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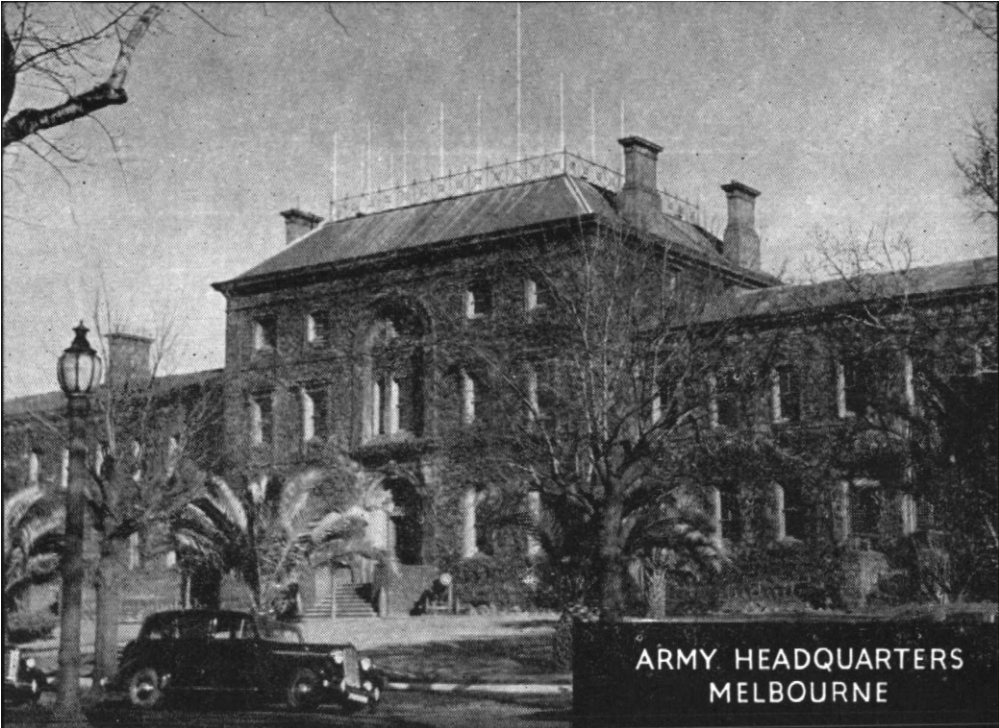
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AUSTRALIAN ARMY JOURNAL

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The STUDY OF WAR

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First Field Regiment, R.A.A.



PART 1 MILITARY HISTORY

Aim.

The aim of this paper is to discuss the effective study of Military History.

Around us the stage is set for the most catastrophic conflict ever, a conflict on which the degree of our survival will depend on our military efficiency. This paper examines the study of war and indicates the most effective way in which we can learn from the experience of others. There will not be time to learn from our own.

The Officer's Task.

The average officer is led sooner or later to realise that the only way he can make himself master of his business in peace-time is by the study of the history of war. No planned career can substitute for constant, enquiring, intelligent study. The modern officer has a three-fold task.

Technique.

Firstly he must be an expert in his own arm. If he is, say, in the RAAC, then he must study tanks; he must know quite a lot about physics, engines, suspensions, guns, ballistics and radio. He has to know so much about tanks that he is at home with any tank after a brief inspection.

Tactics.

Secondly he must be master of the employment of his arm in the team. He must be familiar with the organisation, tactics and role of every element of the armoured division, and of a tactical airforce. He must be able to control artillery fire and to understand fully the deployment of an infantry brigade. He should be able to carry out a staff appointment equivalent to his rank. In short, an officer has more to learn than he can handle in a 40-hour week.

Leadership.

These two divisions, technical and tactical, are still not enough. Any intelligent man, who goes to the schools of the given arm, to the Staff College, and who reads enough technical literature, can be a genius on tank design and unit organisation. To be an officer there is a third and all important requirement—an officer must be a leader, a leader who understands fighting. On the battlefield an officer can manage on a limited knowledge of an electric clutch, but he can do worse than nothing on a limited knowledge of war.

