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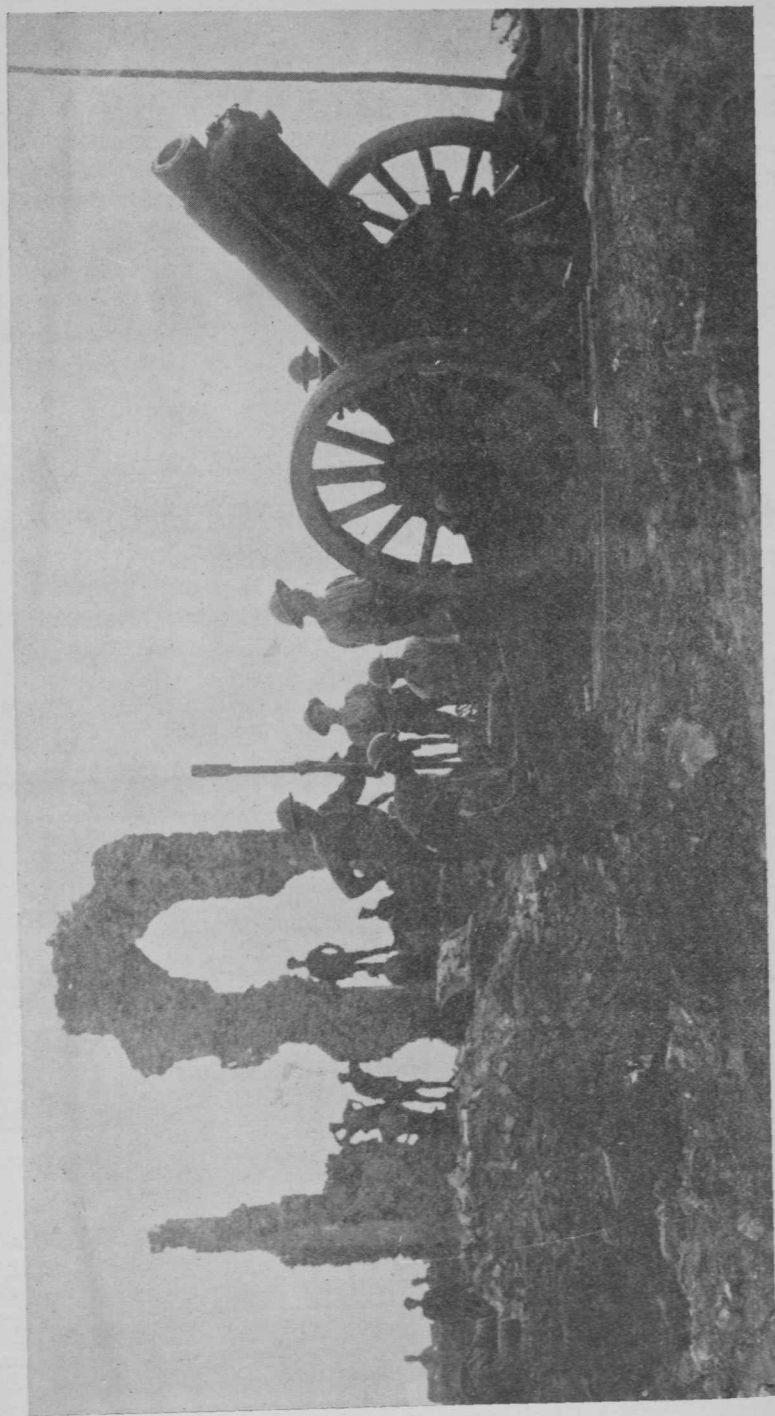
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A BRITISH HOWITZER AT FULKEN

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THE COAST ARTILLERY JOURNAL

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The Use of Books

Committee Problem No. 20, The Coast Artillery School

I. INTRODUCTION

By CAPTAIN R. C. JONES, C. A. C.

JUST what is a book? The *Encyclopedia Americana* contributes the following: "Used without qualification the term currently implies a printed literary composition in many sheets; but in law and custom it has received three extensions, one of form and two of matter. The form includes anything bound like a book. The matter includes by English statute law 'every volume, part or division of a volume, pamphlet sheet of letter press, sheet of music, map, chart or plan separately published'; in literary usage the written compositions of ancient times on whatever material, if of some volume."

The earliest forms of writing were recorded on stone and clay tablets nearly 8000 years ago. Later these were grouped and lettered or numbered by page and volume, thus coming within our definition of a book.

The next step was papyrus, originating in Egypt, made from a species of bullrush found on the banks of the Nile. It ran from small single sheets to rolls in size up to 10 inches by 46 feet, with a stick on each end, and operated like a mortar Zone-Elevation Board. Documents dated as early as 3580 B. C. have been unearthed, but papyrus is believed to antedate that period. Due to its hygroscopic nature it seldom lasts over 200 years in the average climate. It was introduced into Spain by the Moors in the 8th century and by the 12th was practically defunct. While tablets recorded only major facts, papyrus, being cheap and plentiful and used in an age of greater culture, was employed to record speeches, literary compositions, and history, as well as the more prosaic matters of laws, tax returns, dispatches, etc. An *Encyclopedia of Ancient Wisdom* was published in Heliopolis, Egypt, in 1466 B. C.

Next came parchment made from the skin of sheep and goats and accredited to Attalus II, King of Pergamos in Asia Minor about 150

B. C. By the 7th century it was in common use for books and documents in limited quantities.

Vellum, of finer quality than parchment, made from the skin of new-born calves, was extensively used by the monks of the 10th and 11th centuries. The finest examples are the beautifully illuminated and hand-inscribed church bibles.

Paper was made by the Chinese from mulberry as early as 156 B. C., but its history in Europe dates from the introduction of rag paper in 1085 and linen paper about 1100. Our present cheap paper is made from wood pulp.

The Chinese printed from wood and clay blocks about fifty years before Christ, but Johannes Gutenberg, of Mainz, printed the first books from movable type about 1450. The early presses were developed from home cheese and cider presses with very little modification. The making of books continued largely as a handicraft until 1865.

Attalus II, of Pergamos, evolved the idea of binding his parchment sheets together back in 150 B. C. The British Museum has bindings dating back to the 7th century. These, made by the monks, had board covers with metal clasps and hinges, elaborately embellished in many cases with enamel, gold, and jewels. Cloth binding was introduced in 1820. Due to the activity of the monks the early books were largely of a religious character.

The early Romans published the *Acta Diurna*, *Acta Publica*, and *Acta Senatus*. These bulletins, the forerunners of our daily newspapers, were confined to affairs of state. The first printed and oldest newspaper, the *Peking Gazette*, was founded in 1340. The first American newspaper was printed September 25, 1690, by Richard Pierce, of Boston. In his salutatory he stated that there were many false rumors being circulated in the town of Boston which were constantly doing a great deal of harm. He requested his readers to furnish him the names of persons who were starting such stories that he might advertise them in the succeeding issues of his paper. The paper was promptly suppressed by the authorities.

Although some power presses were used by newspapers about 1800, the first big development came in 1846 when the Philadelphia *Public Ledger* installed a Hoe press with a capacity of 20,000 sheets per hour. The modern revolution occurred between 1875 and 1895. In 1865 William Bullock invented a press to print from a continuous roll of paper. In 1875 came the rotary perfecting press with a capacity of 24,000 complete 12-page newspapers per hour. The enormous distribution and broadened field of books today is a matter of common knowledge.

So, too, is the scope of the subject matter and contents. Just to bring it home lend me your imagination for a moment. Conceive, if you can, this earth stripped of every trace of man and his works. Let us imagine a totally different race inhabiting a neighboring planet, with no knowledge of man except possession of all his books, and at the same time having daily access to the earth. Do you realize that from these books they could reconstruct our entire civilization? Our homes and factories down to the last detail? Even start manufacturing our most technical products? If you doubt this think of some concrete detail. Is it not in some catalog, some report, some scientific treatise, some reference or other book? It surely is.

Reading has three great functions. The first to inform—so that one may stand on the shoulders of all his predecessors and utilize their labors and experience in any subject. This cumulative wisdom of the race passed on in books makes possible the marvels of civilization. A still more vital function, but less tangible, is the inspiration which lifts up and builds character, the work of the books of power, the books of all time. The last great function is to afford rest and recreation for the tired and overworked, to fit them better to carry life's burdens.

Patrick Henry said he knew no way to judge the future except by the past. In the face of a specific problem we may hesitate how to attack it, especially an unfamiliar one; but if one acquires the habit of always asking first what is the history of the problem, the method of attack resolves itself into the collection and study of evidence. When a real diagnosis of a case has been made the treatment follows. Only a quack treats symptoms. One must have a well-rounded general idea of the background of the whole problem before him. Cultivate the habit of turning to books for your solutions. The answer is in some book somewhere.

Some book somewhere! How and where shall I find it? That brings us to the trail from a question to its answer. The natural habitat of books is the library. We are concerned with two classes—public and special libraries. Special or private libraries date back to our friend King Attalus II in 150 B. C.—200,000 volumes. The oldest public library was at Nineveh in 668 B. C.—stone tablets cataloged and indexed. Rome had a public library in the 4th century. Our first important public library by enactment of law was established in Boston in 1844. The New York Public Library exceeds it considerably in size, and the greatest of all is the Library of Congress. To obtain an American copyright a publisher must deposit there two copies of each edition of his book. In addition, there are government publications and many foreign ones. While on the subject of government

publications, if manuscript records of the War Department are needed it is one of the duties of the historical section of the War College to assist in identifying and locating them. All the great governments except our own have established archives where their historical documents are assembled, preserved, classified, and indexed. The historical section of the War College has made considerable progress in this direction.

Libraries have an exchange system with each other and, in addition, the Library of Congress will furnish them books under conditions which need not concern us. Thus almost any book is available, even though one has access to but a small library.

In using a library it is important to get a reference list of all available material quickly. First, read up your subject in a good encyclopedia so that you can search intelligently for details. There is usually a reference room where standard books may be consulted freely. Often there is a skilled librarian in charge. Next, consult the library cards. Here you will find books listed by title, author, subject, and subdivisions of subjects. Look over the shelf list. This shows all the books on a subject together. Get *A Map of the World's Knowledge* and also the American Library Association Catalog, which is cumulative since 1912. There are also indexes to articles published in periodicals. Take some first-class newspaper like the *New York Times* and consult its quarterly index. If you have a commercial subject try the trade journals, they are excellent. The *Dry Goods Economist* runs back to 1846, the *Iron Age* to 1855, and the *Engineering and Mining Journal* to 1866. The *World's Almanac*, the *Statesman's Year Book*, and the *Statistical Abstract of the United States*, published by the Department of Commerce, are strong on statistics. There are many other guides if you need them. Their detailed use will be discussed later.

As you go along note carefully on cards the title, author, subject, and call number of each reference given, page numbers particularly. At this stage consult the librarian—you are ready to talk and listen intelligently without wasting time. Note any additional references suggested. Check the books that can be consulted in the reference room and learn the ropes for drawing the others as needed.

II. SELECTION AND ELIMINATION OF BOOKS

By 1ST LIEUT. J. V. DEP. DILLON, C. A. C.

Before going into a discussion of the subject of selection and elimination of books, I will ask: Why is the judicious selection of our

reading material necessary? Is there no merit to the statement that a treatise or story good enough to be written, printed, and bound is good enough to be read? In my opinion that statement has too closely guided our American readers in the past. I will venture that until recently ninety-nine out of every hundred American readers read chaotically. By that I mean their reading was rambling—history today, government tomorrow, archaeology the next day, and so on at random, obtaining a smattering of many more or less uncorrelated subjects. This, of course, leaned toward the development of a blustering race, and if any feature of our mode of living has contributed more to such a reputation for the American throughout the world, I know not what it is. Fortunately, our leading American authors have recognized this condition and have bitterly arraigned the Americans on their lack of culture. As a consequence all classes of our population have become conscious of certain deficiencies in their national life, and are now at last beginning to correct them.

Peculiarly true to type the first response to this changed national attitude has been the immediate rise of a swarm of quacks seeking to supply the demand for some indesignate thing called culture, by all sorts of meretricious schemes and devices. They have by clever systems of advertising attempted to establish as sound the assumption that culture is something that can be standardized, packed, and labelled for our purchase and consumption, and that little or no effort is necessary for its acquisition. It seems essential therefore that we not only insist upon what culture is but also what it is not.

Culture is not a mere veneer, a garment, something apart from life; it is an integral part of life. It is the art of life. All that is necessary to acquire culture is the development of an avid hunger for knowledge and beauty. To acquire culture and a liberal education, all that you need is a guide to take you through that first confusing wilderness of books and to indicate some of the paths and directions that lead to that great treasure house which contains the common heritage of mankind.

Since information alone does not constitute culture, it will not be my purpose to point out any specific books but rather to indicate a means or method of selection. The principles governing the selection and elimination of books are numerous and naturally vary with the individual. I will deal only with those broad principles which apply generally.

1. Select books which tend toward the development and enrichment of life.

2. Let the basis of selection be positive, not negative. That is, if the best you can say of a book is that it will do no harm, question your

need of it, eliminate it. Every book should be of service to you in information, inspiration, or recreation.

3. Do not reject a book on the opinion of a few narrow-minded people who think it either harmful or bad. A book that provokes thought or even arouses opposition to the constantly changing concepts of thought is indeed to be welcomed, provided it does not seek to destroy those principles upon which our civilization is based.

In addition to the few principles governing the selection and elimination of books there are certain tests which should be applied. These tests vary with the different classes of books, so I will cover each class briefly. The tests cover the subject matter, authority, treatment, date, and general makeup of the book.

The tests for books of information are: Subject matter—Is it a survey of the whole subject or part of it? Does it present theory or practice? Is it a history of the subject or a discussion of modern conditions? Is it a statement of facts or an argument? Is it brief, exhaustive, or neither? If selective, is it well-balanced and representative? These and other equally pertinent questions should be considered solely with respect to your need for any particular book.

Authority—What are the author's qualifications? What has been his education and experience? Does he thoroughly understand the theories, period, and facts with which he deals?

Treatment—Is the treatment concrete or abstract? Is it technical, semi-technical, scholarly, or popular? Is it a technical subject treated in such a popular manner as to be worthless? Is it designed for advanced or beginning students or the general reader?

Date—Is it an old book? If so, does its age give it value or render it worthless? Is it valuable as the latest word on the subject or is the subject it treats so new that any book would be of slight value?

General makeup—All books of information should have a table of contents and an adequate index. Most books published nowadays are not without these essentials, still there is considerable room for reform in the quality of the index which in the test of actual use is often found to be wholly inadequate and really nothing but a makeshift. Where the nature of the book gives them value there should be illustrations pertinent to the text, well reproduced, with definite adequate legends. Also, where the nature of the book makes it valuable, a carefully selected list of recommended books should be included.

This then covers in a very general way the tests for books of information. A discussion along similar lines of the qualities an inspirational book should have would be too comprehensive for a short dis-

cussion of this nature. I shall therefore offer merely a few of the most important considerations.

1. Does the work show any degree of creative power?
2. Is it sincere?
3. Is it original in expression? Conception?
4. Is it of purely human interest, or has it artistic, literary, religious, ethical, or philosophic value?
5. Does it appeal primarily to the intellect or to the emotions? If to the latter, has it self-restraint?
6. Has it vitality? Will it endure as a permanent contribution to literature?

These few considerations should be used also in selection of fiction or recreational reading. In addition, one might determine regarding fiction works:

1. Is the life that it portrays true to nature or is it exaggerated, sensational, melodramatic, distorted, or morbid?
2. Are the characters alive? Do their acts ring true?
3. Is the plot original? Is it well worked out? Does it hold the interest?
4. If it depicts sin (as so many of our modern best sellers do) is the author's attitude moral, immoral, or unmoral?
5. Does it leave a sense of completeness? Satisfaction? Does it stimulate? Inspire? Or merely amuse?

These tests that I have suggested would no doubt result in the selection of the most desirable books in the class wanted. But, you will naturally ask, how are we to make these tests without actually reading the book? In short, how may we be simply, practically, and expeditiously guided in our selection? The answer is in the use of well-recognized book reviews. The foremost of which, in my opinion is, the *New York Times Book Review Section*. This publication has a very able staff and is impartial. It deals generally with current issues but a review on almost any work can be obtained by request. A good rule to follow regarding reviews is to discount the value of the book about twenty per cent under the estimation of the review, for it is natural that a critic will hesitate panning any work. The error in criticism is most generally in favor of the author. Other reviews that are of value are the *Readers' Guide to Periodical Literature*, the *Review Digest*, the *Saturday Review of Literature*, and the *Periodical Review*.

For those who might be interested in modern up to the minute reading of value I would unhesitatingly recommend "The Book of the

Month Club.”* This organization employs a staff of very capable critics, who form the selecting committee of the club. Most of the important books are sent by the publishers prior to publication to the selecting committee of the club, who reads them and then by an independent system of voting select an outstanding book each month. To my way of thinking any book so selected cannot well be without merit and is very likely to be outstanding. All enrolled members of the club receive a review of the book so chosen and if from the review one decides that he does not care for the book he may so notify the club, otherwise the book is sent at the time of publication at the regular publisher's price.

There is one further question which I take liberty to discuss. What guide have we as Coast Artillerymen in our professional reading? “One thing,” says General Callan in his article on a five-foot bookshelf for Coast Artillerymen, “that was outstanding in the search of many officers was the desire to obtain some reasonable limit to the number and kind of books that would cover even, generally their profession.” This led to the utilization of Dr. Elliot's idea of a five-foot bookshelf. With the aid of school officers, members of the Coast Artillery Board, and others, a collection of books was made, the contents of which are thought to be the meat of a tactical and technical education for a Coast Artilleryman. This list of books is published with the article and should serve as an excellent guide to our professional reading.

I will close with a passage from J. L. Bennett's book on *Culture and a Liberal Education*. “To pass through life without knowledge or understanding of what the great adventure of living has meant to millions of men and women of other lands and times, to pass through life without knowledge or understanding of all the great treasures of thought, of literature, music, science, and art, is to rob oneself of the most enduring satisfaction of life.”

III. EVALUATION OF BOOKS

By 1ST LIEUT. W. B. MERRITT, C. A. C.

Evaluation of evidence is something in which all officers have had considerable experience. The rules of evidence must be kept constantly in mind during the sessions of a court-martial.

A witness takes the stand and is sworn. Before he begins his testimony he must be identified. The court wants to know who he is and how he got his information. If he is called as an expert, his qualifica-

* Or “The Literary Guild.” a similar organization.

tion as such must be shown. These points being determined, the witness begins his story and each member of the court begins to evaluate his testimony. The court must judge as to whether or not he was competent to understand what he saw or heard, whether he really remembers or only thinks he does, whether there is any reason to suspect that he is not telling the truth or that he is coloring it, whether his testimony is inconsistent or suspiciously perfect in its consistency, whether it agrees with other testimony on the same subject and, if not, whether the statements can be harmonized. If the statements are hopelessly inconsistent, what is entitled to credit? If part of the testimony is rejected as false, must the whole be rejected, and if not, what caution is necessary in using the part accepted?

All these questions must be kept in mind by each member of the court, and in answering them he must be guided by the rules of evidence.

So, also, in judging a book there are certain rules which must be followed as guides. Instead of a witness we have a book and must determine its value as evidence. The same process of criticism used in the court-martial can be used here, except that the rules for the admissibility of evidence are not so strict. No part of this evidence is inadmissible because of its form. Every kind of evidence must be considered for what it is worth. In the determination of what it is worth we must apply the same rules as to credibility as those used by a court in evaluating the evidence brought before it.

When we begin to appraise the value of a book we should begin on the title page. This page, among other things, gives the name of the publisher. Certain well-known firms, before accepting a manuscript, have it reviewed by trained and competent editors. Hence, to some extent, the imprint of a good firm creates the presumption that the book conforms to a certain technical and literary standard.

The title page also identifies the writer as a witness and gives some indication of his qualifications as an expert and his competency to write on the subject. It shows his name, indicates his professional standing, academic degrees, and what other works, if any, he has written.

However, the evidence contained on the title page is not conclusive. The author may be a most distinguished person in certain lines, but it does not necessarily follow that he is qualified to write on the particular subject at hand. An example of this was the case of a doctor of medicine who gradually developed into a very brilliant novelist and short-story writer. During the war he turned his attention to historical writing and published studies on the military history of many of the campaigns; but there was nothing whatever in the writer's known record to indicate his qualifications to write either an historical narrative or a

military criticism. Again, there was the case of a teacher of science who later discovered in himself great talent as a imaginative story writer. He developed an intense interest in world politics and economics and finally published a very comprehensive outline of universal history; but there was no reason, from his past record, to pay any attention to what he had to say.

Yet, these books must not necessarily be rejected. They may be very useful, if properly evaluated. Sometimes the best books are written by men whose title pages do not show all the qualifications necessary. A specific example of a book in this class is Smith's *War with Mexico*. The title page shows that the author had a definite standing as a teacher and writer of modern history and that he had a leaning towards military subjects, but there is nothing to indicate special military knowledge and nothing on that page to lead one to expect a book out of the ordinary. But the book proves to be extraordinary in skill and thoroughness of research, as well as in the grasp of military subjects.

It might be asked, "How is one to find out these things without reading the entire text?" The answer to that question is, "In the preface." The preface should be read carefully and not skipped or read casually, as is frequently done. It tells *why* and *how* the book was written, indicates the author's point of view and *may* review to *some* extent the material used. Is the subject a new one or has it been treated before? In either case, what was the reason for writing this book? Does the writer present any newly discovered evidence or a new point of view which justifies the production of a new book on a subject already so thoroughly covered? The preface should answer all these questions. If it does *not* the book must be regarded with a certain amount of suspicion.

The preface of Smith's *War with Mexico* shows that a new book was needed; it shows what material was used and *how*; it indicates the pains taken by the writer to secure the necessary military knowledge and shows the amazing industry, thoroughness, and patience with which the work was done.

The next point to consider in evaluation is the ability of the writer to handle his material. If the book is a study of Napoleon's campaigns it would be necessary for the writer to be able to read French, since a large part of the *source* material is *written* in French and has not been translated into English. Similarly, a Frenchman could do no serious work on a study of our Civil War without a good reading knowledge of the English language.

Consider now the *time* when the book was written. This is shown by the date of *copyright* and *not* by the date of publication. Suppose

the book deals with Napoleon. The literature on that subject can be divided into certain periods, each of which stamps its character upon books of the time. Immediately after Napoleon's fall many historical books were written about him. The Bourbons were then in power in France and all Europe was hostile to the Bonapartes. An impartial historian was difficult to find and indeed it would have been almost impossible to get material for writing an impartial history.

While at St. Helena, Napoleon dictated his memoirs. He realized that he himself would never again be in power, so formed the ambition to have his son ascend the throne. So his memoirs, reviewing the military and political events of his career, were more propaganda than history. These memoirs, together with stories picturing Napoleon as a martyr, began to influence public opinion until 1848. Seventeen years after the death of the former emperor, his nephew, later Napoleon III, was elected president of France. During this period literature was intensely partisan, both for and against the Bonapartes. When his nephew became Emperor, it became the fashion to *glorify* Napoleon. This was a complete reversal from the fashion which existed following Waterloo.

Then in 1869 was completed the publication, in 32 volumes, of Napoleon's correspondence. Until then, these papers had been inaccessible, but *their* publication made it possible to reconstruct a satisfactory picture of the emperor. From this it can be seen that, while earlier books are worth something if properly evaluated, no really accurate and impartial history could be written prior to this publication of real source material.

Our inquiry so far having led us to believe that the book has proper character and standing, its value to us in covering the particular points for which we are looking may be judged by examining the table of contents. Next, we come to the statements in the text itself—the testimony of the witness.

These statements may be divided into two classes—first, events seen by the writer himself, and, second, those which he did not see. Few events will belong to the first class; most of them will be of the second class—events about which the writer has called others to witness. Here the rules of evidence differ slightly from those applicable in law. This hearsay evidence is admissible, but the writer, in making a statement must label it correctly in order that it may be evaluated properly.

However, just as the law requires the best evidence, so also must a writer's statement be backed by the best evidence on the subject.

How are we to know whether this rule has been followed? The writer must inform his readers who his witnesses are. This he may do

by a general statement in the preface; by an appendix giving a list of sources quoted, with perhaps a bibliographical remark on each; by a system of notes; or by a combination of several or all of these methods.

A mere general statement in the preface is ordinarily insufficient. A detailed list of sources appended is better, in that it gives the reader a better start in case he wishes to make further study. But if he wishes to test the accuracy of the writer's work he must review all these sources. This task should not be imposed upon the reader. The writer must name the witness relied upon for each material statement of fact. If he is not willing to do this, his work is of doubtful value and must be regarded with uncertainty, if not with some suspicion.

