days proceeded about as before, with constant rear guard actions. But a new complication arose, unforeseen by the Allies.

On April 17th Japanese forces were reported on the east bank of the Salween River, about due east from Toungoo. No particular attention was at first given them, but on the 21st strong enemy forces were noted around Bawlake and Loikaw. On the 22d this group had reached Hopong (about 10 miles east of Taunggyi); it had mechanized forces, had 40 planes in the air, and was heavily engaged with the Chinese Sixth Army, which detached strong forces to drive back the enemy around Taunggyi. It was *assumed* that the mission of these Japanese was to reach the Sittang River and cut off the retreat to Mandalay, otherwise progressing smoothly by both British and Chinese; in this it now appears they were mistaken.

The Japanese near Taunggyi were a flank guard, covering the movement of about a division completely mechanized which was racing up the valleys parallel to and east of the Sittang toward Lashio. It was indeed a Japanese effort to cut off the Chinese retreat, but the enveloping movement was much larger than either British or Chinese headquarters envisaged. The British were the first to realize the situation: on April 25th they identified the real Japanese advance by air reconnaissance; three hostile columns in as many valleys were disclosed, each followed by long lines of trucks and advancing towards Lashio. The British wasted no time in withdrawing, but the Chinese continued to fight around Taunggyi.

By the 28th the new Japanese advance was on a line with Mandalay and about 50 miles east of it; only minor forces were in front of it. British headquarters decided that Burma could no longer be held. Immediate preparations were made to abandon and destroy materiel and to withdraw the personnel to India. By this time the British retreat was near the junction of the Irrawaddy and the Chindwin Rivers, both navigable at this season, and was diverted up the Chindwin. The Chinese in the Sittang valley were near Pyawbwe, and continued to fight around Taunggyi.

The British Burma Government evacuated Maymyo, where it had gone from Mandalay. A desperate series of demolitions was initiated, with first attention to bridges in front of the presumed enemy advance, and then to installations, stores, and transportation which must be abandoned and might be of use to the enemy. Lashio, full of lease-lend supplies, was set on fire, while the Chinese garrison was sent south to tear up the roads along which the enemy was coming.

These measures came too late. Advancing nearly 100 miles in one day, the Japanese reached Lashio about 1:00 PM, April 29th. A violent artillery preparation was fired, to which there was no corresponding reply; tanks, armored cars, and planes attacked on a broad front and drove the weak garrison out of both old and new Lashio. A large quantity of lease-lend supplies, which the Japanese state included 1,200 new automobiles nicely parked outside town, fell to the invaders.

On May 1st Japanese troops entered Mandalay without resistance. The Chinese Sixth Army was still far south, fighting that flank guard around Taunggyi. All United Nations resistance collapsed.

As far as can now be ascertained, the Chinese Army disintegrated. General Stilwell left and was next reported on May 4th at Wantho, several hundred miles to the north, from where he escaped to India by marching across the mountains. Units of his Chinese Army went in various directions; they were reported for only a few days and appear to have been destroyed. The British made their last stand at Kalewa on the Chindwin, about 150 miles northwest of Mandalay, on May 13th. Most of the British that escaped from Kalewa were eventually saved. Commencing about April 28th, the RAF, U. S. Air Force, and China Navigation Co. transport planes worked daily on evacuating personnel to India, carrying over 4,000; the balance of the troops, abandoning materiel and transportation, marched across the mountains.

COMMENTS

Allied troops in this campaign appear to have totaled about 32,000 British and 15,000 Chinese. Lieut. Gen. Stilwell after the campaign was over estimated the Japs at between 40,000 and 50,000, so there was not much difference in the strength of the two sides.

The Japanese had the advantage of an efficient air force. The Allies had only a few planes, which were employed not on the battlefield but in raids on enemy presumed sensitive points. Japanese planes were regularly present to assist ground troops.

The Japanese had superior equipment. They were all mechanized, well led, and outmaneuvered the Allies. Their first maneuver at Yenangyuang failed to capture the British army,

but did inflict serious losses; the second (on Lashio) was a complete success. The Allies failed to foresee the possibilities of the enemy's operations.

Perhaps most of all, the Allies were always on the defensive. The morale of troops suffered by continuous retreats from one position to another, each a little more hopeless than the last. It was useless to announce retreats to "prepared positions" as made for "strategic" reasons—the troops knew what was going on. They were short of rations, ammunition, clothing, medicines—everything that an army needs. They were cut off from bases. The Japanese had a clear, uninterrupted line of supply, and were helped by Burmese who, wishing to be rid of the white man's rule, were willing to take a chance on the Japanese and actively assisted them.

THE AXIS INVADES EGYPT

During the past spring, British forces in Egypt were depleted: tank units had gone to Burma, other troops to Singapore, and the Australian Corps had returned to its own country. After the loss of Burma India seemed to be in danger, so a large convoy of troops and supplies from the United States and Great Britain en route to the East, and which normally would have landed in Egypt, was diverted to India. These losses had prevented the British from continuing their Libyan offensive.

Still they had no fear of the known intended Axis offensive, for (according to the speech of Prime Minister Churchill on July 2nd) the British Intelligence Service estimated Rommel's entire force as about 90,000 men, of whom only 50,000 were Germans. Against this the British 8th Army had 100,000 men, giving an overall superiority of 10%, a specific superiority in artillery of 60% and in tanks of 40%, and a "complete superiority"—ratio not stated—in the air. At the proper time a counterattack would be directed against Rommel, which it was hoped would lead to further successes for the cause of the United Nations. This plan failed, as the counterattacks were defeated with a loss of about 70% of the British tank strength, without corresponding loss on the part of the Axis. With the capture of Tobruk on June 21st, involving the loss of 30,000 troops, the British strength dropped materially below that of Rommel's force.

It was therefore decided on June 18th to withdraw the main body of the 8th Army to the frontier between Libya and Egypt, where it would occupy a defensive position (for which the terrain was suitable) pending reorganization and replacements of men and materiel.

Whether or not to leave a garrison in Tobruk had been considered. Lieut. Gen. Ritchie, commanding the 8th Army, received instructions to do so. In a previous siege Tobruk had held out for months, and there was no reason to believe that it would have any difficulty doing so again. It had a large garrison and ample supplies. Its possession would deny its excellent port to the enemy, and it would further block the coast road, which was the only improved road in Libya and over which the Axis supplies would have to come from their present base at Bengazi. As long as Tobruk remained in British hands it seemed probable that Rommel could not muster a sufficiently strong force to overcome the border defense line.

This hope vanished too when at noon on the 21st the British learned that Tobruk had surrendered. It was presumed that the Axis had probably captured large stocks of food, gasoline, and other supplies which he could immediately use to aid a prompt advance. Indeed, on the very day that Tobruk fell, motorized Axis infantry pushed through Bardia and arrived at Azeiz, only 12 miles northwest from Fort Capuzzo, one of the border defense strong points. Next day Rommel's troops closed in on the British line and were obviously preparing to attack.

Once again the British abandoned their plan. It was considered that it would be too hazardous to accept battle against a victorious and superior enemy on the border with the troops that were available. The British had relatively few armored forces, the enemy had many. The country was open desert to the south, and it would be possible for mechanized troops to move across country and turn the British position. It was decided to withdraw nearly a hundred miles to Matruh, and there establish a line extending from that port south some 40 miles to the west end of the Qattara Depression. Matruh was an intermediate base, and was protected by field fortifications. The Qattara Depression is a below-sea-level area, about 120 miles long from east to west and varying in width from 20 to 50 miles; it is composed of very soft sand, supposed to be impracticable for motor vehicles and consequently impassable for the completely mechanized enemy.

Either side could send turning forces around to the south of the Qattara, but in view of the size of this obstacle, a division of forces into two parts separated by such a large distance would be dangerous to whoever tried it, unless overwhelming strength was available. It was not believed that the Axis had this much strength. The British withdrawal commenced at night, and apparently was not noticed by the Axis.

On June 24th the Axis attacked the border positions at Fort Capuzzo, Solum, and Halfaya Pass. British observation parties retired rapidly, and there being no opposition other than from patrols, the Axis pushed on; by evening they were 50 miles further east at Sidi Barrani, which had been the high-water-mark of the Italian invasion of Egypt in 1940. The British were safely on their new selected line, busily preparing it for defense.

Next day Lieut. Gen. Ritchie was relieved by the British C-in-C in the Middle East, General Sir Claude Auchinleck, who himself assumed command of the 8th

Army in addition to other duties as C-in-C. This change was promptly approved by the home government in London.

On the 26th the Axis pushed forward in three columns, each consisting of one armored division. In order from north to south 15th Panzer Division, 21st Panzer Division, 132nd Ariete Division; they covered a front of some 20 miles. Smaller columns were posted well out on each flank. Combat patrols marched between columns to prevent infiltration. In all, the marching front was around 30 miles.

Among the Axis armored vehicles were noted a number of British, American, and French tanks which had been captured in Libya. Some had been repaired by German and Italian repair units (who had specialized in making repairs *quickly*) and then reissued to German and Italian units. They were now marked with a swastika painted on their tops and flew small flags of appropriate nationality.

On the 27th the Axis attacked the Matruh line, with the main effort well south of that town. A small force of armored vehicles got through the mine fields, pierced the main line of resistance, advanced over twenty-five miles, and then changed direction to head north toward the sea. A small British armored force chased after the enemy but did not catch them before the northward turn. They attacked the enemy's rear in an effort to drive him north and, as this was just the direction the enemy wanted to go, the attack made progress in that the enemy did go north. Later in the afternoon Axis artillery was emplaced on the edge of the escarpment overlooking the narrow coastal plain so they could shell the coast road which was about two miles from the sea. Shortly afterward Axis armored troops with artillery arrived on the road itself and proceeded to block it.

Information of this situation soon reached British headquarters at Matruh. Unless the block could be broken, communication with Alexandria was gone, so the British once more abandoned their plan. It was now decided to give up the Matruh line and retire to a new one to extend from about El Alamein near the sea to the east end of the Quattara Depression. This would also be about a 40 mile line and would be absolutely the last short line resting on impassable obstacles before the vicinity of Alexandria could be reached. A withdrawal of some 100 miles was involved, to begin that very night.

It was first necessary to remove the road block. Troops were sent from Matruh to attack from the west; other troops, which were reenforcements en route from Alexandria, were to attack from the east. As the Axis forces were not strong, the two attacks succeeded and the coast road was reopened.

On June 28th the Axis assigned the capture of Matruh to the Italian XX Corps, and the piercing of the main line of resistance to the German Afrika Corps. The German attack commenced with the removal of mines in the foreground of the British position by engineers covered by artillery fire and air protection. The German engineers marked off passages through the mine fields as they removed the mines. Some time in the afternoon the work was sufficiently completed for the Panzer Divisions to move forward; protected by strong air bombing and an artillery barrage of great intensity, they went through on a broad front. They went straight forward about 15 miles, then turned north and reached the coast road. Most of the British troops had already withdrawn, however.

While the German attack was being made, the Italian XX Corps attacked Matruh from the west. Later in the day this attack was supplemented by an attack made by the German 90th Motorized Division, which attacked Matruh from the east. The Italians made considerable progress and captured about 6,000 prisoners, mostly from New Zealand. These troops were new, having just arrived as reenforcements for the 8th Army.

British tanks counterattacked the Afrika Corps toward evening, coming up out of the desert to the south. The Germans met this attack only with artillery fire, using their all-purpose 88-mm. batteries as antitank guns. The British attack was stopped, yet it accomplished its purpose of giving the British main body an opportunity to break away for El Alamein.

On the 29th Matruh, the important British depot, with a great quantity of stores which it had been impossible to destroy, fell to a joint attack by Italians from the west and Germans from the east. The Axis took several thousand more prisoners. This sacrifice by the British probably gained them one day for occupation of their new line. The Axis did not arrive before the El Alamein position until two days later.

July opened with the British hastily installed on the El Alamein position. El Alamein consists of a one-building railroad station and about three other houses, out in the middle of the Sahara. From occasional small ridges a wide view of the open desert could be seen. Reenforcements had arrived: in additions to New Zealanders, South African troops withdrawn from line about June 15th for reorganization due to heavy losses which they had incurred were returned to duty; these were seasoned veterans to desert warfare, sunburned and accustomed to torrid days and cold nights.

General Auchinleck had no intention of withdrawing again. He could not, without endangering the great naval base of Alexandria. He knew other reenforcements were on the way. He had also received considerable air troops, including some United States forces. He changed the air mission so as to make its primary objective the crippling of enemy ground troops in action and the destruction of their motor supply trains, with the special object of interfering with the reception in front areas of Diesel oil. Fighter planes and light bombers scoured the desert to locate the huge German

tank trucks with trailers which brought up oil from bases.

July 1st the wind blew strongly and there was a heavy sand storm. Desert sand gets into the eyes, becomes encrusted on the bodies of perspiring men, gums up carburetors, and above all interferes with observation. Both air and ground reconnaissance were out. Taking advantage of this condition, the Axis advanced to the attack. To the Axis Intelligence Service it looked as if the British 8th Army had been decisively beaten. A little more pressure and it would be completely overthrown and the way opened to Alexandria.

Through the sand storm, two strong armored columns advanced between El Alamein and the Qattara Depression. They got on to the British line before they were observed and broke through in several places. Some Axis tanks got into El Alamein and for a moment General Rommel's headquarters thought the battle was won. It was not won. The British sent what tanks they had into the fight. They sought out the Axis forces and in a determined counterattack recovered most of the ground which had been lost. At the end of the day the British line was intact.

Next day the weather was better and there was good observation. After the fighting of the day before neither side at first made any attacks. There was considerable artillery shelling. Both Axis and British prepared a minor attack to be launched late in the day.

The Axis attack started first, toward El Alamein, strongly supported. Although the British had the sun in their eyes to impede observation, their artillery was effective and the Axis advance was stopped.

In a short time the British attack was launched. There were really two: South African troops attacked from north of Alamein while Imperial forces attacked well south of that place, about 15 miles from the coast. Both attacks were pressed with great vigor. The artillery fired heavy barrages at a very high rate of fire, while the R.A.F. attacked enemy batteries and forward troops. The British broke into the Axis lines, capturing nearly 2,000 prisoners and 30 guns. Night ended the battle, which convinced Marshal Rommel that the British 8th Army was in a strong position.

During the next two days the British continued to attack, making slight progress and capturing some more prisoners. Prisoners' statements indicated that they were exhausted; the reporting officers stated that they looked it. They had been short of food and water, and some badly wounded men were so tired that they fell asleep while on the operating table.

British headquarters was now of the belief that Rommel had advanced so far and so quickly that he was probably out of supplies and his men in no condition physically to support another severe battle. Maybe a strong British attack might overthrow him and reverse the strategical situation. In addition to the South African troops, some Indian troops (who were also seasoned veterans) returned from rest areas. It was decided to make a major attack next day, with a view of piercing the enemy's center.

On July 4th, South African and New Zealand troops attacked near the center, starting from southeast of El Alamein. Their immediate objective was a ridge several miles long extending east and west parallel to the direction of attack. An artillery and air preparation preceded the attack of armored troops, which in turn was followed by infantry. The enemy's advanced positions were overrun and about 600 German prisoners were captured; there was no time to collect these, and it subsequently turned out that the "prisoners" had in considerable part walked around the front back to their own lines.

Encouraged by their advance, the British renewed the attack on the following day. The offensive was extended

Acme

to the area around El Alamein. Visibility was good, and the artillery most active. Some of the British targets varied from 2,000 yards' range to as much as 20,000 yards for heavy 210-mm. guns. Notwithstanding all efforts, only minor progress was made. Consequently, believing in the enemy's assumed state of exhaustion, night attacks were ordered which were to be delivered soon after dark.

One of the night attacks was made by New Zealand troops, a Maori unit which entered and held an enemy strong point in a bayonet attack. They were later counterattacked by the Italian Pavia Division and lost a part of their gains during a severe fight under a fading moon.

This ended the British offensive; it had made some tactical gains, but had not succeeded in overthrowing the enemy. Both sides now settled down. The British revised their estimate as to the supposed stage of exhaustion of the Axis. New reports on prisoners taken showed that though the Germans were undoubtedly tired, they were well fed, clothed, and supplied. In lieu of water, they received regularly Italian mineral water with occasional issues of canned German beer. Their personal kits were models for desert warfare: each contained a substantial shelter tent, toilet articles, antiseptics, vitamin compounds, etc. The men were sturdy and their morale appeared to be good. Italian prisoners were reported to be also well kept and supplied, but seedy as to appearance. Their clothing was poor, and it was noted that their shoes were of all models and colors, presumably due to a shortage of leather in Italy. Italian morale was also reported good, the majority of prisoners, especially officers, apparently being genuinely convinced that the Axis was bound to win this war.

Under these circumstances it appeared to British GHQ that an immediate resumption of the offensive was not justified and would promise no substantial gain. Directions were given to intensify the air attacks against enemy transportation, particularly toward his fuel tank trucks. Incidentally, the Axis adopted the same tactical idea, so both sides now employed their air forces primarily in attacking each other's motor vehicles. Attacks were made by day and night, and led to an extraordinarily intensified air activity. Notwithstanding, the daily reports of air losses do not show any material increase, although both sides have claimed large successes against the other side's transportation. It is not at this time possible to verify these claims.

On the 10th the British made a local attack just west of El Alamein to improve the position in that sector. The objective was a low hill, Tel el-Eisa (Arabic for *Hill of Jesus*). Australians carried out this attack. At 3:30 AM combat patrols started out simultaneously with the commencement of a severe artillery preparation. At 5:00 o'clock the main attacking force jumped off; they reached their first objective within an hour and by 6:30 had the entire hill in their hands. About 1,500 Italian prisoners were taken.

The success in the north was partly balanced by a similar Axis attack in the south. The Axis took this sector by surprise and made a small gain. Thereupon the artillery of both sides violently shelled the position recently lost to the enemy, but no counterattack developed: the main Axis and British forces which were opposite the center of the line were not engaged on this day.

On July 12th the Axis center just before sunset made a local attack, presumably to secure identifications. They captured an advance post, and having accomplished their mission then withdrew. For at least the next three weeks only local fighting occurred.

COMMENTS

Early in August the Axis has air bases within 100 miles of the great British naval base, Alexandria. Although the city has good antiaircraft defenses, a new situation has arisen, since this is the first time that the enemy has been able to base his air forces so close. The British fleet has other anchorages in Palestine, Syria, and Cyprus, and fuel bases in Palestine and Syria—but it has no other repair establishments or large docks in the eastern Mediterranean. The Axis is now also inconveniently close, within medium bombing range, to the Suez Canal, and can now bomb this important artery from relatively close bases.

Should the Axis overcome the British in the desert where the fighting is now going on, they would soon arrive at the border of the Egyptian Delta, thickly settled and cultivated and crisscrossed with numerous rivers and canals. They would find an entirely different terrain from the desert.

In the desert, armored troops can operate rather freely across country. They can not do this so easily in the Delta, which is full of obstacles to cross country movement. It is an almost ideal country for delaying actions, provided the number of troops available are sufficient to cover the entire front and so prevent turning movements.

The Axis success in freeing Libya from the British, and pushing their front eastward about 400 miles within five weeks, while defeating what the British had announced was a superior army, may have some repercussion among the peoples of the Near East; this point was brought out by Mr. Churchill in his speech of July 2nd. To date it has only acted in confirming their intention not to join the cause of the United Nations. Their ultimate reaction can not yet be foretold.

The evidence now available indicates that Marshal Rommel's success was greater than he had expected and greater than German GHQ, 'way off in Russia, had believed to be possible. The consequence was that there were insufficient forces available to fully exploit the victory gained. Both sides are now engaged in reenforcing their North African front, the Axis with the hope of driving the British out of Egypt, and the British in the hope that reenforcements will arrive in time to enable them to drive the enemy completely out of Egypt.

The British sea line from the United States or Great Britain, around Africa, is roughly twenty times as long as that of the Axis from Italy to Libya. Both lines are subject to submarine attack by the enemy, and the Axis one is also subject to air attack. Both sides are short of shipping. If either side can build up a force which will be strong enough to carry out wide turning movements, the present stalemate may be changed. It could also be changed if either side accumulates the necessary artillery and armored forces for a direct frontal attack.

FIRING TESTS FOR CORPS ARTILLERY

By Col. Lowell M. Riley, FA

AUTHOR'S NOTE: *The following list has been taken from the carefully considered evaluation of one Corps Artillery officer on the results of the GHQ test of the battalions of his corps. The scope of the details and the suggested steps to correct the deficiencies noted, make it a valuable guide to training and therefore of great interest to all artillery officers. It might well serve as a partial check list for commanders in day to day training. You battalion and battery commanders and executives should go over it carefully item by item and ask yourselves the question—"Does the condition obtain in my organization?" Careful observation of the work of your unit in field exercises, in service practice, maneuvers, and communication problems will furnish the answer. When you can check off these listed deficiencies as no longer applicable in your command, you may be reasonably sure that your "outfit" is ready to meet the enemy.*

RSOP

The need has been demonstrated for intensive training in the prompt occupation of position and the fast and accurate delivery of observed fires by batteries acting alone and by the battalion as a whole.

CONDUCT OF FIRE

The results of Test I indicated that many individual officers are weak in the preparation of initial data, and the conduct of observed fires.

THE FIRING BATTERY

Many batteries and battery executives are not up to the standard desired. Artillery fire, including that in the initial stages of action, must be available in minutes, not hours.

Immediate steps should be taken by schools, tactical problems, simulated and actual service practice, and closely supervised drill in gun parks, to correct these deficiencies. Appendix II. TM 6-605, covers admirably the training of firing batteries, and should be carefully studied by all concerned.

OBSERVATION

The use of mobile forward OP's is imperative. Training must emphasize this with varied set-ups for forward observers.

COMMUNICATION

1. Wire laying and servicing of lines must be improved.
2. Numerous communications officers, by failing to make a careful communication plan, slowed up the opening of fire by their units. Wire lines must be laid off roads or removed from roads promptly, and laid with sufficient slack.

TACTICAL

1. The tactical aspects of the occupation of position were neglected too frequently.
2. Antimechanized defense was not evident many times when battalions went into assembly areas.
3. Antiaircraft guards were notably lacking in alertness, particularly when batteries were going into position.
4. Field artillery guns were often placed in the open at regular intervals, even when staggering of guns at irregular intervals under cover was possible.
5. Batteries frequently approached position areas from the front, breaking overhead cover and making tracks, when covered routes of approach were available from the rear.
6. Trucks remained in position areas too long a time and many times halted in the open when overhead cover was available nearby.
7. Thorough care against the possibility of air observation when emplacing guns was the exception. All training, including marches, occupation of position, and service practice should be held under assumed tactical conditions.

USE OF AIR PHOTOS

Test II indicated that the key personnel of most battalions are reasonably proficient in the use of wide-angle photographs in making transfers of fire and firing for surprise effect on observed targets. Speed, however, must be emphasized.