This knowledge can only come from a study of war in the past, combined with constructive thought on war in the future.

Study.

As time is limited study must be effective, therefore the first requirement is a system of study which ensures that time spent produces adequate return.

Why should a soldier study Military History? Can, for example, a junior officer learn anything from a close and detailed study of the Battle of Hastings which would serve him well commanding a self-propelled battery in a tank battle on the Kara Kum desert? Can a general, charged with the defence of the Northern Territory, draw conclusions of value from the siege of Syracuse?

Obviously there are no direct deductions from one battle which can serve as a template for another. Later it will be seen that there is a vast pattern of war, but there is not, and never can be, any formulae. History does not repeat its

minor details. What then do we require from the study of history?

Requirement.

This is a question to which the answer is clouded to a remarkable degree. The first, and usual, answer is "To become familiar with, and to understand, the principles of war." The second answer is "To be so familiar with all the possible situations in war that a correct solution of any battlefield problem is automatic." The dangerous part is that both answers are reasonably correct, so the real purpose of the study of war must be clear. It is this.

Aim of Study.

"To so develop the military judgment that in any situation at all the soundest course to achieve the aim can be selected and the correct orders issued to implement that course." That is all that has to be done, but it is a large undertaking and it is only human nature to seek a formula.

History Does Not Repeat.

A moment's reflection can show that no two battles can ever be the same. The forces at work are subject to too much variation. Some of the factors which always vary are there: Weapons—alteration in weapons means alteration in tactics and organisation. Ground—it is never twice the same even for battles in desert. Also there are weather, national characteristics, training, intelligence, and even the reason for the war. Overall are the personalities of the leaders. Battle is a struggle of will as well as of material.

Chance or luck would appear to play a major role, but this is not so.

It can be taken as axiomatic that fortune favours firepower and audacity; much of what is attributed to luck is in fact the ready response of a conditioned mind.

No battles then can be the same; they can hardly, except in a general way, be similar—despite the sickening resemblance of Verdun and the Somme. Consequently the deduction of principles from the past must be a major aspect of the study of history.

History.

There are a lot of misconceptions about history, but the main one is the idea that history is a unity. History in 1951 is not the summit of a long human effort by which man has raised himself from a primeval life in the jungle to the glory of skyscrapers, totalisators and consumer credit. History is the story of civilizations. The story is only continuous where one civilization is derived from a preceding one, and then it is not continuous as is a Shakespearian play, or a moving picture. Great civilizations rose and fell in the Americas without influencing or being influenced by the civilizations of Asia.

Civilization.

Civilization and history commenced only 6-8000 years ago, when the desiccation of the steppes drove some men into the river swamps along the Nile, the Euphrates and the Hwang-Ho. Here was no hunting and fruit-picking, man had to get his bread by the sweat of his brow; here under the stimulus of toil did man for the first time start to reach up; for perhaps 300,000 years before he had made but limited progress.

Consequently when reading history we must read it against the background of the civilization it describes. There have only been 19 civilizations and very few of them came into contact with each other, and even fewer are directly related as is the civilization of Western Europe related to the civilization of Greece and Rome. To underline the fact that history is not a continuous story it is well to remember that, in 1800 AD, England, in surgery, medicine, astronomy, general education and sanitation, was as far behind the standard of Babylonia 4000 years ago as Siam is behind Australia today.

The Historian.

The readers of history can be divided into three groups:—

- (a) Those who enjoy the fascinating story and who have no real interest in distinguishing between fact and fancy.
- (b) Those students whose revision and research is intended to complete the tale, remove inaccuracy and fill in the blank spaces. These are the historians.
- (c) Those who study history to trace the trends of the past with a view of projecting them into the future, whether the trends be in the legal, political, economic or military spheres. Of these students of applied history we are a part.

The Soldier and History.

The soldier is rarely a true historian, and therefore goes for his raw material to the works of others. A vital thing he must do then, is to evaluate correctly the reliability of his source.