In conclusion, then, it might be said that each book reflects the character of the author and the purpose he had in view. Some are prepared with no desire to tell the truth, but rather to please and entertain the reader. Many writers choose an historical subject but produce a piece of fiction; and some readers will praise the book as interesting, forgetting that history is a science and not literature. Those books in which the writer does not ask his readers to take his statements on faith, but, by means of convenient references, directs the reader to the sources; draws inferences and conclusions but labels them as such, so that the reader may accept them or reject them; states in his preface his object in writing the book, and appends a bibliographical note—these are the books of value for they carry with them the necessary proof of sincerity and truth. It is upon these principles that our final judgment must rest. By application of this process of criticism we may appraise the value of the book and accept it for what it is worth, just as we evaluate the testimony of a witness before a court-martial.

IV. THE USE OF BOOKS

By 1ST LIEUT. R. E. STARR, C. A. C.

I have interpreted the title, "The Use of Books," to cover two things:

1. The usefulness of books, or to express it better, perhaps, the place occupied and the missions fulfilled by books of the various classes.
2. The application or employment of books of the various classes—how to use them.

Formerly, the chief function of a library was to store books. The modern library is less a reservoir than a fountain. It is the librarian's duty not only to get and keep books, but far above this, it is his duty to make books useful. The old library was of use to a learned few. The modern library has won a place beside the public school as an instrument of education.

The significance of the new part the public libraries are playing, and by the public library we really mean the accessibility of books to the general public, has been the action of Andrew Carnegie, who, in his avowed purpose of distributing his wealth for the greatest good of his fellow men, has found nothing promising so large returns as co-operation with communities in the establishment of public libraries.

Every department of human endeavor is using the library as its laboratory and books as its tools.

In general, books are used for one of two purposes:

(1) For recreation and entertainment.

(2) For information and education.

Under the first class we find the novel, the drama, poetry, and many others.

There seems to be no doubt but that the novel is the most popular book of our day. The novel is based, primarily, on the instinct for a good story. The portrayal of characters is added and emotional elevation stressed.

The chief characteristic of the drama is the imitative action, and the popularity of the drama is due largely to the fact that the human being is rare who has never felt an impulse to pretend he is some one or something else.

Books of voyages and travels, with their spirit of moving and seeing; poetry, with its sense of the aesthetic—these and numerous other books appeal to us primarily for their recreational and entertainment features.

Under the classification of books to which we turn for information and education we find history, science, biography, and others.

History, we all know, covers anything that concerns men and that has a past; not politics only, but art, science, music; not institutions only, but legends and chronicles and all the masterpieces of literature reflect the clash of nations and the tragedies of great men. There is no subject, save perhaps astronomy, that is quite so vast, and quite so little known. And so it is that we are all interested in history in some form or another.

Biography is the key to the best society the world has ever had—the men and women who by their talent or the significance of their careers or by some special deed have stood out above the throng. By following the careers of other men and women we forget ourselves. We are shown the way by example.

Science is the latest of man's great achievements. The other important agents of civilization long ago attained their full stature, but it is only in the last half century that science has reached its maturity and revealed its titanic power. Today, after a few decades of the scientific

era, agriculture, transportation, communication, food, shelter, clothing, birth, and death themselves are different from what they were before, and it is difficult to imagine life in the past. Most wonderful of all is the growth of natural knowledge, an understanding of nature itself. All things are counted, measured, and figured, then analyzed and classified. Out of such orderly knowledge laws arise and are confirmed, until at length knowledge appears to extend to almost all phenomena.

As a subheading under books of science we might list professional books. We all know how dependent the professional man is on his books; the engineer relies entirely on his handbook for his formulae and figures, while the lawyer must have his digest for his precedents. And so it is in the Army, where we are guided and educated by our army and training regulations, our manuals for court-martial, and our various publications, technical and otherwise.

Teaching the use of books and libraries is a practice steadily gaining ground among the educational institutions, from the high schools to the colleges, today. Inasmuch as such a large proportion of the time of officers is spent in schools, it behooves us to know how to use books properly. Modern teaching methods, instead of confining a student to prescribed text books, often requires the use of a variety of material, e. g., other texts, reference books, or magazine articles. These may be indicated, but more probably the student will be required to discover them himself.

In even small libraries much valuable time is wasted in trying to use books without knowing how.

In addition, the ability to use books encourages the use of them.

In learning to use books the first thing to know is how to care for them. I will not, however, go into the physical make-up of the book or the more common instructions as to how and how not to handle books.

In covering the second division, "How to Use Books," I am going to make my remarks apply practically exclusively to reference books, inasmuch as it is facility in referring to these in which we are particularly interested.

For convenience in discussion, I have divided books into (1) general reference books, (2) special reference books, (3) bibliographies, (4) magazines and periodicals, and (5) other publications.

Reference books are any books used for looking up particular points rather than for reading through. By particular point is meant any fact which may be stated in a word, paragraph, line, or article. Any work may be used as a reference book, but strictly speaking the term applies to books, such as dictionaries and encyclopedias, which have a great deal of information in a small space and are especially planned for

finding facts quickly. In libraries the term reference book is made to include any book not lent for home use. Hence, magazines, public documents, rare books, and similar publications come within this class.

Reference books differ so much among themselves not only in contents but in arrangement, that each must be studied especially to be used easily and quickly.

Among the most widely used general reference books are the encyclopedias and the dictionaries.

The encyclopedia, as we all know, is a work in many volumes, containing thousands of articles on all branches of knowledge. Articles in the encyclopedia are descriptive, explanatory, statistical, and historical. Encyclopedia articles, on the other hand, rarely give practical directions for doing things; they are sometimes brief, and for many subjects soon out of date. We may say that the encyclopedia is useful for giving a compact account longer than the dictionary but shorter than a book.

Among the important encyclopedias are the *Encyclopaedia Britannica* the *New International Encyclopaedia*, and the *Encyclopedia Americana*. These differ slightly from each other. The *Britannica* is a standard work of reference, wherein the arrangement is under general heads rather than by specific subjects, *e. g.*, Lake Erie is described under the St. Lawrence River, instead of Erie (lake). In this case the St. Lawrence River is taken as the name of the general system of lakes and rivers of which Lake Erie is a part. Owing to this arrangement, articles frequently become lengthy treatises, and to find a subject in the *Britannica* it is often necessary to consult the index, which forms a separate volume. Articles are by authorities and are signed.

The *New International Encyclopaedia* is the most important published in the United States. In it subjects are usually found under their own name, and not grouped with allied subjects. Alphabetical order is letter by letter instead of word by word.

The *Encyclopedia Americana* is much the same as the *New International Encyclopaedia*, except that the *Americana* is often stronger on scientific subjects, but more likely condensed on other subjects.

The dictionary contains primarily alphabetical lists of words of a language with their etymologies and meanings. The modern, unabridged one-volume English dictionary includes, besides the ordinary words, proper names of all kinds, abbreviations, and words and phrases from foreign languages.

Proper names include names of places, persons, including noteworthy living persons, of characters in books, and of mythological personages. With geographical proper names are given location,

population, area, political relations, and other brief facts. Names of persons have nationality, station in life, profession or occupation, and dates of birth and death. Proper names may be included in the body or included in special lists of names in an appendix.

The appendix contains miscellaneous useful lists. Just what will be in it depends on the particular dictionary.

There are a number of important dictionaries in use today. The principal differences are in the lists, the arrangements, the facts that some have more complete or briefer definitions, etymologies, systems for showing pronunciations, etc.

In addition to the general reference books, we have any number of special reference books—each book covering that subject alone. Some examples are the *Cyclopedia of American Government*, *Encyclopedia of Social Reform*, biographical dictionaries, dictionaries of classical literature and antiquities, and others too numerous to mention.

Biobibliographies are lists of books or writings related to some one thing. They may be lists of works by an author, or they may simply relate to some subject; they may fill a book or a chapter; they may occur at the ends of chapters or articles, or be scattered through the book in footnotes. To the student, bibliographies are valuable in a number of ways. They may list all that has been published on a subject, or they may be limited to the most important; they may include magazine articles, pamphlets, and indeed any material on the subject. They may have useful notes describing or criticizing the books or sources. In all these ways they serve as guides and time-savers to the student who must follow up a subject with thoroughness.

The card catalogue calls attention to the most important bibliographies in any particular library; others must be sought in the text books, reference books, and standard works on a subject.

Magazines and periodicals form extremely valuable references in our day and age, inasmuch as they supplement books with the latest news and thought of the day. As magazine articles are usually short compared with books, they are at their best in dealing with small subjects or with particular aspects of large ones. Each number of most magazines contains a table of contents, while every year or six months a volume is completed, and in most cases an index to each volume is published. In addition there are a number of general magazine indexes, among them *Poole's Index*, the *Reader's Guide to Periodical Literature*, and others, in which magazine articles of different classes from our more important magazines are indexed. In using these indexes, a subject is looked up exactly as in the index of an ordinary

book. The names of the magazines indexed and a key to their abbreviations are found in the front of any number or volume.

Besides magazines there are other publications which come out from time to time, often irregularly, which are useful in reference work, and which are referred to in periodical indexes and bibliographies. Among these are certain publications of the United States government and proceedings of important societies. Those published by the Government cover an immense number of subjects, are written for many kinds of readers, and are a class authoritative and reliable. Important professions, trades, and lines of business frequently hold local or national assemblies where papers relating to professional matters are read and discussed. Such papers are often very valuable, but naturally are likely to be more or less technical in treatment.

To sum up then the use of books for reference work:

(1) Be able to use the library as a whole. To do this keep in mind the principal resources of the library which are summarized as follows:

(a) Card catalogues. These tell what the library has by an author, whether it has a particular title, and what books it has on a subject.

(b) Reference books, including dictionaries, encyclopedias, and special reference books. These give short accounts of subjects.

(c) Magazine indexes. These give clues to recent material and to many subjects not covered in reference and other books.

(d) Miscellaneous aids including bibliographies mentioned in the card catalogue and reference books.

(2) In addition, the general arrangement and classification of books and the use of the index and other parts of a book should be understood, the former as an aid in finding one's way about, and the latter in order to make the use of any book easy and efficient.

V. BIBLIOGRAPHY

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Mechanization and Motorization and Their Effects Upon Heavy Artillery

By LIEUT. COL. GEORGE L. WERTENBAKER, G. S. (C. A. C.)

EDITOR'S NOTE.—*The author, who has had considerable experience with mobile heavy artillery, feels, in the face of the present trend toward mechanization, that we need not be unduly alarmed over the comparative lack of mobility of heavy artillery. The JOURNAL would like to receive the opinions of its readers on the subject. To what an extent will materially increased mobility for combat units necessitate increased mobility for heavy artillery? Does mechanization foreshadow any marked change in heavy artillery materiel, such as self-propelled mounts or giant tanks? Are our tactical methods suited to the future? The JOURNAL feels that the subject is one of great importance, worthy of considerable study.*

THE wonderful advance made in the development of motor propelled vehicles during the past 25 years is well known. That this development should have been noted by military men and their best thought devoted to its application to the military art is a natural conclusion.

The adaptation of motor power to military uses was given an enormous impetus during the World War, and extensive use was made of it.

Motor power was the basis for the invention and development of airplanes, armored cars, tanks, tractors, self-propelled mounts, and cross-country cars of various types which have been adapted to military use. In addition, motor power was extensively used for the rapid movements of troops from one point of action to another. As a result of this development and from lessons learned during the World War all armies are contemplating an increased use of motors and other mechanical devices.

Reports indicate that in most instances, their effort is to place increased mechanical power in rear of the attack. In at least one instance the authorities have looked to some extent at the attack itself.

These uses of mechanical power, viz., in rear of the attack and in the attack itself, have produced two terms—*motorization* and *mechanization*.

In further consideration of the subject in hand the accepted meaning of these two terms must be understood and remembered.

NOTE: An excellent article on "Mechanization" by Maj. René E. DeR. Hoyle, C. S. (F. A.) will be found in the *Field Artillery Journal* for May-June, 1928.

a. Motorization of any unit, large or small, consists essentially in substituting motors for animals, as motive power. (In rear of the attack.)

b. Mechanization, on the other hand, may be defined as the "application of mechanics directly to the combat soldier on the battle field." (In the attack.)

Another possible definition of mechanization is the use of motor-drawn and other mechanical appliances to increase the tactical mobility, or firing power, or both, of combat troops and their equipment on the battle field, and to give them added protection.

Motorization may provide partial mechanization of a given force in that the motor-drawn motive power may increase the tactical mobility and even fire power of the combat unit. This is desirable, but not always possible or essential.

This paper refers mainly to mechanized forces.

As a result of the lessons of the World War and subsequent study of the application of motor power to military tactics, two distinct schools of thought have resulted. One sees mechanized armies; the other, remembering principally the failure of tanks in the World War to accomplish decisive results, views them as but a poor auxiliary of present-day infantry, and would limit motor power to motorization.

"The solution, at least for some time to come, probably lies between the two."

"No machine can replace the brain of man. But machines have in the past extended the striking power of his arms and legs and will do so in an increasing degree in the future."

"An English military authority is reported as stating, 'The British Army is now committed to a new scheme of fighting wars and the change from old schemes of man wastage to new schemes of using machine power is breathing new life into the services.'"

"Mechanized forces will be used in the battle fields of the next war. The question is, to what extent?"

"It is not conceivable that armies can be entirely mechanized. The mass of equipment required would be such that even with all the manufacturing resources of this Country, war would be brought to an expensive impasse before this could be accomplished. When we consider the requirements in raw materials, personnel for manufacture, its requirements in fuel and oil, an estimate of the cost alone would be prohibitive."

"To embark on such a project would immediately lead to a race in land armaments commensurate to, if not exceeding, anything known in naval building competitions."

Moreover, machines have tactical and strategical limitations which prevent our striving to make universal use of them.

We are forced to the conclusion that mechanization has very distinct limitations, and that infantry and cavalry divisions of the present type, or with increased motorization as development continues, must continue to form the bulk of armies.

"Almost every major offensive operation, studied in the light of the power of the defense in modern war, brings out some situation somewhere on the front of a large unit which could be best solved by a self-contained, highly-mechanized unit of great striking power and of limited holding power."

"Equally, it is shown that on other parts of the front such units would have no role." Therefore, the place for such a unit is above the division, viz., as a part of corps, army, or G. H. Q. troops.

The following are believed to be some of the missions that could best be performed by a mechanized force in war:*

- a. As a strategic advance guard of a large force.
- b. As a mobile flank guard.
- c. To seize and hold key positions for a short time.
- d. To attack enemy's flanks or break up his communications in rear areas.
- e. To penetrate the enemy's line when strong resistance is met.
- f. As a counterattack weapon.
- g. As a rear guard of a large force.

The organization, strength and equipment of the mechanized force must be worked out by trial, but the following is suggested:

- a. Light and medium tanks.
- b. Light (75 and 105-mm.) artillery, self-propelled.
- c. Infantry, strong in machine guns, and provided with fast cross-country motor vehicles.
- d. Detachments of signal, engineer, and service troops, also provided with suitable cross-country transportation.

If one visualizes the above force (as a combat unit of a corps) traveling at a rate of from five to twelve miles an hour, making an envelopment on a limited front or a rapid break-through on a continuous front, we will probably have an approximate picture of the employment of a fully mechanized force in the next war.

From the above we see the latest application of the principle of "fire and movement"—the most up-to-date means of restoring movement to the modern battle field, in rear of which the decision lies. But there

* Mechanization—Hoyle, *The Field Artillery Journal*, May-June, 1928.

has been no change in the theory of tactics—tactics will remain fundamentally “changeless as the human nature on which they depend.”

The tactics, as well as the organization and equipment, of this mechanized force itself must be worked out, and developed by practice and experiment. It was for these reasons that the “Experimental Mechanized Force” was assembled at Fort Leonard Wood during the past summer, where tests, practice marches, and tactical maneuvers were held.

Enough has been said to show that, whatever may be determined as to the tactics, organization, and equipment of the Mechanized Force, no change is contemplated or visualized in the theory of tactics for our military forces.

We come now to the question of the artillery.

We have seen that it is proposed for the mechanized force the same caliber of artillery provided in the division, viz., 75-mm. and 105-mm., but self-propelled—as an integral part of the force. This must be so. Such artillery must be able to act in close support. It must be able to come into position rapidly, and to displace forward at a rate comparable with that of the attacking tank units. It must be able to emplace well forward, avoiding loss through short changes of position rather than through the protection surrounding its guns.

The 75-mm. gun and the 105-mm. howitzer, self-propelled, with shields sufficient to protect against small arms and shell fragments, appear the proper weapons, rather than tanks of enormous size. The former will permit control of fire by battalion and battery methods. The latter would tend towards isolation of the piece as a unit of fire.

Nothing in the above discussion has touched on artillery heavier than divisional artillery—nor has anything been said that indicates a change in our present principles of artillery support or the use of corps and army artillery.

Heavier artillery can, on occasions (penetrations and counter-attack) help the mechanized force to the limit of its range and can, by echelonment forward, aid its further advance or assist it in holding ground gained until a normal division (less mobile) can relieve it; but it hardly seems practicable for *heavy* artillery, weighing fifteen tons, or more, to maneuver with or be of material assistance to a very mobile, fully mechanized force on other missions when the full use of its extensive mobility is brought into play.

The tactical and strategical mobility of our divisions, corps, and armies may, and probably will, be increased considerably by motorization. Nevertheless, one who visualizes *heavy* artillery, weighing fifteen to fifty tons, lumbering cross-country at a rate of from five to

fifteen miles per hour, going into position in a few minutes, firing a few *well-placed* rounds and again lumbering across the country to render direct support to a rapidly-moving envelopment or break-through, is surely over optimistic, and looking far into the future.

This in no sense relegates the *heavy* artillery to the "limbo of innocuous desuetude." The heavy artillery will still be called upon to perform the functions that it alone can properly perform.

In spite of all our efforts to make war of movement a continuous thing, the battle line will become more or less stabilized, and, following the first "digging in" of the evenly matched forces, of increasing length. It is also evident that movement and activity will not be continuous on this long front. On parts, there will be marked activity and movement, while other parts are quiet and stabilization will set in.

This line will be held by divisions, corps, and armies not materially different from those we now have.

Then will come the opportunity for the heavies, as heretofore. Behind this more or less stable battle line the heavy artillery will perform its normal functions much as it did in the World War.

The use of mechanized special forces for the envelopments and break-throughs on a limited front will, however, increase the difficulties of heavy artillery, and to render artillery support to the rapidly moving envelopment or break-through will necessitate—

a. Improved means and methods of terrestrial and aerial observation of fire.

b. Closer liaison with, and observation of, the supported unit.

c. More rapid means of shifting fire.

d. Better and more rapid means of signal communications.

e. More tactical mobility and more speed in going in and out of position. (This latter is probably the least important.)

Likewise, increased strategical mobility is worthy of and is receiving constant study.

The weights that can be moved, at anything approaching a rapid speed, over the best roads, to say nothing of poor roads or cross-country, are limited. We cannot, therefore, hope to move heavy artillery weapons at the speed even now reached by the divisional and corps weapons.

Nor is this considered necessary. The divisions and corps will move at approximately the same speeds as heretofore (except in special cases when the troops are transported in motor trucks). These forces will eventually meet opposition. If this opposition is overcome, well and good; if not, stabilization of greater or less extent will take place.

If this stabilization continues, then there is need for heavy artillery and time is available for the slower-moving weapons to come up.

This is the opportunity for the heavy artillery to influence the combat and the force which can first bring its heavies into action undoubtedly has the best chance of breaking the impasse, other factors being equal. Example—Critical delay of German right wing on advance into Belgium until heavy artillery could be brought up.

To repeat, mechanization does not mean that heavy artillery has passed from the scene. It still has, and will have, for a long time to come, its missions—missions which it alone can perform.

Efforts can well be expended on increased mobility; with special attention to tractor-drawn and railway artillery, but heavy artillery has no place in, and is not materially affected by, the mechanized force as now visualized.

MAXIM XLVI

The keys of a fortress are well worth the retirement of the garrison, when it is resolved to yield only on those conditions. On this principle it is always wiser to grant an honorable capitulation to a garrison which has made a vigorous resistance, than to risk an assault.—Napoleon's Maxims of War.

An Economic Survey of the United States

By CAPTAIN V. W. HALL, C. A. C.

IT has long been recognized, both by ourselves and by foreign nations, that the United States is by far the richest of all powers. This recognition has undoubtedly occasioned for us more than a little malicious envy on the part of many of our neighbors. I am afraid that it has been the belief of many of the European powers, and possibly some of our own people, that our present national wealth and prosperity had its foundation in our activities during the war. But we shall find this to be far from the fact.

If we consider the economic progress of the United States over a period of a quarter of a century, and any economic study should necessarily extend over an appreciable period rather than be concentrated upon the present only, we shall find that our national growth in industry, banking, and commerce may be divided, like the individual lives of most of us and the activities of the world at large, into three distinct periods: the pre-war period, the period of the war, and the period since the war.

If we analyze the various economic elements properly, we shall probably find that during the first fifteen years of the present century the United States grew amazingly in wealth and prosperity and that by the end of that period, and perhaps even before, had reached the position of a world leader in many branches of industry.

During the war, as all know, this country was called upon, by force of circumstances, to supply the civilized world with a greater proportion of food and materials of all kinds than ever before. There was greatly increased activity and the volume of trade was enormous. But during this period we were operating under unusual, and in many cases artificial, economic conditions, and under many handicaps. Vast numbers, some four and a half millions of us, were drawn from the producing ranks and became consumers of tremendous capacity. While many individuals and corporations profited greatly by this increased activity, when considered as a whole it was unhealthy, it was conducted with a relatively high degree of inefficiency, and the net result to the country at large was perhaps detrimental rather than beneficial.

Since the war, starting with the return to normalcy along in 1921, we shall find, however, that quite independent of any of the effects of the war we have been riding on a tide of prosperity and

development which is simply astounding and has no parallel, not only in the annals of this country, but in those of the world's history.

Let us consider a very few of the elementary facts which tend to bear out these assertions.

Per Capita Wealth of the United States
(4-885) *

1900	\$1165
1904	1318
1912	1950
1922	2,935

The above figures are deceptive unless we know how they are derived and what they represent. Wealth here is expressed in actual dollars. But we all know to our cost that the purchasing power of the dollar is very much less today than in earlier years. Some economist has computed the per-capita wealth of the United States for 1914 and 1923 in terms of "1913" dollars, and found that the increase has been so slight on this basis as to be entirely inconsequential.

Comparative Per Capita Wealth
(In "1913" dollars)
(4-886)

	1914	1923
United States.....	\$2062	\$2091
Great Britain	1522	1489
France	1447	1485
Germany	1184	902

Bank Clearings
(5-287)

All U. S. Cities New York City
(000's omitted)

1900.....	\$ 85,582,450	\$ 51,964,588
1910.....	168,986,664	102,553,959
1915.....	163,173,137	90,842,708
1920.....	463,020,250	252,338,249
1923.....	411,251,633	214,621,431
1925.....	505,298,883	276,873,935
1927.....	543,955,530	307,158,631

The enormous growth of clearings during the years of the war will be noted, indicating our assumption of the position of banker to the world.

We now enjoy a national banking system which, while possibly far from perfect, represents a great advance over anything which we have

* Where figures appear thus in parentheses, the first number refers to the authority quoted, as listed on the final page of this article, and the second number to the page of that authority.

ever possessed in the past. The Federal Reserve Bank affords that centralized control of money and credit which is so essential to stability, while at the same time it permits to its member banks that initiative and decentralized operation which is fundamentally an American characteristic. In former years, financial crises and panics recurred approximately every ten years with such regularity that they were accepted almost as a natural, though calamitous, event. While the Federal Reserve System cannot perform the impossible and there will always be periods of relative inflation and depression, it is only reasonable to expect that it will in the future, as it has during the past fourteen years, prevent periodic recurrence of such financial disasters as visited the country in 1893, 1903, and even in 1907.

<i>Savings Bank Deposits</i> (5-288)		<i>Life Insurance In Force</i> (5-301)	
1900	\$2,449,547,885	1900	\$ 8,562,080,722
1905	3,261,236,119	1905	13,364,009,759
1910	4,070,486,246	1910	16,406,702,709
1915	4,997,706,013	1915	22,743,336,831
1920	6,536,470,000	1920	42,281,390,527
1925	9,055,181,000	1925	71,642,127,685
1926	9,599,118,000	1926	78,492,142,287
1927	9,738,902,000		

Foreign Trade
Total Imports and Exports, United States
(5-337)

1900	\$ 2,244,424,266
1905	2,636,074,737
1910	3,301,932,150
1915	4,442,759,085
1920	13,342,340,777
1922	6,379,235,497
1924	7,865,422,008
1926	9,220,671,813
1927	9,221,206,342

Foreign trade has been perhaps a fetich with economists and is sometimes given undue importance as an index of our prosperity. While it is of importance and it is gratifying that our foreign trade continues to grow, yet it has been estimated that the value of our domestic trade is ten times greater than the total volume of our foreign trade, let alone the volume of our exports, and it thus goes without saying that the development of trade at home is of vastly greater importance than trade abroad. There are many of our products which we cannot export, because they do not meet the desires or the prejudices of foreign peoples, but more particularly because many of the

articles which are now our commonest necessities are luxuries available only to the wealthy few in most foreign countries, with their lower standards of living.