Training along this line should be continued, stressing vertical control, varied methods of using photos (TM 6-200), speed, and the development of additional replacement personnel trained in the use of these photographs.

AIR OBSERVATION

1. Emphasis must be placed on the utilization of slow-flying airplanes for the adjustment of artillery fire.

Normal procedure should contemplate the assignment or attachment of two airplanes to each battalion, operating from advance landing field in the vicinity of battalion CP. Planes should normally fly at low altitudes in rear of our own front lines, and be able to start adjustment within one minute after taking off. Adjustment must be completed in the briefest possible time. This necessitates careful planning, perfect communications, and the closest liaison between observer and pilot with ground troops.

2. Test II demonstrated the weakness of certain radio operators in procedure. Station logs many times were not properly kept and the air-ground code was not followed closely at times.

MISCELLANEOUS

1. Results of Test III showed a general proficiency in the present key personnel in the deliberate preparation of fire for the particular method employed.

Varied methods should be utilized in future training (TM 6-200) with frequent night occupations of position and night firing. Proficiency in the determination of direction by astronomical methods (use of Polaris and sun) should be developed as in many theaters of operation this method may prove invaluable.

2. The test showed that the use of an old VE is essential if effective unobserved fire is to be delivered on a target with metro data.

Guns should be calibrated to the extent that existing ammunition allowances permit. This can be done with careful preliminary planning by recording results in various types of firing without interfering with the service practice as a whole.

SOME CONSIDERATIONS

On the part of the officers and men of the battalions which participated, considerable time and effort was expended. Some of that time and effort was incidental, some was superimposed upon an already full training schedule and meant "burning the midnight oil."

For the first time all combat activities of all battalions of artillery have been uniformly tested and measured and proof given of units readiness for combat. Deficiencies have been pointed out and incentive to further directed training activities furnished.

The results, on the whole, were gratifying, both from the point of view of proof of readiness for battle and for the added stimulus given to training. These tests proved themselves preeminently worth the effort and the time and money expended—everyone who had any connection with them learned a great deal. They undoubtedly will be continued as part of the training schedule for all battalions. They should be repeated, where time permits, with improved and constantly more realistic layouts to test further progress and to emphasize the lessons learned. Unavoidable artificialities due to area limitations, safety, and control should be reduced to the minimum.

The list of marks furnished to organization commanders at the conclusion is not, however, sufficient to the end in view. A carefully considered evaluation based upon recorded deficiencies substantiated by plots of the rounds and concentrations fired should be furnished; that is the best evidence upon which these commanders can base the further training of their units, and such an evaluation might well be required in the basic directive for the tests.

DIRECT ARTILLERY FIRE

(As recently reported in the Kuibyshev press)

The Soviet artillery has developed a very effective technique in destroying visible firing points of the enemy. All targets are thoroughly reconnoitered, plotted, and their positions made known to all artillery and infantry commanders during daylight hours. Under cover of darkness large numbers of guns, for example 15 to 20 guns for each 70 targets, are placed in readiness on the support or main line of resistance. All preparation of positions and their approaches are conducted at night. Pieces are moved forward to defiladed positions in rear of firing positions, where they remain camouflaged, inactive, and motionless during the following day; strict camouflage discipline is vital to the success of this operation. Just prior to dusk at the zero hour all guns are quickly rolled by hand from defiladed positions into their open firing positions, and direct fire is begun on the predetermined targets.

Targets are fired on in the following priority: Observation points, machine guns and antitank guns, and dugouts. Other targets are attacked simultaneously by infantry with rifle, machine gun, and mortar fire. So-called "sentinel" guns are held in readiness during the attack to take under fire newly discovered targets, and must be able to fire on areas which other pieces cannot reach.

In the event that tanks appear in a counterattack, all pieces shift their fire to the oncoming tanks.

As night falls and visibility ceases the artillery withdraws by echelon to its normal positions.

THROUGH THE MILL

By Lt. John Hughes, FA

Fourth of Series

I remember with concern our trainer problems fired on the drill field at school. Our PMS&T was a large, impressive man, a major with about 20 years' service. Sometimes he "Fired" the class, at other times he was an onlooker.

We started with the usual simple axial precision and stumbled along for a few days gaining membership in that *not so exclusive* club, the BRACKET JUMPERS. Our failure to develop rapidly into expert artillerymen irked our instructors no end, so they decided to use an entire period, 55 minutes, to demonstrate firing the Large Angle T. They strung up blackboards for illustrations, figured their data before the class, picked their own targets, weren't under the stress of having seniors there to hand out a "U" or an "S" for proficiency; nevertheless the major held us overtime, still failing to get an adjustment. I watched that experienced soldier struggle hopelessly for more than an hour with the apparent intricities of *S, d,* forks, and shifts, and wondered what would happen to me when I had to shoot for "pay."

I met my first Waterloo while in ROTC summer encampment. The captain "firing" my group was going down an alphabetical list of our names, so we knew a little in advance when we were to fire. However, we had been duly and dutifully warned to keep up with the problems in case we were asked to "give the next command." All day I had been working steadily, keeping up with the commands and giving whispered advice to bewildered blokes who struggled with private theories for simplifying firing.

"Everett," the instructor called. Everett fooled about dumbly for a bit, failed to figure data within the time limit; "Time's up," the captain called; "Garrison, finish the problem." Garrison did so and Hobbs, A. P., was called up. This time because it was nearly my time to fire I decided not to attempt to follow the problem; I would review some of the rules instead, so that all would work smoothly. Hobbs, A. P., started the problem but failed to get a solution in his time limit. "Hobbs, J. J.," the captain yelled, "take over the problem." Hobbs, J. J., fumbled about a bit, obviously not knowing what to do. I was still dillying about, unaware that my time was so near.

"Horton, what's the next command?" Very suddenly I realized that I was next. If Horton failed, I was on the spot with no idea of what was going on. "I don't know, sir," Horton beamed brightly—and I felt a rush of blood to my head as I remembered that I didn't know either.

Thomson, a lad sitting nearby, leaned over and said, "Rt. 25; on No. 2 op 8; btry left; 4,000."

I glanced at the instructor. He was frowning at his list of names. "Where in hell's the target?" I whispered hoarsely.

UP AT BAT

"Hughes, give the next command." I got up slowly, looked wisely at the recorder's board, then in good fashion gave the command that Thomson had flashed a minute before. The captain was so surprised he rocked back and forth on his toes. "Hmm, that's correct, Hughes, that's correct."

I worked like a maniac trying to figure my next possible commands—but was a total blank. Off to my left I could hear the battery shooting. I looked out toward the center of the impact area and there they were, four beautiful bursts all on line and evenly spaced. But how to sense them? I didn't know anything about anything. "Next command! What is the next command?" I was hopelessly bewildered. "How did you sense them?"

"I didn't, sir."

"Well, assume they're *over,* what is the next command?"

"Aw — Aw — ah 3700, sir."

"Give your orders to the telephone operator, not to me, I'm not going to execute them for you."

"Yes, sir."

"Well, go ahead."

"3700."

"Cease firing," the captain yelled.

"Think, Hughes," he said, "use yer bean, use yer bean."

"3800?" I guessed hopefully.

"Correct, positively right," he beamed.

"Now give that to the operator."

I did and four nicely spaced bursts fell around an old

Over? Short? Doubtful?

caisson, blasting parts of it into the air.

"What do ya call it, whada ya call it?"

"Well, I'm not sure but——"

"Target, man, target! Don't be modest! Next command."

"Two ro——"

"That's right, exactly right. Cease firing, end of problem. Any comments?" he asked, looking around.

"No. Well, I have this to say. Hughes, although he eventually gave the proper command, wasn't quick enough with his commands and appeared to be undecided. He lacked confidence." (That was a masterpiece of understatement.)

That's the true story of my first problem.

ORC Firing Point

About a year later I went to an ORC short course and tasted my first service as an officer. Strangely, getting bars on my shoulders didn't make the problems go smoother or easier—or, for that matter, at all. We pulled some terrific boners in that encampment. We had good instructors but the classes were too large. There were so many of us that instructors not only couldn't remember our names, they couldn't even pronounce all of them from a roster. About the third day of firing we were working on Small Angle T. The temperature was terrific—well over a hundred—and noses were peeling, tempers hanging loose.

I've run across considerable firing in the past three years, but none to compare with what went on at that firing point. Communications went out, we had a near muzzle burst, a G.I. truck meandered through the impact area, a fire broke out on the range, the range control officer forgot his signal flag—it was cyclonic.

Around 2:00 PM the instructor reached the limit of his endurance.

"I'll fire a problem for you," he said. "This time there will not be that continual *Cease Firing*. There will not be the usual bracket jumping contest. I'm not going to *shift* left when I *sense* left. I'm going to fire a problem complete within 10 minutes."

He rasped at an operator, "Get me the Executive.

"Listen, Lieutenant, this is Major Cutter. I'm going to fire the next problem as a demonstration. Take your orders just as I give them." He turned to a student officer, "Select a target for me."

With targets plentiful all over the range, that officer could not decide which one he wanted, so the major found his own, pointed it out to the class, and started figuring data.

Time:

2:30 Starts figuring data.

2:31 Sends commands to guns.

2:32 Repeats commands to guns.

2:33 Replaces telephone operator.

2:34 Repeats commands to guns.

2:35 Round on the way. Senses 35 right, over; commands, Left 35, 4000.

2:36 Repeats commands.
Telephone goes on blink. Radio substituted. Operator reports he can't get guns but has Mexico City.

2:38 Major Cutter mad "fit to bust." Telephone service back in. Major will operate it himself. "What is the delay?"

2:40 Round on the way; sensed 70 Rt.
"Cease firing, 20 mils outside right safety limit—Safety Officer."

2:41 "Give me the Executive. I want the Executive."
"He's busy right now, who's calling?"
"I don't care what he's doing, I want him on the phone, right now."
"Lt. Bonner, sir."
"What in hell's wrong down there? I gave you left 35 and you shift right. Who is that safety officer? Get him out of the way. Don't fire another round, I'm coming down there. Do you understand, do not fire until I give the command."

2:45 The major, red faced and almost desperate, signaled a driver. Just as the car moved up, "BOOM" rumbled from the battery. The major whirled from the car, looked toward the gun position a moment, then toward the target, which jumped high in the air and slowly settled down,

blown to bits. It was a "target!"

2:47 The major shook his head sadly. "Cease firing, end of problem, end of practice," he muttered.

FOR ARMY INSPECTION

But it was not every time that Dame Fortune spurned me. A few times I've seen systematic work from trained crews that made you swell with pride.

I remember that once when we were to fire the battalion for an Army inspection, we were to make an afternoon survey, a night occupation of position, with firing at daybreak next day. All machinery clicked. I was RO for one of the batteries. My instrument sergeant, an experienced soldier, knew the answers, and I managed to stumble through. Our battery's registration was used to establish a K for the battalion. It worked: when the battalion fired a concentration using the K, the rounds dropped in consistent pattern on the target. We could and did pat ourselves on the back for that bit of good work, but it happens only sometimes, and with green troops you can't expect it often.

Instructor shoots an example

DIFFICULT SHOOTING

One dismal spring we spent day after day on the range. We had an excess of old ammunition which we were to shoot prior to a prescribed date or lose credit for that amount on the next year's allotment, so we fired regardless of weather.

Standing on a hill at the firing point, sleet and rain driving the warmth from our bodies, we spent one day shooting from the flank, 1400 *mils*. That is the only really difficult shooting I've seen. We were using 37-mm. subcaliber, and targets were 1800-4500 yards from us. Occasionally through the haze we would pick up a faint burst on the frozen ground. In due course it was my time to fire and I jumped to it with a will, for I had studied hard and believed there would be little difficulty. I fired with the battery at "open sheaf" in order to pick up a sensing more easily.

Commands	*Rn.*	*Sen.*	*Rds.*	*Comments*
Btry Rt	3000	Lost	4	(None)
	3000	Lost	8	(None)
	2600	Lost	12	(None)
	2600	Lost	16	(None)
	2200	Lost	20	

(We overlooked the entire impact area, so should have picked up a round or two. A hasty call to the safety officer informed us that we were within limits. "Hmmm," the instructor grunted, "let me try it a bit.")

Left 400	2000	Lost		

("I'm afraid to move left because we are near the left limit, regardless of the safety officer's opinion," he said, "so we'll try range changes only." Sometimes above the howling wind we could hear the distant *plop* of the exploding 37-mm's. "I will converge the sheaf to see if that will assist in locating bursts.")

Commands	*Rn.*	*Sen.*	*Rds.*	*Comments*
On No. 2 close 12, btry 1 rd.	2500	Lost	28	(None)
	3000	Lost	32	(None)
	3500	Lost	36	

("Anyone else want to try it?")

Someone did, so he called the safety officer to find how much we could move left (we didn't trust that safety man). He said we had plenty room left so Major Arnns tried it.

Commands	*Rn.*	*Sen.*	*Rds.*	*Comments*
Left 400, btry 1 rd.	3500	Lost	40	(None)
	3000	Lost	44	(None)
	2500	Lost	48	(None)
	2000		52	

(A swish, like the wings of startled ducks, crossed just before us and 4 shells burst over the nose of the ridge about 200 yards away. There we were 52 rounds in the hole and hadn't seen a round, but now we knew where they were falling.)

"Cease Firing, End of Problem.

"Hughes, I can't give you a 'U' on that one even though you didn't get an adjustment. A most unusual problem!"

PRACTICE SHOOTS

A few times we fired when our problems were for practice only. Those occasions were less trying, for it was a sort of free-for-all with everyone having his say—it being understood, of course, that the officer with the most rank also had the most say.

One morning we started firing early, so that every officer would get his chance for at least one problem. Ordinarily the junior officers fired first; then after enough targets, BP's and RP's were accurately located, some of the senior officers would venture a few shots at some select target. This day was ordinary in that respect and we young Louies led off with a group of very good "shoots." For some reason it was the opinion of the older officers that after a BP was established and located, no one should have an error of more than 25 to 35 mils in deflection.

Every time we Louies missed more than 40 mils or thereabouts, we were criticized rather severely. We took a lot of ribbing in a couple or three hours, then the colonel commanding the battalion decided to try his luck. He selected a target rather close to the BP and said he would use an aiming point and a deflection in his data. He used the AP and did an exemplary job of getting a round out quickly. We looked for the burst but only a dull rumble reached us. The colonel lessened the range and we picked up a shot 5 mils inside the right safety limit and 135 mils right of the target. All the oldsters took on a pained expression while the rest of us tried to suppress our mirth. The colonel was so off-balance that his voice broke on the next command, "Left 140, 3000."

From there things didn't go so well either. Shift and re-shift, advance the range and shorten the range, close and open the sheaf. His problem finished with an adjustment after excessive shifting in range and deflection, he stepped back from the BC scope, and the critique started.

"Major Arnns," said the colonel, "you critique the problem."

"Well, gentlemen," said the stouthearted major, after clearing his throat, "aside from a *slight error* in computation of original data, an excellent problem. I believe an adjustment was obtained. No further comment."

So that was that.

MISSING A SENSING

Firing shrapnel always made me uneasy: I could never remember just what to do with the stuff. A few days after a new BC came to my battery, we went on the range to fire. Naturally I wanted to do a good job so as to impress my new BC with my ability, so was all hepped up over the thing. As was usual, the officer conducting the firing selected my target, a four-gun battery outlined against the sky about 3000 yards to our left front.

Somehow, I prepared the initial data in good time and got out a "Btry 1 rd, 3000" in good order. Four bursts appeared just short of the target and 10 mils above. I sensed "Short," gave "Down 10, 3400."

"Cease firing. Are you sure those rounds were short?"

"Yes, sir."

"All right, go ahead."

"3400" and the guns boomed. I waited a little while feeling warm and depressed. A rumble drifted back over the range to me.

"Lost, over; 3200." Again the guns answered quickly and I waited 'til that distant rumble reached me. Now I was no longer sure about that first volley being *short*.

"Lost, over; 3000." I said it weakly. Now I was back to my initial range. This one certainly would give the answer. Rules of Firing flashed through my harried mind. I remembered what I had been told about sensing shrapnel "short" when it was high and I couldn't see the *effect*.

The guns spoke again and I picked up a slight cloud of dust and smoke about 200 yards OVER the target.

"I could have saved you that, Hughes," the instructor was saying, "but I wanted you to see for sure what it means to miss a sensing. I wanted to make an example of your error."

Be sure I won't forget that little item. Next time I sense a shrapnel shot, I'll see the effect first.

On the way home my new BC said (with some sympathy, I think), "Well, Hughes, you didn't do so good today."

That's all he said about it, but a few days later he had a short quiz (written) for his 2nd lieutenants—all about shrapnel and firing. You bet, I knew the answers.

SPREADING THE FACTS

Giving advice on better or best methods of firing problems can best be done by experienced instructors. But good, experienced Field Artillerymen are few in units so small as the battalion, so minor changes in approach may appear in various units. But on the whole, changes will spread rapidly via officers from new courses at Sill. When these officers with the new "dope" reach an outfit, they are generally used immediately and thoroughly in their specialty through classes for other officers in the unit.

Just recently I was asked what Sill courses I had completed.

"Why," I answered, "best I remember, five battery officers' courses, two communications courses, two equitation courses, two motor courses, and one on chemicals from somewhere." All those, yet I haven't been to Sill.

All those courses were taken from officers who had just completed their studies at a service school. They had the dope, and even though their instruction was not the very best it was far superior to any attempt at digging it out by reading circulars and FM's.

Most of these young officers are good, many of them exceptional. Utilize their knowledge to spread the school gospel to every officer in your unit. You won't go wrong.

SURVEYS—PRO and CON

A Graphical Computer for Quicker Survey

By Lt. Lowell Gregory, FA

PART I

ONE TROUBLE WITH SURVEY

The short base method of locating points has become standard practice for the field artillery, and those who have worked on the timberless slopes of Fort Sill know its magic at its best. But in actual practice, it results that after the magic has been made, the angles turned, and the bases measured, there remains the most difficult part of the task—the computation—not of merely one or two triangles, but sometimes of as many as a dozen. And one mistake in a trigonometric solution may result in error not of yards, but often of hundreds of yards. Checking and catching such likely errors are both tedious and time consuming. Here is where the graphical computer plays one of its roles.

The Short Base Slide Rule consists of two scales: the outer is plotted as log numbers from 48 to 3850, the inner scale as log sin mils from 55 to 1600 and will also read directly from 1600 to 2700; 2700 to 3200 may be found by looking for the supplement (3200 minus X). It will solve any shape triangle, with its primary use the solving of short base intersections with speed and with accuracies averaging 1 in 1000. It can be used to compute coordinates readily, with an accuracy of at least 1 in 500.

Efforts have been made in years past to obtain from commercial slide-rule manufacturers a slide rule with trigonometric functions of angles in mils rather than in degrees and minutes. To the hard pressed survey officer, to the harried battery RO, such a device would fill a multitude of uses, presupposing only two things: (1) that he possess such an instrument, and (2) that he teach himself how to use it properly. So far, nothing has come from the commercial manufacturer, so it remains for us users to improvise a substitute. Part II describes in detail how to build the graphical computer, and Part III contains instructions on use of the finished product and suggestions on how to adapt it to practical survey problems.

First, perhaps you would like some evidence that such a device is worth the time and effort necessary. How is this: Short base solutions obtained in one-fourth to one-half the usual time, and with less instruction; coordinates computed in half the usual time; soldiers with limited education and ability for "figuring" taught to use the graphical computer successfully long before they could be taught the use of log tables; and a five-man crew performing a traverse and computation simultaneously in only slightly longer time than six-man crews performing only a traverse—this traverse with accuracy averaging 1 in 800. These things have been accomplished with a crew of limited training.

PART II

HOW TO CONSTRUCT A GRAPHICAL COMPUTER

The graphical computer is a circular slide rule with a pointer to aid the eye in matching values on the inner scale against those on the outer. The inner scale is mounted on a revolving disc, and both scales are continuous within the extreme limits imposed on each. Although the scales are continuous, they have been placed on concentric circles so that the smallest value on one circle takes up where the largest value left off on the preceding one. It has thus been possible to expand the distance between graduations to allow interpolations to the accuracies required to justify such an instrument.

Construction can be divided into four steps, the first of which is merely getting data into the desired form for plotting. The second step is the plotting of master sheets (done with an ordinary protractor on issue-type plotting paper). The third is the production of copies. And the fourth step is the mounting on backing material and providing a durable, waterproof surface.

STEP NUMBER 1

Provide yourself with a set of log tables, preferably a copy of TM 5-236. Get an adding machine—any size will do so long as it will add and put the result in writing. You are going to reduce the log functions of sines and numbers to units which you can plot as mils along the circumference of a protractor.

In Table LIII you will find the function of angles in mils. Begin at 55 mils, take every mil, and multiply its log sin by .2. This can be accomplished by adding the log sin to itself on the machine and pointing off one place with a pencil.

EXAMPLE: Log Sin 55 mils = 873215

873215

1746430 T

(With one decimal pointed off the value becomes 174,643.0)

Continue for each mil up to 400; this figure is arbitrary and may well be as low as 200 mils, depending on the accuracy you expect to be obtainable from the finished product. Four-hundred mils is recommended.

Beginning at 400 mils (200 if you chose that figure) take only every five—400, 405, 410, etc. Continue taking every five up to 800 mils.