Accuracy.

It is essential to be quite honest with ourselves on the question of accuracy. We have to realise that a lot of history has been written by men who were primarily engaged in grinding their own battle-axes. Those who could reply may have been dead, or may have replied in an untranslated book.

Most writers tend to inject their own opinions and prejudices into their subject; this is inevitable, and in most cases, such as H. G. Wells' "Outline of History," adds interest and flavour to the work.

The student of war must weigh carefully the opinions given in books published immediately after a war. It is most noticeable that few writers say "I made a serious mistake at . . ." and fewer still in their list of lessons learned say "If I had done so-and-so I would have taken . . . with fewer casualties." As many sources of information as possible must be balanced.

Official Histories.

In the same way the official accounts fail to give the real story. Many a commander has signed an instruction or issued an order for reasons not given in his unit or formation war diary.

This tendency of a commander to show himself in the best light is no new phenomenon with its origin in Caesar's account of the conquest of Gaul. Listen to this: "I am the destroyer of adversaries, whirlwind of the battle, annihilator of enemy peoples, conqueror of rebels. I shattered warriors like images of clay and opened up difficult paths."

That was Khammurabi, Emperor of Babylon, circa 1900 BC; and had

publicity been better in those days this would doubtless have provoked much cynical laughter in the Marches of Egypt. The same meaning, if not the same wording, has come frequently from the printing presses since 1945.

The Remedy.

Accuracy is a problem to the student. Private accounts could be coloured by the opinion of the author, whilst official documents give only the final orders and a description of the actual results. The points of real interest do not appear. What was said around the conference table? Records give the decision made, reasons are often distorted, omitted or added to in the light of after knowledge. What was the weather like, the reconnaissance, the calibration of the artillery, the standard of the last draft of reinforcements?

Rarely in a commander's orders is there mention of pressure on him from his superiors, or of reluctance by his subordinates. These gaps can only be filled in by imagination, and such a military imagination can only be developed by a long study of wars and of the men who fight them.

Geography.

The next problem which faces the student of military history is to decide upon the amount of detail it is necessary to read. On the one hand there are the official histories with the hour by hour lists of the location of minor units, and on the other hand are personal accounts containing vague generalities omitting any comment on days of fighting.

The desire of most readers to find

out as much as possible once a start has been made leads usually to the assimilation of too much detail, with the consequent result of failing to see the tree because of its leaves. Not much detail need be studied if the account is read in conjunction with a first-class map.

Physical Features.

The influence of geography on war is profound. Geography decides obstacles and communications, prevailing weather, and local supplies, and a host of other factors which vitally affect war. The story of a battle without a clear visualization of the terrain is like a record without a gramophone.

Unfortunately good maps are scarce, except in official histories, and even a good atlas tends to be on too small a scale. The great majority of war books contain small maps which are mostly diagrammatic; they do not show the physical features; indeed very few of them show all the towns and rivers and roads mentioned in the text. In the same way the scale of the map is important. No one is going to learn much by studying the 1941 battles in Russia on a 5 in. x 7 in. map, as appears in the standard type of book. Consider an invader moving on Sydney from the north. The usual book would show Sydney as a small shaded square being menaced by arrows. The real decision for Sydney would be taken out near the Hawkesbury and Nepean Rivers. Sydney would not be another Stalingrad, the Parramatta River is no Volga. The towns immortalized in the history of the future would include Brooklyn, Wisemans Ferry, Windsor, Richmond, Kurrajong, Springwood and Pen-

rith. These are the towns which control the Northern Marches, and these are the towns which would hardly appear on a small-scale map, whilst their significance is not really apparent on a school atlas.

Remedy.

When a book lacks maps it must be read in conjunction with the best available atlas. If an atlas does not give a reasonable picture of the ground then the student must perforce to the library, where books on previous or subsequent wars may contain suitable maps, or, failing books, a long search through military and travel magazines is the final resort.

Detail.