Competent students are convinced that of our vast domestic trade, amounting to about eighty billions of dollars yearly, from ten to fifteen per cent is avoidable waste, the result of ill advised or ineffective methods, such as overproduction and deterioration, lack of cooperation between distributing agencies, ineffective loading and packing, destructive competition, unwise advertising and sales promotion, bad credits, too many links in the chain of distribution, and so on. These leaks are receiving attention by trade associations and governmental agencies and it is to be hoped that the solution of the problems involved may aid in the reduction of costs and prices.

Value of Manufactures, United States
(5-328)

1899.....	\$11,406,926,701
1904	14,793,902,563
1909.....	20,672,051,870
1914.....	24,246,434,724
1919.....	62,418,078,773
1921.....	43,653,282,833
1923	60,555,998,200
1925.....	62,713,713,730

AGRICULTURE

Agriculture has not shown any such increase, and it is not to be expected that it would. The amount of food consumed per individual does not vary materially from generation to generation and agriculture usually increases directly with population. Our agriculture shows approximately this rate of progress. Farmers in general have not been making money in the period since the war, although their condition seems to be improving somewhat, and, as all know, the subject of farm relief is one of the live topics of the day. Apparently the main troubles of the farmer are that he neither individually nor as a class plans his crops in accordance with the economic principles of supply and demand and that he has poor facilities for marketing his product.

Farming methods are progressing, however, and there is a constantly increasing application of mechanical power in production, greatly increasing the output per farm worker over that of other countries.

	<i>Railroads Operating Revenue</i>	
	(5-349)	
	<i>Gross</i>	<i>Net</i>
	<i>(Including Dividends)</i>	
	(000's omitted)	
1900	\$1,487,044	\$ 481,171
1905	2,082,482	683,168
1910	2,812,141	805,097
1915	2,956,193	694,276
1921	5,632,665	601,138
1923	6,419,209	974,917
1925	6,246,883	1,136,728
1926	6,508,320	1,229,000

The cost of operation has increased in much greater proportion than the growth of gross earnings, both on account of the higher wages and the increased cost of materials of all kinds. Net earnings over a considerable period have been very unsatisfactory; indeed, for a time, the railroads as a whole showed an operating loss.

The increased efficiency of railroad operation has been particularly marked during the past five years, the freight-ton mileage having increased 40% while the number of employees increased but 9%.

Motor Transportation—Passenger Cars and Trucks
(5-352)

	<i>Production</i>	<i>Registration</i>
	(Number)	
1910	187,000	468,500
1915	892,618	2,445,666
1920	2,205,197	9,231,941
1922	2,659,064	12,239,853
1924	3,606,815	17,775,373
1926	4,428,286	22,001,393

An interesting development of motor transportation is the increased employment of both passenger and freight vehicles. Seventy-two railroads now use trucks to supplement their freight services, either in terminal operations, door-to-door delivery or the replacement of local trains. Competing corporations operate more than 43,000 trucks in like manner.

Sixty steam railroads have over 1200 passenger busses in operation. Electric railways employ more than 7200 busses and competing services another 19,000; and these figures were old before they were originally written.

AVIATION

Aviation is altogether too youthful to permit of any comparative figures. We of the service perhaps have been better placed to know

something of the work of the army, navy, and mail air services, but the American people at large unfortunately have been suffering from an inferiority complex as regards air development. This has largely been dispelled by the exploits of Lindbergh and other pioneers of transoceanic and intercontinental flights. The mail is now being carried by commercial companies, and passengers, in limited numbers it is true, are being transported to and fro in all parts of the country. On June 30, 1927, air operators were serving 66 cities with regular plane services, their mileage totaling 8396. While the majority of them operated during the year at a financial loss, during the last three months of the past fiscal year the greater part of them made expenses and several showed satisfactory profits.

Some 4121 miles of air routes were lighted for night flight by June 30, 1927, and the Department of Commerce planned to increase this by 3398 miles during the 1928 fiscal year, and is considering an additional 6257 miles for its 1929 budget.

On June 30 last, there were 864 municipal, commercial, and private airports in operation and in addition 144 other cities had the establishment of airports under consideration.

Now what is the cause of all this expansion and prosperity? Its existence is recognized, not only by ourselves but by the world at large, and observer after observer has visited us to determine for himself the answer. If I read the signs aright and properly interpret the opinions of many leading economists, the answer is that America has entered upon a new economic era based upon a new economic principle, or rather, upon a principle which is as old as the hills, but which has never before been put to practical application. "The laborer is worthy of his hire." From the first stages of organized industry, when man first ceased working for himself at his home and assembled with others in a small shop as an employee, there has been controversy between master and man. The employer has endeavored to keep down his costs of production by paying as small a wage as he could, at the same time exacting every possible ounce of energy and effort from his help; and the employee, recognizing, in many cases justly, that his employer was amassing wealth while he himself was gaining merely a poor living wage, retaliated by doing no more than was absolutely forced from him and making all the trouble he could. This conflict between capital and labor has continued through generation after generation and has come to be considered a law of nature.

Since the war, however, there has been a most decided change in the attitude of American capital and American labor toward each other. The employer is perfectly willing to pay any wage, provided it is fairly

earned, and relies upon quantity production to reduce his costs; and the employee has thrown himself into his work and is producing as never before. It has come to be mutually recognized that capital and labor form a team whose interests are identical; that where one gains the other must gain and that where one loses the other must expect to lose.

Number of Labor Disputes
(2-52)

1916.....	2667
1920.....	2226
1925.....	1012
1926.....	783
1927.....	378 (first six months)

Not only has the number of disputes decreased, but the number of men affected by those that have occurred has decreased in a considerably larger degree. In the last five years there has not been a strike of any national importance, coal production alone excepted. That is the one American industry that has failed to keep abreast of the times.

The vast increase in the use of mechanical methods and appliances in production has played no small part in this transformation, and the production per worker has increased enormously.

Index of Output Per Worker—Manufactured Products
(5-333)

1899.....	94.5
1904.....	98.1
1914.....	102.2
1919.....	100.0
1921.....	102.6
1923.....	126.9
1925.....	140.7

It is greatly to the credit of American labor that it has never made any attempt to curtail the employment of machinery. While these machines each do the work of many men and do it better and cheaper, no reduction of employment has been occasioned, for this development has not only so stimulated production and trade as to make places for all workers at increased wages, but it has opened up for them many new lines of opportunity. Witness the number of men employed in the various ramifications of the automobile industry, radio, and aviation, all products of the last quarter century, and, in the main, of a very small portion of that period.

Cost of Living—Index of Cost of Living
(2-59)

1913.....	100.0
1915.....	105.1
1918.....	174.4
1920.....	200.4
1923.....	173.2
1925.....	177.9
1927.....	173.4

Price Indexes
(1-xi)

<i>Wholesale</i>	1923	1927
General Average	156	147
Farm Products	139	138
Food	142	150
Clothing	193	171
Fuel and Light	220	175
Metal Products	139	124
House Furnishings	181	159

Index of Full Time Weekly Wage Rate In Organized Trades
(2-138)

1907.....	91.5
1913.....	100.0
1927.....	240.8

Standard of Living

Indications of Material Progress
(1-xxxvii)

	1919	1926	
Life insurance	\$ 369	712	per capita
Savings deposits	\$ 144	211	per capita
Assets, building and loan	\$ 20	48	per M. population
Sugar consumed	lbs. 84	117	per capita
Meat consumed	lbs. 138	156	per capita
Butter consumed	lbs. 15.4	16.7	per capita
Pupils in high schools	No. 20	35	per M population
Students in college	No. 4.3	7	per M population
Electric household appliances	c. 37	55	per capita
Washing machines, domestic	c. 39	60	per capita
Bath tubs sold	No. 3.9	10.2	per M population
Telephones	No. 122	151	per M population
Motor vehicle registrations	No. 72	189	per M population
Roads, rural, surfaced	total mi. 2.9	4.8	per M population
Tractors on farms	No. 38	79	per M farms

Radio sets and electric refrigerators are not mentioned above because even as recently as 1919 their number was entirely insignificant.

Our present mode of life is made evident not only by these material things, but by the fact that it is making it possible for increased numbers of children to receive an education, so that the benefits are not only immediate but will be cumulative.

Public School—Per cent Enrollment to Population
(5-397)

1900	70.1
1905	70.5
1910	73.5
1915	74.7
1920	77.7
1926	82.4

Students In Universities, Colleges, and Professional Schools
(5-393)

	<i>Number</i>	<i>U. S. Population</i>	<i>Number per M Population</i>
1899-1900.....	109,929	75,994,000	1.4
1909-1910.....	183,583	91,972,000	2.0
1919-1920.....	356,694	105,710,000	3.4
1923-1924.....	664,266	112,078,000	5.9
1925-1926.....	821,052	117,135,000	7.0

Before the war, when I was a bond salesman, I was accustomed to juggle with figures such as these, and more particularly with statements of earnings and operations, and to predict with apparent confidence the growth of individual corporations and the trend of general business conditions and of the markets. Now, however, I am in a position to tell the truth and confess that I cannot and never could foretell the future and I seriously doubt if anyone else can do it either. I have presented a certain few elementary facts. You may make your own estimate of the situation and draw your own conclusions.

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A System of Spotting and Plotting for Antiaircraft Firing

By LIEUT. ROBERT W. CRICHLAW, JR., 64TH C. A. (A. A.)

THE problem of spotting for antiaircraft firing has been a much discussed subject during the last few years, and no doubt, through the trial of new methods and the improvement of old ones, the present target practice season has advanced its development considerably. The difficulties encountered in the early methods of spotting, using an aerial observer equipped with a grid and a ground observer equipped with a combersome range rake, were numerous. Changes No. 1 to C. A. M. No. 7 state that the aerial observer method will now be used only in case it is not practicable to use a terrestrial bilateral method. Until the motion picture method can be used successfully, and is available, it would appear that there is one resource left for the accurate determination of the position of the burst with respect to the target. That is a terrestrial bilateral method, using improved spotting instruments.

The spotting system used this year by the 64th Coast Artillery (A. A.) for a total of twenty-four record practices and an equal number of preliminary practices, at slant ranges varying from 3000 to 7000 yards, is described herein. This system, though far from perfect, contains some ideas that may be helpful to those who are concerned with improving their present spotting system, and may also serve as a step in the development of something better for the observation of antiaircraft firing. This system consists of observers and readers, located at both ends of a horizontal base line and equipped with telescopic instruments modified for spotting. The readers are connected, by telephone, to a central chronographic recording device. All devices and modifications used in this system are home made. From the accompanying illustrations and working drawings, they can be constructed in the battery by a good battery mechanic.

Probably the outstanding feature of this system is the method used for obtaining the range deviations. For this purpose, observations from secondary are made in the slant plane which contains the gun-target line. The instruments used for observing and the methods used for plotting and computing deviations are described under their respective headings.

Reading the deflections from secondary in the slant plane rather than in the horizontal plane has a distinct advantage in that it simplifies the problem of determining the range deviations. To one familiar with the horizontal plane method this is evident. With the slant plane method the plotting consists of simply putting a pencil point or pin at the intersection of the lateral deviation line and the range deflection line on the impact chart. This locates the burst in the slant plane. From this point the range deviation is scaled off and recorded.

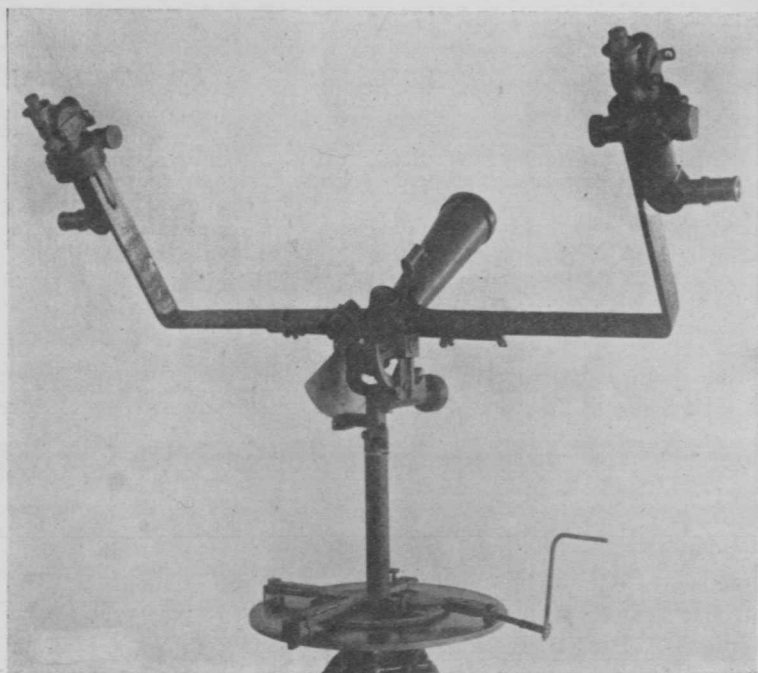


FIG. 1

Using this method it was possible to complete the computation, determine the deviations for all shots, and plot the hits on the hypothetical target in approximately three hours after the termination of a practice. It is a help to the battery commander to have these data for the purpose of analysis before he starts his next practice.

If the reader will keep in mind the fact that the observations from secondary are made in the slant plane, he will have a clearer mental picture of the whole system.

The spotting section mentioned herein is a regimental spotting section, organized for the purpose of determining hits. The data obtained by them were, however, available for the use of the batteries for ad-

justment of fire. A battalion range officer received the data by having three recorders, each equipped with a headset, tapped in on the three spotting telephone lines. From this he determined the center of impact for each course. This enabled the battery commanders to make corrections based on accurate data.

The system will be discussed under the following headings:

- I. Spotting Instruments.
- II. Recording Device.
- III. Record Keeping and Plotting.
- IV. Communications and Drill.

I. SPOTTING INSTRUMENTS

B' INSTRUMENT.—*Construction.* The spotting instrument located at B' is similar to the one used in the tests at Aberdeen, except that the 1917 Panoramic Sight is used instead of the 1917 Gun Sight, and a slow motion device has been added to the A. A. Telescope. (See Fig. 1.) The B' instrument consists of two 1917 Panoramic Sights and a 1920 A. A. Telescope, fitted with a cross-arm, which is slotted at each end to accommodate the Panoramic Sights. A working drawing of this cross arm is shown in Figure 2-A. The slot can be made to fit the sight snugly so that the instrument will remain in adjustment unless the lateral or vertical knobs are turned. The reticule of one sight is turned ninety degrees in order to place its mil scale vertical. In the A. A. Telescope, the cross wires do not intersect. This makes it difficult for the observer to keep the imaginary intersection on the target. A small dot placed on the reticule at the imaginary intersection of the cross wires proved to be a help in this respect. In order to obtain a smooth and uniform motion in tracking the target, a slow motion device was devised and attached to one of the arms just above the plate of the A. A. Telescope. A working drawing of this device is shown in Figure 2-B. In order to attach this device it is only necessary to remove the slide and sleeve from the arm and clamp the device to the arm instead.

Operation. The instrument is set up in the vicinity of the guns. The lines of sight of the two Panoramic sights and of the A. A. Telescope are then made to converge on some distant point. This is done by means of the lateral and vertical motions on the sights. The instrument is manned by three men: an observer, who follows the target with the A. A. Telescope, a lateral deviation reader, and a vertical deviation reader. The deviation readers are connected, by telephone, to the central recording device. The observer keeps the deviation readers on the target, thus allowing them to concentrate on reading deviations quickly and accurately.

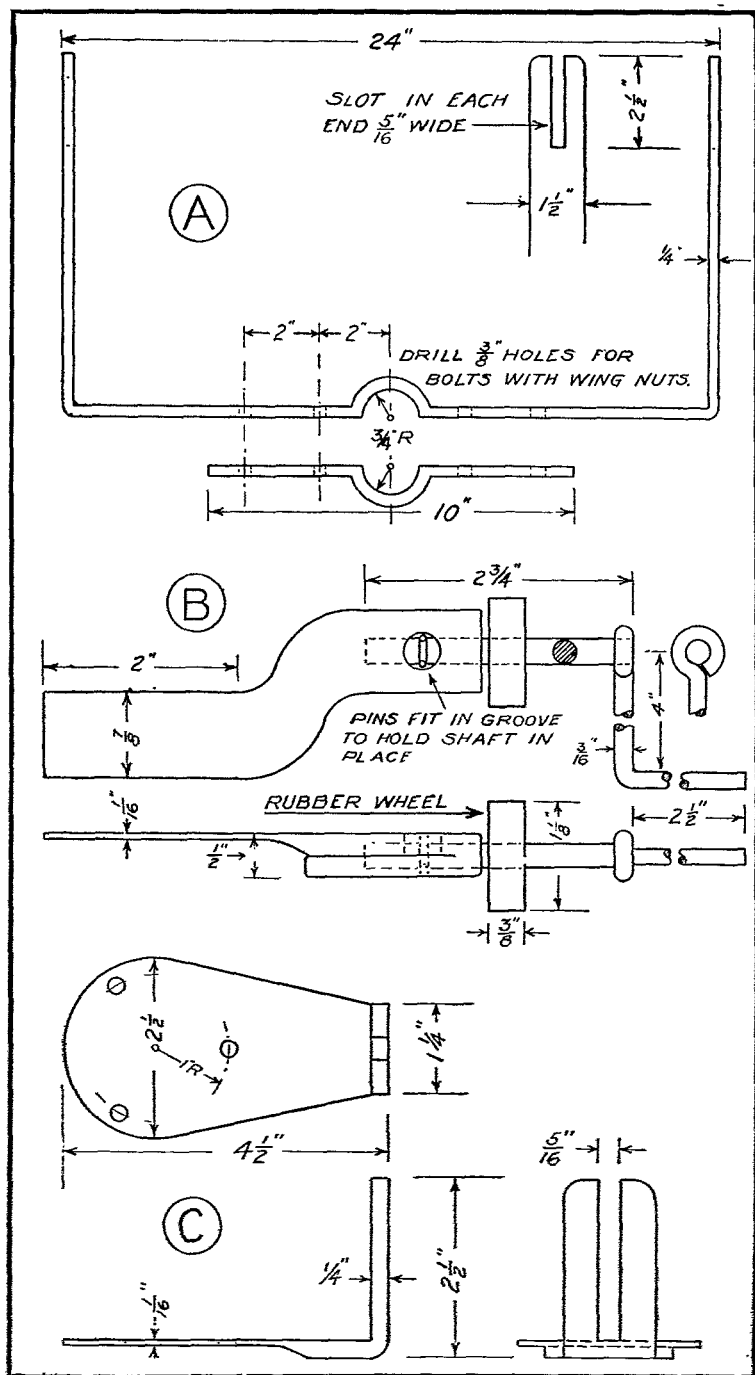


FIG. 2. BRACKETS AND SLOW-MOTION DEVICE FOR SPOTTING INSTRUMENTS

B" INSTRUMENT.—*Construction.* Located at a secondary station, 3300 to 5100 yards from the B' instrument, there is another spotting instrument, approximately on the prolongation of the course of the target. This secondary spotting instrument consists of a 1920 altimeter and a 1917 Panoramic Sight. (See Fig. 3.) The Panoramic Sight fits in a bracket which is clamped between the altimeter sight and the sight base. A working drawing of the sight bracket is shown in Figure 2-C.

Operation. The altimeter is set up with the plate perpendicular to the base line; that is, the axis is coincident with the base line. The lines of sight of the two sights are made to converge on some distant point and the instrument is ready for use. This instrument is manned by two men: an observer who follows the target and a deflection reader who reads range deflections in mils as they appear in the Panoramic Sight. The secondary deflection reader is connected by telephone to the central recording device. It may be seen that with this instrument, the "over" and "short" deflections from secondary are read in the slant plane which contains the base line and the secondary-target line. The deflection as read from secondary will give the "over" and "short" deviation directly only when the angle gun-target-secondary is a right angle. For all other angles, it is necessary to plot the burst on a chart similar to an impact chart constructed in the slant plane. The method used to obtain the range deviation is discussed fully under the heading "Record Keeping and Plotting."

The above system is suited for a particular situation, that is, for target practice purposes where the firing is done in the vicinity of the normal to the course of the target. As the target departs from this position a theoretical error is introduced due to the lateral readings not being in the slant plane. However, for a considerable distance on either side of the normal this error is negligible, in fact, much less than the error of reading. This error increases as the target approaches the secondary station and is greatest when the target is in the vertical plane passing through primary and secondary stations.

The above system can be modified for universal use by the addition of another altimeter spotting instrument for reading lateral deflections in the slant plane from the primary station. These deflection readings would be used for the determination of range deviations only and would be used instead of, and in addition to, the readings taken from the B' instrument already described. The method for obtaining lateral and vertical deviations would remain unchanged.

For target practice purposes the advantage to be gained in accuracy by use of this additional instrument is so slight as to make its use for

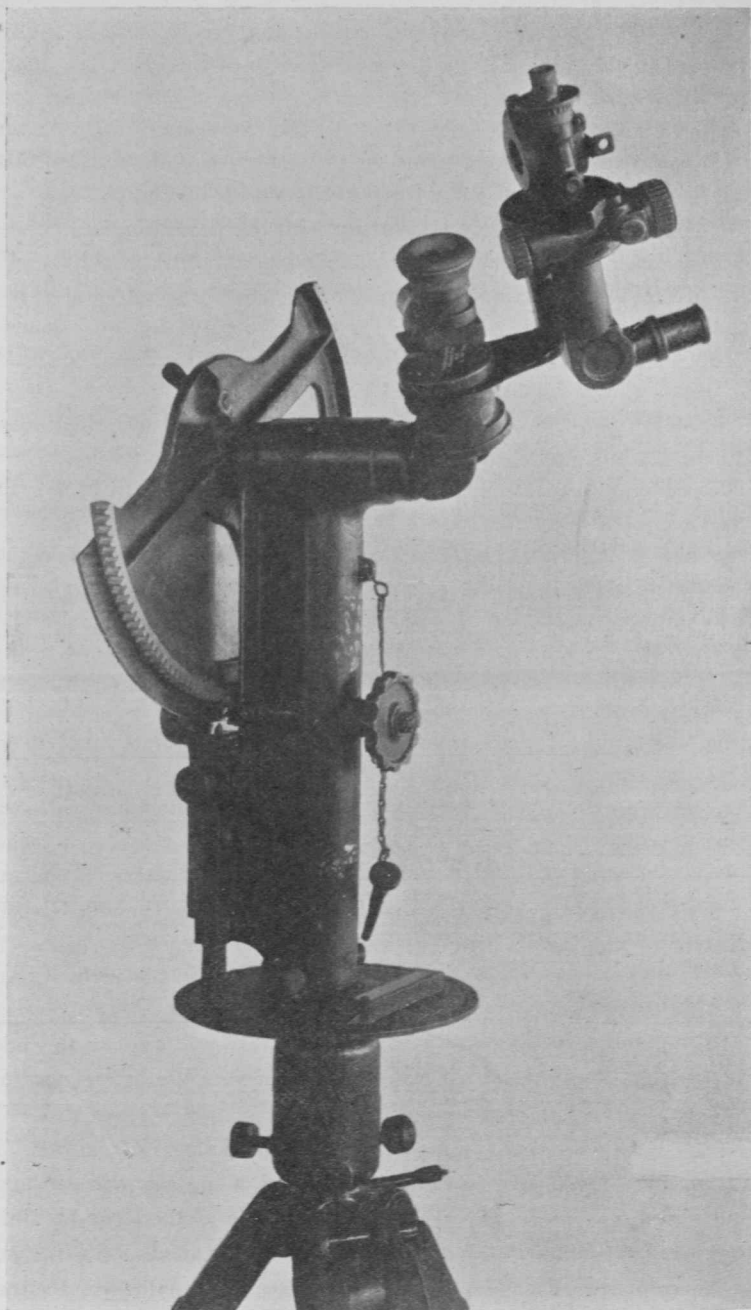


FIG. 3

that purpose superfluous. However, its advantage in other cases make it worth while considering.

II. RECORDING DEVICE

Construction.—In order that the readings taken in the above manner may be of any value, they must be synchronized so that one particular reading from each of the three readers will be known to pertain to one particular burst. The stop-watch method is unsatisfactory because the recorder has to listen to the number of seconds called off and at the same time listen to the readings called off by the reader. At the primary instrument the noise of the guns is likely to drown out the voices of both men. In order to obviate these difficulties, a recording device was improvised along the lines of the one described in C. A. M. No. 8, but somewhat simpler in construction. (See Fig. 4.) This device consists of a box containing two rollers. The ends of the rollers extend through the sides of the box, and to one end of each roller a crank is attached. Over one roller a roll of twenty-four inch wrapping paper is placed and clamped to the roller. There are two slits extending across the top of the box. The paper is threaded up through one slit and down through the second slit to the second roller. This leaves only a small strip of paper exposed all the way across the top of the box. Over this strip of paper a piece of celluloid is placed. This strip of celluloid has three windows, one for the use of each of the three recorders. By turning the crank of the second roller, the paper is rolled off of the first roller, past the three recorders windows, and on the second roller. Three lines are drawn on the paper so that one line appears in the center of each of the three windows as the paper passes, thus dividing the paper exposed in the window into two spaces. These spaces are designated as "Right" and "Left," "High" and "Low," "Short" and "Over," by markers over the windows.