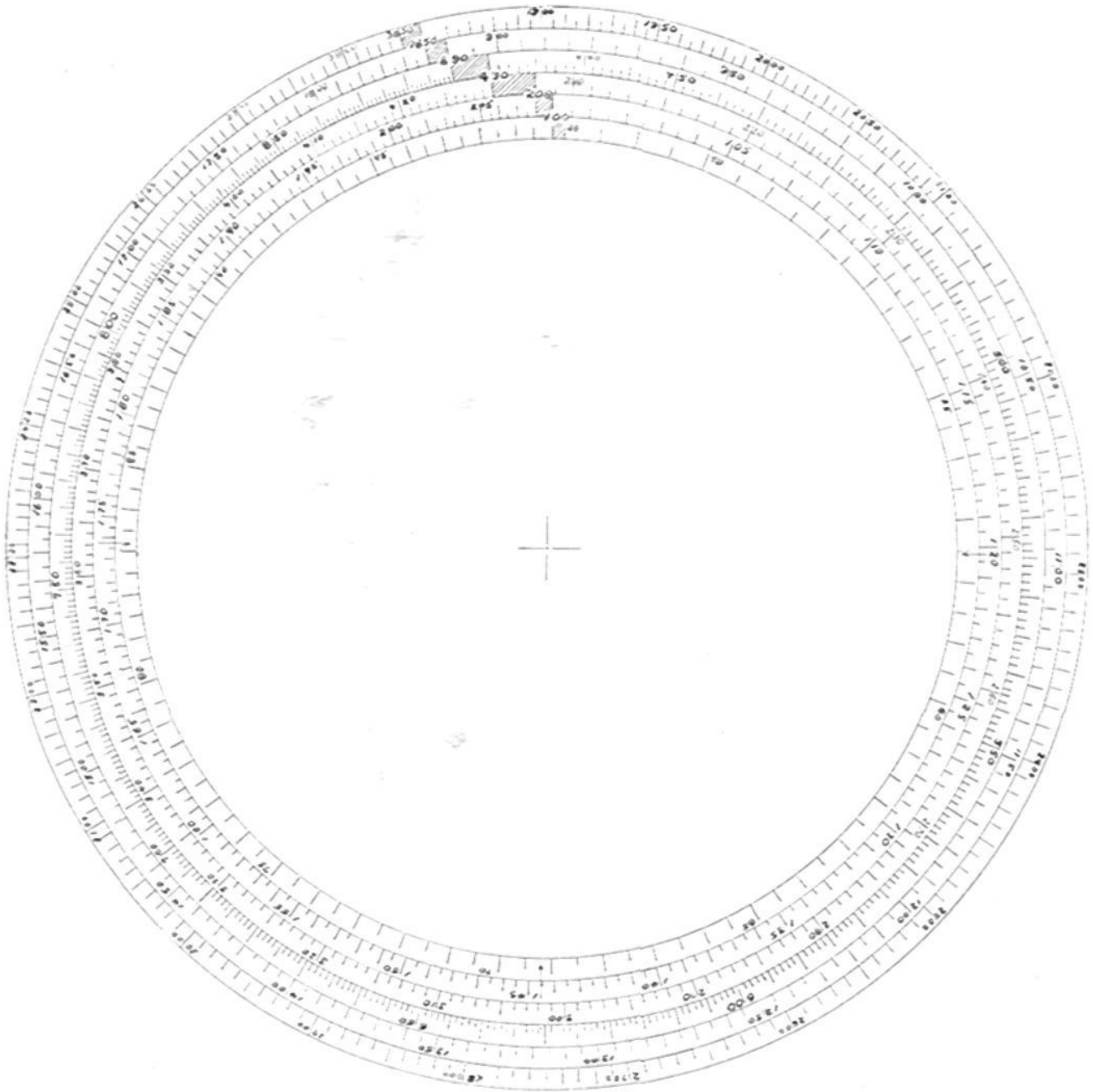
Beginning at 800 take every ten up to 1500. Lastly, take 1550 and 1600.

You have taken care of the log sin; now for the log numbers. Table I on page 8 will be next. Begin with 48 (yards) and do the same as you did with log sin: multiply each log with the characteristic and mantissa by .2.

EXAMPLE: Log number 48 = 168124
168124
———
336248 T

(With one decimal pointed off the value becomes 33,624.8)

Continue for every half-yard up to and including 208, every one-yard to and including 430, every five yards through 1850, and every ten yards to 3850.



Before completing any one section of tape and beginning on another in the adding machine, it is a good idea to put in the decimal point and write opposite each total the mils or yards it corresponds to.

EXAMPLE: 873215
873215
** 174643.0 T (55)
873997
873997
** 174799.4 T (56)
etc.
etc.

STEP NUMBER 2

This step is the plotting of the master sheets from which duplicates can be copied. A few simple precautions will nearly eliminate loss of accuracy.

1. Check to see where the inaccuracies of the protractor are. Use a grid sheet or check one part of the protractor against another. Most protractors show an error in the first two hundred mils from either end and in the fact that the right hand quadrant is greater than 1600 mils. Use only that portion you know is correct.

2. Divide your circle into four *equal* quadrants by trial and error or any other method. If they are equal they will be 1600 mils.

3. Use a portion of the protractor which will measure one of the above quadrants of your circle as being 1600 mils.

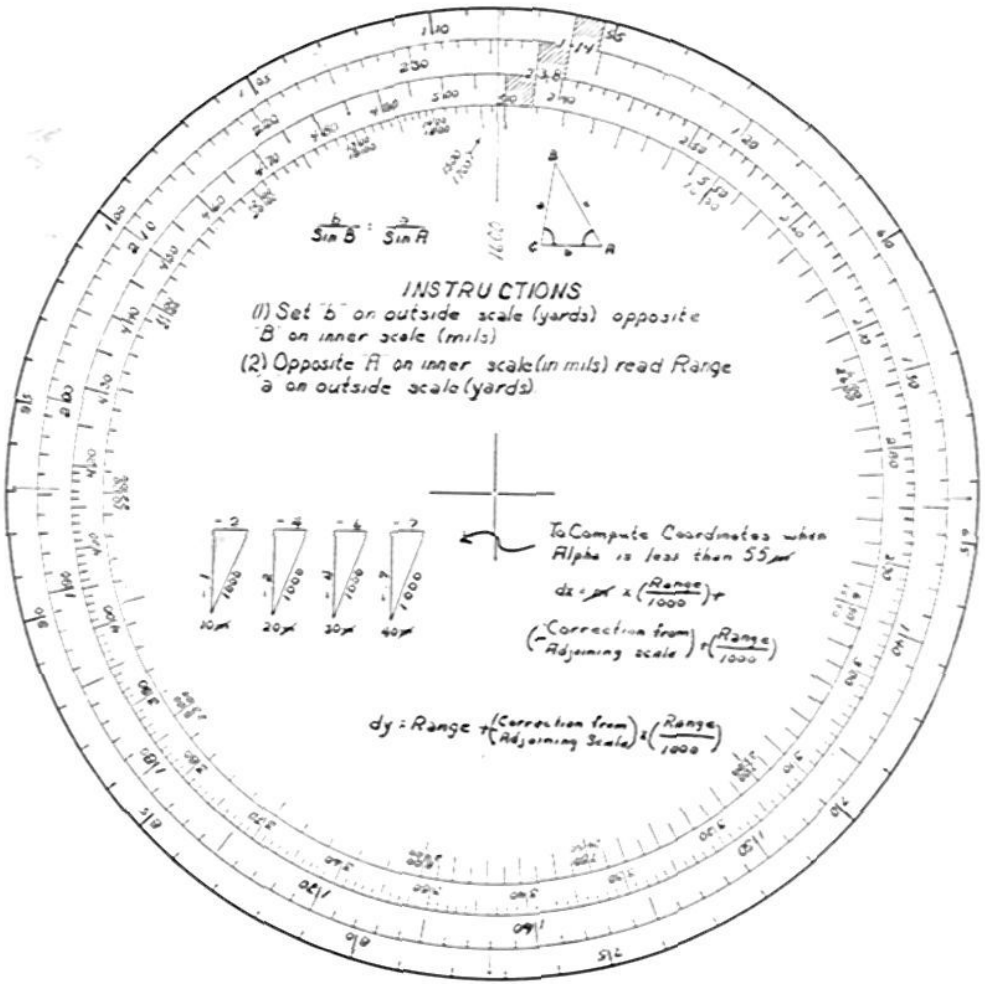
4. Orient your protractor for plotting by means of these quadrants and not by previously plotted readings. Thus you will have your protractor in at least four different positions for plotting a complete circle, and any any errors accumulated in one quadrant will not be carried over into the next.

Get a 16-inch protractor, plane table top, plotting pin or needle, compass with an 8″ radius, sheet of brown plotting paper, and bottle of black India ink. Draw a circle the same size as your protractor and clearly mark the center.

After the circle has been laid out on the plotting paper and divided into four equal quadrants, label the upper part of the north-south line as 174,400. This value is units for plotting. One mil along the circumference of the protractor equals one unit. This line is 174,400 units around from an imaginary zero.

From your adding machine tape get the value you have obtained for logs in 55 mils, 174,643.0. To plot this you merely go 243 mils to the right of the north-south line which we assigned a value of 174,400. To plot 56 mils we use the value 174,799.4, which is 399.4 mils right of our north-south line. After each quadrant is completed, it is best to mark each plotted point by inking in a short, straight line passing through the point and the center of the circle. Label enough points to identify them for future use, say every five. The value for 112 mils will complete the circle, so we have from 55 mils to 112 mils on one circle.

Ordinarily it will be possible to put two complete circles on each master sheet provided the second circle is indicated by using an ink of a different color. Thus we have on the first master sheet two complete circles beginning at 55 mils and ending at 235 mils, with unit values beginning at 174,400 and ending at 187,200 for the top of the north-south line.



The second master sheet will take care of the remainder of the mil scale, ending with the 1600 mil mark exactly on the north-south line at a unit value of 200,000.

Master sheets for the outer scale are plotted in the same manner as the ones for the inner scale. Use the top of the north-south line as a unit value of 33,600. The first value of 33,624.8 units for 48 yards will be plotted 24.8 mils to the right of the north-south line. Continue, putting two complete circles on one master sheet; highest values on their respective circles will be the 100, 208, 430, 890, 1850, and 3850 yards. Unit values for the top of the north-south line for each circle begin at 33,600 and end at 72,000.

STEP NUMBER 3

A draftsman's set, available at battalion headquarters, is used for producing workable scales by copying information from the master sheets and arranging it in the pattern you want (see sketch of the finished product). The darkened squares aid the eye in going from one concentric circle to another: line 208, for example, is common to both second and third circles.

To produce copies first determine the finished size; an outside diameter of 5 to 9 inches is recommended. The inner scale should be as large as possible without crowding the outside scale—about 1½″ less in radius.

Lay out your 5 or 9 inch circle on ordinary plotting paper, with necessary concentric circles inside, using black India ink. Trim to size and, using a needle through the center of the circle, place the center of the plotted circle over the center of the master sheet and hold firm with thumb tacks. Leave the needle through the center, pressing it firmly into the plane table top. Hold a straight-edge against the needle in the center, align it along the graduation on the master sheet, and mark that graduation on its proper place in the concentric circles.

CAUTION: On the circumference of the scale reproduce the lines used to indicate the quadrants on the master sheet, so that these lines can be used to orient the scale as it is transferred to each master sheet in turn.

Remember that relative values should be indicated by different lengths of graduations: those for fives should be longer than for units, tens should be longer than fives, etc.

Numbering the graduations comes last. It should be done in pencil first, checked for correctness, then inked. Not all graduations need be numbered:

From 55 mils to 110—every five mils
From 110 to 510—every ten mils
From 550 to 800—every fifty mils
From 800 to 1600—every hundred mils
From 48 yards to 205—every five yards
From 210 to 450—every ten yards
From 450 to 2050—every fifty yards
From 2100 to 3800—every hundred yards

In addition, 1500 mils will be labeled 1700 since the log sin of both are the same. Likewise, 1400 will be labeled 1800, etc., up to and including 2650 at least.

STEP NUMBER 4

Fiberboard ¼-inch thick is a suitable though not ideal mounting material. The qualities desired are lack of warping, strength, and lightness. Rubber cement is good. Shellac, not lacquer nor varnish, is good for waterproofing. A nail cut off and bradded down over a small washer makes a spindle or shaft on which the inner scale can revolve, and a salvage triangle or range deflection fan will provide material for a transparent guide.

The revolving disc upon which the inner scale is mounted should be the same size as the scale to avoid obscuring any graduations on the outer scale. Scales should be mounted before spindle holes are made so that they will be accurately made through the exact center of the scale.

In the absence of any better method, holes can be made by driving successively larger nails through the desired place.

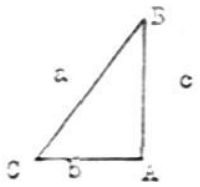
After a similar hole is made in the transparent guide, straight-edge and needle are used to score a fine index line passing through the center of this hole. This line is used in matching values on the outside scale with those desired on the inside scale. Black India ink rubbed into the scored place and allowed to dry will aid the eye.

After all has been made ready to assemble and has been tested for proper fit, cover with two coats of shellac, applying the second before the first is absolutely dry.

PART III—EXAMPLES

SECTION I—*Short Base Intersection*

Problem 1



AC represents a short base 200 yards long. B represents a target to which angles A and C have been read.

A=1600 mils AC=b=200 yards
C=1500 mils

Required: Length of side BC (range to target from C).

Solution: Having determined angle B by adding A and C together and subtracting from 3200, thus:

1600	3200
1500	—3100
3100	100= angle B

use the slide rule in the following manner:

1. Turn the slide rule until 200 appears on the top of the outside scale. This represents the length of the base of AC.
2. Turn the inner scale until angle B (100 mils) appears at the top.

3. Use the pointer to match the 200 precisely with the 100. Hold the two scales so they will not change relationship during the rest of the operation.

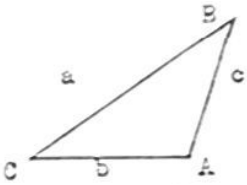
4. Since you wish to know the length of side "a" you use angle A: move the pointer to 1600 mils (angle A) on the inner scale.

5. Opposite 1600 mils (angle A) read the length of side "a." In this case 2042 is the answer.

6. Notice that the pointer also falls across 978, 467.5, 223.7, 107.2, and 51.25 in addition to the correct answer of 2042. To determine which is the correct answer:

7. Remember your original setting of 200 yards over 100 mils. Use this as a fraction (200/100 = 2/1 = 2) for finding the approximate value of R (R = Range/1000); thus you know your correct answer is 2042 and not 978 or some other setting.

Problem 2



AC = 100 yards

A = 2000 mils	3200
C = 1000 mils	3000
3000	200 mils = B

Required: Length of side BC.

Solution:

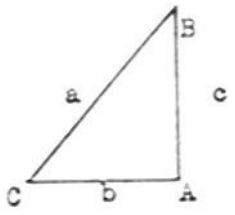
1. Set 100 yards (outer scale) over 200 mils (inner scale).

2. Opposite angle A (2000 mils) look for answer on outer scale.

3. Remember the fraction 100/200 (or .5) in looking for the answer. Because of this the answer must be about 500.

4. Correct answer: 474 yards.

Problem 3



AC = 220 yards

A=1600 mils	3200
C=1545	3145
3145	55 mils angle B

Required: Length of side BC.

Solution: If you attempt to solve this problem in the same manner as the preceding ones, it becomes apparent that the outer scale does not read high enough. A glance at the fraction of 220 over 55 shows that R is about 4. For such cases, reduce the size of the base AC by some convenient fraction such as ½ or 1/3; solve the problem in the usual manner, then multiply the final result by the reciprocal of the fraction you first used, i. e. by 2 or by 3.

1. 220 × ½ = 110 = AC/2

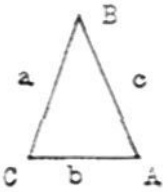
2. 110/55 = 2 (the fraction now used to determine R).

3. Set 110 (on outer scale) opposite 55 mils (on inner scale).

4. Remember the fraction (110/55 = 2) in looking for the answer. Because of this the answer must be about 2000; actually it is 2038.

5. Multiply 2038 by 2 for true answer of 4076.

Problem 4



A=1500 mils	3200	AC=50
B=1500	3000	
3000	200 mils angle B	

Required: Length of side BC.

Solution:

In some cases, more accuracy can be obtained by using AC × 10 and then multiplying the final result by 1/10. Only experience will show just when to do this.

1. AC equals 50. Multiplying by 10, new AC equals 500.

2. Set 500 yards (outer scale) opposite 200 mils (inner scale).

3. Opposite angle A (1500 mils) look for answer, remembering the fraction 500/200 = 2.5 (answer must be about 2500).

4. Answer is 2552.

5. Divide 2552 by 10 to get true answer of 255.2 yards.

NOTE: This can not be done if the true range is greater than 385, since this makes 10R greater than 3850, the maximum graduation on the outer scale.

SECTION II—*Computation of Coordinates*

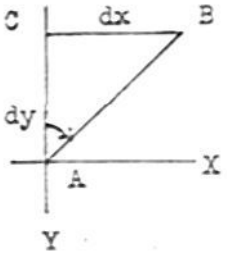
Problem 1

1. Alpha is defined as the smaller angle formed between the leg of the traverse and the "Y" grid.

2. Given: Azimuth from A to B = 300 mils
Distance from A to B = 1000 yards
Required: dx and dy.

3. If Azimuth AB = 300 mils, Alpha is the same in this case.

4. Opposite 1000 yards (on the outer scale) set 1600 mils (inner scale). (1600 mils is angle C of the triangle ABC).



5. To find dx read opposite 300 mils on the inner scale the answer 290.5.

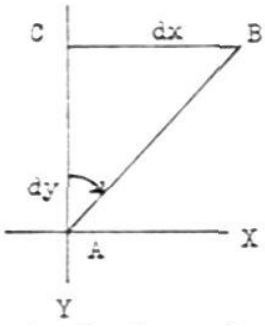
6. Notice that the pointer also falls across 66.5, 139, 607, 1267, and 2650 as well as the correct answer of 290.5. To determine which is correct:

7. Multiply R (1000/1000 = 1) by Alpha (300 mils). This is the approximate value of dx. Thus dx = 1 × 300 = 300 yards (approximately).

8. To find dy: Having set up the scale in finding dx, simply move the pointer to 1300 (angle B) on the inner scale and read the answer 957 on the outer scale.

9. Notice that the pointer falls across 2000, 458, 219, 104.9, 50.2 as well as the answer of 957. To determine which is correct begin at 1000 on the outer scale (which is the length AB) and trace back along that scale to the pointer (opposite 1300 mils).

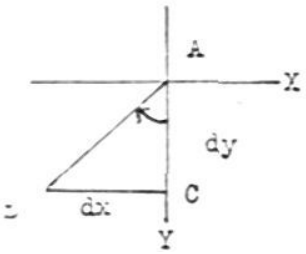
Problem 2



Given: Azimuth of AB = 800 mils
Length of AB = 900 yards
Coordinates of A: 90,340—50,650
Required: Coordinates of B.
Solution:

1. dx = 637.2
   dy = 637.2
2. Coordinates of A: 90,340 —50,650
   +637.2 +637.2
   Coordinates of B: 90,977.2—51,287.2

Problem 3



Azimuth of AB = 4000 mils
Length of AB = 900 yards
Coordinates of A: 90,340—50,650
Required: Coordinates of B.

Solution:

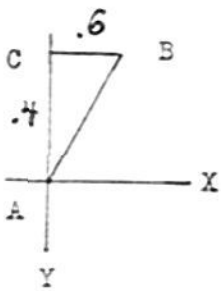
1. Alpha = 4000—3200 = 800
2. dx = 637.2
   dy = 637.2
3. Coordinates of B: 90,340 —50,650
   —637.2 —637.2
   89,702.8 50,012.8

Problem 4 (*Special Cases*)

When Alpha is less than 55 mils, the smallest graduation on the inner scale, dx and dy may be determined by the following expedient:

1. Compute dx by mil relation and correct it by interpolating among the corrections indicated on the figures shown on the face of the scale.

2. Compute dy by using AB as the length of dy and correct by interpolating on same figures used in getting dx above.



Given: Azimuth of AB = 30 mils.
Length of AB = 900 yards.
Required: dx and dy.
Solution: W = mils × R
= 30 × 900/1000
= 27

Correction = — (.6 × .9)*
= —.54

dx = W—Correction
= 27—.54
= 26.46 yards

dy = 900—Correction
= 900—(.4 × .9)
= 900—.36
= 899.64 yds.

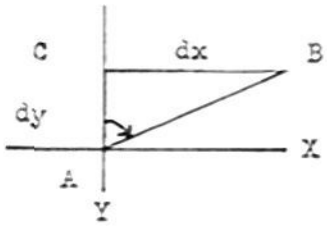
*NOTE: In the corrections above, allowances had to be made for the range as well as the value of Alpha. The corrections on each face-of-scale figure have been calculated for a particular number of mils at a particular number of yards, namely 1000. For 900 yards, only .9 of the correction will be used. *Correction* is always *minus*.

By the above process we arrive at these formulae:
dx = (m × R)—Correction
dy = Range—Correction
Correction = value from table for the value of Alpha × R.

dx = 30 × .9—(.6 × .9)
= 26.46

dy = 900—(.4 × .9)
= 899.64

Problem 5



Given: Azimuth of AB = 1570
Length of AB = 900
Required: dx and dy
Solution:
Alpha = 1570 mils
B = 30 mils

dx = Range — Correction
= 900 — (.4 × .9)
= 900 —.36
= 899.64

dy = mils × R — Correction
= 30 × .9 — (.6 × .9)
= 27 — .54
= 26.46

NOTE: This problem is the same as the preceding one, except that dx and dy are in reverse positions. That is, when Alpha is 30 mils or 1570 mils the procedure is the same except the formula for dx in one case will give the answer for dy in the other.

EASY DOES IT

By Lt. Robert E. Bernhard, Jr., FA

Too many artillerymen have been taught—through no fault of their own—to expect a beautiful 1/20,000 multicolor map or a wide-angle photo for a firing chart. When they don't get these gifts from above, their minds immediately turn to transits, plane tables, and logarithms. Of course, if they insist they *can* spend several hours doing a few minutes' work. Survey can be made as difficult as a reconnaissance officer desires to make it. But there is no reason why Sniper Kuniyoshe Tanaka or Hauptmann Heinrich Schmidt should be given the delightful opportunity of making a leisurely adjustment on an American artillery survey party while a long base is being run or a Bessel resection is being argued over.

Furthermore, the limitations on accuracy are such that under typical field conditions, an exhaustive survey will be so maltreated in plotting and firing that only the party's fatigue will be left. In the first place, the 1/20,000 plotting scale makes locations within 5 yards debatable. With dividers, a grid-sheet location within 3 yards is practicable—if everyone who checks it has the same eye-correction. Sixteen-inch protractors permit a reading to 3 mils provided the origin hole is minute (or, in the type without an origin hole, if the centering line is precisely fixed to the point of origin). Where geometric methods are employed, these errors are multiplied by the number of points plotted from, width of the plotting lines, and fineness of the needle pricks for each located point. With trigonometric methods plotting errors are reduced but not eliminated, while mathematical errors are possible.

Disregarding survey, mathematical, and plotting errors, such factors still remain to be considered as deflection and range probable errors, weather changes between metro messages, and fate. The last is not covered in either the new 161 or any available firing tables, graphic or otherwise.

While the burst area of the 105-howitzer shell at typical light artillery ranges compensates for a deflection error of approximately 10 mils, the range probable error of about 30 yards at these ranges—plus the bare possibility that either the angle of site or the position correction, whichever is employed, may be slightly off—makes surveys to the yard seem Utopian: conceivable, worthy of achievement, but nor at present available for issue.

By this, it is not to be inferred that the rapid survey methods suggested here are careless or inaccurate, or that work of that type is acceptable. However, they are not recommended if accuracy to the yard is desired and enemy forces are neither present nor expected to be present.

Taking a situation calling for a comprehensive battalion survey wherein no large scale maps or aerial photographs are available, certain essentials are usually required: (1) horizontal and vertical control; (2) battery locations; (3) base point and target locations.