Study of the minor detail of a battle is a waste of time without a contoured map, and then usually only justified when minutiae is required for a specific purpose. Such study is usually in the realm of historical research, but military applications are the investigation of operations to decide the pros and cons of, say, four platoon companies, or the need of a support battalion in the lorried infantry brigade.

The Principles of War.

The newcomer to Military History is impressed always with the necessity of being familiar with the validity of, and application of, the principles of war. With the need for familiarity there can be no argument. However, the would-be student must be clear that the principles of war alone are not enough. To know ten or a hundred examples of the application or non-application of the principles does not make a tactician or a strategist. To memorise the Concise Oxford Dictionary,

and to take a correspondence course in journalism, does not make a Shakespeare or a Peter Cheyney.

The principles of war are as necessary to a soldier as is a rifle to a sniper. As the sniper uses the rifle as part of his organism, unthinkingly, unhesitatingly, and automatically, so then must the strategist use the principles of war. They are a means to an end.

Examination of the Principles.

Let us examine the credentials of these plenipotentiaries of victory. At the moment we have ten principles; some have been in the list for centuries, others are included and excluded according to the views of the soldier of the hour. All ten are sound. Disregard of any of them will almost certainly lead to trouble, but some tend to be redundant, while there are other important principles not included in the list.

Administration.

If there is a failure of administration there will certainly be a failure of the relevant operation, but that does not make it a principle. If a complex night attack is carried out with untrained soldiers there will even more certainly be a failure, but training is not a principle. It is so obvious that a military operation must be planned within the means available that inclusion of administration as a principle is open to question. A motorist would not go driving on a garage holiday with an empty petrol tank, but he might coast down hills or exceed the speed limit; his administration is axiomatic, but his Economy and Security are matters for his balanced judgment. Similar argument can be used against Flexibility and Co-

operation. There are other factors which merit consideration as principles.

Propaganda.

In the world today a major effort is being made in the propaganda field. From the great nations down to the soap maker there is a constant torrent of words—reasoning, hectoring, exhorting, appealing to us to believe this or to buy that. Propaganda is big business; it is most important international business. Although propaganda is closely related to morale, morale is the derivative not the principle. Propaganda could well be listed as a principle with the aim of gaining and maintaining public goodwill. The vital military significance of fifth column activity or of determined national unity is obvious. Propaganda is more important than morale, which is too narrow in its meaning and too circumscribed in its application. The military use of propaganda must be on a large scale. It is a war in itself, permeating the fabric of society from the nursery to the battlefield, and reaching out to ally and to enemy alike. Long and effective propaganda can destroy nations. In 1940 France was defeated by a lack of unity and a loss of faith, the pace of the panzers alone would not have been decisive. As General Fuller points out, there is no justice in blaming Gamelin, Weygand or Pe-tain; they were not corpse raisers.

The conquest of Khorasm by the Mongols was a perfect example of the effect of even a little propaganda on a people who had lost faith. Khorasm in 1215 presented a nasty similarity to some of the units of the Western Civilization in 1951. It was the disunity, lack

of moral standards, selfish greed, submissive treachery, and the faint-heartedness of the people which did more to conquer Khoresm than did the speed of the disciplined tuman or the might of its long curved sword.

Simplicity.

The most striking feature of all the decisive battles of history is that they were won by the rapid implementation of a simple plan. Austerlitz is perhaps the only exception. Without simplicity there can be no flexibility, and co-operation is difficult. Simplicity could be classed as a principle.

Audacity.

Audacity is usually the basis of spectacular success in war, and is obtained by a combination of speed and surprise, by the application of true generalship. Audacity is that quality which distinguishes between the Wavells and the Grazianis, between the Lees and the Burnsidés. It is too complex to be considered as a principle, but it is a fundamental attribute of the successful commander.

Psychology.

Knowledge of psychology is essential to the comprehension of both politics and history, and is basically essential to the comprehension of war. Psychology is the science which deals with the nature of the mind and with human behaviour; human behaviour is depressingly similar irrespective of nationality. Any national difference is due to environment, to the influence of the ground and its people on the growing child. New-born babies in Tula or Manhattan have the same potential.