Operation.—The device is manned by the three recorders and a man who turns the crank. Its operation is as follows. When a burst occurs, the three readers send in their readings simultaneously, and each recorder, equipped with a headset, records the value of the reading in numerals in his window on the side of the line corresponding to the direction of the deviation. For a zero reading the zero is recorded on the line. The crank operator turns the crank at a rate just sufficient for the recorded reading to be cleared before the succeeding ones are received. After each course, the rollers are turned back and the readings are recorded on a computation sheet. In case a burst is lost, this will show up in the recorder's window as a blank space.

III. RECORD KEEPING AND PLOTTING

In addition to the above deflection records, the following records are necessary.

Altitude: Kept at the B' altimeter or at the height finder. Alti-

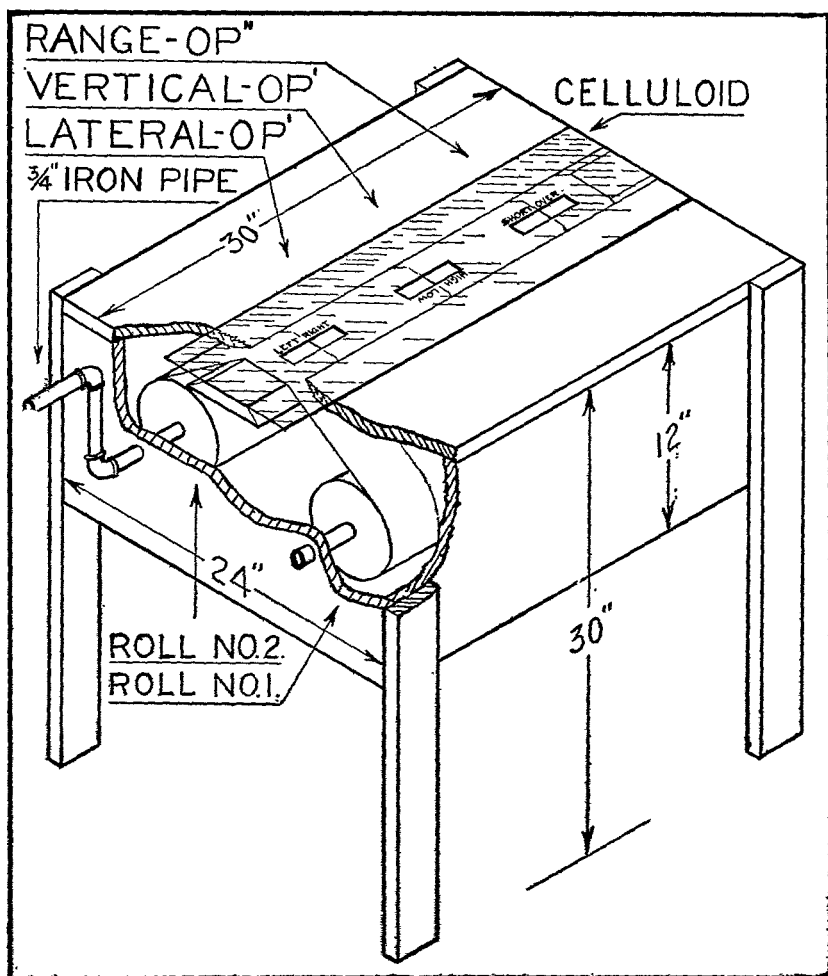


FIG. 4. RECORDING DEVICE

tude recorder put a check mark opposite the last altitude received each time a gun is fired.

Angular height of the target at instant of first and last burst: Kept at the height finder or the B' spotting instrument.

Azimuth of target at instant of first and last burst: Kept at the height finder or the B' spotting instrument.

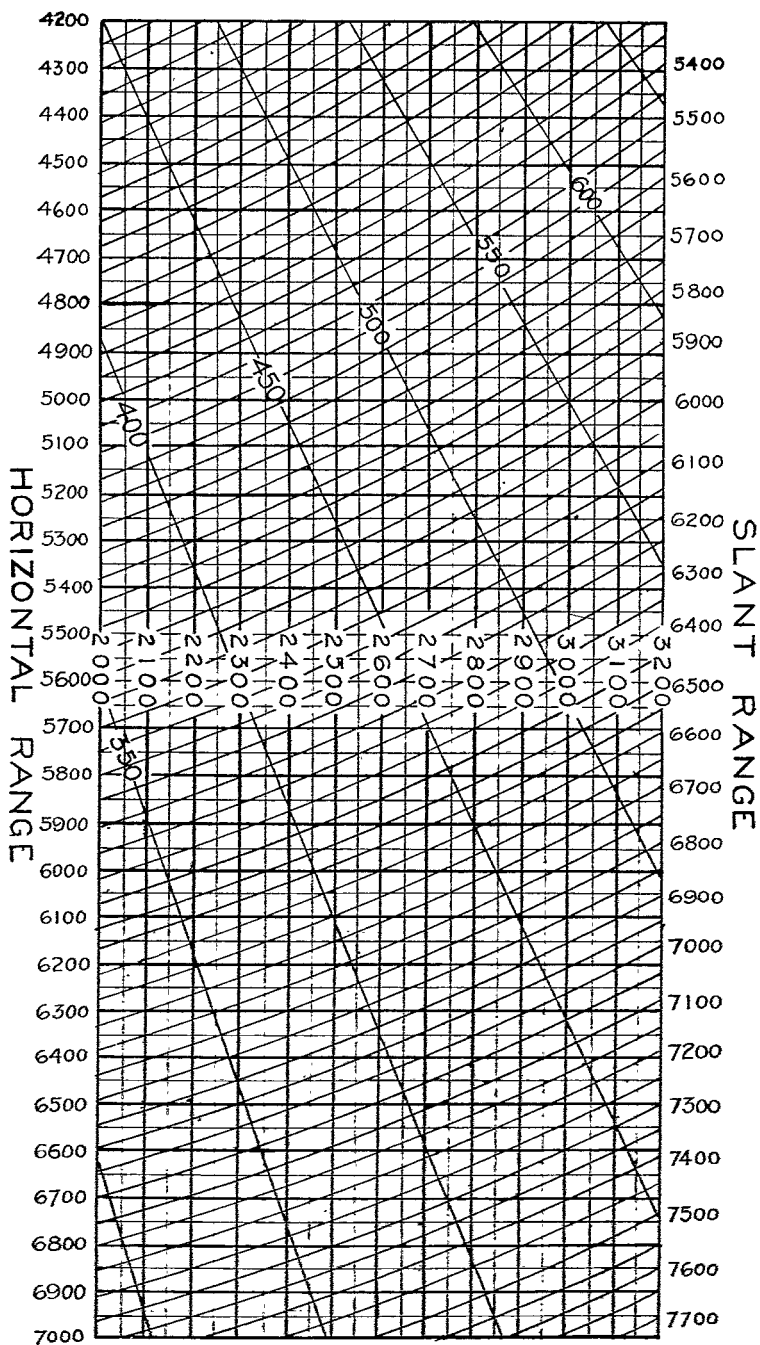


FIG. 5

COMPUTATION SHEET

BATTERY "B" 64th COAST ARTILLERY (AA)

Night

Record

Date Aug. 23, 1928

Day

Preliminary

Course No. 6Direction R to LHour 8:30 a.m.Target at instant of 1st Burst, Azimuth 3300Angular Height 580Target at instant of last Burst, Azimuth 3120Angular Height 550Time from 1st to last Burst 24 Sec. Speed of target 70 mph. Average Alt. 3200

Shot No.	Observed Defl.			Horizontal Range		Slant Range		Computed Def. (Yds.)			Deviation in Yds.			Hit
	OP'		OP''	OP'	OP''	OP'	OP''	OP'		OP''	L R or L	V H or L	R O or S	
	L R or L	V H or L	R O or S					L R or L	V H or L	R O or S				
1	L1	H3	03	5000	5250	6000	6200	L6	H18	019			017	
2	L3	L3	02	5050	5350	6050	6300	L18	L18	012			044	
3	R5	H5	02	5100	5475	6075	6400	R30	H30	013	(8)	(9)	S11	Hit
4	0	H4	01	5125	5600	6100	6500	0	H24	07	same as (8)	"	010	
5	R1	L5	52	5175	5700	6150	6600	R6	L31	S13			S25	
6	L3	L6	53	5225	5800	6200	6700	L19	L27	S20	same as (8)	"	S5	Hit
7	R2	L10	S10	5300	5950	6250	6800	R12	L63	S68	same as (8)	"	S120	
8	0	H5	54	5350	6050	6300	6900	0	H32	S25			S40	
9														
10	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														

(Signed) _____

64th Coast Artillery, (AA)

A record of slant ranges is also kept to be used as a check against the slant ranges obtained from the altitude and angular height records.

The steps in plotting are as follows:

a. Immediately after the practice, the Computation Sheets, containing the deflections in mils (first three columns) are received from the chief of the Recording Section. Upon each computation sheet, enter the azimuth and angular height of the target at the instant of the first and last bursts and the average altitude of the target from the first to the last burst. With these data on the computation sheet, all records may be placed in a marked envelope and put out of the way until the plotting is completed.

b. From a chart, similar to the one shown in Figure 5, obtain the horizontal from OP' of the target at the first and last bursts, using the altitude and angular height. Record these horizontal ranges in column 4 on the computation sheet, opposite the first and last shots.

c. With the azimuth of the target and the horizontal range from OP' , plot the horizontal projection of the target at the first and last bursts. The line joining these two points will be the horizontal projection of the course of the target. Distribute the total number of shots equally along the course. Two hundred yards equals one inch is a convenient scale for this plot. A sheet of drawing paper of suitable size should be prepared before the practice with the baseline and an azimuth mil scale for OP' . All courses may be plotted on this one sheet.

d. Scale off the horizontal ranges to the target for all shots from OP' and then from OP'' . Record these ranges in columns 4 and 5. Two convenient range arms can be made of celluloid and pivoted at OP' and OP'' , and will save time in completing this operation.

e. Enter the chart (Fig. 5) with the average altitude and the horizontal ranges to obtain the corresponding slant ranges. Record these slant ranges in columns 6 and 7.

f. With a slide rule, convert the mil deflections from OP' and OP'' into yards and record in columns 8, 9, and 10. The values, as taken from deflections at OP' , will be the deviations since they are measured perpendicular to the gun-target line. However, the deflection read from OP'' will give range deviation only when the angle gun-target- OP'' is a right angle.

g. In order to obtain the range deviation, it is necessary to locate the shot on a chart, constructed in the slant plane. The range deviation can then be measured with a scale and recorded in column 13. Such a chart is shown in Figure 6. Forty yards equals one inch is a convenient scale. It will be noted that the grid lines on this chart are for yards and

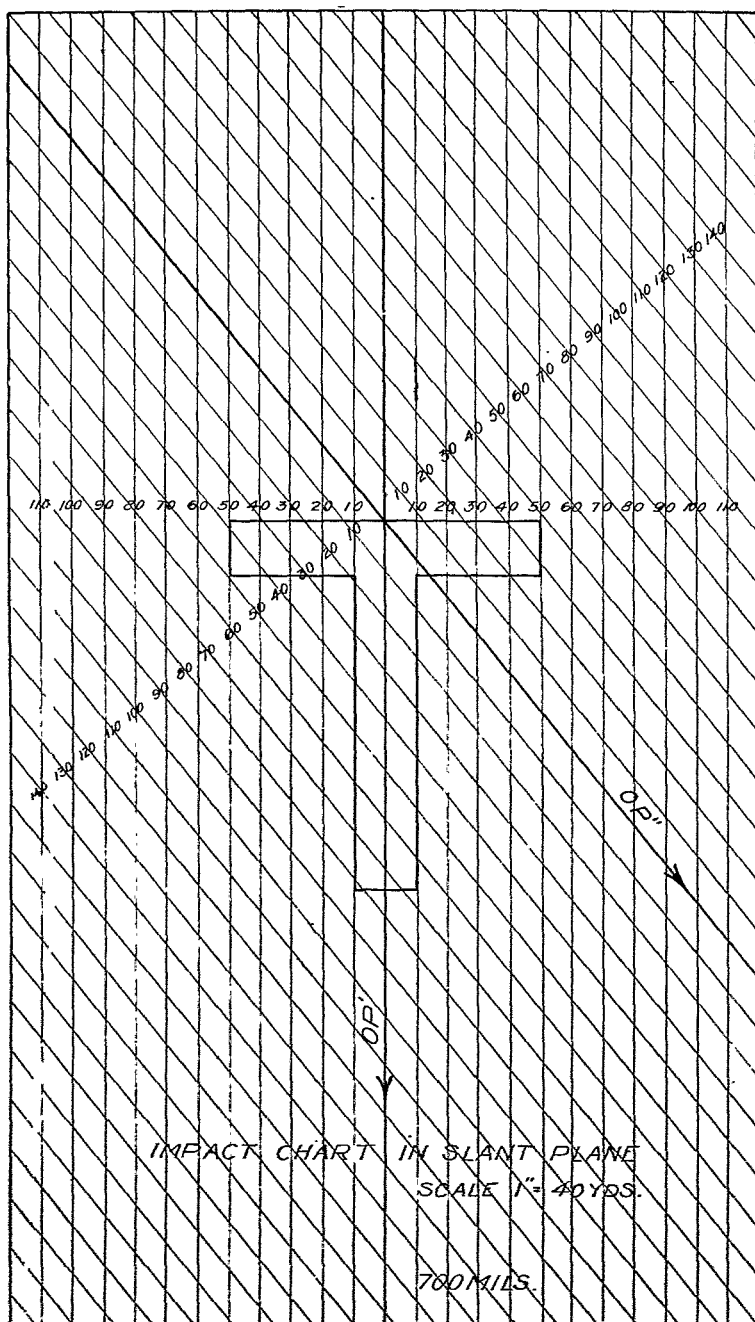


FIG. 6

not for mils. In order to construct the chart, the angle at the target must be known. This can be determined by striking arcs from OP' and OP'' with the radii equal to the slant range to the target from OP' and OP'' . From the intersection of the arcs, draw lines to OP' and OP'' . This gives the required angle. The same angle may be found by using the celluloid range arms mentioned in *d* above. Make the two arms intersect at the proper slant ranges and measure the angle at the intersection. This angle changes as the target moves along the course. However, the angle obtained by using the average slant ranges for the part of the course fired on will usually give the necessary accuracy. Where a shot comes very close to being in or out of the hypothetical target, the exact angle should be measured, using the slant ranges for that particular shot. A book of these charts should be made up before target practice covering angles from the maximum to the minimum angle to be expected. The value of the angle should be marked at the bottom of the sheet for ready reference. The book of charts used by the writer contained a chart for every ten mils change of angle. It was found however, that one for every twenty mils was sufficiently accurate.

Instead of using the book of charts described above, a universal chart may be constructed as shown in Figure 7. This device saves the trouble of making the book of charts but is a little more cumbersome to use.

h. The lateral, vertical, and range deviations determined and recorded on the computation sheet, it only remains to plot the position of the shot on the hypothetical target. This plot is shown in Figure 8, for the course shown in the computation sheet.

IV. COMMUNICATIONS AND DRILL

Efficient communication plays an important part in the success of the spotting system. If shots are lost because of poor communication, it means a waste of ammunition. The equipment used by this regiment is as follows: The type EE-5 telephone was used throughout and was satisfactory. The handset was replaced, first, by the old fire-control headset, Type EE-70, with curved mouthpiece. Due to the high resistance of the transmitter and to old, defective cords, these proved unsatisfactory. These were replaced by the type T-3 breast transmitter and type SC headset, such as is issued with the radio instruction set. The combination proved highly satisfactory. The change was made before the first preliminary firing was completed and their use was continued throughout the remainder of the target practices.

The Type BA-9 dry battery issued for the EE-5 telephone, due to its small capacity, is not satisfactory for long continuous use. Also, the

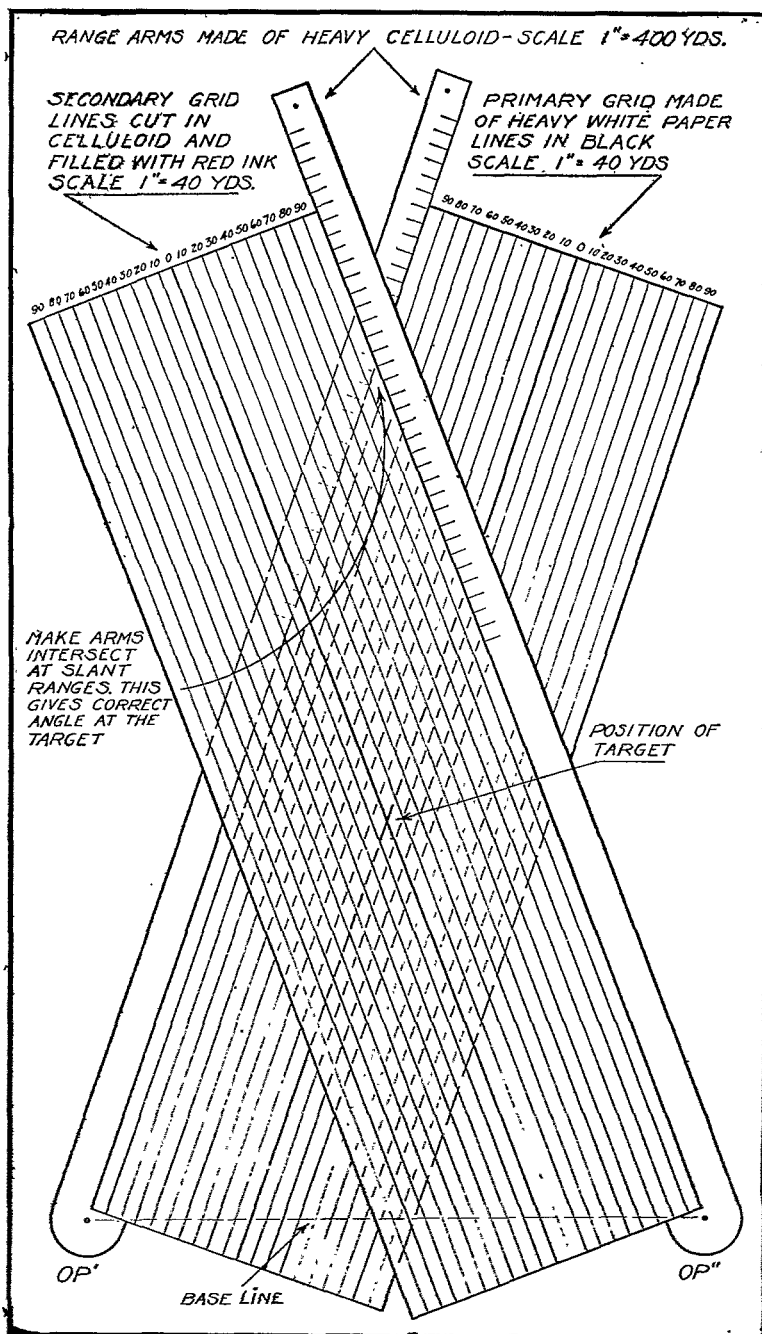


FIG. 7. UNIVERSAL IMPACT CHART

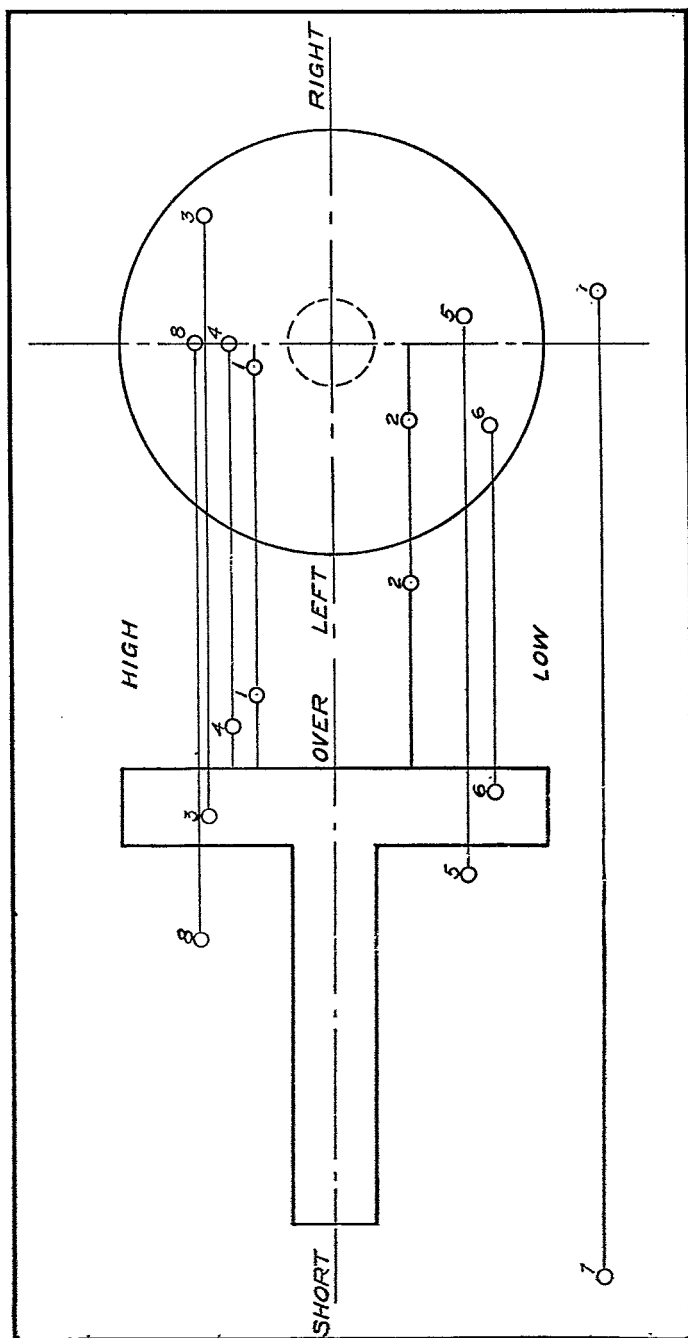


FIG. 8. PLOT OF SHOTS

method of making contact is unreliable. For this purpose, the 4-volt Edison storage battery was found to be satisfactory, and was used during the entire period.

Telephone drill is very important and should be started some time before target practice. With several bursts occurring in the sky almost simultaneously, the readers must be able to speak as quickly as they see them. Any hesitation on their part will cause the readings to pile up, and lost readings will result. The first drill should consist of the reader, on one end of the line, reading off lists of hypothetical deviations to a recorder on the other end of the line, who records them. The speed with which they are read should be increased daily, paying particular attention to enunciation and tone of voice. The lists recorded should be checked against the lists read, and errors brought to the attention of recorder and reader. Although all men should be instructed along the same lines, as to telephone language, better results are obtained if the same pair of men are kept working together. Each gets accustomed to the other's voice and pronunciation. This principal was followed in the spotting section throughout the target practices of this regiment and was found to be worth while.

Hand in hand with telephone drill goes spotting drill for breaking in the spotting section. A miniature target course was constructed to take care of this. It consisted of a miniature target drawn across a tight wire, stretched just below the eaves of barracks. The course was about 150 feet long. The target was a piece of broomstick about four inches long, suspended from two pulleys, which rested on the tight wire. A small piece of white cotton on the end of a long stick was used to represent the burst. This was placed at different positions with respect to the moving target and the readers read off the deviations just as they would for a real burst. This spotting drill and the straight telephone drill are of considerable importance in developing a quick eye and tongue for the reader and an accurate ear for the recorder.

MAXIM XLVII

Infantry, cavalry, and artillery are nothing without each other; therefore they should always be so disposed in cantonments as to assist each other in case of surprise.—Napoleon's Maxims of War.

The Budget of the United States

By LIEUT. CLEM O. GUNN, C. A. C.

IN any discussion of the Budget of the United States it is necessary to speak in large figures, for we are talking of the finances of the wealthiest nation in the world; a nation whose population is only seven per cent of that of the world, yet owns and operates eighty per cent of the world's motor cars; a nation which has a wealth of about four hundred billion dollars; a nation which was first to inaugurate a plan to finance its war debts and to put that plan into execution.

The Bureau of the Budget was created by the Act approved June 10, 1921. It is in the Treasury Department but not under the direction of that department. It is under the immediate supervision of the President. The Bureau has the authority under the Act "to assemble, correlate, revise, reduce, or increase" the estimates of the several departments and establishments. (Needless to say that it rarely exercises its authority by increasing any of the estimates.) The act requires the head of each department or establishment to appoint a Budget Officer. These officials are Liaison Officers between the departments and the Bureau of the Budget. The Bureau deals directly with them in the routine work of preparing the Budget.

There has been great improvement in the business operations of our Government during the past eight years. Prosperity in this country has been increasing from year to year since the depression of 1920. Three substantial tax reductions have been made during that time and we are on the eve of another.