An effective three-station survey using six men, three aiming circles or BC-scopes, four aiming stakes with pennants attached, steel tape, three SCR-194 sets, and an assortment of tent pegs may be organized rapidly for most situations where high ground is available. Care must be taken when using this method that gun positions and the target area are clearly visible from two of the stations. The third station need not be occupied, but should be chosen for an easily identifiable reference point.

Arbitrary coordinates and an arbitrary elevation are assumed for Station A. The party is split into groups

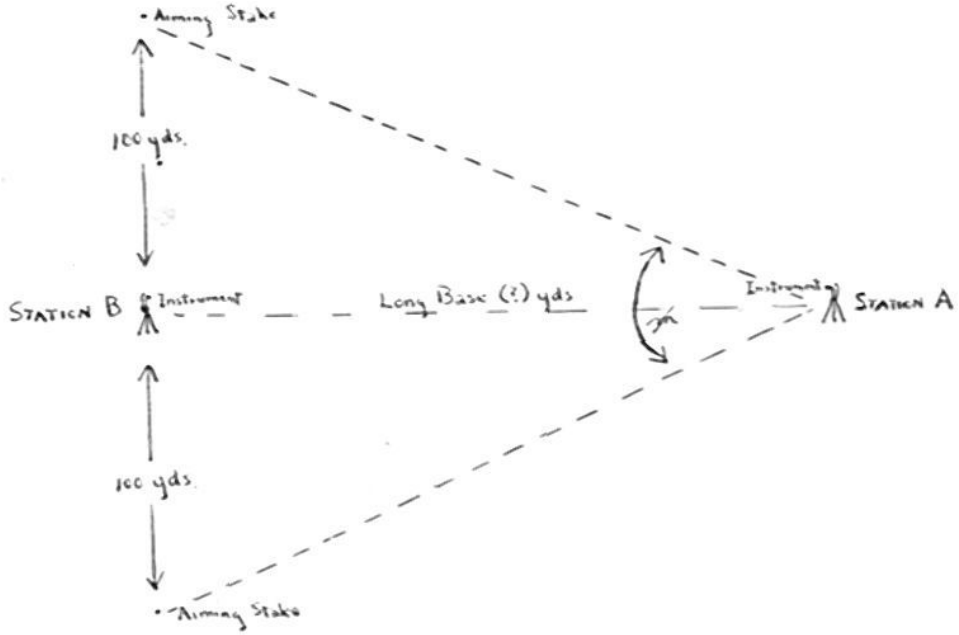


Figure 1—Computing the Long Base.

of two, each taking one angle-reading instrument and a radio set. Group 1, which should contain the survey officer, goes to Station A. Group 2 takes two of the beflagged aiming stakes and the steel tape, and proceeds to Station B. Group 3 takes the other aiming stakes and tent pegs, and jeeps to each of the gun positions.

Groups 1 and 2 set up their instruments at their respective stations and sight on each other. Group 2 then turns off a right angle and sets up one aiming stake at a distance of 100 yards (taping is preferable although pacing will give good results on fairly level terrain). A 3200-mil angle is turned and the second stake set up 200 yards from the first one. This places the instrument at Station B midway between two aiming stakes—100 yards from each one. Station A measures the angle between the two stakes, divides 200 (yards between stakes) by the measured mils, adds 2% (approximately the mil relation error), and thus has the distance in yards between Stations A and B. When Stations A and B are closer than 500 yards, stakes may be set up only 100 yards apart—the distance is arbitrary, based purely on visibility.

Stations A and B then take readings from each other to Station C, the Base Point, and all probable targets. A little time can be saved if Station C is also the Base Point. Radio communication simplifies coordinating the work of the two parties. If the enemy is within radio intercept range, readings are either coded or not broadcast; a simple code is merely adding 500 to every reading, others will readily suggest themselves.

The instrument operator at Station A then takes whatever angle of site readings are necessary for adequate vertical control.

All readings, incidentally, are noted—no attempt is made to plot while at the stations unless the gun positions are so widely separated and the terrain so difficult that the crews at Stations A and B must wait some time for Group 3 to travel from one battery position to another—this period is best spent in reading vertical angles.

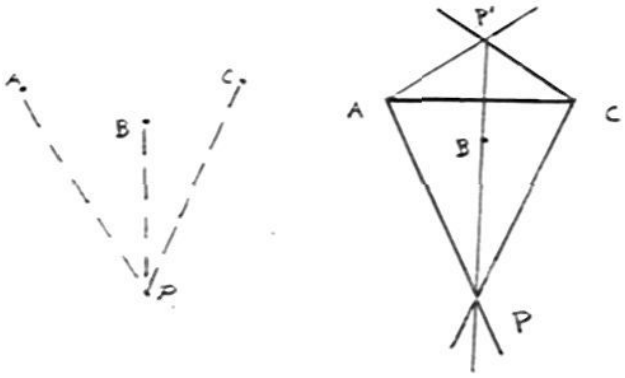
Group 3 sets up its two aiming stakes at least 100 yards apart near a gun position, taking care that they are clearly visible to both Stations A and B and that the right gun position can be seen from some point on a line between the stakes. When Stations A and B have both read angles to the stakes, Group 3 is notified by radio, replaces the aiming stakes with tent pegs, and locates the right gun with reference to the line between the stakes. This line, of course, is the orienting line. The same process is repeated for each battery.

Triangulation having been completed, all groups return to a rendezvous and plot the data. Base angles are measured, and 'phoned or broadcast to the gun batteries.

Station C is identified only so that in improving this survey it will not be necessary to reoccupy any station; succeeding locations can be made by resection. Also, if Station C is in friendly territory the entire survey can be checked for accuracy.

In case Division Artillery assigns control points designated by a division or higher coordinate system, the plan of survey described may still be used, but Stations A and B must first be located with regard to these control points. A simple geometric Italian resection usually suffices, and with Stations A and B located the survey continues as before.

The geometric Italian resection referred to is that so ably described by Capt. Dupuy in his article in the March-April, 1940, FIELD ARTILLERY JOURNAL. Three known points are required. All of them cannot be on the perimeter of the same circle, but that situation is rare. Setting up an angle-measuring instrument at the point (P) to be located, the angle between Point A and Point B and that between Point B and Point C are measured. At a plotting table, a line is drawn connecting A and C. At A, the angle BPC is turned off from the line AC away from the probable location of P. At C, the angle APB is turned off from CA away from P. The intersection of these two newly-constructed rays is called P^1. A line from P^1 through B is then drawn. The resulting angle AP^1B is set off at C along AC toward P and the angle CP^1B is set off at A toward P. The intersection of these two rays with P^1B prolonged is the correct location of P. Advantages of this resection are that only two angles need be measured in the open, the known points need not be on all sides of the point to be located, and neither plane-tables nor compasses are required.



A—Angles to be measured on the ground from P. B—Plotting the location.

Figure 2—Geometric Italian Resection.

In the event that this system does not work perfectly, it is the fault of that unknown scoundrel who left a thumb tack hole in the middle of your plotting board.

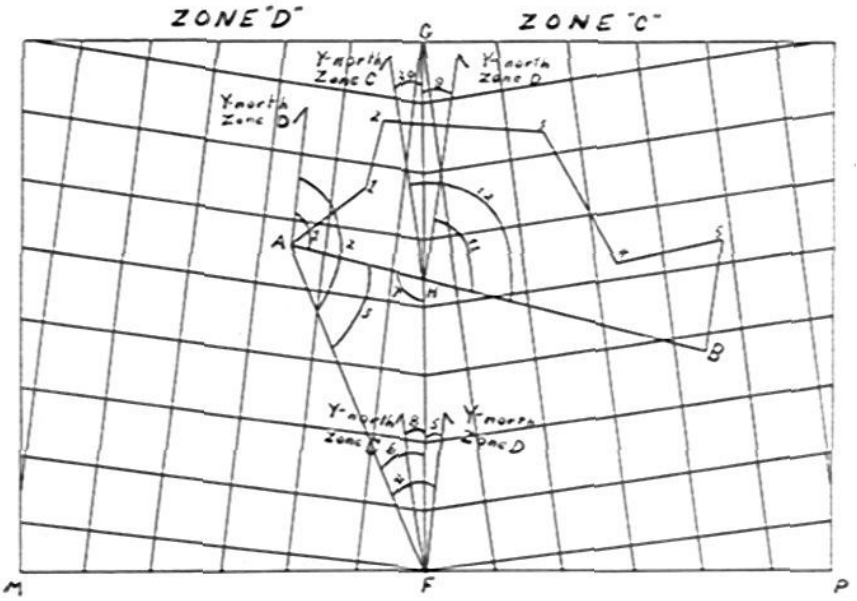
Survey Computation Between Grid Zones

By Capt. Byron B. Jones, FA

Down in Louisiana, the boundary between Grid Zones C and D runs right through the center of the maneuver area. This situation has rarely been encountered in the past, but the solution of surveys extending from one zone into another now has special interest.

Point B, in grid zone C, is to be located from point A, in grid zone D. The coordinates of A and an azimuth to a point are known.

From A a traverse is run through stations 1, 2, 3, 4, and 5, to B (triangulation should be used when possible), giving the zone D coordinates of B. Having these coordinates of A and B, the azimuth (angle 1) and length of the imaginary line AB can be computed.



The line FG is the boundary on the map between grid zones, MFP is the bottom of the map. The latitude and longitude of F will be given on the map, and its grid coordinates for Zone D and Zone C may be found in the table "Grid Coordinates for Five Minute Intersections," in *Special Publication No. 59*, Department of Commerce, U. S. Coast and Geodetic Survey, Government Printing Office, Washington, D. C.

Coordinates of A and F in Zone D now being known, the azimuth (angle 2) and length of the imaginary line AF can be computed. The azimuths of AB and AF being known, angle 3 can be found by subtracting the azimuth of AB from the azimuth of AF (angle 2 minus angle 1). Having the azimuth (angle 2) of AF, angle 4 can be found by taking the back azimuth of AF (180° minus angle 2).

FHG is a true north line. Angle 5, formed by Y north of Zone D and the true north line FH, is next desired. This may be found in *Special Publication No. 59*, under "Corrections for the Reduction of Geographic Azimuths to Grid Azimuths." Angle 4 and angle 5 being known, angle 6 can be found (angle 4 minus angle 5).

In the triangle AHF, the length of AF, angle 3, and angle 6 are known. Angle 7 can now be found (180° minus angle 3 plus angle 6). Having angle 3, angle 6, angle 7, and AF, the lengths of AH and FH can be computed (log AH equals log AF plus log sine angle 6 plus colog sine angle 7; log FH equals log AF plus log sine angle 3 plus colog sine angle 7).

Angle 8, formed by Y north of zone C and FH, is next needed. This is also found in *Special Publication No. 59* under "Corrections for the Reductions of Geographic Azimuths to Grid Azimuths." Now having the zone C coordinates of F, the length of FH, and the azimuth of FH in zone C, the zone C coordinates of H can be computed (one leg traverse).

The lengths of AB and AH are known; the length of HB can therefore be found (AB minus AH). The zone D azimuth (angle 11) of HB is known, it being the same as the azimuth of AB (angle 1 equals angle 11). Angle 9 equals angle 5 and angle 10 equals angle 8. The zone C azimuth of HB (angle 12), therefore, will equal angle 11 plus angle 9 plus angle 10. The zone C coordinates of H, the zone C azimuth of HB, and the length of HB all being known, the zone C coordinates of B can be computed by a one leg traverse.

HIGH BURST ARTILLERY FIRE

is being used by the British to guide tanks in night attacks—which are exceptional because of directional difficulties—and through thick country where direction may be lost in day attacks. These bursts are high up, in line, behind the objective, and fired by one gun at about 15-second intervals.

For Men Only

The GPF required a sizable pit . . . .

This article was first written while the author was a Heavy Artilleryman. Since then he has been transferred to a light battalion. He still thinks the heavies are orphans, however, and so sticks to his original title in the hope that it will arouse enough interest to start discussions of the problems of the Heavies.

By Capt. T. N. Dupuy, FA

We of the Heavies seem to be the orphans of the Artillery. I speak particularly for those of us in the 155 outfits, but I know that the 240's feel as neglected as we do. Whenever we are mentioned in Field Artillery publications, or in most of the Field Manuals, it is as though we were an afterthought. It usually runs as follows: "The same procedure may be followed with the 155-mm. gun and the 240-mm. howitzer, save for obvious changes due to the differences in materiel."

We realize, of course, that we are relatively few in comparison to the great number of Light and Medium Artillerymen, yet we have been led to believe we are rather important. It seems, therefore, that more attention should be paid to our Heavy Artillery. I offer what I trust will be the first of many articles dealing with the peculiarities and difficulties of the Heavy Artillery. This article concerns the 155-mm. gun, with which I am much more familiar than with the 240-mm. or the 8-inch howitzer. It is my firm belief, however, that officers of these other types of heavy materiel should take pen or typewriter in hand to air their problems and to show others their method of meeting them.

T/O Changes

It is the opinion of at least several officers that the Instrument Section of the 155-mm. gun battery needs revision. That section has three prime functions. The first is to assist the BC in his reconnaissance and selection of position; the second is to be able to run an accurate, speedy survey; and the third is to operate instruments and assist the BC at the OP or CP after the position has been occupied. The first two functions are closely allied and are, in my opinion, more important than the third because the Fire Direction Center makes most of the computations during combat. To perform the first two functions the Instrument Section at present has an Instrument Sergeant, an Instrument Corporal, two Operations Corporals, and an Instrument Operator. That is not really enough to run a proper survey, let alone assist the BC in the reconnaissance and selection of his gun position at the same time. Three

more Instrument Operators would enable the section to perform its missions more efficiently.

While we are on the subject of changes in T/O, it is the firm opinion of the author that the Supply Sergeant should have a clerk. The reasons for this are legion. To name a few: The Supply Sergeant is practically always off on one of his supply missions whenever the BC needs information which only someone intimately acquainted with the battery supply set-up can give him. The supply records, when considered in connection with all of the various jobs which the Supply Sergeant must perform, becomes a formidable obstacle to the proper execution of his other multitudinous duties. I'm sure other Battery Commanders, whether in Heavy, Medium, or Light Artillery, can think of several other equally good reasons for a Supply Clerk. The suggested change, of course, has nothing to do directly with the functioning of the 155-mm. gun battery in combat.

The reasons for the arrangement of the BC Party and the Remainder of the Detail will be seen in the suggested RSOP procedure below. It is appropriate here, however, to

. . . . but the M-1 is readily emplaced. (*Signal Corps photos*)

discuss one or two other points which might provoke argument. Some officers will object to having the Executive ride with the truck column, or Light Column as it will be hereafter termed, while the Assistant Executive sticks with the guns in the Heavy Column. Similarly some officers may raise their eyebrows at the Chief of Section abandoning his gun. But nothing will occur in the Heavy Column which cannot be handled by the Assistant Executive and the Gunner Corporals just as well as it could be by the Executive and Chiefs of Section. On the other hand there will be many things arising at the gun position which are the direct responsibility of the Executive and the various Chiefs of Section; things that could and should be decided and done before arrival of the slower Heavy Column. There is, for instance, the extremely important matter of deciding upon the route of the tractors, with their tell-tale tracks, to the gun position proper. Then there is the manner in which the individual guns will be put in their proper places. If those things are to be decided only after the Heavy Column arrives, the delay will be considerable. If there are other batteries behind a serious road-block may result. In order to achieve the smooth occupation of position which we are all seeking, the Executive and Chiefs of Section should be at the gun position when the tractors and guns arrive. One of the main objections to the old GPF is the length of time it takes to go into position; everything should be done to eliminate all foreseeable, preventable delays. For instance there is the matter of camouflaging the position—a great deal of the work can be done before the guns arrive.

Other changes which might invite discussion are the elimination of the Executive's truck and the creation of a Tractor Maintenance truck. Bantam command cars are ideal for both the Executive and his assistant to lead and check their respective columns. Furthermore, it is the author's belief that there should not be a trailer encumbering the 5th Section tractor. In the first place the trailer is not big enough to carry all of the tools, equipment, fuel, lubricants, etc., which the Tractor and Artillery Mechanics should always have in the vicinity of the guns. Probably more important, the 5th Section tractor has for its prime purpose the assistance of other sections when the going is tough. This assistance must be immediate if the column is to be kept moving. If the driver has to worry about a trailer, when to drop it, when to pick it up, and the consequent shuttling in and out of column, much of the value of the 5th Section tractor is lost. We might just as well unlimber gun-section tractors to assist each other, since with a trailer on the 5th Section tractor practically the same amount of time will be lost.

HEAVY RSOP

Let's look at the functioning of a battery. Despite its rather summary treatment of Heavy Artillery, there are several paragraphs in the Field Artillery School Instruction Manual T-2, relating to RSOPs, which may be read profitably by Heavy Artillerymen. Note particularly paragraphs 3, 6, 15, 16, 17, 19, 24, 45, 46 and 47.

The normal situation in the 155-mm. gun battery is a deliberate occupation of position, a daylight reconnaissance followed by night occupation of the position.

While battery commanders go forward with their parties to receive the battalion field order, the remainder of the battalion, under the battalion executive, is usually well to the rear in an assembly area. The battalion executive, carrying out orders of his commander, will usually bring the battalion under the cover of darkness to some previously identified point where the batteries will be released to the BC's. If the assembly area is very far to the rear the BC will usually include his instrument truck, containing his survey party (the Instrument Section) and their instruments, in his party. This truck will not be brought to the point where the battalion commander gives his order, but will be left somewhat to the rear in order that there shall not be too much activity concentrated in one spot.

After having received his order the BC reconnoiters his area. If there is an OP to be occupied by the battery he will generally reconnoiter that first. At the OP the BC explains the situation to the RO, Instrument Sergeant, and Signal Sergeant. He tells them what he wants at the OP and what communications he wants. The party then goes to the area in which the BC has decided to select his gun position. The signal car is then unloaded and turned over to the RO. RO and Instrument Sergeant are released to return for the instrument truck and its personnel. Upon arriving at the truck, RO sends the Bugler and Instrument Operator 4 back to the GP in the signal car, the driver of which then reports back to the Signal Sergeant. RO meanwhile proceeds to carry out the survey in accordance with the Standard Operating Procedure of the battalion or regiment, and in accordance with the BC's orders.

The BC reconnoiters the area in which he will place the firing battery. He tells the Signal Sergeant where he wants the CP and the switchboard, and the general limits of the actual gun position; the Signal Sergeant then has the local net installed by T1 and T2, all ready to attach to the switchboard when it arrives. Signal Sergeant next takes the signal car to reconnoiter the route over which he will lay wire to the OP. In the meantime the BC, accompanied by Operations Corporal 1 locates the exact position of each gun, marking on the ground the precise spot where the sight stake of each gun will be placed. When he has finished this, Operations Corporal 1, assisted by Inst. Op. 4 and possibly T1 and T2, puts in the line of centering stakes for each gun, using the aiming circle for this purpose. A stake is driven at the point designated by the BC for the gun sight; then, on an azimuth designated by the BC, the Opns. Corp. has his assistants drive stakes to the front and rear of the sight stake so as to form an unmistakable centering line.

In the meantime the BC reconnoiters to the rear to select positions for trucks, tractors, and kitchens. He takes his driver and bugler with him, the driver being shown where the motor park and latrines will go, the Bugler where the kitchen will be.

When the survey is complete the RO gives, or sends, the coordinates and elevation of the base piece to the BC who has them sent, by messenger, to the Bn. CP. The RO then occupies the OP, if one is to be established, with the Inst. Sgt., Inst. Corp., and Opns. Corp. 2. The set-up made and the data figured will be in accordance with instructions given earlier at the OP by the BC. If the instrument truck can approach close enough to the OP it will be used to transport the RO, his OP personnel, and equipment to the OP. If not, the signal car will be used, two trips being made if necessary. Inst. Ops. 1, 2, 3, and 4 will remain at the gun position to guide the gun section trucks to their proper positions when the Light Column arrives.

The BC has the instrument truck's machine gun located at a suitable point. He selects a position for the other gun and points this position out to the senior machine gunner present, with instructions to prepare it for occupation and to show the position to the Machine Gun Sgt. when the Light Column arrives. Machine gunners immediately begin preparing emplacements for both guns, taking all possible measures to ensure cover and concealment. If there is time they may begin work on alternate positions for the guns.

In the meantime T1 and T2 dig a position for the switchboard (Figures 1 and 2). When this is completed they begin work on slit trenches for the Executive, GP telephone operators, Opns. Corp. 1, and Inst. Op. 4. They are assisted in this by Inst. Op. 4, Bugler, and chauffeurs as soon as they have finished their other

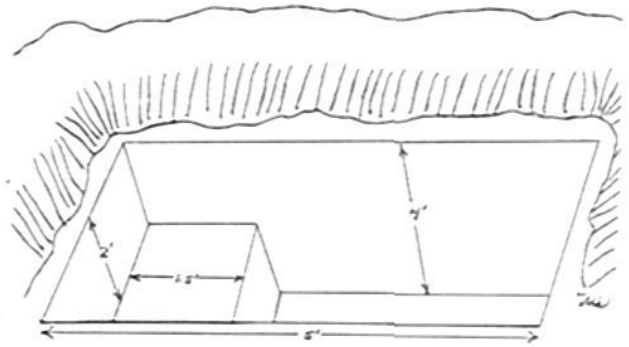


Figure 1—Emplacement for BD 71 switchboard

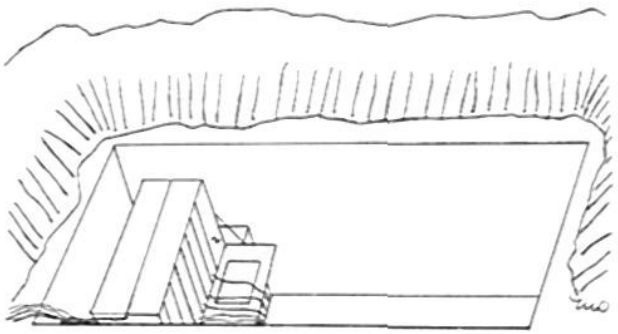


Figure 2—BD 71 switchboard in emplacement

duties. The other instrument operators also participate when they are through with the survey. The next work, particularly if no OP is to be occupied, is to prepare a dug-in CP, so covered that a light can be used inside without being visible from outside.

Opns. Corp. 1 is sent in the signal car to the release point in time to meet the Light Column; he is to lead the Light Column into the gun position and the driver of the signal car will lead the heavy one.