The widespread tendency to iden-

tify geographical areas with typical people, or with a typical person, is one of the most pernicious features of modern nationalism. Few would accept Uncle Sam or John Bull as typical of the United States or the United Kingdom, but the use of these symbols prove that the vast majority attribute to the State many of the characteristics of a human being. The effect of this fallacy on international relationships since the French Revolution has been profound. The effect of it on armies is equally profound; when a soldier can be led to believe that he himself is the embodiment of his national characteristics, a fanatic is born.

Wars are made by and fought by men, and the result in war is the result of human behaviour, both in the mass and in the individual. The effect on destiny of men such as Churchill, Lincoln, Napoleon or Jenghiz Khan needs no elaboration. The point of importance is for the student to decide the relation between the leader and the led. Is the leader a single figure who inspires and dominates those who do his bidding, or is he the focal point, the figurehead of a mass movement. Which was Hitler? Success in war seems usual in the second case; the revolutionary levies at Valmy in 1792 fought better than did the Foreign Legion in Syria in 1941.

Related to the effect of psychology on war is that some of the momentous actions in history have arisen from minor causes, from court intrigue, from personal antipathy between officers, and often from the greed for power which, with some men, matters more than God, country or comrades' lives.

Psychology is sufficiently important, then, to require serious consideration by all soldiers.

It is stressed that these paragraphs are not intended to decry the Principles of War—far from it. Principles alone are not the goal of study.

The Elements of Battle.

The art of generalship then is more than a knowledge of the Principles of War. A sure strategic touch is a combination of many factors. In the technical direction of battle only three things matter. Battles are won by the correct relation of SPEED, SPACE and FORCE. These elements are not principles, they are attained by the application of principles.

Speed.

Speed in war is not only miles per hour and the power-weight ratio of cross-country vehicles. It is the product of study and training. It is an attitude of mind. The operations of J. E. B. Stewart, Sherman and Von Kleist show the performance of commanders who understood speed.

Space.

Space can be defined as the three-dimensional zone from the main support area to the front which is dominated by the armed forces of a theatre deployed along the Axis of Decision (Napoleon's Line of Operations).

The movement of armed forces must be in sufficient space to ensure that the objective is not approached so directly that the defender can concentrate to counter the move. The German drive on Stalingrad, and the Allied advance to the Rhine are the two extremes

of a misconception of Space. The US operations culminating at Okinawa are classically correct.

Force.

Force on the Axis of Decision must appear overwhelming, yet Force is best used as a threat. With modern weapons the strategic attack must be combined with tactical defence. The German conquest of France in 1940 is a shining example.

The Elements of Battle will be elaborated in a subsequent paper.

Handmaids of History.

The study of history relative to our given aim cannot be divorced from the study of people and of geography. Little value can be obtained from the contemplation of a battle apart from its social and political setting. Therefore the student of military history must extend his research into other fields. Modern wars are essentially political, and the decision is still taken on the ground.

Politics.

Politics is defined in Oldham's Dictionary as "the whole system of principles and forms of administration concerned with the theoretical and practical aspects of social organisation." This is quite a sweeping statement; for military purposes something more definitive is required. We assume that politics means those actions of an area in matters of state which direct its internal programme and its relations to external areas.

Geography.

The same dictionary says that Geography is the science which deals with the description of the earth's surface. This is acceptable.

The aspects most necessary to the soldier, topography and communications, have been discussed above.

Political Geography.

Political Geography is a dish of Geography and politics liberally salted with history. This subject receives little attention in Australia, and it is worth while to consider why. There are two main reasons, and one is ignorance. The great majority have either never heard of it, or have heard vaguely of its use by the Germans. The usual reaction to the strange is one of suspicion; further, it is thought that this field of knowledge is of very recent development, and is therefore on a par with other pernicious modern 'isms. Of these the most important is the association of Political Geography with Nazi plans for world domination. It has been blackened as an instrument of evil, a pseudo-science closely allied with, and subservient to, the Herrenvolk and the Aryan superman, in which connection it was known as Geopolitik.