Seven years ago the costs of the Government were over \$5,500,000,000.00 annually. Now they are about \$3,500,000,000.00* each working year. Out of our surplus earnings we have paid off nearly one-third of our national debt and furnished billions of dollars to stabilize and refinance other parts of the world.

The Budget system of business management is responsible for savings that were never before thought of and I will mention a few of the savings here, some of which are insignificant compared to the whole but which are worthy of note for they show that unnecessary expense no matter how small is being eliminated.

* The total taxes have been reduced about \$1,500,000,000.00.

The Post Office Department eliminated the blue stripe from its mail sacks and saves one cent a yard on three million yards of canvas used annually.

By reducing the size of the application for domestic money order by one quarter inch, the Post Office Department saves \$8152.00 a year.

The Government printing bill in 1921 was over \$12,800,000.00; it is now under \$4,000,000.00 a year.

A saving of nearly \$300,000.00 was made in the Quartermaster Corps last year by cutting down large sizes of clothing in stock instead of manufacturing new articles.

Great savings have been made in the reduction of Federal employees. On Armistice Day, November 11, 1918, we had over 650,000 employees in the Federal Executive Civil Service, exclusive of the Postal Service. We now have about 200,000, a reduction of over 400,000 employees at an annual saving of nearly \$1,000,000,000.00.

The taxpayers of this country paid \$8,500,000,000.00 in taxes last year. This includes city, state, and federal taxes. Agriculture pays out eighty-six per cent of its net profit in taxes; mining, sixty per cent; transportation, thirty-six per cent; construction, thirty-two per cent; banking, thirty-one per cent; and manufacturing, twenty-four per cent. State and local taxes take twice as much money from the taxpayer as the federal taxes, and these taxes are increasing while federal taxes are decreasing. Although the federal debt is rapidly diminishing, many states are continually going deeper into debt. California ran its state debt from \$10,000,000.00 in 1913 to \$100,000,000.00 in 1926; Oregon debt ran from \$635.00 in 1913 to \$38,000,000.00 in 1926; Kansas debt in 1916 was zero it is now nearly \$30,000,000.00.

Our national debt touched the clouds in August, 1919, when it reached the startling figure of \$26,600,000,000.00. It now stands at about \$18,000,000,000.00, a reduction in eight years of over \$8,000,000,000.00. From April, 1917, to December, 1927, we paid the stupendous sum of \$17,000,000,000.00 in interest and principal on the national debt, an average annual payment of about \$1,600,000,000.00. Out of the \$636,000,000.00 surplus in 1927, \$612,000,000.00 was applied to redemption of the public debt. The balance in the general fund at the end of the fiscal year 1927 for working capital was \$234,000,000.00.

The United States depends on three sources of revenue:

1st. Custom duties.

2nd. Internal revenue taxes.

3rd. Miscellaneous revenue, such as receipts on account of foreign loans, railroad loans, and from the sale of capital assets.

Custom duties comprise about fifteen per cent of the receipts, internal revenue taxes about sixty-nine per cent, and miscellaneous revenue about sixteen per cent.

The total receipts for the fiscal year 1927 were over \$4,129,000,000.00

The expenditures from ordinary receipts are about as follows:

Public debt—51.1%. Of this amount interest takes 21.1%, statutory retirements 13.8%, and other retirements 16.2%.

Military functions—31.8%.

Ordinary functions—17.1%.

Table showing receipts and expenditures for the fiscal year 1927 and estimated receipts and expenditures for the fiscal year 1928 and 1929.

RECEIPTS			
	1927	1928	1929
Customs	\$ 605,499,983.44	\$ 602,000,000.00	\$ 602,000,000.00
Internal revenue	2,869,414,341.81	2,803,545,000.00	2,705,545,000.00
Miscellaneous receipts	654,480,115.85	670,053,091.00	501,952,314.00
Total receipts	\$4,129,394,441.10	\$4,075,598,091.00	\$3,809,497,314.00
EXPENDITURES			
	1927	1928	1929
Legislative establishment ...	\$ 19,678,325.13	\$ 17,128,804.00	\$ 17,290,461.00
Executive proper	612,197.93	586,333.00	420,700.00
State Department	16,497,668.60	12,554,029.00	13,939,006.00
Treasury Department	151,560,333.78	157,856,735.00	180,800,335.00
War Department	360,808,776.71	392,477,038.00	392,506,915.00
Department of Justice	24,819,057.70	28,285,484.00	26,653,460.00
Post Office Department	189,037.77		
Navy Department	318,909,096.28	357,074,767.00	371,227,000.00
Interior Department	302,706,745.19	297,978,599.00	280,974,343.00
Department of Agriculture	156,287,304.95	155,442,319.00	146,593,049.00
Department of Commerce ...	30,939,749.02	37,000,758.00	37,767,000.00
Department of Labor	9,921,644.26	10,120,573.00	10,725,840.00
U. S. Veterans' Bureau	391,470,413.72	414,169,512.00	412,652,360.00
Other officers and com.	35,442,771.15	38,429,182.00	38,493,436.00
District of Columbia	37,566,520.57	39,558,024.00	38,850,000.00
Unclassified items	448,920.63		
Total gen. expenditures	\$1,857,858,563.39	\$1,958,662,157.00	\$1,968,893,905.00
Public Debt:			
Interest	787,019,578.18	720,000,000.00	670,000,000.00
Retirements	519,554,844.78	536,185,065.00	541,623,394.00
Refunds of receipts:			
Customs	20,320,524.37	20,010,500.00	19,013,000.00
Internal revenue	117,412,172.61	151,321,500.00	126,271,500.00

Postal deficiency	27,263,191.12	30,370,400.00	15,270,042.00
Panama Canal	8,305,345.04	9,515,543.00	9,250,000.00
Unclassified expenditures ..	155,850,299.91	195,249,120.00	206,635,190.00
Total expenditures chargeable			
against ordinary receipts	\$3,493,584,519.40	\$3,621,314,285.00	\$3,556,957,031.00
Excess of receipts over			
ordinary expenditures ...	\$ 635,809,921.70	\$ 454,283,806.00	\$ 252,540,283.00

Out of the \$636,000,000 surplus for 1927, \$612,000,000 was applied for the redemption of the public debt, a total payment on the public debt for the fiscal year 1927 of nearly \$2,000,000,000.00.

It is much easier to borrow money than to pay it back. In a little more than two years the United States ran its national debt from \$1,000,000,000 to \$26,000,000,000. It has taken us over eight years to pay back one-third of what we borrowed in two years.

Following is a comparative statement showing how the average dollars of appropriations and expenditures, exclusive of the postal establishment, payable from postal revenues, is apportioned to governmental functions in the Budget for the fiscal year ending June 30, 1929:

<i>Functions</i>	<i>Estimates of appropriations cents</i>	<i>Estimates of expenditures cents</i>
1. General functions	3.35	3.37
2. Military functions		
a. National Defense	18.46	18 50
b. Military pensions, retirement pay, world war allowance, life insurance, etc.	21.51	18.58
Total military functions	39.97	37.08
3. Civil functions	14.53	15.26
4. Non-functional operations		
a. Refunds, etc.	4.45	4.54
b. Fixed debt charges	34.72	34.06
c. Trust funds	2.98	5.69
Total non-functional operations	42.15	44.29
Total	100.00	100.00

In conclusion let us see what some of our great men think of the Budget system of business management.

In a recent address on the Budget, President Coolidge stated: "We have been writing a new page in the history of governments the last few years. No less urgent had been the call to arms than the call for relief from the gigantic burden which the World War imposed upon the people. They had made their sacrifice. It was for the government to take the lead in the effort to restore their financial and economic

structure. It is only necessary to point to our prosperity, to the influence which better business in government has had in the welfare of the people. Elimination of non-essentials and direct savings have about reached their limit. The normal growth of the nation will require additional outlays, and our efforts should be and must be to absorb them by more economical administration. This means scientific business management, and it has been demonstrated that the Budget system makes this kind of management possible."

General Lord, director of the Bureau of the Budget, has said: "If Budget policy has been responsible for close saving, has so restricted available funds that resort must be had to all sorts of plans and devices to do the job, if federal people have been obliged to scratch gravel, if they have been driven to even save the dust off spiders legs, we are content. That's what it is intended for."

The Secretary of the Navy stated: "It is the opinion of this department that enforced economy has benefited the Navy by eliminating extravagance and waste, by developing thrift and thoroughness, and in particular by developing the skill, zeal, and character of the Navy personnel."

Some people compare our present expenditures with what they were before the war and say that our expenditures are more than they were then. But why shouldn't they be? A young man who stuttered moved from his small home town to New York City and after he had been there for some time one of his friends from his home town met him in New York and after talking to him for awhile said, "John, you stutter more than you did back home." "Y-yes," said John, "d-dern s-s-sight b-b-bigger t-town."

MAXIM XLIV

If circumstances prevent a sufficient garrison being left to defend a fortified town which contains a hospital and magazine, at least every means should be employed to secure the citadel against a coup de main.—Napoleon's Maxims of War.

Early Artillery Organization

THE organization of the artillery of the American army during the Revolutionary War was based upon that of the Royal Artillery Regiment—the only artillery with which the colonists were acquainted. Some of the colonies had had limited experience with their own artillery during the French and Indian wars, and these colonial units had, on occasion, served with the British regulars. Three companies of the Royal Artillery, assisted by some militia from Massachusetts, manned the artillery at the capture of Louisburg in 1745, and one company of regular artillery accompanied Braddock on his ill-fated expedition into the West. Thus, artillery organization and management could scarcely be said to be unknown to the Americans when the time came to create an army in the defense of their rights.

The origin of the artillery of the United States Army may be dated from the beginning of the Revolutionary War. In June, 1775, Massachusetts raised the first regiment of artillery brought against the British forces. This regiment was adopted by the Continental Congress and placed under the command of Colonel Richard Gridley, a half-pay British officer of experience. The regiment was given the ten-company arrangement of a British battalion and differed only slightly from the details of organization of the battalion. With two majors, where the British unit had but one, and with two first lieutenants in each company, instead of one, the Continental organization may be considered superior to that of their opponents, but the American company contained only fifty-two enlisted men instead of the seventy of the British company.

Gridley did not prove altogether acceptable in the role of a regimental commander, and as the term of service of the regiment neared an end a search was made for a suitable successor. Choice fell upon Henry Knox, a young man of twenty-five, who had been serving under General Washington as a volunteer. Gridley's regiment was mustered out on January 1, 1776, and Knox's regiment was immediately raised, mainly by re-enlisting for one year the men who had been serving with Colonel Gridley and those of Crane's company of Rhode Island artillery which had been associated with the regiment at the siege of Boston. The new regiment consisted of twelve companies, and was given a second lieutenant colonel.

Upon the evacuation of Boston by the British, two of the artillery companies, dragging with them two thirteen-inch mortars, were de-

tached to accompany the expedition sent to the relief of Benedict Arnold after the failure before Quebec. One company was detailed to remain in the defenses of Boston, and the remaining nine companies, in April, 1776, moved under Knox with the main army to New York. Here the regiment was augmented by two companies of New York artillery—one under Alexander Hamilton and one under Sebastian Bauman.

After the defeat on Long Island in August, 1776, and the retreat from New York, Colonel Knox recommended:

6. The corps of artillery now in the service of the United States is exceedingly insufficient for the operations of an extensive service. It consists of a little more than 600, officers included; of these, 100 are in the northern army, where their numbers are very unequal to the service. His Excellency General Washington has, to supply the deficiency of this corps, drafted from the different regiments 600 men, and General Gates a proportionate number. This is a temporary remedy, attended with a variety of inconveniences.

7. There ought to be a respectable body of artillery established which shall be equal to all the services of the war. In proportion to every 1000 men of the marching regiments, there ought to be one company of 60 men, including officers. This number will be found to be small when the various contingencies of the artillery shall be considered. Supposing, then, the army to consist of 80 battalions of 726 men each, making nearly 60,000 men, the number of artillery requisite will be 3360. These may be thrown into two or three battalions, as may be thought best.

Congress had decided upon a reorganization of the army, with the number of infantry battalions fixed at eighty-eight. It soon became evident that the requirements of the Continental army might exceed one hundred battalions, and Knox elaborated upon his plan accordingly. He recommended five battalions of artillery, each to consist of one colonel, one lieutenant colonel, one major, and twelve companies; each company consisting of one captain, one captain-lieutenant, four lieutenants, six sergeants, six corporals, six gunners, six bombardiers, and twenty-eight matrosses. Knox admired the British system so greatly that he even proposed to adopt their name of battalion for a unit which the Americans had theretofore called regiment.

The five battalions (or regiments) were intended to furnish artillery for all the armies. Three of them were ordered raised when Congress delegated dictatorial powers to Washington early in December, 1776, and were confirmed by Congress on December 27, on which occasion Knox was made a brigadier general of artillery. The first regiment had been recruited in Virginia, under Colonel Charles Harrison, pursuant to resolution of Congress, November 26, 1776. The regiments organized under Washington's authority of December 12,

1776, were raised at large and were commanded by Colonels Crane, Lamb, and Flowers; but Flowers' regiment was converted into one of artificers and became a part of the Department of the Commissary General of Military Stores. The fifth regiment, under Colonel Thomas Proctor, was raised by Pennsylvania in February, 1777, and was taken into the Continental army on June 20. Harrison's, Lamb's, Crane's, and Proctor's regiments became the First, Second, Third, and Fourth Artillery, respectively.

These four regiments constituted the regular artillery of the Revolution, although there were other companies and battalions organized by the States and, in some cases, placed upon the Continental pay roll. As might be expected from their sources, the four regular regiments differed in details of organization.

The First Artillery initially consisted of ten companies, and was brought to the recognized twelve on May 30, 1778, when General Washington assigned to the regiment the two Maryland companies of Captains Brown and Dorsey. The Second Artillery was organized with twelve companies, which was also the strength contemplated for the Third. However, the Third included in its complement three companies raised by Ebenezer Stevens in Massachusetts, under authority of General Gates, at the same time that Colonel Crane was recruiting his regiment. Stevens never recognized Crane's authority over him, and continued to serve as commandant of an independent battalion, leaving but nine companies in the regiment. Steven's promotion to the lieutenant colonelcy of the Second Artillery in the fall of 1778 settled the dispute, and his three companies were thereafter a part of the Third Artillery. The Fourth Artillery had been raised as an eight-company battalion and it never reached its twelve-company strength. In fact, it was not given ten companies until 1780, when the other regiments were reduced from twelve to ten, two of the surplus companies being transferred to the Fourth.

This reduction of the artillery regiments from twelve to ten companies each followed the reorganization of the army which resulted from the resolves of Congress of October 3 and 21, 1780. The first proposal had been to cut the regiments from twelve to nine companies, but this did not meet with the approval of General Washington and the number was changed to ten. The First Regiment, which had gone south with General Gates, had suffered so severely, particularly at Camden, that neither consolidation nor muster-out was necessary. The Second Regiment transferred two Pennsylvania companies to the Fourth, which still had but eight, bringing both to the required strength. In the Third Artillery, two companies were absorbed, the

enlisted men being transferred and the surplus officers being placed upon the list of supernumeraries.

With the end of the war came the necessity for disbanding the war military establishment and the organization of a peace establishment. In so far as the artillery was concerned, General Duportail expressed himself as of the opinion that the artillery and the engineers should be united in two regiments, each to consist of five companies of gunners, one of bombardiers, one of sappers and miners, and one of artificers. A committee appointed by Congress to study the peace-time requirements agreed in principle with General Duportail but recommended a single regiment of eight companies, to be called the Corps of Engineers.

A greater part of the army was mustered out in November, 1783; but one regiment of infantry and one battalion of artillery—from the Second Artillery, except four officers and fifty-five enlisted men from the Third—were kept temporarily in service for various military purposes. It was then found that there were many obstacles to the formation of a peace-time establishment, the principle of which were a lack of funds and a doubt concerning the authority to maintain a standing army under the Confederation. While plans were being discussed, the remnant of the Continental army was further reduced, under resolution of Congress of June 2, 1784, by the discharge of all but eighty artillerymen to guard stores—fifty-five men at West Point and twenty-five at Fort Pitt, including Hamilton's New York battery.

To care for the situation along the Canadian frontier, Congress, ignoring the disastrous employment of militia during the war, authorized seven hundred militia to be raised for twelve months and to be organized as a regiment—the "First American Regiment"—of eight companies of infantry and two of artillery. One of the artillery companies was Doughty's (the company raised by Alexander Hamilton in 1776) from West Point, and the other was Douglass', raised in Pennsylvania. A brief experience convinced Congress of the need for trained men, and when the enlistment period of the militia expired, they were replaced by an equal number of men enlisted for three years, but with no change in the organization.

In October, 1786, when the strength of the Army was increased to 2040 enlisted men, a new idea in organization appeared. Secretary of War Knox, authorized to organize the whole, decided to form a "legionary corps," in which the artillery formed a separate battalion of four companies, commanded by a major. This legion was ordered on January 30, 1787, but by resolution of April 9, 1787, the additional troops authorized by the October resolution were, except for the two artillery companies which had been raised, ordered discharged. This

left in service, then, only the eight companies of infantry from the 1785 organization and four companies of artillery. These were, in October, 1787, organized as a regiment of infantry and a battalion of artillery.

The unsatisfactory state of affairs on the frontier and the defeats of Harmar and St. Clair had brought about small increases to the Army, which, by act of March 5, 1792, reached an authorized strength of 5120 men. Following this act, the army was again formed as a legion—an organization dear to the heart of Baron von Steuben and from whom Knox probably obtained it. The legion was divided into four sub-legions, each consisting of one troop of dragoons, one company of artillery, four companies of riflemen, and eight companies of infantry. The artillery battalion commander passed to the staff of the legion as commandant of artillery. Thus early we find the Army groping for the divisional organization—the self-contained tactical unit.

Shay's rebellion, troubles with the Indians, and the threat of war contained in foreign complications developed the insufficiency and inadequacy of the artillery branch of the Army. The act of May 9, 1794, authorized the enlistment of 764 men who were to be incorporated with the four artillery companies of the Legion to form a Corps of Artillerists and Engineers. The corps was organized into four battalions of four companies each. Each company consisted of one captain, two lieutenants, two cadets, four sergeants, four corporals, forty-two privates, sappers and miners, ten artificers to serve as privates, and two musicians.

The plan of combining the engineers and the artillery had received the support of General Duportail and of Colonel Hamilton's committee at the close of the Revolution, but it was not until the United States began to erect coast fortifications that the plan was carried into effect. In the meantime, the artillery had been little more than infantry, with a few guns, on the Indian frontiers.

The new organization was no more satisfactory than the previous experiments had been. It was thought that the duties of the two branches were so closely related that it would be well to have a single branch charged with the construction and the manning of the coast forts. Stephen Rochefontaine, the lieutenant colonel commandant, was a civil engineer, too busy building forts to have time to weld his corps into a harmonious whole. Two of his majors were engineers, and two were artillerymen. The artillery was poorly trained as artillery and was scattered in many small detachments on the frontier and along the

coast. It is therefore not a matter for surprise that the combination failed to be a success.

Complications with both England and France made it highly important to look to the defense of the maritime frontier, and on April 27, 1798, Congress authorized a regiment of three battalions of artillerists and engineers. This organization was entirely separate and distinct from the Corps of Artillerists and Engineers but it had the same duties to perform. This anomalous situation could not long endure, and was corrected by the act of March 2, 1799, which authorized a fourth battalion for the regiment, giving it the same organization as the Corps. Thereafter, the corps was known as the First Regiment of Artillerists and Engineers, while the regiment became the Second Regiment.

International difficulties having been composed, the Army was reduced, by act of May 14, 1800, to four regiments of infantry, two regiments of artillerists and engineers, and two troops of light dragoons, aggregating 5437 officers and men. This arrangement continued for a brief time, and in the reorganization of March 18, 1802, the Army was further reduced to two regiments of infantry, of ten companies each, and one regiment of artillerists of twenty companies organized in five battalions. The engineers disappear as a part of the combined arm and reappear as a separate—but tiny—corps located at West Point.

The next event of importance to the artillery resulted from the increasing probability of war with Great Britain. By act of April 12, 1808, the Army was increased by five regiments of infantry, one regiment of riflemen, one regiment of light artillery, and one regiment of dragoons. The light artillery regiment consisted of ten companies, each company containing one captain, one first lieutenant, one second lieutenant, two cadets, four sergeants, four corporals, four musicians, eight artificers, and fifty-eight privates. Considerations of economy prevented the complete equipment of the regiment as light artillery, and it differed from the artillerists in scarcely more than name and number of companies.

Under the pressure of impending war, the Army was again increased by act of January 11, 1812, two regiments of artillery being added to those already authorized. The Army, as organized by the acts of 1802, 1808, and 1812, consisted of seventeen regiments of infantry, three regiments of artillery, one regiment of light artillery, two regiments of dragoons, one regiment of rifles, and the Corps of Engineers, aggregating 35,603 officers and men. The artillery regiment raised by the act of 1802—the First Artillery—consisted of twenty companies organized in five battalions; the regiments raised in 1812—

the Second and Third—consisted of twenty companies each organized in two battalions. A company in the First Artillery numbered eight-one officers and men, while in the Second and Third regiments and the Light Artillery the companies each had ninety-five officers and men.

The formation of the artillery in regiments had been the first scheme adopted in the organization of the artillery of the United States Army, and during the long series of experiments through which the artillery had passed, the one recurring organization was that of the regiment. It was the one method of arrangement that had continued to prove successful, whatever the branch of service; yet one more experiment was attempted upon the artillery—an experiment that was to be repeated nearly ninety years later. Pursuant to the act of March 30, 1814, the three artillery regiments were organized as a Corps of Artillery, consisting of twelve battalions. The sole benefit derived from the change was the substitution of lineal promotion in the corps for regimental promotion. The principal defects in the change can be traced to the dispersion of the artillery in twelve units in place of three.

A curious consequence of the battalion organization resulted after the close of the war with England. Following the reorganization of the Army in May, 1815, the reduction of the Corps or Artillery to eight battalions, the nine military departments of the country were formed into two military divisions, called the Northern and the Southern Divisions. To each division four battalions of the Corps of Artillery were allotted. Within each division the battalions were numbered from one to four, and the companies lettered alphabetically from A to Q (exclusive of J). Thus it became necessary to refer to a company as "Company Q, Fourth Battalion, Southern Division," or whatever its designation might be. Whenever a company was ordered from one division to the other, another had to be moved from the latter division to the former, and the two companies exchanged designations. One can scarce imagine a more awkward or cumbersome arrangement.

In 1821, the artillery once more returned to the regimental organization. The act of March 2, 1821, reduced the Army from 12,264 to 6183 officers and men. In the reorganization the Ordnance Department, the Corps of Artillery, and the Light Artillery were merged to form the First, Second, Third, and Fourth Regiments of Artillery. Each regiment consisted of one light and eight foot companies, with a field and staff of one colonel, one lieutenant colonel, one major, one sergeant major, and one quartermaster sergeant. One supernumerary captain was attached to the regiment to perform ordnance duties; the adjutant was detailed from the subalterns of the regiment. Each company con-

sisted of one captain, two first lieutenants, two second lieutenants, four sergeants, four corporals, three artificers, two musicians, and forty-two privates—total, sixty; total for the regiment, five hundred forty-six.¹

With the reorganization of 1821 the artillery completed its experimental stage. For the remainder of the century, changes were slight, but were always in the direction of progress. The Seminole War brought about the addition of one company to each regiment and an increase in the number of privates in each company from forty-two to fifty-eight, and the Mexican War caused the further addition of two companies to each regiment and some other slight changes. The Fifth Artillery came into being with the Civil War and completed the artillery establishment until the increase which followed the Spanish-American War. This increase was accompanied by a reversion to the idea of a corps in which the evils of the 1814 organization were multiplied by breaking up the artillery into companies, instead of battalions. With the separation of the artillery into two branches, the Field Artillery resumed the regimental organization, while the Coast Artillery waited until the World War brought about the necessity of organizing for service in the field before it returned to the grouping of companies (which had finally become "batteries") into battalions and regiments.

<i>Company</i>	<i>Organized From</i>	<i>Company</i>	<i>Organized From</i>
<i>First Artillery</i>		<i>Second Artillery</i>	
A	A, Light Artillery	A	M, 2nd Bn., North. Div., and Det. at West Point
B	D, 2nd Bn., North. Div.	B	I, 1st Bn., North. Div.
C	C, Light Artillery	C	C, 3rd Bn., North. Div.
D	G, Light Artillery	D	L, 1st Bn., North. Div.
E	N, 2nd Bn., North. Div.	E	6th Infantry Recruits
F	B, 4th Bn., North. Div.	F	Q, 3rd Bn., North. Div.
G	B, Light Artillery	G	K, 4th Bn., North. Div.
H	D, Light Artillery	H	H, 4th Bn., North. Div.
I	A, 2nd Bn., North. Div.	I	O, 1st Bn., North. Div.
<i>Third Artillery</i>		<i>Fourth Artillery</i>	
A	E, 3rd Bn., North. Div.	A	K, Light Artillery
B	B, 2nd Bn., South. Div.	B	C, 3rd Bn., South. Div.
C	F, 3rd Bn., North. Div.	C	D and part of L, 4th Bn., South. Div.
D	K, 2nd Bn., South. Div.	D	G, 3rd Bn., South. Div.
E	I, Light Artillery, and Q, 1st Bn., South. Div.	E	N, 1st Bn., South. Div.
F	E, 1st Bn., South. Div.	F	A, 3rd Bn., South. Div.
G	P, 2nd Bn., South. Div.	G	E, Light Artillery
H	F, Light Artillery	H	I and part of E, 1st Bn., South. Div.
I	O, 2nd Bn., South. Div.	I	M, 4th Bn., South. Div.
<i>Broken up</i>			
H, Light Artillery		P, 1st Bn., North. Div.	
G, 4th Bn., North. Div.		F, 3rd Bn., South. Div.	
H, 4th Bn., South. Div.			