Night falls. The Light Column arrives at the release point. Opns. Corp. 1 jumps on the Executive's car and leads him to the GP. As they arrive, the Executive jumps out, and the Opns. Corp. jumps off and shows him the position. The Sig. Sgt. has Wire Truck 1 pull over near the prepared switchboard position, followed by Wire Truck 2. Enough slack is pulled off Truck 1 to attach to the switchboard and that truck then starts for the OP, directed by the Sig. Sgt., laying wire as it goes. This is only, of course, in case an OP has been selected. T1 and T2 then show Sig. Corp. 2 where the switchboard goes, and local installations are completed as rapidly as possible. If communications are completed to battalion before the Sig Sgt. returns from the OP, that fact is reported to the BC personally by Sig. Corp. 2, if the BC is still at the gun position. If the BC has gone to the OP the report is made by 'phone just as soon as a line is open to the OP. In the meantime the instrument operators have pulled the gun trucks out of column and shown the Chiefs of Section the locations of their respective gun positions and centering stakes, and have indicated the proper direction of fire. Machine gunners show the Machine Gun Sgt. the position which they have prepared for the second machine gun, which is taken off the 5th Section truck and emplaced. The 1st Sgt. closes the remainder of the Light Column up, then, guided by the BC driver, leads it to the motor park. The Bugler has jumped on the mess truck and pulled it out of column at the position previously designated. The BC driver points out the latrine positions to the 1st Sgt. and leads him to the motor park, where the latter details men to dig the latrine and has the Motor Sgt. supervise occupation of the park. Accompanied by the BC driver and Bugler, the 1st Sgt. returns to the gun position in the Executive's car; BC driver and the Bugler report to the BC that they have accomplished their missions. The 1st Sgt. collects the four gun section trucks and leads them to the motor park. He inspects the park to make sure that all precautions for safety and concealment are being taken.

When the Heavy Column arrives at the release point the signal car driver leads it to the gun position. Each Chief of Section has made a reconnaissance of his part of the position and selected a route for his tractor and gun to follow to keep the position invisible to air observers and so the tractor drivers can so drive over the centering stakes as to have the tube parallel to the line of centering stakes with the sight over the middle (sight) stake. The Executive checks to make sure that proper routes have been chosen. The Chiefs of Section post guides to bring their tractors and guns to the positions along the selected routes.

Russia's 210-mm. howitzer is ready to go as soon as uncoupled (*Sovfoto*)

As soon as he is satisfied that occupation of the position is progressing satisfactorily, the BC goes to the OP in his car, accompanied by the Bugler and Inst. Ops. 1, 2, and 3. Opns. Corp. 1 and Inst. Op. 4 remain with the Executive to act as recorder and aiming circle operator, respectively.

If batteries have been instructed to send out forward observers, or if that is the Standard Operating Procedure of the unit, the assistant executive will proceed forward immediately. Unless orders have been issued to the contrary, and if time and the situation permit,

Wire Truck 2 will follow him to establish wire communications. There should be a reel of wire in the assistant executive's car so he can keep the communications continuous in the event he has to move.

At the gun position the executive sees to it that measures are taken immediately for protection and concealment. The digging of slit trenches is emphasized. The executive makes sure that his car is kept in the vicinity of the GP, available for transportation. Tractors may be sent back to the motor park or be concealed near the guns, the executive ordering whichever procedure seems best in the particular situation.

When the battery has been laid the executive has the sections refer to aiming stakes fitted with lights bright enough to be seen only for a short distance and with only a vertical slit of light showing. A different colored light should be used by each section to prevent any possibility of confusion, and aiming stakes should have some distinguishing mark of the same color in the daytime.

When the occupation of position is to be hasty and/or the batteries are to be released to the BC in the assembly area, BC takes the assistant executive with him in his party. The procedure described above is followed, except that just as soon as the BC has decided the general location of the gun position, he sends the assistant executive and orderly back to bring up the battery. The orderly directs the executive and the Light Column to the gun position, while the assistant executive leads the Heavy Column.

The executive may be ready to lay the battery before the survey is complete, in which case he lays the battery by any appropriate method. As soon as the place mark is located and the orienting line materialized, he places his aiming circle over the place mark, has the instrument laid reciprocally by No. 1 gun, and measures the base angle which he reports to FDC and to BC.

Sometimes the agent's car will be available to the BC for use. In some rare cases more vehicles may be assigned to a battery than the present TBA authorizes. In that case one extra vehicle, a bantam or ½-ton command car, should join the BC Party in order to reduce the amount of shuttling the above procedure prescribes for the signal car. If still another bantam is available, it has been found very handy to have it follow the rear of the Heavy Column in order to dash up and inform the assistant executive whenever his presence is required in the rear. This gives the assistant executive, or executive if he happens to be with the Heavy Column, much peace of mind and enables the column to move more rapidly, particularly at night, since it will not be necessary to stop so frequently in order to check the column.

SPEEDING OCCUPATION

As mentioned above, the main objection to the old GPF is the length of time it takes to put it into position. Most of this time is taken up, we know, in digging the recoil pit. If we could eliminate or at least greatly reduce that digging, we could cut in half the time for occupation of position. One method which is being tried is to raise the gun off the ground. Up to now this has not been tested in service practice because there has been no firing since the innovation was inaugurated. It is done by running the rear wheels (gun wheels) onto a wood-block ramp four feet long, two feet wide and one foot high. It is realized that this will raise the silhouette of the gun and slightly complicate the use of the camouflage net, but probably not enough to outweigh the advantage of quicker occupation of position.

There are other advantages as well. We all know how the recoil pit collects water in wet weather. The footing can become abominable. As a matter of fact in actual combat, when men will be hurrying around such a pit, there will be plenty of opportunity for them to slip and fall into the path of recoil. Poor footing naturally reduces the efficiency and speed of any gun squad. If only a shallow pit were dug it could easily be drained. Another solution is the digging of a comparatively narrow trench just below the breech, where it would not interfere with the service of the piece yet would afford a recess into which the gun could recoil at extreme elevations. Such a trench would also be handy for the Gunner and No. 1 to dive into during air or mechanized attacks.

Something else which most of us have noticed is that we gain greatly in the matter of recoil pits when we put guns into positions on a reverse slope. The pit under such circumstances does not have to be so deep, and furthermore it actually becomes an approximately level space between the trails, which improves rather than detracts from the footing. Also, it is very simple on such a slope to devise drainage ditches which will keep the pit relatively dry and hard in wet weather.

There are probably many officers who do not agree with much in this article. Unless they sound off, however, we will lack the impetus towards progress which only discussion and argument can give.

ON NIGHT MARCHES

in open country when artillery may be subjected to air or armored attack, the British adopt a scatter-and-rendezvous plan made known to all drivers beforehand. This system works out very well, especially since for long marches several rendezvous are selected, each within a certain time zone.

AXIS BORN YANKS

By Lt. William D. Kilduff, FA

It's a bit bewildering to them, this U. S. Army. It works hard, it plays hard. It gets ready for battle with a song and a joke. It wears its uniform—so much finer than the one they used to wear—cockily yet carelessly. It grumbles over food they never dreamed of in their old camps. It laughs about Messerschmitts, Capronis, and Japanese Zero fighters. "Those b..... ds will never touch us," it shouts in its great collective voice. It prepares for death in a lively way they can't understand. And they try so hard.

They? The European-born, Axis-trained soldiers who are now part of our Army, of course. The men who stole, smuggled, and ran away from a war-torn Europe only to land in a war-bound America. The old soldiers who through the ironies of fate and the U. S. draft are now learning to fight all over again, learning to fight the armies they once served. There are not so many of them. In an army which numbers millions they aren't prominent. But they are there all right, make no mistake about that. Officers serving in replacement centers run across them every training cycle.

Well, how do they like it? How do they feel serving Uncle Sam, these poor devils who left the armies of Germany, Austria, and Italy a few years back to seek peace and a new home? The answer is: they don't mind it a bit. Born in the European arena they have been used to marching feet, to uniforms, since they could remember. They didn't dislike serving in their old army—and they *like* serving in their new one. They enjoy watching it grow; they take pleasure in the fact that it absorbs lessons from their old outfits and moves ahead with ideas of its own. They seem proud of its progress and they get a real kick whenever they can contribute to it. The only thing they can't understand is how the hell an American soldier gets that way.

But to go back a bit. How did they get in our Army? This country may well be a melting pot, but how in the world did they get into our uniform? They got into it because they live in the United States by choice and because their newly adopted government asked them to get into it. They certainly never left the Old Country to fight, but they are here now and fight they will rather than return to the turmoil they used to call home.

"They" are all ages, all sorts, all nationalities. They speak a frightening number of languages, they worship at all manner of altars, but now they all wear the same olive drab uniform.

In one regiment at Fort Bragg's replacement center you can find Poles who saw Warsaw fall and somehow got away, Czechs who watched their land sold out at Munich, Italians who got very, very sick of bad black bread, Austrians who loved the old Republic and despise the new "unified" Nazi state. You can even find Germans who served their time with the armies of the Reich when the *Panzerdivisionen* were abuilding and now are happy to serve with the armies determined to wipe out those same mechanized units. They were good soldiers in their old uniforms and they are even better in their new one.

But be specific. How do they compare the old and the new? As they see it, how does the U. S. Army stack up? They don't like to talk about it, but you can find out if you talk with them honestly. They know that the Axis is good. Yet they also feel that this time they are on the right side. They don't shout the fact about, for their European background doesn't permit shouting, but they give themselves away every day.

Sometimes they talk to their officers about it in quiet tones. More often they show it by drilling just a bit harder, by keeping their barracks just a bit neater, by studying at night just a bit later than their American-born buddies. It's very plain if you take the trouble to look and listen.

A German boy will tell you that in camp over there the officers and the men lived and ate together, that in theory they were all part of the same happy family. Then he will add, "With you it is different, sir. You don't live with your men and you don't always eat with them. Yet you *like* them—and they like you. It was not like that over there." This same boy helps his buddies in the squad room with their artillery arithmetic until taps almost every night.

Another man, a former machine gunner in a Krupp tank, will add: "In training over there we were ordered—and we did. Here you explain. You teach as though your men had a brain as good as yours." He may point out that in his old regiment the drilling was more precise, the marching more perfect, but he will quickly explain that in the Reichswehr which Hitler built every recruit spent one full year on nothing but drilling and body conditioning.

An Italian boy ("My old regiment was just as good as the Bersaglieri!") tells you with amazement that he

talked with his BC yesterday. And all the permission he had needed to enter the orderly room was the approval of the First Sergeant! In Italy, he continues, he could see his commanding officer only by gaining the approval of his own particular NCO, the sergeant of the guard, and the officer of the day. Practically an all day job. He is quite confused to find himself in an army which trusts its men.

Then there is the Austrian. He speaks English poorly, but he takes careful, almost painful notes on everything his officers say. He knows that some of his mates in the squad room are still suspicious of his Axis background and he tries so very hard to convince them of his sincerity. He likes to sing their songs, is eagerly learning baseball and is inordinately proud of his ability as a soccer player—he's the only good one in the outfit. But it is in the field that he really comes into his own. After a morning's firing with the 75's he can experience no greater thrill than to serve the officers' table at dinner. Waiting on the officers—the "shentlemen," he calls them—was a special privilege in the old Austrian army when his father was a sergeant major. Dutch still considers it an honor, although anything so closely related to KP is, logically, scorned by the rest of the battery. He has told all his fellow recruits how it was "in the old days." Dutch wants them to know that he is no beginner, that he is a field soldier versed in the art of dignified warfare and the conventions of the campaign, though you might have some trouble preventing him from spreading a snowy tablecloth for mess in the middle of an engagement.

All of these foreign-borns suffer from an acute inferiority complex. Each feels that he must do better than the rest of his battery mates just to stay even with the crowd. Each worries that he may be kept out of the actual scrap. When word came down from the rumor factory (God knows exactly where that is!) that the "graduating" trainees might head west, two Axis-born privates rushed to the battery commander to learn if they were to go too. The projected move was hearsay of the flimsiest sort, the chances of immediate action even flimsier, but they took no chances. They are forever fearful lest they be treated differently from the other men. Not even the toughest of the sergeants picks on them any more than the rest, yet they inevitably feel sorrier for themselves than a crowd of shaved lions. All their lives, you see, they have been knocked about. A land which offers them an even break is too much of a novelty for them to understand at once.

And so they work harder than ever. Take that little No. 1 cannoneer from Hamburg. He used to be an infantryman in a crack North German division. Now he is busy becoming the finest (and tiniest) No. 1 in the U. S. Army.

Some of the others have seen a Stuka in action. Some helped service Junkers bombers before the war. There is no need to teach them the difference between a Spitfire and a Me-109; they learned that long ago, and a few have even seen the two planes scrapping it out. While it may be necessary to dramatize instruction to impress the Yankee-born Yank, the straight facts will get the point over to the foreign-borns. They know precisely what you mean when you use the terms "flame-thrower," "forced march," or "shrapnel wound."

One of the new men drove a tourist taxi in the vicinity of Halfaya Pass before the war. He followed that epic winter struggle of Auchinleck vs. Rommel like a hawk (or like an Intelligence Officer, to use a better term). Two others in the regiment also came from the Near East; one is an Arab, the other a Palestine Jew. Over there they would have been at each other's throats all day long. Here in the battery each goes his way quietly. Strange that they have to go to war to settle their old racial differences peaceably! We even had a White Russian and a Red who let bygones be bygones and pitched into the very serious business of becoming soldiers.

One thing about the Americans they do not like: their continual practical jokes. When a frisky Georgian tried the old hot-foot trick on our Italian, the air was deep blue. That Latin blood really flared up. And when another of the battery's southerners deliberately tricked Dutch, telling him the Colonel wanted to see him, Dutch shined up his uniform, reported to the old man, took the Colonel's blustering calmly, then proceeded to lick the daylights out of the prankster. Like the others, he couldn't quite understand that sort of humor. None of them appreciate anyone who creates discomfort "just for a laugh." Too much misery came their way as a matter of course in the old country for them to enjoy deliberate injury.

No, they are eager to fight; they will in Europe if necessary, but, as one Hungarian explained, "I prefer it better if we hit down the Jap'nese." It is not so much that they could not point a gun at their old comrades, as that memories of the past make them anxious to stay here. Europe holds grim recollections for many of them, the little cannoneer for example; he spent a month in a German concentration camp, somehow he got out, but the scars in his mind have not healed. The Austrian, too: his father was "taken away" by the Gestapo.

And so each afternoon at sundown they spruce up their uniforms, dust off their heavy "G. L's" and fall in for retreat as United States artillerymen. When the bugler sounds his flourish and the battery commander calls down "Pr-rresent, H'arr-rms," they, those Axis-born Yanks, snap up their rifles with the precision of good soldiers and the determination of men with a mission. Glance down the platoon lines and you will see men who salute our colors with their chins out and their shoulders back. They are American soldiers now—good ones.

RUSSO-GERMAN WAR

PART IV

By Colonel Conrad H. Lanza

Russian tanks having blasted a German position, infantry dashes from cover for their assault hard by the tanks. (*British Press Service Photo*.)

GENERAL SITUATION ABOUT 20 OCTOBER, 1941

During recent years, agriculture in the Ukraine had been completely mechanized, so the potential booty was enormous. This area was strongly garrisoned and orderly, ready for administration and exploitation. The Ukrainians seemed reasonably ready to cooperate, but the Axis' most pressing problem was the securing of sufficient workmen: tens of thousands of skilled men had been taken from farms and factories, and only 10% of the tractors and farm vehicles remained. Allowing for salvage of "destroyed" tractors, it was estimated that if gasoline could be found to operate them, enough crops could be raised for local needs during the coming year, but without leaving surplus for export. This estimate by American correspondents has since been confirmed in part by German announcements that no food would reach Germany from the Ukraine during 1942. According to British reports, the Germans have insufficient gasoline for mechanized farms; this problem was solved by substituting steam tractors for gasoline ones: these have been definitely reported in Belgium and in occupied France.

American correspondents further reported that invariably the central business districts of the large towns had been razed by fire. Factories, public utilities, and buildings had been blasted or burned, or had had the machinery or other contents removed. Residences along main highways had been destroyed, but residential districts elsewhere were generally intact, so there was sufficient shelter. Markets were functioning, the prevailing method of purchase being barter. Russian money was spurned, while German was accepted very reluctantly. The country was full of abandoned damaged material. There were thousands of motor vehicles, tanks, tractors, trucks, etc., on which salvage crews were working.

The great cities of Kiev, Odessa, and Nikolaev, and lesser towns visited, were found to have been thoroughly sabotaged by the Russians before they withdrew, but there had been no destruction of villages and small towns. City people were apathetic: they saw no future before them and appeared not to see any particular reason to exert themselves. Contrary to conditions in the country, there was a food shortage in the cities, probably due to insufficient transportation. In general, however, the people had enough to eat, and on the farms they seemed well nourished. Throughout, the people were poorly clad.

As a rule, in the country (except for the lack of motor equipment) conditions could be rated as good, while in the cities the rating was poor.

As an illustration, look at conditions in Nikolaev. This city was the main Russian naval base on the Black Sea and the site of the naval shipyards. Out of a normal population of 167,000 possibly 100,000 remained. Water service had been reestablished, and power partly so. Some trolley cars were operating. The navy yard was employing about 2,000 hands. A 35,000-ton battleship and two submarines were observed lying on their sides. The center of the city had been gutted by fire, but the remainder was intact. Important munitions, leather, and agricultural machinery factories had been destroyed. A soap factory and part of a steel plant had been salvaged, and were working. German morale was good. The men were healthy and clean; they plainly disliked the war with Russia, but obeyed orders without faltering. The soldiers joked about the much advertised "Soviet paradise": they contrasted the living conditions they found with their own superior standards of life in Germany. They were working hard to reestablish the occupied territory as a source of food and industrial products.

About this time German GHQ reviewed their previous estimates of the situation. It now seemed that the Axis victories had resulted in great diminution of resources and production in what remained to the Soviet Government. In the Ukraine alone, the Axis had already captured vast mineral and industrial centers:

Iron, steel, and ore	86%
Bauxite and aluminum	75%
Coal	70%
Magnesium, nickel, and platinum	95%
Farm produce	60%

According to Intelligence calculations, 260 Russian divisions had been captured or destroyed to date, out of an original total of some 425. Some divisions were arriving from east Siberia, so the total number might now be around 180. There were also an uncertain but considerable number of home guards, hastily raised and equipped, in line around Moscow and Leningrad, who had some value in defending positions.[1]

The situation along the front was:

a. **In the far north the fighting was at a stalemate. A railroad was being built from a base in north Finland, leading toward Kandalaksha. When completed some time in 1942, it would be possible to supply a sufficiently large force in this area, but nothing important could be accomplished until then.**

b. **In south Finland, on both sides of Lake Ladoga, the Finns had reconquered the territory they lost in the preceding war of 1939-40. About 40,000 Finns who had been driven from this section were now being repatriated.**

c. **Around Leningrad the Russians were fighting hard, showing considerable initiative and ingenuity. Their air defense in this sector was the best and strongest yet met anywhere. Air photographs showed that the Russian Baltic Fleet at Kronstad had been disabled by bombing and shelling, thus was no longer a factor in the situation.**

d. **In the Moscow sector it was believed that the main Russian armies had been hopelessly defeated in the Vyazma-Bryansk battles, where the loss of men and materiel had been so great that it seemed it could never be made up. There were some new divisions in this area withdrawn from both north and south, plus some Asiatic ones. New divisions were being formed, and a large number of home guards and labor troops were erecting fortifications in rings around Moscow. In general, everything here seemed to be improvised and consequently probably was weak.**

e. **In the south, the one important force which remained was that withdrawn from Odessa, which with other troops was assembling in Caucasia. North of here the Russian front was weak, but was being bolstered with new levies.**

f. **In the Crimea a considerable force was defending the important naval base at Sevastopol.**

As it looked to German GHQ, strong opposition was being met at the extremes of the front, at Leningrad and at Crimea. There was no urgency about Leningrad, and offensive operations there could be discontinued to release troops for use elsewhere; blockade of Leningrad would eventually lead to surrender anyway. Sevastopol was desired to establish naval control over the Black Sea, which would require clearing the Crimea. It seemed that further advances could be made in the Moscow sector and in the Donets valley without involving any new major campaigns. However, troops were not immediately available for these operations.

In the center a large force was needed to evacuate the 600,000-plus prisoners taken around Vyazma and Bryansk; movement of these hordes to the rear seriously interfered with the forwarding of stores and munitions. In the south, due to rains, the roads were in an awful condition, and the troops were reported fatigued and incapable of moving rapidly under the existing weather conditions; immediate resumption of the offensive did not appear to be practicable, but in view of the apparently weak enemy forces, a short delay might not be important.

According to the American and British press, it was Hitler who decided to attempt to capture Moscow before winter set in. He is represented as acting against the advice of his generals, who recommended withdrawal to a line, not defined, behind which the winter would be passed. It has been openly charged that, due to lack of education, Hitler forgot about the Russian winter, and refused to listen to suggestions or information on this subject.

The known facts at this time are insufficient to establish who planned the German move decided upon. It is incorrect, however, that Hitler or his generals forgot about the Russian winter: Hitler had carefully studied Napoleon's campaign in Moscow—in fact commented on it at times—and German GHQ knew all about Russian winters. On or about October 22nd, when the new decision appears to have been made, orders had already been issued for the necessary clothing and equipment to fit out the army for a winter campaign; snow was already on the ground from Moscow north, although it did not yet freeze every day.

The decision at German GHQ was:

North Group of Armies: reduce operations around Leningrad to a blockade, and release troops to the Center Group of Armies.

Center Group of Armies: proceed on to Moscow as soon as troops were available, with major effort to west and south of that city.

South Group of Armies: as soon as road conditions permitted, continue the advance as far as the Donets River, to include the occupation of a bridgehead at Kharkov.

Rumanian Group of Armies: proceed with the occupation of the Crimea.

Russian GHQ also re-estimated the situation. Moscow still had the impression that the Axis objectives were areas. It seemed likely that Leningrad and Moscow might be primary German objectives on account of their political and industrial importance. Of the two, Leningrad was believed to be in most danger, as Moscow was believed to be now well protected with the new levies. But there was no doubt that Caucasia, with its extensive oil fields and refineries, would certainly be the enemy's main objective: there was general agreement in Russia and among its allies that the Axis just had to have more oil. Here, then, was where the greater counter-effort was needed. Finally it was necessary to consider the Crimea, with its large naval base at Sevastopol.

It was decided to:

a. **Continue the resistance at Leningrad; send additional troops to that area as far as circumstances permitted.**

b. **Defend Moscow by strengthening its all-around defense, employing all available organized troops and the maximum number of home guards and labor troops.**

c. **Assemble as large a force as possible in the south to defend Caucasia.**

d. **Defend the Crimea, which could be reenforced and supplied by sea.**

[1]There is no reliable information as to the number of German divisions available at this time.—C. H. L.

A partial reorganization of the High Command was ordered as of October 19th. General G. Z. Zhikov was appointed to command the West Front (around Moscow), vice Timoschenko, relieved, who was to assume command of the South Front, vice Budenny relieved. Marshal Budenny was to proceed to rear areas, to raise during the coming winter a vast number of new divisions, which would be needed next spring and summer.