In fact Geopolitik is neither new, pernicious, nor pseudo. Science cannot be classified as Right or Wrong. Only the use to which a science is put determines its morality. Geography and Politics are two of the oldest studies of man. In the Cairo museum there is a map of the Sinaitic Peninsula dating from 1270 BC, whilst principles of politics 2000 years older are hewn in Sumeric stone. Combination of the two was first achieved by the philosopher, Immanuel Kant, in the eighteenth century. In the nineteenth century much development was done by Friedrich Ratzel, a German, and his contemporary, the Swedish Profes-

or, Rudolf Kjellen; but it was not until 1904 that Political Geography could be recognised as a science and was given a new dynamic conception.

In this year the British Geographer and Economist, Sir Halford Mackinder, addressed the Royal Geographical Society on a subject he called "The Geographical Pivot of History." The measured words of this erudite statement fell largely on uncomprehending ears, but not in Germany. The German who listened was Professor Karl Haushofer, who fought as a division commander in Von Mackensen's armies. He saw in this new science both a vindication of and a pattern for German plans. Misuse of Geopolitik by the Nazis is no more a reflection on its validity as a science than was the *Inquisition on the validity of Theology*. The German term, Geopolitik, is more appropriate than the American euphemism, Political Geography.

Geopolitics.

The study of Geopolitics is a vital and necessary corollary to the study of war. Particularly does this relate to the higher study of operations and to the education of those who may be called upon to formulate long-range plans. Geopolitics is a vast subject, and definitions differ widely. For the study of war we will define it as "The relation of a nation to its space." In its dynamic sense geopolitics is the study and appraisal of power, actual or potential. The basic tenet of the geopolitician is that all power stems from two factors, manpower and raw materials. It is no accident that coal, iron, working hours and transport are the foci of communist subversion.

The Pattern of War.

With this background it is possible to sketch briefly the outline of war, and to examine the commitments of the belligerents.

The Political Commitment.

Wars are of two types, total wars and limited wars. Limited wars have a way of becoming total, but limited wars have been plentiful. They range in scale from the manoeuvre campaigns in medieval Italy to the Russo-Japanese war of 1904. Total wars are exemplified by the Third Punic War, which resulted in the absolute destruction of Carthage in 146 BC, and by World War II, which ended in the almost complete destruction of Germany and some of her neighbours. The difference lies in the aims of the warring nations. In Korea the United States had appeared content with very limited aims, whereas in World War II that nation demanded the same from Japan as Scipio demanded from the Citadel of Carthage.

The Military Commitment.

A war, as distinct from battles in it, can employ two forms of strategy. These, from the writings of Clausewitz and Delbruck, are known as the Strategy of Attrition, and the Strategy of Annihilation. The decision on which to adopt is a result of the relation of Speed and Space. Should, for example, France and Belgium combine to declare war on a weakened Germany, then their correct strategy is one of annihilation. The core of German military power is the Ruhr. Considered in Space the Ruhr is in easy reach, the Germans would have to defend it, and the war would be one of annihilation on the frontier. In a

war declared by Russia on the United States, the Russian strategy would be attrition, a gradual remorseless grinding down of men, material and will. The two can be combined; Russia would employ a strategy of annihilation in Western Europe. The Normandy landing changed the last war, from a British viewpoint, from attrition to annihilation. It should be noted that usually a change from annihilation to attrition is the penumbra of defeat, as was seen in German policy in the 1914 war, and in the overthrow of Assyria by the Medes and Babylonians somewhat earlier.

The People's Commitment.

Wars are fought by people, and the prowess of people in battle is usually tempered by the will of their nation behind them. To fight, men must have faith in an ideal and in themselves. This is complex. Compare the tireless valour of the handful of British soldiers who conquered India, with the performance of the Italians in 1944. Here are great deeds done for an avaricious commercial company, and there is nothing done by a great nation in defence of its own homes.