¹Artillery Reorganization Effected in June, 1821.

Strategic Naval Bases Throughout the World

By LIEUT. WILLIAM H. BURNS, C. A. C.

THE function of a fleet is to control sea communications in the interest of its own nation and to the discomfiture of the enemy. For a fleet, naval bases correspond, in a way, to the jumping-off position from which an army makes an attack. Their installation during peace, in correct geographical positions, has an importance quite on a par with building the ships. Admiral H. F. Schofield, of the United States Navy, has said, "Ships without outlying bases are almost helpless—will be helpless unless they conquer bases."

The existence of great industrial centers, the movement of raw materials from other countries necessary for peace and war and of troops and supplies to any point which might be attacked, all depend on the maintenance of lines of communication. Their defense obviously relies on two factors: a navy to guard and the holding of positions from which that navy can most effectively carry out its work. Without such stations a navy would be as helpless as an army without a base, and it is also true that no holding of strategic points by land forces can maintain sea communications without an efficient fleet. It might be well to define clearly the functions which such stations can perform in time of war.

1. They are used for docking and repairs to capital ships and auxiliaries.

2. They form fuel and supply reserve depots.

3. They are submarine-proof shelters in which a fleet can rest and take in stores and where transports and supply ships collect in safety to be conveyed to given points.

4. They are harbors of refuge and refueling stations for smaller craft with a limited radius of action.

5. They aid in the control of trade. By the ownership of the most fueling stations of the world, placed on the main routes of trade, shipping can be compelled to take certain pathways in time of war, while the enemy can be stopped or forced to sail by circuitous routes.

The conditions, then, that make a naval base strategically valuable are its situation, its military strength, and its resources. Its position must be in the theater of operations, which, of course, is a gift of na-

ture, and it should not be so far advanced that the lines of communication leading to it are flanked by strong enemy positions.

EXAMPLES:

Negative

Jamaica

Trinidad

Affirmative

St. Johns, N. F.

Halifax

It should, if possible, afford to the force occupying it the advantage of the use of interior lines. Example: Gibraltar against France. Positions in narrow seas or where sea routes converge are, generally speaking, more important than those in a great ocean because it is less possible to avoid them by circuitous routes. Examples: Panama, Gibraltar, Malta. Again the value of positions depends upon nearness to a vital sea route, either our own or the enemy's. In this connection the amount of trade that passes over this route enters into the question as well as the nearness of the base to this route. Examples: Hawaiian Islands, English Channel, Panama, Gibraltar, Malta, Suez Canal. If the position is at the crossroads of two routes, its value is greatly enhanced. Examples: Cape Verde Islands, Constantinople.

Inasmuch as the United States, Great Britain, and Japan are conceded to be the three greatest maritime nations, this discussion will deal principally with the bases established and controlled by them. They are the only countries having important bases outside their continental limits and therefore I will merely enumerate some of the bases in the other countries and give their location.

Germany. As a result of the treaty of Versailles the German navy amounts to practically nothing. There is therefore no need for naval bases in her case. Her most important bases during the war were at Kiel and Wilhelmshaven and these, in all likelihood, would be developed again in case they were needed.

France. Practically all the important ports of France are equipped for the repair and supply of naval vessels. Brest and Toulon are the largest.

Italy. As a general result of economy, all but a selected few of the bases in operation during the war are to be reduced to the basis of the minimum expense for maintenance and upkeep in those details affecting preparedness for war. This will leave the two naval bases at Taranto and Spezia, although there are a few others at which minor repairs can be made. There is also some discussion as to the necessity for establishing advanced bases in the Mediterranean, both Sicily and Sardinia being under discussion as possibilities.

Mexico. There are Naval Depots at Vera Cruz, Guaymas, Salina Cruz, and Payo Obispo, and a fueling station at Manzanillo, but the only drydock is at Vera Cruz. Vessels in the gulf have to go to the United States for docking.

England. Great Britain is well equipped with bases in the western Atlantic to strike at our vital coast area trade and for the protection of her lines and transport of troops overseas.

A general examination of the Atlantic shows us that there are four principal routes from Britain for operations against North America.

1. The direct route, straight for Halifax, then on to the United States.

2. A southern route, via the Azores, on to the West Indies, and then on to Jamaica and the Canal or to the Atlantic coast of the United States.

3. A sub-southern route, via the Madeiras, Trinidad, and on to the Canal.

4. A northern route, via Hudson Bay.

In considering an attack by Great Britain, the most strategic point from which she could initiate any movement would be from the port Berehaven, located at the extreme southwest corner of the Island. It is suitable for the assembly of a fleet. The route to Newfoundland is the shortest and this line continues on in practically a straight line to Halifax, Cape Cod, New York, Charleston, and Florida.

It can readily be seen, then, that one of the principal strategic features of the north Atlantic is the advanced position of Newfoundland, either as a point of approach from Europe, or as a point of jump off or as a threat against Europe. Also, Newfoundland guards the mouth of the St. Lawrence, and this river is the key to Canada. An even more important base to obtain possession of would be that of Halifax. With these three bases, the two St. Johns and Halifax, in our control, any hostile force would be forced to go farther north and come down through the Hudson Bay region, and this route, while not impossible, has many disadvantages.

Let us consider the southern route across the Atlantic. The positions of Trinidad, Jamaica, and other islands of the West Indies permit of their use as possible bases in operations against us. The area between Trinidad and South America would provide an ideal fleet base—affording sufficient room for unlimited anchorage and for exercises. This and Long Island Sound and Chesapeake Bay are what may be termed satisfactory bases in both area and position.

The harbors at Trinidad and at Jamaica in the British West Indies have a few resources, but little industrial development. There are many

other anchorages and some small enclosed harbors scattered elsewhere all through the West Indies. Bermuda is defended and has a fairly large space for anchorage but no resources and very little industry, except a small navy yard. Halifax is undoubtedly best in all these requirements, including defenses and a harbor space which is ample for all needs. There are several anchorages in Newfoundland, St. Johns being by far the best one, where there is one large drydock.

The Falkland Islands guarding the route through the Magellan Straits would be an important position in the event of the Panama Canal being blocked. This base is rather distant for operation against the Atlantic coast or even against Panama but it is difficult to tell what eventualities may entail when once war starts.

Let us now travel eastward from the British Islands. Gibraltar is a fortified naval and fueling station and is the home of the British Atlantic fleet. Its position near the entrance to the Mediterranean makes it of great importance and increases its value as a rendezvous for the Atlantic and Mediterranean fleets.

Malta is placed almost midway between Gibraltar and Port Said and is nearly equidistant from Messina and Cape Bon. Its position therefore makes it a suitable station for commanding the approaches from the western to the eastern Mediterranean. The harbor of Valetta is well supplied with docks, is strongly fortified in its immediate neighborhood, and is the base of the Mediterranean fleet. Its central position in the Mediterranean makes it even more valuable from a naval standpoint than Gibraltar.

Aden is a fortified fueling station about one hundred miles northeast from the entrance to the Red Sea, and about halfway between Port Said and Bombay. It offers the opportunity for controlling the junction of the Indian routes where they converge before entering the Red Sea.

The naval base of Bombay possesses the largest and safest harbor in India and railways diverge from it in every direction. This brings all the resources of India within easy reach; but on the other hand it is rather a terminus of sea lines than a strategic point placed across them.

Port Said is located at the entrance to the Suez Canal which gives it a great value as it is at the entrance of a maritime gateway.

Some of the other British bases which complete the loop around the world are the Falkland Islands, Colombo in India, and Sydney, Australia.

A consideration of the naval problems of the Pacific cannot fail to include Singapore, the strategic center of the British Empire east of Suez. Singapore is the natural gateway through which must pass all the vast traffic on its way from Europe to China and Japan and upon

which converge the great ocean routes connecting India with the Dutch East Indies, Australia, and the Far East. Singapore, therefore, is in an ideal position to safeguard trade with all these nations.

Japan. Let us now consider the islands composing the home territory of the Japanese Empire. The Inland Sea, which is the economic center of Japan, is a naval Gibraltar and constitutes an ideal naval base with few and easily defended outlets. The exits lead immediately to important strategic areas and are widely separated so that a blockading fleet would be tactically separated. Within the Inland Sea there is ample space for anchorage and maneuver. Also, surrounding the Inland Sea are important supply and repair facilities. Protecting the Inland Sea and its entrances is a circle of heavy fortifications.

Japan has three splendid bases in these home waters—Kure, Yokosuka, and Sasebo. These are excellently equipped. Subordinate fleet bases for operations in the sea of Japan exist at Maizuru and Chinkai. There are torpedo bases at Ominato and Oshima in home waters and at Bako and Truk in outlying possessions. Bako and Truk can be used as fleet bases for short periods. In addition there are moderately good harbors in the Mandate Islands which can be used as destroyer and submarine bases. A few divisions of heavy ships could also be based in these harbors. Anami-O-Shima has a fine harbor and could be made into a valuable fleet base. Some facilities exist at Port Arthur and Yeiko, Korea. Farther away there is an outlying circle of defense consisting of the Pescadores, Formosa, the Nansei Islands, and the Kurile Islands. Still farther out is a second line which encircles Guam and Manila—formed by Yap, the Carolines, the Marshall Islands, and the Bonin Islands. Of the last named circle only the Bonins are fortified.

There are many islands in the Pacific, controlled by the Japanese, which are very important strategically besides the Caroline and Marshall Islands. They extend from the Philippines two thousand miles toward the Hawaiian Islands and are only two hundred and fifty miles south of Guam. The nearest one to Oahu is Rongelab, which is thirteen hundred miles nearer Oahu than Guam is.

United States. Navy yards and naval stations in our country will be found at various places along the coast from Maine to Key West and from San Diego north to Bremerton, Washington. The largest on the eastern coast are those at New York and Norfolk. At Newport is the torpedo station where torpedoes are manufactured and tested and new developments are tried out. The station at New London is a base and training school for submarines, and that at Pensacola a base and training school for aviation. Shipbuilding is carried on on a large

scale at Brooklyn, Philadelphia, Norfolk, Newport News, and Mare Island, and on a small scale at Portsmouth, New Hampshire. Long Island Sound, Chesapeake Bay, San Francisco, and Puget Sound are our best home bases.

In the vast expanse of the Pacific Ocean every problem of naval strategy is fundamentally a question of base facilities. Modern fighting ships have a narrow radius of action dimensioned by their relatively meager fuel capacity. From experience gained in the World War it is estimated that a battle fleet can remain at sea under war conditions not longer than four days. This means a cruising radius of two days.

The central or direct route and the most important course to the Philippines is the one via Oahu and Guam. The next most important route is the southern route via the Marshall and Caroline Islands, utilizing any of the various possible bases at Rongelab, Jalut, Iruk, etc. These are two practical routes. There are two others via Kiskra and Samoa which are improbable routes due to the unfavorable weather and because there are no areas for fleet bases.

The Hawaiian Islands are the best example we have of the installations required of a fleet base. Pearl harbor is designated as a main outlying base. It has practically all the facilities necessary for this kind of a base.

Guam ranks only as a fuel station, though its position invests it with a unique strategic value.

Under present and expected conditions in the Pacific, San Francisco is the nearest real base to the Philippines. There are docks and shops at Pearl Harbor but no great protected harbor for a fleet. If the fleet mobilizes or bases there for a time, a large part of it will lie in open roadsteads where serious repairs cannot be undertaken.

Our only strategic base in the far East is at Manila but it is an extremely important base. There is a fine harbor at Manila which gives a place to establish a base for repairs and for a fresh takeoff; it provides a terminus for our lines of communication from Oahu, from the Pacific coast, and also from Panama. In addition, it must be remembered that in case the Panama Canal should be blocked by slide or design, the Suez becomes a route to the far East and we would need a terminus in such a strategic position as Manila.

Our other bases in the Philippine Islands in addition to Manila, or in lieu of Manila, are really not bases, but are undeveloped harbors, safe anchorage spaces, such as Coron Bay, one hundred and fifty miles south of Corregidor, and Malayampa Sound, two hundred miles, both facing on the China Sea and both favorable as a base in a counterattack on Manila; Tawi Tawi, five hundred miles south of Manila; also the

Gulf of Davao, six hundred and fifty miles southeast. Each one of these bases has its favorable characteristics, depending on the nature of the campaign or the relative strength and activity of the opponents.

In conclusion, it might be well to compare the three powers, England, Japan, and the United States. It is apparent that while the United States and Japan have bases from which to operate defensively, that neither has the facilities which are available to Great Britain for conducting operations away from home waters. Neither Japan nor the United States could carry on operations away from home waters without first capturing or establishing bases in the theater of operations, and obviously it is impossible for either to do this without going to war.

MAXIM XLII

Feuquiere says that "we should never wait for the enemy in the lines of circumvallation, but we should go out and attack him." He is in error. There is no authority in war without exception; and it would be dangerous to proscribe the principle of awaiting the enemy within the lines of circumvallation.—Napoleon's Maxims of War.

EDITORIAL

In Retrospect

HOWEVER nearly we may have forgotten the war, November remains a month in which we pause for a backward look. Ten years ago the "war to end war" came to an end and many of us believed that we had had the fortune of serving in the last of wars. Yet, as we review international relationships of the past ten years, we are forced to the conclusion that war is very nearly as prevalent as it always has been—a little harder to start, perhaps, but none-the-less an ever-present possibility.

That we are on the way to perpetuation of peace can scarcely be doubted, but perpetual peace is not yet with us. The League of Nations has had a record of successes mingled with failures; it is an instrumentality for good, but it cannot assure peace. Conferences for the limitation of armaments have tended to limit the scale on which war may be fought; but they have not reduced the possibilities of war. International disavowal of warfare as a method of settling disputes between nations has been a step in the right direction, but its real effectiveness remains to be seen. We have already done much toward making war more difficult, but we have a long, long road to follow before we can make it impossible.

We should not be too much encouraged by what has already been accomplished. Attempts to end warfare are not new. Partial success in the preservation of peace has, at times, been achieved in the past. Every war ends in peace, and every peace creates a desire for its perpetuation. The whole history of the human race has been that of a recurrent cycle of war, peace, treaties and realignments to preserve peace, forgetfulness of the evils of war, and war once again.

This is, in a way, but natural. An instructor at the Military Academy remarked that he found it difficult to avoid addressing the cadets as though they had participated in the war. To us the Armistice is as of yesterday, yet when it was signed these young men were boys of nine, ten, or eleven years of age—too young to have been deeply impressed as a group by the war. All our schools and colleges and the schools and colleges of other nations are filled with young men such as these. In another ten years they will have become a large and important part of our society, and in another ten years they will dominate

the world. Never having known the horror of war, what is more natural than that they should forget the evils begotten of warfare?

True, as civilization continues to rise to a higher plane, peace gains on war, but the end is not yet in sight. Our glance at the past induces us to hope for the future, but our part still remains, as it ever has done, to carry on and to pass on such knowledge as we may have acquired to our successors that they may be prepared for eventualities.

Army Problems

Following the war the Army passed through a period of depression from which it now seems in a fair way to emerge. The war, as wars have a way of doing, disrupted the Army to such an extent that reorganization became necessary, and the reorganization brought in its train the problems of housing, promotion, and equipment, and the subsidiary problem of morale. The housing situation is approaching a final solution, carrying with it a marked improvement in morale, which may now, in a large part of the Army, be classed as high. The development of new equipment and materiel has continued apace, and new aircraft, tanks, antiaircraft materiel, automotive equipment, and other developments of the war are being supplied or have been designed for supply. Further developments may be anticipated as a result of the experiments which are being made in motorization and mechanization. The one remaining problem is promotion (which should perhaps be accompanied by the question of pay), and that is definitely on the books for consideration.

It is interesting to note that the problems which are being or have been solved are exactly the same problems which confronted the Army after the Civil War, the promptitude of solution, however, lying with the Army of today. The long internecine struggle of the 'Sixties very nearly exhausted the resources of the country and for many years thereafter, Congress, in the interests of economy, scrutinized its appropriation bills with even more care than it has used in recent years. The Army could secure but limited funds with which to work out its own salvation, and it is doubtful that it foresaw as promptly and as clearly as today its future requirements.

At the close of the Civil War, Army posts were cluttered with buildings of temporary wartime construction, even as they are today. These buildings were made to serve the purposes for which they could be fitted until they would serve no longer. Finally, about a dozen years after the end of the war, Congress felt that it had become necessary to enter upon a definite building program, and many of the houses now

to be found at the older posts resulted from this program, dating from about 1880 and the years immediately following.

As did the World War, the Civil War introduced new materiel, of which the principal were rifled weapons, with elongated projectiles, detached emplacements for cannon, rather than forts, and armored steamships in place of the old sailing warships. This new materiel was long in reaching the military and naval services. For many years the Navy sailed the sea with obsolete ships, their first real warships dating about twenty-five years after the war. In the Army, the provision of modern cannon and the adoption of modern emplacements were delayed for twenty years, and it was thirty years before guns were mounted in emplacements in any considerable number.

Worse than housing and materiel was the promotion problem. In the reorganization following the Civil War many comparatively young officers, who had proved their worth in the war, were appointed to the higher grades. Older officers were to be found in lower grades. Promotion became completely stagnant and records show that some officers served as much as thirty years in the grade of lieutenant. The story is told that one officer declined a majority in a colored regiment to accept a lieutenancy in a white regiment and that twenty-five years later he was promoted to a majority in the regiment in which he had previously declined to serve.

The promotion situation was never corrected. In the reorganization of 1901, following the Spanish-American War, most of the Civil War veterans had served almost their allotted span. Their retirement was expedited somewhat in the period from 1901 to 1903, but by that time it was too late to affect materially the careers of those officers who had entered the Army prior to about 1880.

So we find that our problems are not new. Every large war will bring the same problems, and whenever we are inclined to feel that Fate is treating us harshly we can look back and reflect that we are at least better off than were our predecessors.

Military Biographies

If recollection serves accurately, the JOURNAL some time ago expressed the opinion that the tide of biography then pouring forth from the publishing houses of this country had passed its peak. In that the JOURNAL was wrong. The public interest in the lives of the great and the near great and even the unknown continues to be as acute as ever, and never has there been more biographical books upon the market than there are at present.

Among the volumes that have recently appeared there are many of value to the military man. Nowhere can the secret of a man's success be better learned than in a study of the man's life. Naturally, these studies are not of equal value nor of equal interest, whether because of subject matter, of manner of treatment, or of method of attack, but most of them contain something worthy of study. With a few exceptions, it is not the intention of the JOURNAL to express an opinion of the comparative value of the books, but it is desired to point out some of the new books in the field of military biography. Most of these have been reviewed in the JOURNAL and the reaction of the reviewers may be determined from the book review section.

Of particular interest might be mentioned Harold Lamb's two books on *Genghis Khan* and *Tamerlane*, two of the greatest military leaders of all times, concerning whom practically nothing has previously been written in English; Captain Liddell Hart's *A Greater Than Napoleon*; *Scipio Africanus*, another great leader who is little known; Ludwig's *Napoleon, The Man of Destiny*; Maurice's *Robert E. Lee, the Soldier*, and Tate's *Stonewall Jackson*. These books are recent, well written, and extremely interesting.

Other recent books are given in the following list, which is far from complete, but which has been made up to show the great variety of material available. All have a value to the military student.

Ballard's *The Military Genius of Abraham Lincoln*; Barrè's *Memoirs of a Napoleonic Officer*; Bercovici's *Alexander*; Greely's *Reminiscences of Adventure and Service*; Geer's *Napoleon and His Family*; Liddell-Hart's *Great Captain's Unveiled*; Halévy's *Vauban, Builder of Fortresses*; Hudleston's *Gentleman Johnny Burgoyne*; Hughes' *George Washington, The Human Being and the Hero*; Ludwig's *Bismarck and Wilhelm Hohenzollern*; Macartney's *Lincoln and His Generals*; Maurice's *Statesmen and Soldiers of the Civil War*; Powy's *Henry Hudson*; Robertson's *Soldiers and Statesmen*; Sedgwick's *Lafayette*; Seitz's *Braxton Bragg, General of the Confederacy*; Starritt's *Kitchener: Soldier and Statesman*; Wilson's *Napoleon, the Man*; Pickett's War letters to his wife, *Soldiers of the South*.

Truly no man with a liking for biography need lack for something to read.

PROFESSIONAL NOTES

Coat of Arms of the Harbor Defenses of Key West

Shield: Gules a tower or in chief a key fesswise of the like.

Motto: Quod Habemus Defendemus.

The shield is red for artillery, Key West being the strategic key to the Gulf of Mexico is represented by a key and tower. The motto means, "We defend what we have."

Retirement of Sergeant Tony F. Monroe

HEADQUARTERS SIXTY-SECOND COAST ARTILLERY

Office of the Regimental Commander

HCB-G

General Orders

Fort Totten, N. Y.,

No. 14.

August 20, 1928.

1. Upon the occasion of the retirement of First Sergeant Tony F. Monroe, 6026703, Headquarters Battery, 62d Coast Artillery, the Regimental Commander desires to invite the attention of all members of the regiment to Sergeant Monroe's record of service, which is as follows:

Continuous service from July 2, 1898, to the present time, except the period from November 23, 1898, to January 4, 1899, between discharge and reenlistment.

Discharged once (1st enlistment) as private.

Discharged once (2d enlistment) as corporal.

Discharged four times as sergeant.

Discharged four times as first sergeant.

Discharged once (World War Service) as Captain.

Every discharge (11 in all) with Excellent character.

2. Besides this fine record of military service, Sergeant Monroe has, throughout the same, been a leader in all forms of athletics, having carried many teams to victory in baseball, basketball, football, and other team events, evincing throughout all of these activities a fine spirit of sportsmanship.

3. This record is one of which First Sergeant Monroe, his family, and friends may all be justly proud and one which should be an inspiration to all young soldiers—an example for them to emulate.

4. Sergeant Monroe leaves active service with the best wishes for his future success of all the officers and enlisted men of this regiment and the Regimental Commander feels that he is justified in extending to Sergeant Monroe at the same time the best wishes of the older officers of the entire Coast Artillery Corps,

a large percentage of whom have known him as long and as favorably as has the Regimental Commander.

By order of COLONEL BARNES:

J. J. JOHNSON,
1st Lt., 62d C. A.,
Act'g. Adjutant.

OFFICIAL:

J. J. JOHNSON,
1st Lt., 62d C. A.,
Act'g. Adjutant.

Lieut. Goebel Receives Distinguished Flying Cross

HEADQUARTERS HARBOR DEFENSES OF LOS ANGELES

Fort MacArthur, San Pedro, California

August 18, 1928.

MEMORANDUM.

1. The Distinguished Flying Cross awarded to 2nd Lieut. Arthur C. Goebel, Air Corps Reserve, by direction of the President and under the provisions of Act of Congress approved July 2, 1928, was officially presented at the Pacific Southwest Exposition, Long Beach, California, on August 17, 1928. The presentation was made by Lieutenant Colonel Willis G. Peace, 3d Coast Artillery, Commanding Officer Harbor Defenses of Los Angeles, with the 3d Coast Artillery Band and troops from Fort MacArthur participating.

2. The occasion for the presentation was Aviation Day at the Pacific Southwest Exposition. Approximately one hundred regular army and reserve aviators returning from the dedication exercises at Lindbergh Field in San Diego were guests at the Exposition and witnesses of the ceremony. Lieut. Goebel received the Distinguished Flying Cross exactly one year after his epochal flight to Hawaii, he having landed at Wheeler Field from Oakland on the afternoon of August 17, 1927.

For the Commanding Officer:

GEO. J. B. FISHER,
Captain, 3d Coast Artillery,
Adjutant.

A Combination Rammer-Sponge

By LIEUT. J. E. REIERSON, 92d C. A. (P. S.)

The modification, as described herein, of the rammer for the 155-mm. gun was made by the writer and used by Battery "B," 92d C. A. (PS), in all practices this year and gave very satisfactory results.

The ramming and sponging were as good as if the separate units were used. This was accomplished by using three men on the rammer-sponge. A test made in one practice showed the density of loading to be equal for each trial shot.