On 20 October, 1940, the general line between the Axis and Russian armies was Murmansk and the Murmansk RR as far as Lake Onega (to Russia)—Svir River—Lake Ladoga—Volkhov River—Lake Ilmen—Kalinin—Klin—Volokolamsk—Mozhaisk—Maloyaroslavets—Tuly (to Russia)—Uzlovaya—Orel (to Axis)—Lgov—Sumy—Bogodukhov—Valki—Lozovaya—Mariupol (to Axis)—Perekop (to Axis).

FINAL CAMPAIGNS OF 1941

OCTOBER 21

Considerable and hard fighting on the line Kalinin—Mozhaisk — Maloyaroslavets gained neither side anything of importance. In the south, the Axis advance moved on and Italian troops occupied Stalino; there were not enough Russian troops in this area to present any substantial resistance.

OCTOBER 22

An unstated number of Russians who had escaped from the Vyazma hedgehog and had wandered off through forests to the northeast got back to their own lines. Fighting continued in the Moscow sector, although snowdrifts made movement of all wheeled traffic difficult. No progress was made by either side.

In the south, a German advance was impeded by the weather. In this area it was raining, and the roads were deep in particularly sticky mud. The advance was directed against Kharkov, where new Russian resistance had been organized, which made it necessary to deploy and attack. Foot, animal, and motor traffic were all greatly delayed, and the supply of the troops became difficult. No metalled roads existed. The German Intendance (G-4) solved the problem by finding in the countryside sufficient farm tractors, which gave better service over the mud than any other kind of transportation. The German Air Force commenced a systematic bombing of the defenses around Kharkov, complete photographs of which were taken, so the Operations Section could plan for the eventual attack.

OCTOBER 23

In view of the resistance met, the Germans made several careful reconnaissances of the enemy's positions between Mozhaisk and Maloyaroslavets. The most advanced German troops were yet some 60 miles from Moscow, which was bombed with both HE and incendiaries.

In the south, the advance on Kharkov arrived opposite the outer defense line. The German Air Force bombed the city and started huge fires therein.

OCTOBER 24

A local German attack was launched near Novgorod, north of Lake Ilmen. It secured a bridgehead across the Volkhov River.

Rain set in on the Moscow front. Minor German attacks continued between Mozhaisk and Maloyaroslavets, making no appreciable gains: the Russians were receiving constant reenforcements from Moscow. The Russians were so pleased with their ability to hold their lines that they felt Moscow was no longer in danger, and that there would be no further German advance this year in this sector. The danger appeared to be in the south, where Axis troops were advancing on Kharkov in force and others were attacking the defense on the Perekop Isthmus, obviously to invade the Crimea. In view of this situation, Marshal Timoschenko relinquished command of the West Front and hastened south; he was to pay particular attention to a presumed enemy advance on Caucasia via Rostov.

In the south, the Axis armies did arrive around Kharkov, a city of about 840,000 people and the site of large munitions and tractor factories. Six lines of defense had been erected in country which was generally flat. Logs were freely used to construct pillboxes and obstacles. It was hoped that the city could be held for a considerable time.

Only one regiment of infantry was detailed for the German penetration of a sector selected from reconnaissance reports including air photograph studies. To it were attached, in a single command, artillery, engineers, flame throwers, and dive-bombers. The German attack proceeded practically on schedule. The same troops pierced successively all six lines of defense, and by noon had arrived at the city limits. It was then necessary to advance from street to street by breaking through the center of blocks and overcoming various nests of resistance. Apparently the Russians lost heart at the comparatively easy piercing of their prepared positions, and by night the city had been generally cleared.

Most of the stores and equipment had been removed from Kharkov. Rain and snow made the roads and country so bad that troops were exhausted by the marches. Those on foot sank to their knees in mud, and both horsed and motorized trains and artillery were immobilized.

North of Kharkov, German troops occupied Belgorod with minor fighting.

OCTOBER 25

Sufficient troops had been released from the duty of watching the crowds of prisoners taken at the Vyazma and Bryansk battles to start the German attack on Moscow. Two main attacks were made. The first, between Mozhaisk and Maloyaroslavets, although made with full artillery and air support, found the Russians ready, made only slight gains. The second, to the south, with a view of a wide envelopment around the south side of Moscow,

took the enemy by surprise and so made considerable progress. About 4,000 prisoners, 10 tanks, and 87 guns were reported captured.

OCTOBER 26

Around Moscow the German attacks were continued and both made slight progress. The north attack broke through the outer line of Russian defenses and reached a line generally north and south through NaroFominsk. The south attack reached Mtsensk. At the end of the day the German line in this sector was Kalinin—Volokolamsk (exc.) — NaroFominsk — Aleksin — Belev — Mtsensk—Orel. It was raining and snowing, and roads were bad everywhere.

OCTOBER 27

In the south Axis troops arrived at Kramatorsk. Still further south, new Russian levies of Cossack cavalry reaching the front south of Stalino found Panzer troops in front of them. The German tanks lined up in combat formation, but the Cossacks determined to overthrow them. Mounting their horses and drawing sabers, they made repeated charges against the Panzer Division. The Cossacks suffered extraordinary losses, and did not appear again in this campaign. The tanks were not materially injured.

OCTOBER 29

The Germans fired a very strong artillery preparation on the Moscow front, then attacked straight to the east south of the Moskva River. A new attack by Guderian's Panzer Army was launched at the same time from Aleksin headed north-northeast. The attack south of the Moskva made but negligible gains. A strong Russian counterattack in the afternoon failed in turn.

Guderian's Panzers made considerable progress. With its left along the right bank of the Oka River, the attack reached the river bend south of Serpukhov. Tula at this time was still in Russian hands.

In the south, German and Rumanian troops had been attacking the defenses of the Perekop Isthmus since the 15th by daily limited attacks. The Russians had five lines of defense. Antitank ditches were 45 feet deep, with vertical concrete walls. The Germans organized a special artillery command of 50 heavy batteries to which were attached dive-bombers and assault troops, to attack the fortifications one after another. Flame throwers squirted burning oil through portholes to blind enemy gunners in forts. From time to time the Russian Navy appeared off the coast, and fired upon the attackers; to meet this situation, certain batteries were engaged against naval targets.

After two weeks of steady fighting, Axis troops captured the last remaining lines of the Russians and cleared the entrance into the Crimea. The Russians withdrew to the vicinity of Dzhankoi.

OCTOBER 31

Slight fighting continued around Moscow. Southeast

of Kharkov, Chuguev was occupied by Axis troops. German GHQ decided to stabilize the line along the upper Donets for the winter, to include the bridgehead around Kharkov.

NOVEMBER 1

In the Moscow sector there were rain, sleet, show, and endless quantities of mud which got into everything, but a strong German advance moved east and northeast from Tula. It made some gains.

The Russians, alarmed by the fall of Tula, began to concentrate troops on the south side of Moscow.

Around Moscow, the Germans established a bridgehead which included Serpukhov. The Russians were assembling troops in this sector for a counterattack. There was not much change in positions of either side. To the south, Panzer troops occupied Kursk, an industrial center, against minor opposition. This straightened the line between Orel and Belgorod, and was considered by German GHQ as satisfactory for the winter.

It became colder in the Crimea, and snow fell in the north section. There was no mud, however, and the roads were in good condition. The Russians accepted battle near their selected position near Dzhankoi. German infantry, preceded by tanks, penetrated the center of the hostile position. The Russians thereupon fled; their right wing retired toward Kerch, their left toward Sevastopol, both permanently garrisoned fortresses. The morale of this Russian army appears to have been poor. In addition to the numerous stragglers they had left behind, they lost many prisoners after what appears to have been but a short resistance. The Germans reported taking 35,000 prisoners with corresponding quantities of booty.

NOVEMBER 4

The Russians withdrawing towards Kerch in the Crimea had marched rapidly. Against little opposition, German motorized troops entered Feodosiya, and established a line hemming in the Russians within the Kerch peninsula. Those Russians who had retired toward Sevastopol were in better condition, and occupied a position north of Simferopol in mountainous country.

Around Moscow the fighting had died down. Both sides, somewhat surprised by the actions or resistance of the other, were regrouping troops and bringing up supplies.

NOVEMBER 5

Having completed the assembly of additional troops on the south side of Moscow, the Russians counterattacked against the German bridgehead at Serpukhov and partially reduced it.

In the Crimea, the Kerch Russians had reached the shelter of their lines across the isthmus east of Feodosiya. The Sevastopol detachment was attacked by German and Rumanian troops near Simferopol, but held.

NOVEMBER 6

There was little fighting along the front.

Stalin made two public announcements of his views of the situation on the 6th and 7th, also separately a private one. The public announcement was given wide circulation:

"So far our losses are 350,000 killed, 378,000 missing, 1,020,000 wounded. For the same period the enemy has lost in killed, wounded, and prisoners more than 4,500,000. There can be no doubt that Germany, whose reserves of man power have already given out, has been weakened to a considerably greater degree than the Soviet Union. The full volume of our huge reserves is only now expanding. . . .

"What are the causes of the temporary military reverses of the Red Army? One of them is the absence of a second front in Europe. . . . No armies of Great Britain, or of the United States are waging war against the Germans. There is no doubt that a second front . . . will appear in the near future . . . and will essentially relieve our armies. Another reason for the temporary reverses our armies have suffered is our shortage of tanks, and more particularly aircraft. . . . We have fewer planes than the Germans, (and) we have several times fewer tanks than the Germans."

Alleging that two orders had been found on dead Germans ordering them to kill all Russians, Stalin continued: "the task of the peoples of the USSR . . . will consist in the extermination to the last man of all Germans who have penetrated the territory of our native land as invaders. No mercy to the German invaders! Death to the German invaders!

"Hunger and impoverishment are now reigning in Germany. In four months of war Germany has lost 4,500,000 soldiers. Germany is bleeding to death, her resources are giving out. The spirit of revolt is gaining possession not only of the nations of Europe who fell under the yoke of the German invaders, but of the German people themselves, who see no end to the war. The German invaders are straining their last forces. There is no doubt that Germany cannot sustain such a strain for any long time. Another few months, another half year, one year maybe, and Hitlerite Germany must burst under the weight of her own crimes. . . . The German Fascist invaders are facing disaster."

Very little information has come out as to what Stalin said privately. However, on November 15th there were a number of radio comments on this subject, and an appeal by the well known H. G. Wells appeared in the British press:

". . . the War Office and our authorities dismay us—in spite of Joseph Stalin's plain appeal to us to get busy on the West Front, there is paralysis. . . . The common sense of raiding, the obvious methods, and the A.B.C. of stirring up the Continent against the Germans have been explained to these people over and over again, and they pretend not to hear. They are doing nothing while the Russians bleed for us. I will confess in my anger and dismay I have been tempted to think that there has been deliberate sabotage at work."

On the same day that the foregoing appeared, radio comments were broadcast alleging that Russia had asked for a new front to be opened in order to withdraw German troops from her territory. Great Britain was reported as having declined, not on the ground that a second front was inadvisable, but on account of lack of means to carry out what it was admitted would be a desirable thing to do. Russia is alleged to have asked the United States to declare war on Japan, expecting that in this case the Japanese would not dare to attack Vladivostok; this would permit withdrawing Russian divisions from there to Moscow, where they were badly needed. Substantially the same statements came from American and British sources, and they also appeared elsewhere: for example, a Shanghai despatch of same date added to

the above that Russia had asked the United States to start the war on Japan not later than November 27th.

NOVEMBER 7

German GHQ issued a counter statement as to Russian war losses: the number of Russian prisoners counted in cages to date was approximately 3,806,000, or about ten times as many missing as the Russians had admitted. The Germans estimated that the Russian killed and wounded was between 4,000,000 and 6,000,000. The lower figure was some three times the Russian report.

Fighting broke out again on the Moscow front. Guderian's troops made progress: they captured the commander of the Russian 20th Army, General Jerschagov, with his CP and staff.

In the Crimea, the Axis pushed operations both against Kerch and toward Sevastopol, making some advances in both directions.

NOVEMBER 8

In the north, a minor German operation had been started on October 21st to protect the force charged with the investment of Leningrad. It consisted of a series of limited advances along the Volkhov River front to secure bridgeheads and a line of departure for attacking a Russian relieving force being assembled in the Syas River valley. The early operations secured the desired objectives without attracting undue attention. Now, in a sudden attack a strong German force led by Panzer troops broke through the Russian covering line and dashed on to Tikhvin, CP of the Russian 4th Army, commanding the sector from Lake Ladoga around to Volkhovo. The Germans burst into Tikhvin before the Russians knew they were in the vicinity. The commanding general and his staff made a quick getaway into the woods, but they lost all their papers, transportation, and baggage. The Germans now operated against the rear of the Russians, and claimed to have scooped in 20,000 prisoners, 96 tanks, and 179 guns, including those taken in the initial limited attacks. This German victory ended attempts to relieve Leningrad in 1941.

NOVEMBER 9

Axis troops completed the investment of Sevastopol by the occupation of Yalta, which was only lightly defended.

NOVEMBER 10

Marshal Timoschenko assumed command of the South Front. He announced that he had the situation well in hand, and had instructed his 9th Army (located in the Kharkov sector) to oust the enemy from the Donets valley. The 9th Army claimed they had already started such a program and had made progress, having captured Hungarian and Italian prisoners in an initial advance opposite Kharkov.

NOVEMBER 12

South of Tula, a Russian cavalry division attacked German tank troops in line. The plan was to charge the tanks mounted, after a suitable artillery preparation. During this preparation, the German tanks withdrew behind an entrenched infantry line which apparently the Russians did not know about. The tanks then marched by the right and by the left flank and took new positions. At the conclusion of the artillery preparation the Russian cavalry charged, only to be halted by the entrenched infantry supported by its own artillery. Considerable confusion resulted in the Russian ranks. The German tanks now sallied out on both flanks and, neglecting the melee in the center, circled around and attacked the Russian artillery line from both ends. The cavalry division was forced to withdraw, after losing 91 guns.

Guderian's Panzers were fast-moving and had the best of eyes, but . . . (*Atlantic and Dever from Black Star*)

NOVEMBER 13

Siege operations started against Kerch. The artillery opened fire and assaults were delivered against the advanced works, which were not in very good shape. The permanent defenses were coast forts guarding the Kerch Strait. An attack by land had not been expected, and only improvised defenses appear to have existed on the west side.*

NOVEMBER 15

Two Siberian divisions, reported to be experienced and reliable troops, reached the front. They were placed in line immediately, one each near NaroFominsk and Tula. They were ordered to attack without delay, although

*Shades of Singapore!—Ed.

they were unfamiliar with their sectors. The division near NaroFominsk failed to make any progress, notwithstanding repeated attempts during which they lost about 500 killed. The division near Tula did better.

NOVEMBER 16

German and Rumanian troops captured Kerch, the center of an ore district and with a shipyard and munitions factories.

NOVEMBER 17

In order to better exploit the occupied territories, Germany announced a permanent organization for occupied Russia. Two districts, each under a Governor, were created, respectively north and south of the Pinsk Marshes. Certain areas in Galicia were assigned to Poland, while Bessarabia and adjacent territory was assigned to Rumania. The two main districts contained together about 615 square miles, with an estimated population of over 50,000,000. Over the two, Dr. Alfred Rosenberg was appointed Governor-General.

. . . the solid work was done by "old-fashioned" divisions—foot artillery and horse-drawn artillery.

Rosenberg (although of German Baltic stock) was born in Russia, near Reval. He lived in Russia continuously until 1918, and seems to have acquired a particular hatred for Russia and Russians, although very little is known of what happened to him during this period. He then moved to Germany and became an early member of the Nazi party, in which he soon took a prominent part.

A reorganized German attack on Moscow started. The plan was:

1. **A Panzer Division plus an unknown number of divisions from the North Group of Armies was to attack southeast from Klin.**
2. **The Center Group of Armies, with 3 tank and 4 infantry divisions, was to attack on the right of Force (1), its front extending to Volokolamsk, inclusive.**
3. **II Corps, with 4 infantry divisions, was to attack eastward from Mozhaisk.**
4. **Guderian's Panzer Army, with 4 Panzer and 2 motorized divisions, was to envelop the enemy's left by advancing rapidly from the Tula area toward Ryazan.**
5. **Seven infantry divisions were retained in Army Reserve.**

The weather was excellent, and the attack started off on time after proper artillery and air preparation. Force (1) (seeking to turn the enemy's right) got around the lake in the Volga River, east of Kalinin. Outside of this, Forces (1), (2), and (3) made only slight advances, Russian resistance being very stubborn everywhere. Guderian's force broke through the Russian line to reach rear areas east of Tula.

In the south the Germans held the Donets line, desired as the winter objective, from Voroshilovgrad north to Kharkov. South of Voroshilovgrad, General von Kleist's army was approaching the railroad from Kamensk to Rostov. Timoschenko (having been specially instructed to watch out for an attack on Rostov) had been assembling troops in this very sector, with main weight on his left. When the Panzers arrived opposite Novocherkassk they received an unexpectedly hot reception and were unable to take the place; they withdrew, but remained in observation.

NOVEMBER 20

The German attack near Volokolamsk made considerable progress, as did Guderian's turning movement east of Tula. The Russians proceeded to reorganize to have troops available to meet these two gains.

In the south, part of von Kleist's troops arrived opposite Rostov. Coming from the other direction were Russians sent by Timoschenko from Caucasia, where the troops evacuated from Odessa had been strengthened.

NOVEMBER 21

The attack on Moscow was pushed. Ruza was captured, Guderian also advanced, although the Russian defense was reported strong everywhere.

NOVEMBER 22

Heavy fighting continued all along the Moscow front. The Russians counterattacked, but neither side made any appreciable gains.

Von Kleist's Panzer troops entered Rostov, and were shortly afterward followed by infantry. No great opposition was met: Timoschenko's forces failed to arrive.

NOVEMBER 24

Russian GHQ decided that something had to be done to relieve the pressure on the Moscow front. It was decided to organize a counterattack south of Lake Seliger, and have it move southward against the left rear of the Germans attacking Moscow. In order to prevent having this force taken in flank by a German attack from the west, another attack was ordered to move westward north of Lake Ilmen along the line M. Vishera—Novgorod. It was believed that the Germans would have insufficient reserves to meet these new attacks.

The German attack northwest of Moscow, after some bitter fighting, reached Solnecknorgorsk, only 50 kilometers from Moscow.

In the south, Timoschenko ordered a counterattack to be ready to be launched across the Donets between Belgorod and Kharkov, while at the same time a general advance was to be made from the line of the Kamensk-Novocherkassk Railroad.

NOVEMBER 26

Guderian's troops reached the line Venev (exc.)—Mikhailov—Skopin. Fighting was bitter, the Russians contesting every advance.

NOVEMBER 28

Timoschenko's counterattack finally got under way, with initial mission to recapture Rostov. Troops from Caucasia attacked from across the Donets River, and some got into the city and stayed there. The Germans seem to have mistaken these troops for guerrillas, and failed to provide a sufficient force to protect the river front. They were watching for another Russian attack from Novocherkassk, which was intended to seize Taganrog (in the German rear) and thus encircle Rostov.

NOVEMBER 29

The Caucasian Russians introduced more troops into Rostov during the night and by morning were in considerable strength. At the same time the Russian column from Novocherkassk made progress. In view of this situation, the Germans decided to evacuate Rostov and withdraw their troops to Taganrog in time to be there before the enemy could arrive. This movement was started at once.

NOVEMBER 30

Guderian's troops pushed eastward to Dnitrov, but elsewhere on the Moscow front the Germans, in spite of heavy fighting, made only slight advances.

DECEMBER 4

In Finland, Hangoe (the last Russian post in Finnish territory) fell. Most of the garrison escaped by sea to Leningrad, and the Finns captured only about 300 prisoners.

Fighting in the Moscow area was desultory: it was very cold. A German offensive to clear the territory east of Orel started, the initial attack making a good beginning.

DECEMBER 5

The Russian 4th Army, having recovered from its defeat of November 8th, started an offensive in the vicinity of Tikhvin. The Germans withdrew.

Around Moscow the temperature was —13° F. In spite of the cold, the German offensive east of Orel made considerable progress.

North of the Sea of Azov the Germans stopped their retreat east of Taganrog. They were attacked by wave after wave of Timoschenko's Russians, who made only slight gains.

DECEMBER 6

There was no change in the situation around Moscow. Fighting died down. East of Orel, the Germans reached the line Belev—Chern—Novosil—Livny—M. Arkhangelsk. They decided to hold it.

German GHQ re-estimated the situation. It was now very cold, and it was evident that winter had arrived. Difficulty was reported by motor transportation officers: the synthetic lubricating oils would not function in a hard cold, consequently there were many cases of engines burned out and of vehicles which could not be used because the oil system would not function. New investigation and corrective measures were needed, which would surely take time. The German decision was to discontinue operations as far as possible until next spring, maintaining in the meantime both a strategical and a tactical defensive on the Russian front. While not certain, this decision appears to have been taken late in the day and after protracted discussion. There is no reliable information as to whether Hitler was or was not in agreement with his generals on this question, or who proposed this plan. As soon as the decision was made its substance was communicated to the other Axis nations.

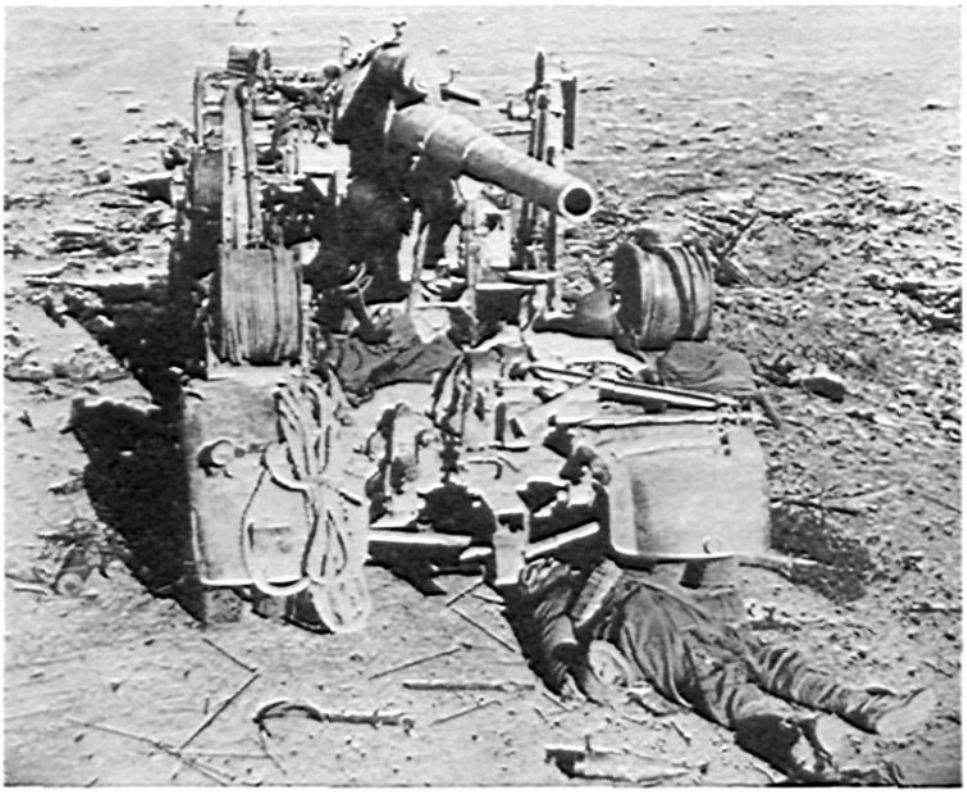
COMMENTS

1. According to an estimate by Major General Piotr Kotov, Russian oil expert, the real reason for discontinuance of the German offensive was the approaching exhaustion of oil and gasoline. According to Kotov's figures, the German oil reserve should be exhausted within 3 months, or by the end of February, 1942; after that German operations would have to be limited to the production available from Germany and occupied countries. In all likelihood, subsequent Axis air and mechanized activity would have to be vastly curtailed. This is outside the question that the German oil was of bad quality.