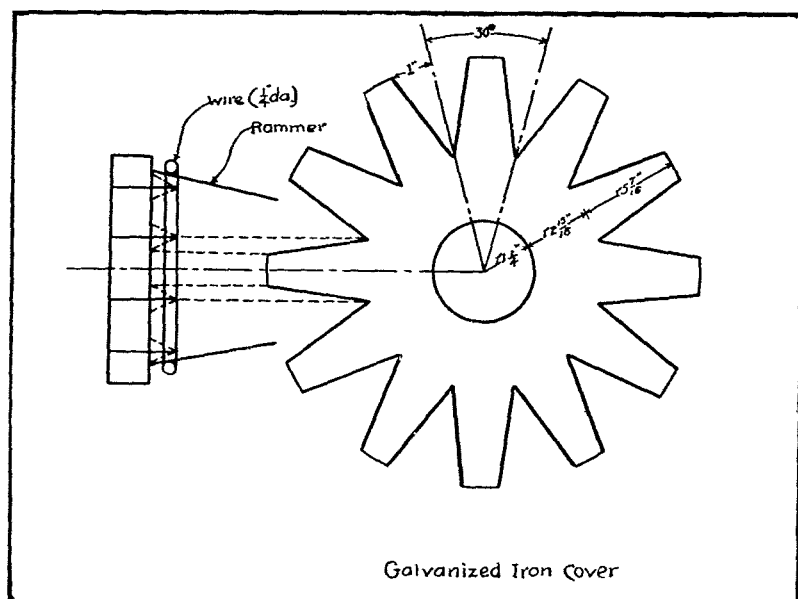


FIG. 1

This rammer-sponge is easier to handle than the rammer as issued, as it weighs 13 pounds less, after being dipped in water, than the latter.

It has the advantage over any other rammer-sponge the writer has seen in that it will, with proper care, last an entire season. The wear and tear of ramming is taken up by the galvanized iron cover.

MODIFICATION OF RAMMER FOR THE 155mm GUN

By 1st Lt J. E. Peterson, CAC, 92d C.A. (PS)

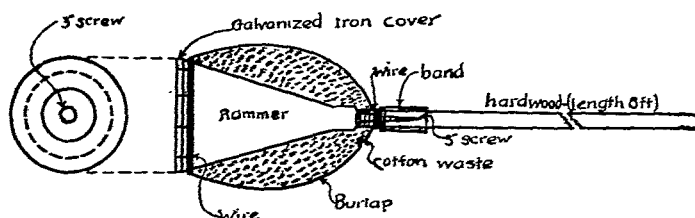


FIG. 2

Several seconds of valuable time were saved by the use of this combination.

The following gives the procedure in the modification:

1. A galvanized iron cover (see Figure 1) is cut and placed on the rammer head, the leaves being bent back over the head. One turn of wire is now placed on these leaves and the leaves are bent forward, thus holding the wire. This wire will support the front end of the sponge.

2. A double thickness of burlap, 24 inches long and 23 inches wide, is placed around the rammer (long edge parallel to stave) with its mid-point at the supporting wire. Several turns of small wire wound around the burlap just in front of the supporting wire holds the burlap in place. That burlap in front of the wire is folded back over the rammer.

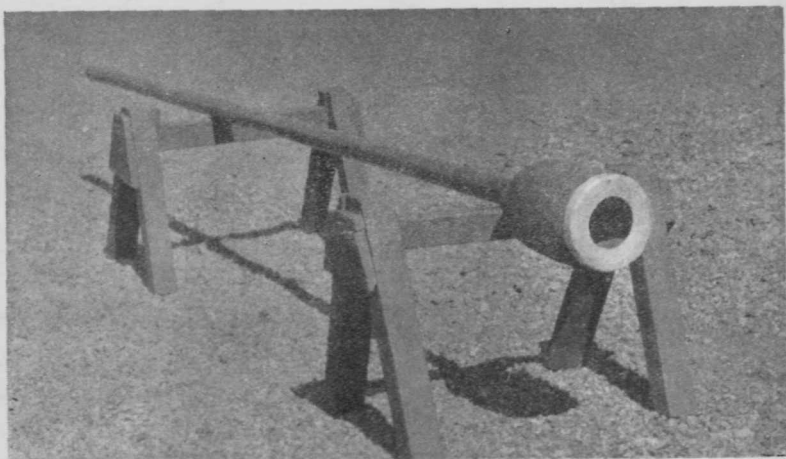


FIG. 3. COMBINATION RAMMER-SPONGE.

3. Cotton waste is now packed inside the burlap and around the rammer. The seam is sewed and the open end of the burlap wrapped with several turns of wire, as shown in Figure 2, as soon as the size and shape are obtained. Any burlap remaining will be folded over the turns of wire and the edges sewed to the rear end of the sponge. The greatest circumference of the sponge should be 21 inches.

4. The iron stave is replaced with a wooden stave, for ease in handling. The wood is screwed into the rammer and made secure by a metal band and a 3-inch screw.

Being An Officer

In the great academies where young men are trained to be officers in the army and navy, one of the first lessons that they must learn is obedience. Yet these men are not being trained to take orders all their lives; they are being trained to GIVE orders,—to be officers commanding others.

The reason for this is that before a man can learn to command, he must learn to obey. Before he is trusted with the responsibility of giving orders, he must show that he can take them and carry them out.

Perhaps that will answer the question that children often ask their parents when they are told to do something,—the “why” that does not always seem to have a satisfactory answer. And perhaps it will impress upon you the fact that it is for your own good to obey, in order that you will be a better “commander” later on.—*Atlanta Constitution*.

The Sheep and the Wolves

One of the fables of La Fontaine they no longer teach to little children. That is why little children when they become big make such stupid mistakes.

The world unfortunately is now managed by grown up children who do not know La Fontaine.

You remember the story: “After a thousand years and when there is no more war, wolves will lie down in peace with the lambs.”

Lambs belong to a very old and very prolific race. There are, of course, lambs in all the great prairies of this earthly paradise. They are always the victims of their own proverbial sweetness; they are even the emblems of gentleness and peace.

By a singular destiny, which forces on them a simple but very distressing lesson, these innocent things have always been eaten. They seem to have no other purpose in life, a very depressing outlook for them.

Wolves are also a very ancient and prolific race, a predatory and conquering people. Their role is always to eat the others, whether it be man or sheep.

Here we see these two principal adversaries face to face.

We can reduce the result to a word; the fight will not be long. What can sheep, clad only in their wool, do against their aggressive enemies? So the sheep to exist must have protectors: shepherds and dogs. It is a serious thing to attempt an attack against a flock of sheep guarded by vigilant shepherds assisted by courageous and faithful dogs.

Can you see the application which can be made to human beings? Vigilant shepherds and courageous dogs, force extending its barrier around innocence, then peace can reign. That is good sense.

But war, even then cannot be suppressed so easily. Hunger makes the wolves dare to come out of the forest. When wolves are hungry they lose all self control and prudence. They risk their lives most boldly in their search for victims. It is equally bad, they say, to perish by famine as to be torn to pieces by the dogs. There is no doubt that to live is their most important instinct. An empty stomach has no ears. With this in mind we see that war is always an exception and a distant possibility. With dogs and shepherds it is possible to limit its severity and reduce its destruction.

Therefore we must keep a strong, well trained army; have confidence in our military leaders; and provide adequate arms and munitions. We must have a strong protection provided by our shepherds and be well guarded by our dogs. In this way if we have any courage whatever, which we should have, we can then have a horror of carnage and of blood. We can afford to become pacific.

To be a pacifist is something else. Pacifists are the undeniable advance guard of invasion and the instigators of war. They prepare for it; they attract it; they make it unavoidable and fatal. How do they do this? By losing sight of that essential element which dominates and rules all the conflicts of the world:—force.

Again our friend La Fontaine points out the truth: "The argument of the strongest is always the best." Ah! if we could only listen to him.

Pacifists purposely misunderstand force and refuse to see evidences of bad faith. The pacifists see nothing but the hypocrisy and whine of the wolves, and so they disarm. They put the shepherds to sleep, or else corrupt them. They overthrow their protecting walls and barriers. They stretch out their arms toward their hereditary enemies with words of welcome and love.

Listen to them. "War on War." "Outlaw war." "Down with the cannon and machine guns." "Limit your armaments." "Reduce the length of military service." "No more army, have a militia instead." "No more conflicts, always have agreement and harmony."

Words, words, words! They sound like the bleating of sheep. But the wolves are there nevertheless, always wolves, always cruel and evil, keeping their natural ferocity, their voracious appetite and their savage spirit out of the sight of the lambs.

La Fontaine says: "They will seize a time when there are no longer shepherds in the fold, and will kill the greater half of the sheep."

That is the way wolves have, and also the way shepherds have who sleep without much thought of the wolves roaming around the house.

Did La Fontaine speak of asphyxiating gas? He said: "The dogs were strangled while sleeping. It was so easily done that they did not even feel it."

The irony of this last verse is admirable. You will see how the pacifists make use of various arguments to excuse the ferocity of their modern methods. They think that there is no pain. A sweet sleep and a beautiful dream of glory. What a great advance! Let us hasten the arrival of such a fine day; let us disarm. Let us all be friends, all be brothers, brothers even to the death. Was it not St. Francis of Assisi who said: "My friend the wolf." We now see the dawn of the day announced in the Scriptures.

It's a fact that we are disarming. It's a fact that the word war has been stricken from our vocabulary. It's a fact that in the whole world shepherds dream no longer of doing anything other than to harmonize their flutes. It's a fact that the dogs are muzzled and that the sheep are running about singing peace for all.

What are the wolves doing? They are sharpening their teeth. Is that not allowable and even natural? They are training themselves; they are disciplining their will power; they are hardening their muscles by various sports and innocent games. They busy themselves around strange gas tanks. They are grouping themselves together; they are calling together the entire wolf people from beyond the frontiers. They are arousing the family spirit among the lambs, urging universal brotherhood and a sincere desire of unity among their victims.

That is the way the pacifist sheep bleat, always having a reply for everything. Fertilized by the recent deaths during the war, the new grass is sweet and tender. The heaven is bright and life is joyous. Yesterday is past; tomorrow is far away; sing peace, ye sheep! But peace is made by wolves.—*Ami du Peuple*, Paris, France.

Peace Pacts and European Armaments

Less than ten years after the conclusion of the most horrible orgy of bloodshed and destruction ever experienced by civilized mankind, and at a moment when representatives of fifteen nations were gathered at Paris to sign another solemn engagement for the renunciation of war, figures were published in the French capital showing how sadly realities still lag behind Europe's aspirations toward stable peace.

If Germany and her wartime partners are left out of account, their military strength having been reduced by the peace treaties, the other ex-combatant and neutral nations of Europe today have standing armies of which the combined numerical dimensions far exceed their total in 1913. In some instances the additions are insignificant, and here may be mentioned the United Kingdom and Ireland. Before the war these two countries had 406,000 men under arms; now they have 408,000. But France has augmented her pre-war standing army of 646,000 by 20,000. Italy had 274,000 men under arms in 1918; today she has 347,000. Belgium went up from 47,000 to 79,000; Greece, from 25,000 to 66,000; Rumania, from 103,000 to 205,000.

Even Switzerland, a non-combatant in the war, has enlarged her so-called active militia from 28,000 to 170,000. On the list of increases are: Denmark, from 14,000 to 33,000; Holland, from 26,000 to 29,999; Spain, from 98,000 to 224,000; Sweden, from 26,500 to 28,500.

The peace strength of Europe as a whole is today approximately 1,000,000 less than in 1913, but the reduction is amply accounted for by the treaty limitations put on German, Austrian, Hungarian and Bulgarian armaments, and by the fact that Soviet Russia and the Russian succession states now have a total of about 900,000 men under arms instead of the Russian total of 1,200,000 before the war. The estimated grand total for Europe is 3,000,000.

If all efforts at land disarmament in Europe have hitherto failed, it was not because of lack of readiness on the part of the European governments to conclude formal peace pacts. Genoa, Locarno, London have seen security and good will agreements signed, and now Paris has been the scene of another accord, perhaps more far-reaching than its predecessors.—*Detroit Free Press*.

Surplus Military Explosives Used Industrially

More than 126,000,000 pounds of TNT and other surplus military explosives accumulated by the Government at the close of the World War have been used for industrial purposes, states Dr. Charles E. Munroe, Chief of the Explosives Division, United States Bureau of Mines, Department of Commerce. These explosives have been expended in road building, in construction of dams and reservoirs, in draining swamps, in clearing cut-over lands and for other useful purposes which have added materially to the wealth of the Nation.

After the entrance of the United States into the World War, the Nation set about the production of military explosives on a scale never before undertaken, and this work continued with such acceleration that when the Armistice was declared the country was producing military explosives in quantities never before realized. There is little doubt, Dr. Munroe points out, that this developed capacity was a material factor in ending the War. A consequence, however, was the accumulation

at various points in this country of enormous stocks of high explosives and propellents, whose safeguarding during storage and transportation constituted a serious and costly obligation, while entailing a menace to the communities near which the material was stored.

The Bureau of Mines, which had taken an active part in the technical research necessary to the production of military explosives on a tremendous scale, advocated the use of these great stocks of surplus explosives on governmental and industrial peace-time projects, pointing out the heavy expense that would be entailed for either the continued preservation or the destruction of these explosives. This suggestion met with much adverse criticism, great stress being laid on the fact that military explosives, and particularly TNT, never had been used industrially and were, therefore, unfit for such purposes. The Bureau, however, proceeded to demonstrate the suitability of these explosives for industrial purposes and issued several publications setting forth the results it had obtained in practice in the field and giving detailed instructions as to the best methods of use. The result was that this huge store of military explosives, instead of being a total loss or constituting a menace to public safety, was diverted into useful peace-time purposes.

Recently the Bureau was informed that some 250 tons of this military TNT, stored for use near an important Federal project, had deteriorated into a dangerous condition and should be destroyed. An explosives expert was detailed to inspect this supply. When tested, both at the Bureau of Mines Experiment Station at Pittsburgh and at the Picatinny Arsenal, this suspected TNT was found to conform completely with the specifications under which it was originally purchased and to be in a perfectly stable condition. This TNT had been packed loose in wooden boxes and with time some of these boxes had become warped and broken, making it necessary to repack such material if it is to be offered as freight.

The results of the inspection and testing of the samples showed that the TNT was in first-class condition and entirely suitable for use as a blasting agent. It is gratifying, concludes Dr. Munroe, to find that TNT, which has disclosed such admirable qualities for use in blasting, is proven, from this test of storage for upwards of ten years, to have excellent keeping qualities also.

What the War Taught

Civilians and military experts, too, who prophesy so confidently what will happen in the next war might take a hint from General Maurice, director of military operations of the British General Staff from 1915 to 1918. General Maurice begins an Article in *Foreign Affairs* on "Military Lessons of the Great War" with the statement that "experts who have been rash enough to utter prophecies have with very rare exceptions been proved wrong."

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The most important military lesson of the war, in the opinion of General Maurice, is that the changes which made that conflict so different from any that had preceded it were due to changes which had no direct connection with war.

These changes were the coming of the motor car and the progress of medical science. Before the Great War, even with the growth of railways, the size of

armies was limited by the amount of transportation which could function in the immediate zone of military operations. This meant transportation by animals, since trains could not run safely so close to the front.

Moreover, disease caused as heavy losses as did battles and thus rendered the massing of huge bodies of troops dangerous.

The motor car, by removing the limit upon transportation, and medical progress, by removing the danger of epidemic, changed the question from How many men can we feed at a given time and place? to How many men capable of bearing arms are available? Hence the unprecedentedly large armies of the last war, with the consequent novelty of continuous contact—"from the first day to the last the guns never ceased firing."

But what of tanks, poison gas, airplanes? These, in General Maurice's judgment, have only "a secondary importance." For every existing weapon, he observes, "some antidote is usually found sooner or later," and the discovery of the antidote provokes "the discovery of some fresh weapon to which the antidote is not an effective reply." More important is it "to consider what developments are in progress in the lives of peoples which are likely to affect the nature of war."

Such consideration, we fear, will not be so easy for amateur strategists as the painting of wholesale destruction resulting from the touching of a button, but its superior pertinence is obvious.—*New York Evening Post*.

Military Training in Peace Time

In the emergency flood relief work along the Mississippi River last year it was necessary to prepare camps for large numbers of refugees on short notice. The camp site had to be carefully selected, with due regard to drainage and sanitary conditions, lest typhoid or some other infection prove disastrous to the hundreds or thousands of persons assembled there.

Mr. Hoover, who directed the relief work, relates that when instructions were sent out for the establishment of a camp the suggestion was made that the assistance of former service men be secured. The idea was to make use of the practical knowledge gained by the men who participated in the World War. It was because of the help of these, in large part, that an excellent record of health conditions was made at the refugee camps.

A reminder of a similar situation came recently from the coastal region of the South Atlantic states. Much of that territory had long been known as unhealthful. Malaria, typhoid and other infections were common. Sources of drinking water often were contaminated, drainage of the low, swampy country was poor and the disease and death rates were abnormally high.

A change came for the better with valuable assistance given by the Rockefeller Foundation in the control of malaria and hookworm. But the transformation in health conditions of the area is attributed also to the influence of World War veterans. Making good use of the experience gained while in the army, these men took the lead in eliminating the conditions which had kept the area unhealthful. Today that section is becoming known as a resort territory, both in summer and winter.

What peace time value can military training have? The examples cited afford one answer to the question. There are others that might be given. They

are furnished, for instance, by the work of the summer training camps which are attended by thousands of young men from all parts of the country. These young men learn not only the means of keeping themselves in the best physical condition and, where necessary, imparting of the knowledge to others, but they learn obedience to authority, strict discipline and loyalty to their country's traditions and institutions. All of which, surely, are worthwhile factors in citizenship.—*Kansas City Star*.

Foreign Periodicals

Principal subjects of comment and interest contained in some of the German, Austrian, and Swiss military journals and periodicals.

Militär-Wochenblatt—Berlin

No. 41, May 4, 1928. GERMANY AND FRANCE. By Major General D. von Aman, German Army, retired. Comments on an article by Count Coudenhove, published in a recent issue of *Pan Europa* on the problem of "an understanding between Germany and France." Count Coudenhove contends that historical tradition does not furnish a very promising prospect of a friendly approach between Germany and France but those two countries are nevertheless admonished by existing European conditions to hold together because a new war would result in general ruin for Europe. Furthermore, the impending economic encroachments of North America render it necessary that not only France and Germany but all the other European powers unite against that. The German commentator holds that much greater antagonisms than those between France and Germany stand in the way of a union of European nations separated by old enmities of language and race and opposing economic and commercial interests. But notwithstanding that such a union would be desirable and the only remedy for resisting the economic preponderance of the United States, he does not believe that it could be brought about voluntarily and that only two ways for accomplishing it appear practicable. One is the domination of a Napoleon supported by the military power of France. The other is recognition of the fact that European powers cannot be united as a whole but may be combined for united action by forming "blocs." One such bloc would naturally be composed of two or more of the strongest military powers and would thus be able to exercise a predominating influence upon any one or even a combination of all the other blocs. The pressure exerted by such a controlling force would be economic rather than military. Only a superior statesman of the Bismarck pattern could succeed in establishing such a condition and such an one is not at present in sight.

GERMAN DISTRIBUTION OF WAR FORCES DURING THE WORLD WAR. By Major General von Borries, German army, retired. Comments on a recently issued work of this title by Ludwig Gehre, which the reviewer classes as a "Clausewitz study." The author of the book argues the question whether or not the German leaders always succeeded in obtaining decisive results by exertion of their maximum strength locally and opportunely in the World War. He adopts as his text in his argument the saying of Frederick the Great: "The good God is always present

with the strongest battalions," but he proceeds from that to Clausewitz's precept: "The best strategy is to be very strong always, first generally and next at the decisive point, but with this reservation: that numbers alone do not represent strength of a military force; leadership, individual value based on soldierly ability," and, in this modern period of technical perfection, upon equipment.

FIGHTING UNITS. By a writer under "124," who describes what he considers "an ideal division."

MERCENARIES. (meaning soldiers enlisted for definite periods of service under fixed pay) **AND DISCIPLINE.** By a writer over signature "123." Continuation of this subject begun in a previous issue. Author discusses the value of the old rigid close order of military drill as an auxiliary in promoting military discipline and the habit of implicit obedience. He holds that such drill should be imposed on the recruit only during the early period of his service and then relaxed. That when the recruit feels that he is out of leading strings and has become a "soldier" he will voluntarily accept the lesson intended to be impressed upon him by rigid drill and come to appreciate its value in making of him a self reliant up-standing man.

No. 42, May 11, 1928. **FRANCE'S SOLICITUDE FOR PREDOMINANCE IN THE MEDITERRANEAN.** By General D. von Mierka, former Hungarian army. Refers to continually increasing causes of irritation between France and Italy, all of which tend toward an alienation of friendly relations between the two countries. The principal source of irritation is naturally naval domination of the Mediterranean waters between the Mediterranean shores of France and Italy and their respective North African colonies which, the writer states, has reached the point of either a friendly adjustment or a bitter rivalry that may lead to an outbreak. He is of the opinion that the naval strength of the two countries is practically on an equality but that the advantage, in case of a conflict, is materially in favor of Italy whose naval forces are concentrated in well known home waters while France would, in addition to its Mediterranean ports, be obliged to protect its exposed Atlantic ports and many distant colonial regions in different parts of the world. Allusion is also made in this article to what the writer calls "the phantastic canal project—le Canal Maritime de Languedoc"—between the mouth of the Garonne on the Atlantic northwest coast of France and Narbonne, near Marseilles on the Mediterranean, which, he states, is receiving serious attention in France. Tentative estimates of cost of a canal of sufficient capacity for passing 10,000-ton cruisers range between 750 and 500 million dollars.

THE INTERRUPTED AIR LINES OF THE BRITISH EMPIRE. A writer over signature "U" refers to an article published in the "Daily Mail" in which General Groves, who is general secretary of the Air League of the British Empire, calls attention to consequences resulting from failure of the British to foster the development of the civil aviation industry. He cites, among many other cases the fact that Russo-German interests have crowded Great Britain out of Persia, that farther in the East Holland's interests are threatening English air lines toward Australia, and that even in near-by Ireland German undertakings, assisted by German shipping interests, are getting a foothold. He also calls attention to the great movement in the United States, Germany, and France for establishment of airplane ocean mail routes and sets forth the detriment likely to result to

English trade in the near and far East and in South America by British indifference and negligence in this direction.

SERVICE AT THE FRONT. By "K." While admitting that the book market is so overstocked with books, pamphlets, and writings on military subjects that it is impossible to acquire and read all of them, writer calls attention to a recently appearing book on the above subject by Lieut. Colonel Max von Schenkendorf of the 8th Prussian infantry regiment which he says is indispensable to and should be in the hands of every officer of the German Reichswehr.

No. 43, May 18, 1928. **ARMY CAVALRY IN THE WAR OF MOVEMENT.** By Major General D. von Borries, German Army, retired. From an extended review of this work by Lieut. General von Kayser, German Army, who is the Inspector of Cavalry, it is quite evident that the opinion expressed by him in the concluding paragraph of his review is fully justified when he says: "The cavalry arm can express its appreciation of this author's work in no better way than by earnest study of the actions described by him. Only he who fully comprehends and clearly values the lessons of the past and recognizes the peculiarities of the cavalry arm that must be taken into account in the proper application and use of army cavalry, can control it and make use of it as a necessary working tool and develop from it the art of leadership." The book is divided into three parts and provided with 46 sketches and an appendix. Part I covers the campaigns of Frederick the Great in the seven years' war and those of the First Napoleon up to Waterloo. Part II shows how the lessons taught and which ought to have been learned from the campaigns described in Part I were neglected or forgotten until revived to some extent by examples of the American civil war where cavalry was again charged with its proper functions of reconnoitering, screening our own and disclosing the enemy's movements and in raids against his rearward communications as well as in battle. The third section takes in cavalry in the World War. The author of this book is a most enthusiastic champion of the cavalry arm and gives many convincing reasons for his contentions that cavalry has not yet ceased to be an important factor in military operations.