2. As in earlier campaigns of this war, the Russians concentrated on defending areas, and succeeded around Leningrad, Moscow, and in the lower Donets valley. The German missions of occupying Moscow and the Donets valley failed completely as to Moscow, and was about 50% successful in the Donets valley, where Kharkov and its bridgehead were captured. The Germans also succeeded in clearing the east sector of the Crimea.

3. There have been numerous stories in the press alleging disagreements between Hitler and his generals. No reliable substantiation as to this has yet come to light. Hitler seeks advice, although he does not always accept it. It is quite possible that he called upon selected generals for their estimate of the situation, and that there might have been some divergence of views. This should not be construed as indicating that the "approved solution" finally arrived at was opposed actively by those whose opinions had been asked for. The evidence now available indicates that the decision to pass to the defensive for the winter was made only after a long discussion, the details of which are not yet known.

FIRE VOLUME



ACCURACY *knocked out this German 88-mm. dual purpose gun and its Italian cannoneers in Cyrenaica.* (*British Press Service photo.*)

All-Important, or Just Important?

By Lt. Charles W. Clark, Jr., AC

Fire power is held up to us as being the *sine qua non,* the all-in-all of military might. It might be defined as the product of fire volume, times fire direction, times accuracy, but in nearly all writings the emphasis is on one phase only, VOLUME! In plain English, God is on the side which can shoot up the most ammunition in a given length of time.

Are we not on the wrong track? *Is* fire superiority the all-important element in obtaining tactical victory? I don't believe it, or if it is some correction ought to be made in the conception of fire power as commonly applied. If the conception is wrong or needs amendment, it is high time we learn the error of our ways; we are in a war for our very existence, and Fate is harsh to nations that make mistakes.

After all, victory and defeat are both psychological phenomena. A football team is beaten the moment all its members are convinced that they are beaten; so it is with an army. Conversely the side with high morale and a belief in victory is hard to stop. For comparison witness the Germans and the French in June, 1940; their respective outlooks greatly influenced the outcome of events.

Much emphasis is placed on maintenance of morale—the spirit of victory—among our own troops. Likewise we strive to instill the psychology of defeat in our enemies. Dissatisfaction with the government, insufficient food, privation back home all help to break the spirit of an army, but the thing which counts more than all of these is *fear of death*. The spectre of a decimated army haunts every commander, and being killed or wounded is an idea not relished by any person, soldier or otherwise.

Fire volume is a successful agent in producing enemy casualties and destroying enemy morale. Bullets make a nasty whine and the nearby explosion of a shell or bomb is far from reassuring. Besides, it is reasoned that since a certain portion of all shots fired will be hits we can double the casualties, and hence the destruction of enemy morale, by doubling the volume of fire. Therefore fire faster and faster! Shoot bigger and bigger shells!

This doctrine of fire power, which is the way most people seem to regard the matter, contains much truth. But is it not likewise open to devastating criticism? Mobility is certainly equally important, with its ever-present threat of encirclement or of penetration. So also is *accuracy,* that little-appreciated stepchild of fire power which can be achieved by practice alone. Even with the best marksmanship the percentage of hits is appallingly low. With the rifle it might average one-tenth of one per cent under battle conditions, and with artillery can also be low: the *Encyclopedia Brittannica* states that in the early, mobile phase of World War I, when shrapnel was in vogue, artillery produced one death for every four tons of ammunition; in the trench stage, where high-explosive shell was the main agent, the rate sank to one death per twenty tons. These figures are certainly not impressive! Why should we not double our casualty-producing ability by doubling our *accuracy?* It can be done.

Volume and accuracy are to a large extent mutually exclusive. Rapid fire is not so accurate as slow fire; given the same sights and stocks, auto-loading weapons are less accurate than hand-operated ones; a panting, fast-working gun crew is more apt to err than is a more deliberate one. Likewise volume and mobility are largely inconsistent. Greater fire volume requires greater quanties of ammunition; tons of ammunition necessitate more transportation, block roads, slow down columns, reduce mobility. There must be a compromise somewhere; fire volume cannot be allowed to run wild.

Historically the first important gunpowder weapons were cannon. They were pushed right into the front lines, side by side with pike-wielding and arrow-shooting infantry. Then the archers discarded arrows for little hand cannon, and the smooth-bore musket was born. The pikemen survived, but they also took up muskets and their pikes became bayonets. Cavalry continued much as before, as a screening, scouting, and raiding force; the saber remained its main offensive weapon and the roaring, close-packed mounted charge was still its trump card.

A muzzle-loading rifle cannot be fired as fast as a muzzle-loading smooth-bore musket, for it takes more time to ram a projectile in a rifled barrel. In other words, the muzzle-loading rifle has less fire power than the musket. But its accuracy is vastly greater, as is also its effective range. During the American Revolution frontier riflemen made short work of British musketeers who had better-trained leadership and twice as much fire power. Yes, we know that only in a few battles were riflemen in the majority in the Continental army; we know all about some of the dark aspects of our glorious War of Independence, about the poor discipline, wholesale desertions, and bad leadership, about the cowardice of some of our brave ancestors. But we also know what happened at Kings Mountain! A generation later a similar thing took place near New Orleans; men who had accurate weapons and knew how to shoot played havoc with trained troops who could throw a much larger volume of lead. How many of Old Hickory's men ever heard of fire power? or thought that two misses were as good as one hit?

During and after the Civil War shock tactics began to fall into disfavor, and the projectile reigned supreme. Infantry no longer relied so much on the bayonet. Despite its lesser fire power the rifle completely displaced the musket and was becoming a breech-loader, even a repeater, to increase the volume of fire the infantry could lay down. Artillery also became rifled and breechloading and moved back out of small-arms range. These changes increased fire power all around, but it should be noted that this increase was not accompanied by any corresponding decrease in accuracy. Rather the contrary, for improvements in powder, projectile shape, rifling, and sights gave an *increase* in accuracy along with the increased fire volume of both infantry and artillery.

Prussia defeated Austria in 1866 and France in 1870. Who will say that these victories came from superior fire power? Were they not rather won by an army better in every way than its opponents, better trained, better led, and better equipped?

Evolution continued on through the Russo-Japanese War down to World War I. The demand was for fire power, FIRE POWER, FIRE POWER! Fire volume grew so great that movement became nearly impossible. Machine guns denied ground to any and all enemy riflemen. Distant artillery allowed riflemen to advance a few yards by smashing the machine guns. The tank was born, and the aeroplane grew to robust youth in an effort—successful—to dodge enemy fire power or to ward it off. Finally overwhelming numbers and equipment carried the day, and the exhausted Central Powers went down in defeat. And many tell us that Fire Superiority won the war! Did our side gain victory through fire superiority or just simple superiority?

Europeans, judging from some rather damning evidence, seem to take the soldier's marksmanship ability for granted; it is enough to point your weapon in the general direction of the enemy, hitting him isn't important. In *A Rifleman Went to War* McBride pictures the poor German marksmanship; fine telescopic sights made little improvement in the hitting ability of men who didn't know how to shoot. Their European opponents were even worse; witness the horrible stock and sighting equipment on a British Lee-Enfield or a French Lebel. Less evident, but just as bad, is the inherent inaccuracy of these weapons. Even from a machine rest they are considerably less accurate than a medium-priced .22. Strange as it may seem, England and France both entered the present war with these same outmoded rifles.

The Americans brought the Allies superior volume of fire as well as superior numbers. More important, they brought Springfield and 1917 Winchester and Remington

rifles easily capable in fairly competent hands of making "possibles" at any target range, and *competent hands;* Germans no longer daringly poked their heads above parapets two hundred yards away; it wasn't safe.

Now again in this present war we have seen overwhelming all-around strength crush weakness everywhere. Many attribute this to superior fire power, and work out formulas showing that a Russian division is this strong, a German division of such and such a strength, and an American division equal to so many foot-tons of explosive energy per minute. Some even go so far as to rate the combat value of pursuit planes in terms of foot-lbs./second.

This is sheer foolishness. Where they have had half a chance, daring men have everywhere upset such calculations. Until they were out-flanked on every front, exhausted, and overwhelmed, the valiant Greeks more than held their own against the fire superiority of the Italians. Now the Japs, whose bravery we cannot deny no matter what we may think of their morals and integrity, are going right on upsetting all our calculations of a few months ago.

Something is surely wrong with our perspective. Once for all, let us agree that, counting the plane as a peculiar type of projectile thrower, this war will be dominated by firearms and fire tactics. Even so, is there not a ridiculous emphasis placed on fire VOLUME as distinct from quality? An enemy hit in the temple by a .22 bullet dies instantly; why shoot him with a sixteen-inch gun? Why not put a little more emphasis on the handling of weapons and less money on enlarging the weapons?

Our programs of marksmanship instruction, while not bad, lean distinctly on the side of inadequacy. We train our men to shoot the pistol; this is a most difficult weapon, and few men become really competent marksmen until they have fired many hundreds of rounds, preferably starting with a small-bore and working up toward the .45. We throw the .45 at them forthwith and theoretically allow them fifty rounds of ammunition per year. They are lucky to get fifteen. My infantry friends indicate that it is the same with rifles and machine guns. And how often does an artillery fire problem end thus: having used up the last round of ammunition allotted to him, the officer firing the problem announces, "At this point I would order, 'LEFT 12, ON NO. 3 OPEN 8, BATTERY RIGHT, 3600.' Then if I obtained a bracketing salvo, I believe I'd . . . ."

These shortcomings aren't peculiar to Americans, nor to any particular extent the fault of the armed services; they are simply the result of people's minds being the way they are. We admire the *biggest* cannon, the *fastest*-firing machine gun, the plane with the *largest* and *most* guns. But they are faults, nevertheless. We need to know our weapons better, be they rifles, artillery, or medium bombers. And the answer is not POWER but PERFORMANCE.

Admitting that our performance with weapons is fully up to that of other nations, it's still sorry compared to what it could be. Many aviation cadets who pass through my hands are former enlisted men from the ground forces. Rare is one who has won an "Expert" in the use of any weapon. The requirements for an "Expert" rating aren't particularly stiff; certainly they should be well within the capabilities of at least half the men with the keen eyes and steady nerves needed by an aviator. These men qualified as mere marksmen or sharpshooters (if they qualified at all) for just two reasons: they weren't sufficiently instructed or they didn't get enough practice. While we are busy making a thousand Garands a day to increase our fire volume, our men are not learning as well as they could how to use the latent power of their old Springfields.

In the infantry we spend much time training men to strike tents and roll their packs quickly—in order to get their weapons into action against the enemy with the least possible delay. In the artillery we train our drivers well—in order to get weapons into action against the enemy with the least possible delay. In the interests of "power" we make bigger and bigger weapons capable of firing faster and faster. It is at least as important so to train individuals and teams in the use of their weapons that when the enemy comes under our fire, his destruction shall be as complete as possible.

Among prize fighters there is a saying, "Do not copy the mistakes of champions." In our increasing devotion to the doctrine of fire volume we may find ourselves doing just that, trying to out-fire-power other nations instead of following some more practical line of endeavor. We need fire power, yes! But it is enemy casualties that count, not the amount of lead and explosives directed at the enemy. This war will be won by men who, whatever their weapons, shoot to kill, and who, having shot with that view in mind, accomplish their purpose.

Any attempt to spare responsibility generates mental flabbiness. The habit of indecision is responsible for most failures.

W. N. D.

Diary of War Events

JULY, 1942

1st Germans, Russians fight in Sevastopol streets.
British hold at El Alamein, Egypt, 70 miles from Alexandria.
Hangchow-Nanchang railway in Jap hands.

2nd British attack Axis southern Egyptian flank; battle raging in "bottleneck" leading to Alexandria. British suffer casualties; 50,000 in retreat.
Sevastopol captured.

3rd Rommel, hammered from air, avoids contact with British counterattacks.
British bomb Bremen heavily.
Enemy sub sinks U. S. ship in Costa Rican harbor.

4th Japs reinforcing Aleutian bases despite U. S. bombing.
Germans launch great drive south from Kursk.
U. S. airforce, replacing AVG, shoots down 5 Jap planes.

5th Germans force wedge, advance up to 100 miles near Kursk.
British seize ridge near El Alamein; Axis attacks subside.
Trial U. S. tank force takes part in Libyan attack; Germans pushed back slightly.

7th Germans cross Don in several places.
Artillery duel on Egyptian front.
Japs occupy Chekiang-Kiangsi railway.

8th Russians counterattack northwest of Voronezh, destroy some Don bridgeheads.
U. S. Navy sinks fifth Jap destroyer in week near Aleutians.
Japs strike southwest from Nanchang in attempt to link Shanghai, Singapore by rail.
Axis digging in west of El Alamein.

9th Germans threaten Moscow-Rostov railway as Russians hold Voronezh.
U. S. planes aid Chinese in recapturing Nancheng, Kiangsi.

10th Russians withdrawing on southern front.
Axis attacks heavily north of El Alamein.
Chinese halt Jap push toward southern railways.

11th Germans in Voronezh outskirts, advance on 200-mile front.
British gain 5 miles on railway west of El Alamein.
4 United Nations merchant ships sunk in Atlantic and Caribbean.

12th Russians hold Voronezh, Germans win new Don bridgeheads.
British drive 10 miles west in Egypt.
Japs capture Wenchow, Chekiang province port.

13th Germans break through Voronezh outer defenses; Russians withdraw near Rzhev, northwest of Moscow.
British fleet bombards Matruh, Egyptian port; Tobruk heavily bombed.
8 United Nations merchant ships sunk off our Atlantic coast.

14th Germans storm Voronezh; Russians withdraw in center of Don line.

15th British repulse renewed Rommel assault on right flank.
Germans force abandonment of two towns within 200 miles of Stalingrad.
Enemy subs sink 4 United Nations merchant ships off our Atlantic coast.

16th Rommel counterattacks to check British gains; Italian troops removed from Axis front line as reward for past performance.
New German drive in south Russia threatens Stalingrad.
Chinese recapture Tsingtien in Chekiang.

17th Germans capture Voroshilograd, cut railway from Donets Basin to Stalingrad, bypass Voronezh.
R.A.F. raids German Baltic ports, submarine factories.

18th Germans advance on Rostov and Stalingrad on broad front.
Chinese make local advances in Chekiang Province, recapture port of Wenchow.

19th Russians gain in Voronezh counterattacks; Germans advance elsewhere.
Chinese recapture 15 miles of Hangchow-Nanchang railway.

20th Germans advance towards Rostov, lose bridgeheads near Voronezh.
U. S. bombers raid Tobruk.

21st Germans 85 miles from Rostov, advancing down Don basin.
U. S. Navy sinks 3 Jap destroyers at Kiska.
U. S. bombers sink 2 Jap ships on Yangtze River; Japs regain Wenchow.

22nd Germans drive wedge between Rostov and Stalingrad, push toward latter.
British advance slightly along entire Egyptian front.

23rd Rostov, heavily bombed, menaced by German attacks; Russians hold Voronezh.
British gain against Axis Egyptian counterattacks.
Japs gain new toe-hold in southeast New Guinea.

24th Germans in Rostov after fierce battle; Russians recross Don near Voronezh, push Germans back.
Matruh flattened by British naval bombardment.

25th Germans nearing Don bend 45 miles from Stalingrad.
U. S. subs sink 5 enemy ships in Jap waters, including destroyer.

26th Germans breach Rostov's inner defenses, cross Don south and east of there.
Chinese gain ground on Hangchow-Nanchang railway.

27th Russians abandon Rostov, withdraw south; Germans reach Don bend near Stalingrad on broad front.
Tobruk heavily pounded from air.
U. S. planes rout 50 Jap planes bound for Chungking.

28th Stalingrad-Caucasus railway menaced by Germans crossing Don; Germans make new crossings in central Don sector.

29th German advance below Don slowed by Russian reserves.
R.A.F. raids Hamburg with 600 planes second night in succession.
U. S., British bombers raid Axis Crete supply base.

30th Germans advance in Caucasus, blocked northwest of Stalingrad and near Voronezh.
Air fighting only on Egyptian front; Axis bombs Cairo first time.

31st German Caucasus drive advances; Russian reserves hold on Stalingrad, Voronezh fronts.
R.A.F. raids North Sea shipping, European coast communciations points.
U. S., British bombers blast Tobruk, Matruh.
10,000 Japs on Aleutians.

Not in the BOOK

EDITOR'S NOTE: *This feature is devoted to ideas sent in by our readers describing methods or devices which, though not specified by official literature, have proved useful in service.*

Minimum Range—105

Table

The Materiel Section of the FAOCS has prepared a minimum elevation table to aid the busy executive of a 105-how. battery. The figures under "charge" are the sums, to the next higher mil, of the elevations to reach the mask (using HE M1), two forks, and five yards, all computed for the mask range shown in the left column.

	CHARGE						
Yd. to mask	*1*	*2*	*3*	*4*	*5*	*6*	*7*
100	60	61	60	61	60	57	56
150	48	50	47	47	45	42	40
200	46	46	42	42	39	35	33
250	47	46	42	40	37	32	29
300	51	48	44	40	36	30	26
400	58	55	47	43	36	29	24
500	70	63	53	46	40	30	24
600	81	71	59	53	43	32	24
700	94	82	66	59	47	34	25
800	106	91	76	65	51	37	27
900	118	101	83	71	55	39	28
1000	132	113	91	77	60	43	30

To determine the minimum elevation, simply add the greatest of the minimum elevations reported by the chiefs of sections to the figure(s) opposite the appropriate mask range, interpolating if necessary.

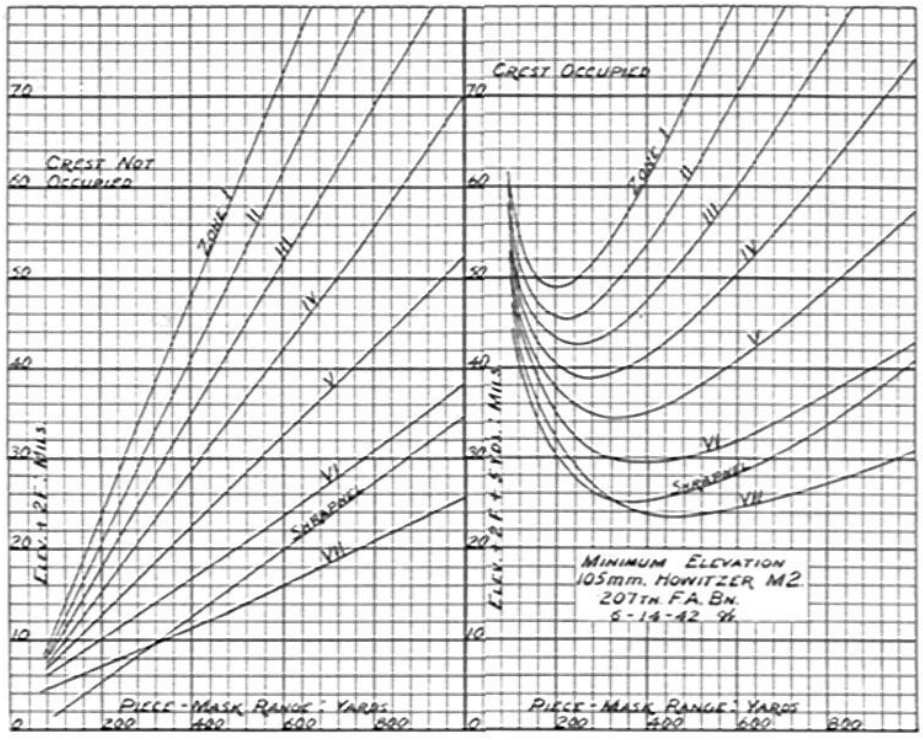
MAJOR SHELDON VILES, FA

Graphs

Our battalion has developed two sets of curves for quickly determining minimum elevations for the several charges of the 105-mm. howitzer: with crest occupied by friendly troops, and with it unoccupied. These charts are reproduced photographically in a large size for quick reference in the FDC, and in small pocket form for battery use.

To use, measure or estimate the piece-mask range. By laying a straightedge vertically along that particular range, locate the ordinate for each charge. The figure at the left indicates the value to be added to the greatest "minimum elevation" (site to mask) reported by the chiefs of section of the battery in question. Quick, safe, simple, and accurate—direct interpolation, and only two figures to add together.

CAPT. JOHN E. WEILER, FA



WALKIE-TALKIES FOR SURVEYING

While practicing for the GHQ artillery tests, we found that our greatest difficulty was locating some point on the orienting line from the OP area. Usually our observation posts were two thousand yards in front of the position area, and separated by terrain that made traverse next to impossible.

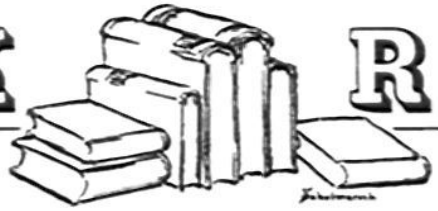
We solved the problem by using an SCR-194 at each end of the directional line. The S-2, at the observation post, laid his BC telescope on the base point and turned an angle to the position area while the radio operator established the net. The assistant S-2 in the position area set up his instrument and radio on the orienting line where he could see the observation post. Then, by radio, the assistant S-2 told the S-2 where to look in order to see the instrument on the orienting line. Once the S-2 at the observation post identified the instrument on the orienting line, he transmitted the angle by radio, and the survey was nearly complete.

In Test II, where a photomap was available, no further angles had to be measured. However, in Test III where only a grid sheet was authorized, an additional angle was measured, either from the OP or from the point on the orienting line. Again the radio was used and the third point described to the other operator.

Our experience has led us to include the SCR-194's as part of our survey equipment and to train our survey personnel to use them. We used the radios for the real tests and got our survey in on time.

CAPT. T. L. LIPSCOMB.

BOOK REVIEWS



PRELUDE TO VICTORY. By James B. Reston. Alfred A. Knopf, Inc., New York, 1942. $2.00.

The author, James B. Reston, is a young newspaper man who weathered the Battle of Britain and of whom William Shirer said: "He has a passion for getting at the bottom of things. Scholars call it research but Reston just thought of it as digging for facts and figures and meanings. He understood the deeper significance of this war." Throughout the entire book the reader feels that Mr. Shirer's estimate of the young writer is correct. The author himself calls his book "an outburst of bad temper against careless thinking; bureaucratic officials; selfish 'special groups'; irresponsible citizens; newspapers and politicians, etc." It may be that, but it goes much deeper than an "outburst of bad temper" against the weaknesses, the selfishness and the faults of our people, for it turns the searchlight on these faults and failures and carefully analyzes them and points out not only the cause but the remedy. It is a book teeming with constructive criticism and is a challenge to our complacency, our apathy, and our mental and physical unreadiness.

Mr. Reston points out that freedom does not come easily—that if we really *want* freedom, we must be willing to pay for it, and that there is no easy way out of this war, and that our every thought and action, both individual and national, must be governed by the answer to the question, "Will it help win the war?"

With startling courage the author points out the weaknesses of the Administration in the failure of the President to bring to his Cabinet in this time of war the nation's strongest and best men, the weeks and months of precious time wasted in placing under one head the overlapping authority of bureaus and committees, and in his failure to formulate a definite policy in the publishing of information that will give to the people a sense of Purpose about the war.

The author says much about Congress, which has delegated so much of its authority to others and has not proven what Hamilton said it should be, "An element of stability in the government." This branch of the government is touched upon under the very appropriate title of "The Illusion That We Can Win the War with Our Second Team." Mr. Reston points out the weakness of Committee Chairmen, due to the determination to cling to the old tradition of seniority, and the time wasted in meaningless debates while important things wait.

The author pleads with the people to be very thoughtful in their choice of candidates in the fall election, for upon them will rest the responsibility of ratifying the treaty of peace and the momentous question of how men are going to live together all over the world after the war. Political experts have pointed out that the one unmistakable trend since the outbreak of the war has been "the decline of the people's interest in the elections." WAKE UP, AMERICA!

Though a newspaper man himself, Mr. Reston lashes out at his colleagues without fear or favor for their failure to paint a true picture, and at all of us for our thoughtless and unjust criticism of our allies. He presents facts and figures to show that our allies, especially Great Britain, have done equally as much for us as we have done for them, and shows the real reason for many

of Britain's so-called blunders. That chapter I would recommend that many Americans read very carefully.

The last chapter deals with that fundamental fact that we all know to be true—that we, as a nation, must get back to God. He says "It is not a question of whether God is on our side, but whether we are on God's. God HAS blessed America. It's our turn now." And here he gives the answer to that oft-repeated question "What can I do to help win the war?" He pleads for more faith—faith in God and in each other, and in our allies and in the rightness of the American Dream. This is the *Prelude to Victory*.

C. T. W.

STRATEGY FOR VICTORY. By Hanson W. Baldwin. W. W. Norton and Company, New York, 1942. $1.75.

A Program to Defeat the Dictators—that's what Baldwin subtitles his book.

After reading his recent magazine article "The Queen Is Dead" I had decided he was slipping badly, but *Strategy for Victory* changed my mind; Baldwin is "back on the beam."

Strategy for Victory plays up these few items: "This is the year of decision," "Total effort for total war," "Hold what is vital," and "Taking the offensive."

We must win or lose the war this year. Germany and Japan will not leave us unmolested until 1943, so that we may prepare for them. *This* year, 1942, is the critical time. Either we enhance our best chances for a sure victory by making the correct decisions now, or we make the mistake that only the future counts. We cannot afford to make serious mistakes. To do so may cost us our national life and our personal and individual lives. This year, 1942, is the big question mark, the year of *decision*. Can we plan large enough and wisely enough to insure the result?

We must mobilize our entire industrial and manpower resources. There is little doubt that potentially we are the strongest nation in the world, but the present doesn't wait: it is now that we have to fight. Our complete mobilization and organization may not be useful in 1945, we have surety only in the near present, now it is imperative.

"Our job, therefore, is clear. It is twofold. It is, to hold certain key areas and to maintain certain key forces. . . . ."

Baldwin lists those areas to include Hawaii and Midway, India, Alaska-Aleutians, Britain (English Islands). These we must hold. Too, we must keep Chinese and Russian armies in the field, then we must hit the enemy, whenever we can, again and again.

Strategy for Victory gets down on rock foundation

when it calls for coordination of our land, sea, and air forces. It spurns the fantastic notions of single-idea advocates like de Seversky and his *Air Power,* Kernan and his land offensive, and others who claim some particular arm or branch the ideal for victory.

Baldwin sounds reasonable in "But sea power—though indispensable to victory—will not be sufficient for victory; total war requires total answer."

"Our errors of omission or commission can, and surely will, if we make too many of them, cost us this war. We do not have time; we cannot afford trial and error. We must see the war clearly . . . ."

It is my opinion that Baldwin has contributed a constructive, critical, and suggestive book in his latest work. Perhaps it doesn't answer all the questions you'd like to have answered, but it gives you a good, wide view of the world situation and our relation to it.

His last sentence, "Only America Can Defeat America," offers the central notion for another book, which, perchance, Baldwin might write for us.

A. V. R.

ATTACK. By F. O. Miksche. Random House, New York, 1942. $2.50.

Tom Wintringham wrote an interesting introduction to ATTACK, which appeared in England under the name BLITZKRIEG. In his introduction Wintringham explains that the book was written in the Czech language and that it suffers from translation into English. Sometimes there is no English word to explain exactly what Miksche means. In some of those cases, German words are used along with definitions.

After all these months of agonized reading of the works of "Military Experts" and "Military Analysts" who claim that our effort is wrong, that our weapons are wrong, that our aims are wrong, but offer little or nothing for improvement, *Attack*, by Miksche, strikes me dead center.

He's not a "Military Analyst" nor an "Expert." He's just a soldier, professional. He's the man who says, "This is what I saw happen in Spain. Tanks followed the French theory of attacking on a wide front and were beaten, they tried the breakthrough on a narrow front and succeeded." Then he reaches a logical conclusion that what could happen in Spain on a small scale could happen anywhere else on a large scale.

Miksche is the one writer I know of who has the specific experience and technical knowledge to say what is good or bad about any particular theory and then give exacting examples and say, "This is what you need."

He is the only military writer I know about who stays away from the "Big Picture" most of the time and tells how to fight with the platoon and how to win the little local battles. He is just one man among many who says "Our organization is wrong," but he is one man alone who says, "and here is how it should be, these are the weapons you should have, here is a diagram of your dispositions in the march."

Miksche's experience as a professional soldier makes him a close observer, a writer in technical phrases. His book is no literary adventure; it is rather a compilation

of thousands of facts from the memory and notes of a man who has fought the Nazis since 1936 and has learned how they operate.

Miksche is a writer who has commanded troops on the battlefield. When he talks of tanks and infantry, artillery and planes, you realize he is one who knows not because he spent some years in a classic War College studying Napoleon and Alexander and Clauswitz, but because he saw men blown to bits by those things and because he suffered through years of being on the field participating daily in a game with death.

When Miksche says "The Germans learned from Spain that war had changed; the French pretended to themselves that they had learned that war remained the same," he gets to a real reason for the French debacle. Germany had a new conception of war, France fought a continuation of World War I. "It was not material superiority that took the Germans over the Meuse, but a failure of doctrine. . . . ." Meaning, of course, French doctrine of the defense.

An important fact of Miksche's book is his statements, followed by explanation and diagram.

Regarding the French Campaign:

". . . . Gamelin never realized how much speed matters in modern war. . . . .

"To analyse the details of the fighting is not yet possible. But it is possible to look at the campaign as a whole and regard it as a collision between two different conceptions of warfare. In this sense we can pass judgment: one conception of warfare leads to victory, and another conception leads to defeat. And both victory and defeat are more 'total' than ever before in civilized warfare."

And so it goes throughout *Attack*. The writer had an experience, reaches a conclusion, and gives an explanation. He talks about "Islands of Resistance," and immediately adds what he thinks an "Island of Resistance" should contain. And he doesn't follow the example of our civilian "military" writers who say "It should have Infantry, Artillery, Antiaircraft and Antitank guns, and maybe a couple of Infantry cannon." Instead, Miksche claims "I would want an Infantry Company, a battery (four guns) of Field Artillery," so many sections of this, that, and the other.

To me there is an unbridgeable chasm of difference between these two thoughts: "You are wrong, you'd better make a change," and "You are wrong, my experience shows you'd better try it this way." There is a great difference between the general and the specific, the possible and the certain, what I learned from studying Alexander and what Franco bombed into Miksche on the hot fields of Spain. That difference is the advantage *Attack* holds over other recent military books. It is slow reading, very dry: but far better *all dry* than *all wet*.

A. V. R.

PERSONAL FINANCE AND MANAGEMENT FOR THE ARMY OFFICER. By Lt. Col. Charles R. Hutchison. D. Appleton-Century Co., New York. $1.50.

This fit companion for *The Officers' Guide* and the *Army Wife* bridges many of the gaps in our literature. As the author says, "In time of war, commissioned officers, regardless of rank or experience, are faced with extraordinary problems in the management of their personal affairs." Although naturally of greatest help to our newer officers, this book is not addressed just to them, will greatly aid officers of all components of the Army of the United States.

Concisely, yet in helpful detail, Lt. Col. Hutchison discusses such service obligations as the purchase of uniforms and equipment, and post and unit activities. The chapter on pay and allowances is up-to-the-minute, with the June 1, 1942, schedules given correctly. Helpful material covers the control of household expenditures, wise spending, use of a bank account, credit, insurance, savings and investments, maintaining a home (one of the hardest problems to solve just now), car ownership, and taxes. A chapter is devoted to the rights of personnel of the Army of the United States and their dependents, in the event of death or disability. Handling of the personal estate is discussed, and most helpful suggestions are made concerning necessary papers for personal files to facilitate settlements by survivors.

The author, who has taught in the Department of Economics and Government at the United States Military Academy for several years, has had wide experience and knows whereof he speaks. His words are never pontifical, and the manuscript had the benefit of comments by other officers so that it presents a good consensus. If not in the officer's quarters, this work should be in his wife's hands along with her most-thumbed books.

WHAT THE CITIZEN SHOULD KNOW ABOUT CIVILIAN DEFENSE. By Walter D. Binger and Hilton H. Railey. W. W. Norton & Co., Inc., New York, 1942. $2.50.

This book is one of Norton & Company's series on *What the Citizen Should Know . . .* , including *Navy, Army, Air Forces, Marines, Coast Guard* and others, all written by experienced military and civilian writers.

Walter Binger, co-author, is chairman of the National Technological Civil Protection Committee; Hilton Railey, the other half of the writing team, a former Reserve Officer in both the Army and Navy. For material they went to records of England's bombing, from the British Ministry of Information, reports of American observers, official releases of the British Library of Information in New York, and various other official and

authentic sources. This book might well have been called "What Every *American* Must Know . . ."

Arthur Smith ably illustrates the work, showing by drawings where you should be in a skyscraper should it be subjected to bombing, what action you should take if you're in a theatre, in a subway, in an old school building, or at home. In addition, Smith offers an example or so for the disguising of large factories, gives a little on the gas mask, on incendiaries, and touches paths of bombs and where they go when they hit a building.

The writers go into interesting detail on a variety of subjects that should become part of the commonly accepted knowledge of every American. By no means should it involve civilians only.

In a careful reading I note only a single misstatement and that easily might be chalked up to "fine writing": "A medium-sized bomber can carry *no fewer than* 1,000 (bombs) weighing about 2 pounds each." Actually, such a bomber can carry *no more than* or *as many as* about 1,000 of the 2 pounders. That slight error is not important. The important thing to know is what to expect those bombers to do, how the bombs will act and how you should react to their actions.

As in nearly all recent books, the question of morale is broached. Concerning England: ". . . after a year of aerial attacks . . . it was demonstrated that the risk of death by bombing was only about six times greater than the risk of death in automobile accidents."

The English learned that fact and stayed at the desk, in the office, in the factory, working even during raids. That's a point for Americans to remember. Even if we're bombed, production must continue, so our people must know that statistics in England prove that life, though miserable, is not unbearable even in heavy raids. A simple British plan was, "You and one other relative or friend in another neighborhood will mutually agree that if one is bombed out the other will take him in for the period of the emergency."

This book answers the vexing questions you want answered. Don't let the words "Civilian Defense" trip you: The book is not a poorly written pamphlet put out for propaganda purposes, but a careful, well prepared study of a very important business, each citizen's business—civilian, that is to say personal, defense.

A. V. R.

PRIVATE PURKEY IN LOVE AND WAR. By H. I. Phillips. Harper and Brothers, New York. $1.50.

Pvt. Purkey is back again, this time in what are to him the equally taxing fields of love and war. Revealed in his "letters" as Typical Draftee No. 1, Pvt. Purkey has gained his war footing in a single easy stride: "While I did not even feel up to fighting a landlord 6 months ago I am now soar because I can't get right in there and battle them Rising Sons of you know what."

There is still nothing starry-eyed about Oscar Purkey. Vitamin tablets arouse his indignation, "nurrishment" or not; army vehicles are only pleasure cars "with everything that would give pleasure left out," and there are still too many potatoes, even though "they don't resist like they used to." The Navy, moreover, is muscling in at home, making the path of love a wavy one, for "when a sailor is lonesome he is no companion for any woman accept a female wrestler."

If a soldier without a gripe is a dead soldier, Pvt. Purkey and his pals are as alive as any officer could possibly wish.

H. P. C.

SPHERICAL TRIGONOMETRY WITH NAVAL AND MILITARY APPLICATIONS. By Lyman M. Kells, Willis F. Kern, and James R. Bland. McGraw-Hill Book Co., 1942. $1.50.

Three associate professors of mathematics at the United States Naval Academy prepared this text to aid prospective officers of the army, navy, or air corps. Treating the subject of spherical trigonometry in detail, it also takes up the more important applications of trigonometry and logarithms to navigation and related topics. Each subject is carefully explained, illustrated by examples, and followed by a list of problems to familiarize the student with its applications and call his attention to important features. Forms are suggested for most computations; these are compact and simple, to save time and induce habits of forethought and orderliness.

Unfortunately the book contains no tables of logarithms or natural functions, let alone logarithmic functions; these are readily available almost anywhere, however, so the omission is not too serious. The authors have leaned over backward in omitting answers to the simpler problems, but aside from this gap the volume could practically be used for self-teaching.

Emphasis of the book is on fundamental ideas stripped of confusing details that tend to obscure the underlying principles—a worthy aim, and well done.

SOME MILITARY APPLICATIONS OF ELEMENTARY MATHEMATICS. Prepared by The Department of Mathematics, United States Military Academy. Institute of Military Studies, University of Chicago, 1942. 25c.

Although not an official War Department publication, this is an excellent pamphlet, prepared in response to requests from teachers of mathematics. Not a discussion of what mathematical training should be given, it is a fine collection of 21 illustrative problems designed to illustrate how mathematics applies to military activities. It stresses that all elementary mathematics is useful in

the military service, and the importance of thoroughness and accuracy in military applications. The bulk of the illustrations have direct application to artillery, dealing with firing, gunnery, mapping, the movement of motor or mechanized columns, and supply. Others, 5 in all, treat aerial navigation, military engineering, and antiaircraft artillery.

The Institute of Military Studies is to be congratulated on reproducing this booklet and making it available at nominal cost. Invaluable for instructors, it is also highly useful to guide the self-taught or those who are brushing up.

FREDERICK THE GREAT. By Pierre Gaxotte. Yale University Press, 1942. $4.00.

This is a good time to be reminded of the first German ruler who grappled constructively with the implications of Germany's position on the European continent. The quick disappearance of the stability he worked fifty years to create is perhaps a good omen. This book stresses neither the military nor the psychological elements of the legend of Frederick the Great at the expense of its other parts, and is a remarkably well-balanced biography. The lack of emphasis on the military genius of the great Prussian may disappoint soldiers, especially at a time when his revolutionary principles of the offensive are being applied anew by a fuehrer who, in the days of Voltaire and the philosopher king, would hardly have qualified as a lackey of his lackeys.

Hitler and Frederick, however different their instincts, had the same desperate fear of encirclement and both produced a force of explosive violence on a continent of toppling coalitions. May the embattled ex-corporal have worse luck and better opposition in his application of the principle of "simultaneous movements made by forces mutually supporting each other" than did his illustrious predecessor at the Prussian helm.

L. B. C.

SHOOTING THE RUSSIAN WAR. Written and photographed by Margaret Bourke-White. Simon and Schuster, New York, 1942. $2.75.

Margaret Bourke-White has gone far, both geographically and professionally, since she set up her tripod in all weathers and on the slopes of the Cornell campus some fifteen years ago. She has documented not only most of the United States, but many remote corners as well, as a staff photographer for *Fortune* and *Life*. And while garnering a sixth sense for lenses, synchronizers, and formulas she has developed an easy-reading style of writing. Her sense of people and of feeling is as keen as her eye for subjects.

These combine to yield a steel-flesh-and-blood picture of today's Russia, along with glimpses of our Pacific

islands on the eve of attack, China, and Britain. Between March and October of last year, Miss Bourke-White and her husband, Erskine Caldwell, circumnavigated the world, flying the Pacific, across China, and to Moscow, returning via convoy from Archangel to Scotland and then by plane to Lisbon and the Atlantic Clipper.

The bulk of their time was spent in Russia, where Miss Bourke-White found herself the only white foreign photographer when the Nazis attacked on June 22nd. Hurdling the strict censorship—and unfortunately benefiting also the ubiquitous Jap photographer—she made and brought out with her a rounded picture of Russia today, a Russia which she found far different from the one she pictured nine years before.

Of greatest immediate interest are her descriptions and photos of Moscow under air raids, and especially the chapters on her visit to the front in the early fall; on these she has done a magnificent job. For the photographically inclined, she has prepared an appendix with data about her equipment and technical details of some of the prints. The entire book is an exciting, sincere, and often humorous account of the varied scenes in and around the greatest battle the world has seen.

Thoroughly recommended.

WAR HORSE. By Fairfax Downey. Illustrations by Paul Brown. Dodd, Mead and Company, New York, 1942. $2.00.

Fairfax Downey, Major AUS, on duty at Fort Bragg, North Carolina, commanded a battery of horse-drawn French 75's in World War I. There was a horse in his outfit, Barbara, a courageous little mare. She is the "War Horse" Major Downey chose as the center for his eleventh book.

For a change an officer has written a book that does not deal chiefly with war. *War Horse* does concern World War I; but it is preponderantly about a mare and a few men who knew her well. The story starts at the stockyards in Kansas City where a young Texan, Jim Thomas, has brought a herd of horses for the Government. As you might well expect, Barbara made her appearance there. Jim Thomas and Barbara go through the war together (when not separated for a short time) and are together after the Armistice.

The book does much to cover a period of our Field Artillery history. From it you learn much concerning the horse-drawn units. You can understand the feeling some of the older officers experience when *The Caisson Song* is played, after you have read this book.

War Horse is a good story. Some scenes are powerful and Downey uses illustrations by Paul Brown to good effect throughout.

A. V. R.

Latest Books on Military Training

THE OFFICER'S GUIDE

NEW 9th Edition

[Over 200,000 sold]

For the third time this year THE OFFICER'S GUIDE comes out in a new edition to bring you the latest information on the mass of War Department regulations and orders affecting the officer.

This new Ninth Edition contains more information than ever before. Full details of the new pay bill are included, of course, and a clear explanation of the new supply procedure. The Army Specialist Corps and the WAAC's are fully covered. Much new information on provisions in anticipation of death, and overseas service, plus scores of other changes, make this the biggest and best OFFICER'S GUIDE ever published.

New Index **$2.50** **Illustrated**

COMPANY ADMINISTRATION and PERSONNEL RECORDS

Lt. Colonel C. M. VIRTUE

New 12th Edition

The Unit Bible has been largely rewritten to bring it in step with the latest regulations. The whole chapter on pay has been overhauled to conform to the new payrates. New illustrative problems on pay rolls, new pay tables and new examples have been included to make the procedure as simple as possible. The Chapter on Supply explains carefully all the provisions of Circular 105, and gives a blow-by-blow account of how to handle the new procedure. Allotments to Dependents and many other matters have been added or brought up to date. In other words, COMPANY ADMINISTRATION is once more up-to-the-minute. You'll find this the handiest book in the world to have for yourself and for the Unit Headquarters.

Spiral-bound paper cover, $1.50 **Sturdy cloth cover, $2.00**

THE SOLDIER AND THE LAW

Lt. Colonel JOHN A. McCOMSEY - Captain MORRIS O. EDWARDS

The soldier is concerned with three angles of military law: Court Martial Prevention, which keeps him out of trouble; Court Martial Duties, which tells him what to do on a court; and Court Martial Procedure, which tells him how a court is conducted. THE SOLDIER AND THE LAW is the only book which covers these three angles. An invaluable handbook for everyone.

Illustrated **$1.50** **Index**

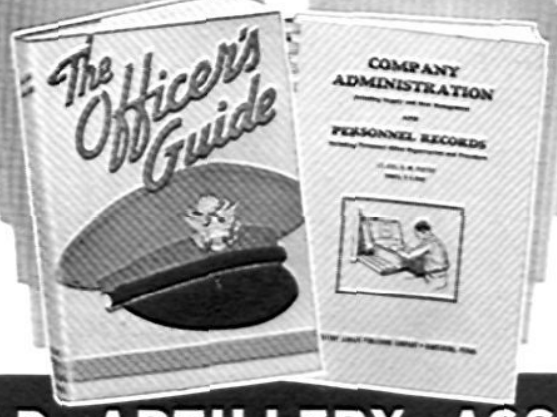
MAP AND AERIAL PHOTO READING, Simplified

Colonel W. F. HEAVEY

New 4th Edition

The Military Engineer calls this "the kind of text I should like to use to train my soldiers." It covers every angle of map and aerial photo reading. Over fifty drawings, twelve full page reproductions, a four color map carrying an overlay, two protractors (one in degrees and one in mils) and a photo co-ordinate card make this the most complete book on the market. All problems are based on the same map, and the questions and exercises carry through in logical progression.

Index **$1.00** **Illustrated**



The Field Artillery Association pays all postage on all orders and handles all types of books.

The Book Reviews in the *Field Artillery Journal* bring you the latest information on the latest books.

U. S. FIELD ARTILLERY ASSOCIATION

1218 CONNECTICUT AVENUE • • • WASHINGTON, D. C.