No. 44, May 25, 1928. General von Taysen, in a brief synopsis of the new "Fighting Regulations for the French Artillery"—"*RECLEMENT DE MANOEUVRE D'ARTILLERIE, 2E PARTIE, L'ARTILLERIE AU COMBAT*," says that although these regulations were approved by the War Ministry in 1926, they have only now been officially adopted and promulgated. The commentator holds that the fundamental principle underlying the new fighting instructions for artillery is its use within the scope of all other arms and its adaptation to and accord with their several fighting regulations. To accomplish this the French have not hesitated to make use of what may appear to be reiterations and unnecessary repetitions in the wording of their instructions. The German impression has been that a certain degree of slowness—deliberation—is inherent to French higher leadership which tends to restrict independence and initiative of subordinates. But deliberation is a relative conception. The Frenchman displays a logical consistency in his conception of the character of the modern fight and it is not, therefore, surprising that handling French artillery is governed by the same precept. This is first manifested in his distribution of the artillery. The division has only

the artillery that is designed primarily to assist the infantry: one regiment field guns (3 detachments of 3 batteries each), one regiment 15.5-cm. howitzers (2 detachments of 3 batteries each). The corps artillery is, thanks to arrangements for early deployment and careful approach against the opponent, expected to arrive in time for fighting enemy artillery. This accounts for the organic composition of the corps artillery, consisting of one horse-drawn heavy artillery regiment of two 10.5-cm. guns and two 15.5-cm. gun detachments. Only the army artillery is differently made up to meet varying requirements for army use and for any possible reenforcement of corps and divisions. French higher army direction has at its disposal a very numerous artillery reserve that includes guns of a great variety of calibers from the 6.5-cm. mountain gun to the 37-cm. railway carriage cannon. In that reserve the 7.5-cm. and 10.5-cm. guns, as well as the 15.5-cm. howitzers, are loaded throughout on trucks on which they are brought by tractors up to the firing positions. The remaining heavy artillery is in part horse-drawn and in part on self-propelled gun carriages, tractor-drawn or carried by caterpillar tractors. Antiaircraft artillery comes in only from the corps up. The eager search for centralization of direction must not be taken as the sole purpose to be achieved. The Frenchman looks upon the artillery in one sense as the working tool of the leadership by means of which a definite influence can be exerted on the development of the fight—"the artillery is, even after it has been brought into action, constantly in the hands of the leadership, as is the case with no other arm." A result of this is that fundamentally there is substituted for continuous firing on scattered targets a short, energetic, and closely held together fire that strikes now here now there and leaves the enemy in constant uncertainty.

The regulations urge that advantage be taken of every opportunity for concealment but it is to be sought less by cover under artificial contrivances than by use of natural cover facilities. But little weight is given to camouflage and that is to be resorted to only where natural—active—cover is wanting. Among means for active concealment mention is made of changing positions, erasing wheel tracks of approach, misleading the enemy, search for young undergrowths that do not disturb the firing outlook and which are not usually indicated on maps, concealment in large villages.

Great importance is placed on ample, prompt, and continuous supply of ammunition and avoidance of anything that might interfere with that by obstruction of routes of supply. In connection with that it should be a maxim that when there is a meager supply of ammunition firing should not be slowed down but kept up by vigorous fire at short intervals. The higher artillery leader should acquire knowledge of the prospective field of artillery action by flying over it.

CONQUEST OF THE AIR. By General Niessel, French Army. The editorial management expresses its thanks for a copy of this work from the French author. An analysis of its contents is given by a writer over the signature "61."

INTERNATIONAL ASSOCIATION OF "FIGHTERS ON THE FRONT." By August Abel. Writer gives a list of various organizations and associations of active participants, on the entente side, in the World War. At their head stands "Fidac"—"*Federation Interallié des Ancienne Combattants*," comprising 32 front fighter associations: namely, 4 Belgian, 8 French, 1 English, 1 Italian, 1 American, 7 Polish, 1 Portuguese, 5 Rumanian, 1 Yugoslavian, 3 Czechoslovakian. The most important among these are: the American Legion, 700,000; British Legion, 500,000; 8 French,

1,079,500; Italian, 518,557. The Rumanian associations number 150,000, the Servian, 138,000. The declared aim of "Fidac" is preservation and fostering of the comradeship between allied participants in battle fields of the war and mutual service in peace. Writer mentions additional details of the aims and purposes of the various organizations above named and of their relations to the governments and people of their respective countries.

Wissenschaftliche und Technische Mitteilungen (Scientific and Technical Reports),
Vienna, Austria, March-April, 1928.

APPLICATION OF ARTILLERY IN THE 11TH ISONZO BATTLE. By Lieut. Col. Rudolph Heinzl, Austrian Army, 4 sketch maps. Writer contends that while the great battles of the World War on other fronts have been and are still engaging post-war literature, the gigantic struggles of the Austro-Hungarian forces contending against an opponent overwhelmingly superior in numbers and equipment, do not appear to be adequately appreciated. He confines his description of this battle almost wholly to the part taken in it by the artillery.

FRENCH ARMY STRENGTH IN THE WORLD WAR. By Colonel Rudolph von Xylander, German Army. Gives information about strength and distribution of French forces in the World War, obtained from a recently published War History of the French 13th Infantry Division. The average fighting strength of the field army was 2,120,000 men in 1915 and 2,210,000 in 1916. It was reduced in 1917 to 1,702,000 due in part to loss by casualties not replaced and to withdrawals of men from the ranks to farming and war industrial purposes. For 1918 rigid search was made of the contingents of young men of April, 1898, "with a fine toothed comb" and exhaustive drafts of colonial colored troops to keep up a semblance of military organization with depleted units.

THE MILITARY RAILWAY SYSTEM OF THE WORLD WAR IN GERMANY AND AUSTRIA. By Engineer General Emil Ratzenhofer. Conclusion of an article on this subject begun in a previous issue. Writer gives a detailed description of the foundation and operation of Austro-Hungarian and German railways in preparation for and during continuation of the World War.

THE LIGHT MACHINE GUN "BREDÁ" (Italian). Extracts from a translation from the *Società Italiana Breda* describing the construction and special functions of this Italian machine gun, with three photolithographs showing the gun in firing positions and other drawings giving separate details of its parts. By Colonel of Engineers Leo Pumerer.

TANKS and MODERN ANTI-TANK WEAPONS. Two articles by Major Fritz Heigel, Austrian Army, retired, now Principal Assistant in department of Army Technical Instruction in the Technical High School at Vienna. His articles in this issue are a continuation of essays on tank construction and operation published in previous issues. In this number he alludes to and gives brief descriptions of tanks now in use and of recent adoption in Italy, Russia, Poland, Sweden, Czechoslovakia, and Spain.

In the last article he again takes up his favorite subject of tank-resisting weapons. Among them are the 13.2-mm. Hotchkiss on light field carriage support, with illustration of gun in firing position; the Holland 2-cm. gun, also with illustration; the 37 and 47-mm. infantry gun "Bofors"; the automatic 2-cm. Holland gun; and the new 70-mm. Schneider infantry gun, all with illustrations of guns in firing positions.

This writer is the author of two books on tank subjects, *Taschenbuch der Tanks* of 1926 and a supplementary volume on the same subject issued in the Spring of 1927. He is also a frequent contributor to the *Technische Mitteilungen* and other German military journals of articles on tanks. A careful examination of his books and contributed papers furnishes convincing evidence of his thorough knowledge of everything pertaining to tank construction and operation. The text of his writings and books and of the illustrations accompanying them indicate very clearly that he has had access to and has utilized sources of information bearing on tanks and lead even the casual reader to believe that there is not a rivet, bolt, lever, or other mechanical contrivance and appliance used in tank construction that is not known to him. It is also quite apparent that he is an intelligent and careful student and persistent follower up of official and unofficial reports and publications describing maneuvers and exercises in which tanks have been used and tested by military powers everywhere and that he has been an attendant at some of these tests. Another impression conveyed by his writings is that since manufacture and use of tanks is prohibited to Germany and Austria it is of greater importance to the military establishments of those countries to learn all that can be known of the construction and operation of an arm that might possibly be used against them because thorough knowledge of everything pertaining to it is essential to successful resistance against it and of the use of weapons for its destruction. In some of his earlier writings he gave the impression that there was a manifest feeling of indifference among officers of the German and Austrian armies to anything pertaining to tanks and it was his purpose to awake in them an interest in an arm that was bound to play an important role in any future war.

THE "DEUTSCHMEISTERS"—a popular regiment of the former Austro-Hungarian army whose home station was Vienna. By Auffenberg Komarow, former Austrian War Minister. Writer is the author of an historical work giving a history of the organization and activities of this famous regiment which was organized more than 200 years ago and has always taken an important part in every military affair in which Austria has been engaged since that time. The history of the regiment shows that during its service it participated in 500 engagements and its casualties were 4000 men killed in action and 20,000 wounded and missing. It left Vienna at the outbreak of the war under the tumultuous acclamation of the population of the entire city where it had always been a popular favorite. When the Austro-Hungarian debacle made further resistance in the field useless its depleted and shattered remnants, still holding together in the midst of the disorganized mob of a dissolved army, returned to Vienna to be met on its arrival there by the announcement "the regiment is dissolved" and its skeleton units, on disembarking from the railway carriages, were welcomed by derisive jeers, curses, abusive and insulting shouts, and even active hostilities of a fanatical communistic bolshevik rabble of stay-at-home dregs of the Vienna underworld which was then in possession of the city. Some of the men of the former regiment

have found a refuge in the 4th infantry regiment of the present Austrian national army where they will have an opportunity to cherish and transmit the glorious traditions of the old "*Deutschmeister*" organization.

Allgemeine Schweizerische Militar Zeitung—Journal Militaire Suisse. May, 1928.

THE INFANTRY PLATOON IN THE FIGHT. By Major H. Frick, Commanding Fusilier Battalion 98. Writer discusses functions of the leaders of subordinate infantry units due to changes made necessary by introduction of the light machine gun in attack and defence. Illustrated by numerous diagrams.

REPORTS FROM THE SCHOOL OF FIRE. Editorial. Subject: *RICOCHET SHOTS.*

MILITARY TRAINING AND EDUCATION OF OUR YOUTHS. By Lieut. Walter Höhn, Rifle Company No. 1. Describes the development of various systems of military training that prevailed in former ages in Switzerland up to the present and states that they have attracted the attention of nations in Europe and some of their characteristic elements found frequent adoption.

NOTRE DEFENSE ARIENNE. (in French) "*L'AVIATION DE CHASSE.*" By Lieut. Ernest Naef, Capitaine Mitrailleuse Compagnie. Refers to recent air maneuver exercises held in March between the 3d escadrilles of observation and the 3d of pursuit and their interesting lessons. Make mention of the great interest taken in development of military aviation in European countries and the necessity for its study and practice by the Swiss.

ON WAR PSYCHOLOGY. Verbatim publication of a lecture on this subject delivered by Sanitary Captain Kielholz to the Officers' Association at Brugger in March, 1928.

THE SWISS MILITARY PENAL LAWS AND REGULATIONS. By Colonel Eugster, Supreme Judge Advocate of the 5th Division. Continuation of a subject begun in a previous issue of this journal. Writer comments on and criticises military penal regulations now governing the Swiss military establishments.

MAXIM XXXI

When you determine to risk a battle, reserve to yourself every possible chance of success, more particularly if you have to deal with an adversary of superior talent; for if you are beaten, even in the midst of your magazines and your communications, woe to the vanquished.—Napoleon's Maxims of War.

BOOK REVIEWS

Tamerlane, The Earth Shaker. By Harold Lamb. New York: Robert M. McBride and Company. 1928. 5¾"x 8½". 340 pp. Ill. \$4.00.

When Harold Lamb brought out his book on Genghis Khan he set himself a high standard to follow. His present volume is equally absorbing and colorful and is, in many respects, more important than the earlier work. The career of Genghis Khan was not altogether unknown to us of today. To be sure, his biography had never been suitably written, but as the founder of the great empire which endured to the times of Kublai Khan, as leader of the great disciplined hordes that spread over Europe and Asia, he could not be overlooked. On the other hand, Tamerlane, the last of the world conquerors, has never received the attention his career deserved. Little has ever before been written in English on this man who, through his own efforts, rose to from comparative obscurity to the rulership of all Asia, save only Cathay, toward which he was headed at the time of his death.

Unquestionably Tamerlane deserves to be ranked among the greatest of military leaders. Skilled both in tactics and in strategy, his success in battle was unbroken after the start of his rise to power. More fortunate in his choice of a wife than most of the greatest leaders, he received encouragement when it was most needed. Possessed of excellent judgment, he administered civil affairs with a skill equal to his military ability. But like practically all of the great leaders, he was unable to build his empire on a foundation sufficiently stable to withstand the shock of his death.

All this Mr. Lamb points out in no uncertain words. He has given us another great book, direct, lucid, and absorbing. Tamerlane, vigorous and positive, is presented in a vigorous and positive manner. The value of the book is augmented by extensive bibliographical notes and, above all, by an index—which most authors today seem to consider unnecessary. No military man should consider his library complete without having this dramatic narrative of the career of Tamerlane in it.

Condensed Military History of the United States. By Colonel H. E. Cloke. Cambridge: The Technology Press. 1928. 5"x 7½". 305 pp. \$2.00.

There is in American military literature a void in the field of military history. To date, no one has ever set himself the task of writing the full military history of the United States. It is even doubtful that anyone has ever clearly stated what is meant by "the military history of the United States." Campaigns and battles, of course—but what else? Upton ventured into the field with a book which he called *The Military Policy of the United States*. Dawson attacked another phase in his *Battles of the United States*, a phase which was repeated by

Carrington in his *Battles of the American Revolution* and which was extended by Steele in his *American Campaigns*. Now Colonel Cloke goes a step further and adds a thread of continuity to our campaigns and battles which the other accounts do not possess, but it does not seem that the term "Military History" should yet be applied. Findlay makes the same error in his *Outline of the Military History of the United States*.

There is more to our military history than campaigns and battles. Surely the history of the Army and of its peacetime accomplishments is a part. Equally, the military policy of the nation, its attitude toward professional armies, its methods of raising and maintaining armies, its military laws, its conception of the part the Army should play in its national and international affairs should be included. It would also seem that the causes of our wars and their results in our economic life deserve a place in military history; and it is probable that the wars which we did not fight are fully as important as those we did.

Of course, campaigns and battles must be studied, particularly by the military neophyte, and of these Colonel Cloke has given us an admirable "general guide and background," to which he has added an extensive bibliography. The space limitations which he set himself—probably induced by the time limitations imposed upon the R. O. T. C. schedule—has required so complete a condensation that his book is really an outline synopsis of American wars. It is suited to its purpose and will be of benefit to any officer working in military history. It begins with the colonial period and ends with the close of the World War. It finds for itself an unoccupied place in our literature, but it should be elaborated. With such an excellent start, it is to be hoped that the author will set himself the task of preparing a military history which will be more than an account of campaigns and battles and which will not require use of the word "Condensed" in the title.

Artillery: Today and Tomorrow. By Colonel H. Rowan-Robinson. London: William Clowes and Sons. 1928. 5½" x 8½". 84 pp. 5s.

"The British Army can and should be wholly mechanized"—this is the assumption on which the book is based.

The author sees in India a stumbling block to mechanization, conditions there being unfavorable. But he goes ahead with a discussion, in chapter after chapter, to prove the necessity for mechanization and to discuss conditions of warfare with a mechanized force. "The presence of infantry in a land battle is anachronism. During the hybrid period, which is necessarily of long duration, it has, however, to be accepted." But "the best antidote to the tank is the tank," and the tank naturally grows into a gun-carrying vehicle. This is the future, he thinks, of all artillery in the field—and it must be commanded from the air.

For the defense of coastal fortresses he sees great possibilities in the airplane, but—"at present the aeroplane . . . is made less efficient than the gun for the special duties involved in the defense of a coast fortress."

A book of interest to all branches of the Service.—S. M.

Alexander: A Romantic Biography. By Konrad Bercovici. New York: Cosmopolitan Book Company. 1928. 5¼" x 8". 335 pp. \$2.50.

While Lamb is establishing a chronological bracket with his biographies of Genghis Khan and Tamerlane, Bercovici takes advantage of the opportunity to write the biography of their only approximate contemporary in their class in the fields of leadership and military accomplishment. In many respects Alexander had a marked advantage over both Genghis Khan and Tamerlane. Born to leadership, he had a following from the very first. He was never reduced to the condition of Genghis Khan, who at one time led only a small family group, nor of Tamerlane, who at one time could count his followers on a single finger. Yet in the end he had accomplished no more than they.

The author, a Roumanian who is fluent in eight languages, strips much of the glamor from the life of Alexander. Instead of the natural born military leader urged on by a destiny which will not be denied, we find him a harrassed young man of tremendous breadth of vision being ever spurred forward by the insatiable ambition of two women and yet, at the same time, hampered by them, neither of whom understood him. His mother, Olympias, the red-haired daughter of an Epirotic king, hating his father, the gross Philip of Macedon, had but one real aim in life. Alexander should become so great, so famous, that he would wipe Philip's name from the pages of history; Philip should be known only as the father of Alexander. Her life was devoted to the fulfilment of this ambition, and Alexander's entire training had this end in view.

When the Macedonian army defeated Darius, the king of kings of Persia, Statira, daughter of Darius, became a factor. Since Alexander had defeated the greatest of all kings—her father—he must now continue to conquer the world and thus prove himself greater than Darius. Nothing less would satisfy her.

Driven by two women who worked at cross purposes, we see Alexander, temperamental, subject to fits, fond of women and wine, pass from one victory to another. A great strategist, an expert tactician, and endowed with the qualities of leadership, Alexander had his own vision which he pursued to the end of the world and returned a haggard veteran at the age of thirty-three.

It is with a sense of disappointment that we finish the book—disappointment in Alexander himself. We feel that he has not risen superior to his surroundings, that something has been lacking in his character to make him truly great. He accomplished wonders, to be sure, but he failed so to build his empire that it would hold together at his death. What might he not have accomplished had he had a sympathetic and understanding mother and a firm government at home?

It may be doubted that this is the Alexander the author intended to paint when he undertook his labors, but this is the Alexander we see. Written in popular style, the narrative is gripping throughout the volume. Alexander, disgustingly filthy in his drunken fits or gorgeously attired in Persian robes on a Persian throne or seated at the head of a banquet watching the nude women of a defeated enemy waiting upon his tables or marching at the head of his victorious army, ever in bold relief against a vivid background!

The book will be well received—but we still wonder if we have seen the real Alexander.

Janus: The Conquest of War; A Psychological Inquiry. By William McDougall. New York: E. P. Dutton and Company. 1927. 159 pp. \$1.00.

It does not appear who William McDougall is, save that he is English (or Scotch) and a psychologist—perhaps one should know the rest without being told. But he writes an admirable little book on pacifism. His demolition of many pacifist theories, particularly of the sentimental, non-resistance and disarmament-before-security schools, is as complete and cleancut a bit of work as can be found. Whether one agrees with his deduction as to the “only” way of preventing war—it is at least an original idea—or whether it appears fantastic, it should be admitted that Mr. McDougall’s analysis of the problem—the solution commonly offered—is made on a basis of clear, scientific reasoning.

His thesis is that the fear of aggression is not only the firm foundation on which armaments are built, but is, in the last analysis, the basic cause of war itself. On their probable ability to remove definitely this fear of aggression, he examines the various panaceas of the pacifist schools, applying to each these three tests—Is it desirable? Is it practicable? Is it likely to be effective? His conclusions are that prevention of war by “popular enlightenment alone is impractical, . . . that the public opinion of the world, even when focussed, directed and expressed by League of Nations and the International Court of Justice, will not suffice in itself to prevent aggression, . . . that treaties of arbitration are in themselves of little effect as guarantees against aggression, . . . that total disarmament . . . is undesirable and impossible . . . , that any considerable reduction of armaments . . . is extremely difficult, perhaps impossible, unless some guarantee against aggression can first be provided, . . . that economic pressure of effective degree cannot be surely brought into play for the . . . prevention of aggression, . . . that the expressions ‘International Law’ and ‘Outlawry of War’ are at present merely delusive terms, . . . that the abolition of nationality and nationalism is undesirable and impossible to bring about even were it desirable.”

This destructive criticism occupies seven-eighths of his short book. In the remaining pages he outlines and defends his own solution for peace—an international air force operating under the orders and backing the decisions of the International Court of Justice; the abolition of all national air forces; and an international agreement limiting all commercial aircraft to a speed of 100 miles an hour. And—oh, yes—he also says: “It might be judged desirable to ask the nations to forego the luxury of possessing antiaircraft guns; though in view of the ineffectiveness of guns against aircraft, that would hardly seem necessary.” (!)—S. M.

Kitchener: Soldier and Statesman. By S. Stuart Starritt. London: The Religious Tract Society. 1928. 4¾" x 7½". 156 pp. Ill. 2s. 6d.

Field Marshall Earl Kitchener of Khartoum, G. C. S. I., G. C. B., O. M., G. C. M. G., led an industrious and adventurous life in the service of his country and died a tragic and untimely death. Eight years in Palestine and Cyprus paved the way for his career in Egypt and the Sudan, where Kitchener earned his reputation as a man capable of accomplishing the impossible. His popularity

was such that Sir William Butler wittily remarked, upon Kitcheners' return to England just before the Boer War, that had the Customs officers searched Kitcheners' luggage they would surely have discovered a Field Marshal's baton.

To cram this eventful career in a hundred and fifty pages means the omission of much of importance in Kitchener's life. The inspirational value of his loyalty, his patriotism, and his distinct sense of duty, however, remain, and it is these characteristics which the author seeks to emphasize. The book is written primarily as an inspiration to boys, but the fact is not obtrusively apparent. The narrative possesses continuity, the language is simple, and the method of presentation is interesting. The volume amply fills its purpose and should be included in the list of books to be purchased this winter for the younger members of the family.

Spy and Counter-Spy. By Richard Wilmer Rowan. New York: The Viking Press. 1928. 5½"x 8¼". 322 pp. \$3.50.

The trouble with writing about spies is that the people who know most about them are not saying anything—for various reasons. Under this obvious handicap Mr. Rowan has nevertheless produced a readable book and a very fair treatise on the generalities involved. It would have been better had he quoted his authorities and far more interesting had he been able to go deeper into the details of spying and counter-spying. But that was where his handicap came in.

In several places he appears to have let his imagination get away from him, as for instance in his assumption that it was solely the lack of good intelligence which prevented the Allied fleet from going through the Dardanelles just after its attack of March 18, 1915. And there is also this amazing sentence: "Excepting Russia in the grip of the Okheana or its Bolshevik substitutes, or possibly India under the Mogul Emperors, it appears that no country or people has ever required so many spies per capita or suffered such generous official, semi-official, and purely officious espionage as the American nation today."—S. M.

Letters of Gertrude Bell of Arabia. Edited by Lady Bell. New York: Boni and Liverright. 1927. 2 v. 791 pp. Ill. \$10.00.

It is difficult to review these two volumes of letters without being carried away by admiration for their authoress. To say that Gertrude Bell was the most remarkable woman of her times is to put it mildly indeed. Scholar, poet, historian, archaeologist, art-critic, mountaineer, explorer, naturalist, diplomat, administrator—and an outstanding figure in all these lines of endeavor—she was a woman gifted with amazing energy, rare intellect, and flawless courage.

Her explorations in Arabia, Mesopotamia, and Syria before the war were made quite alone, except for her native guides and servants, under appalling conditions of hardship and of course at almost constant risk of life. But from them she obtained a knowledge of the tribes and a prestige with them which made her services invaluable to the British Army in Mesopotamia throughout its long and arduous desert campaigns. With the capture of Baghdad in 1917 began the great work in which she bore so large a part, the slow pacification of the country, the creation of the Arab State of Iraq, and its administration under British tutorage—

certainly one of the most extraordinary feats of statesmanship in history. Up to the day of her death in July, 1926, she labored at this task, indispensable to her British colleagues and worshiped by the Arabs.

Her life was one of high adventure, crowned by still higher achievements. Her letters give a clear-cut picture of western Asia and of British colonial administration at its best. They reveal a mind of outstanding cultivation, avid for all the interests which the world and its peoples can give, and humanized by strong affections and keen humor.—S. M.

With Malice Towards None. By Honoré Willsie Morrow. New York: William Morrow and Co. 1928. 377 pp. \$2.50.

John Brown's Body. By Stephen Vincent Benét. New York: Doubleday, Doran and Company. 1928. 342 pp. \$2.50.

Two excellent books of Civil War portraiture. The first confines itself almost wholly to Lincoln, his family, and his strange duel of affection and antagonism with Charles Sumner. Mrs. Morrow makes Mary Lincoln a person of more importance, both in intellect and in character, than she is usually credited with having been.

Benét's long poem deals in the main with pawns in the great struggle; but he gives some excellent sketches of Grant, Lee, Sherman, Jackson, Lincoln, and Davis.

Is it the influence of the movies, of vivid photographic presentation, which has brought about this era of portraiture books, both fiction and biography? They stand out in the mind's eye as clearly contrasted to the old style as does a good news-reel in comparison with a newspaper description of the event.—S. M.

Songs of Tropic Trails. By George Warburton Lewis. Philadelphia: Dorrance and Company. 1928. 5¼" x 7½". 78 pp. \$1.75.

One would not expect to find that the chief of the insular police of Porto Rico would be possessed of the light touch and delicate imagination of a poet, yet here is the proof. Colonel Lewis, veteran of Moro and Boxer days, is a world wanderer and soldier of fortune akin to Poe, Franck, and Christmas. San Domingo, Panama, Nicaragua, Porto Rico, Martinique, Haiti, know him, and it is of these tropic countries that he sings. Forty-eight poems, some short, some long, make up the present volume, and all echo the fantasies of a real poet.

MAXIM XL

Fortresses are equally useful in offensive and defensive warfare. It is true they will not in themselves arrest an army, but they are an excellent means of retarding, embarrassing, weakening, and annoying a victorious enemy.—Napoleon's Maxims of War.