The calculation, with accuracy, of national reaction to a hypothetical situation is not possible empirically. The ability to do it is the rarest trait of generals and statesmen. It is the hallmark of the great strategist.

The Nature of the Next War.

A full-scale war means total war, no aspect of the life of our society nor of any conflicting society, nor of any would-be neutral can remain unaffected by the struggle. In the past most wars were fought for gain, for property, territory or

trade. The next war will be fought for ideals, and for the survival of our civilization. The enemy takes over not only the bodies and possessions of the victims, but also their minds and souls. Defeat would extinguish our way of life to a degree where skilled archaeologists would have difficulty in reconstructing it. Our society would, in a few centuries, present as great a mystery as does the life of the Mayan Civilization. There still can be seen where the jungle has engulfed the massive ruins of Uxmal and Copan, but we know nothing of the men who once held back the tropic forests of Guatemala.

There is no reason to doubt that a materialistic civilization based on force and lies could not survive a thousand years. Technical progress would proceed in a spiritual vacuum. From a study of the past we can be forearmed in the future.

The Method of Study.

Some of the problems which confront the student of Military History have been examined, and it now remains to outline an effective method of study.

The only sure method of study is by a continuous series of appreciations of the situation. This makes study slow. The appreciations can be mental, certainly they need not be written out in detail, although it is nearly always essential to make short notes. After reading an account of a battle the student must be clear on four points:—

1. What each of the opposing commanders did, and why.
2. What I myself would have done in the place of each, and why.
3. What developments should each side have made for the next

campaign in the war, or should the victor have made for his next war.

4. What effect has this on the command and control of our army today.

This process involves an appreciation from the point of view of the opposing commanders at selected stages in each battle or campaign, and it is an extraordinarily difficult undertaking without a lot of practice. This is because we do not know accurately the bounds of the information available to each commander at the selected time. Also, we are in doubt, not only as to numbers of battleworthy troops, but on matters such as unit organisations and performance of equipment. Here again judgment and imagination play the vital part. Where there is a decisive difference in equipment, as in rifles at the battle of Sadowa, then the records stress this. Where the student must be careful is in expressions such as "Division" or "Regiment." For example, comparison of United States and British forces for desert warfare on an infantry divisional basis would give a totally false impression, owing to the number of organic tanks in the US division. On the desert—or the steppe—the tank is even more decisive than elsewhere. National variations in the significance of "Regiment" are even wider.

The Basic War.

The war which the student of Military History should use for his recruit training is the American Civil War, 1861-1865. This war is the most suitable on which to develop a systematic method of study, for the following reasons:—

- (a) It is one of the best documented wars, as the records

and explanations of both sides are written in English.

- (b) The records are very complete and are relatively accurate. This, be it noted, despite the fact that figures quoted in various accounts, particularly of numbers engaged, vary by as much as 50 per cent.
- (c) The accurate geography of each theatre is available.
- (d) The political situation was relatively simple; full details of it are available, and its full effect on operations can be studied.
- (e) The war was on a huge scale, and was fought over great distances, giving wide variation in terrain and communications. It is not generally realised that this war was fought out in an area as big as N.S.W. and Victoria, and that there were more casualties in some of the major battles than there were British soldiers at Waterloo.
- (f) The background, mentality and heritage of the participants was similar to our own.
- (g) Tactics were not subordinate to modern weapons, it being therefore easier to gauge the effect of theoretic alternative plans, whilst methods and manoeuvre were sufficiently modern to be intelligible today.

This war is strongly recommended as the Soldier's First Year with Military History; it gives the maximum data for the abstract study of war, and gives the new student a chance to formulate his own technique; finally it combines pleasure with business, as this is a war which occasionally appears in promotion examinations.

Conclusion.

Wars are won in the end on the battlefield. Here all the resources, the men, the material, the technique, the hope and the will of the warring nations meet, here all that can be done by the scientists and statesmen, the factory and the farm converge, here the ultimate decision is taken by men in hand-to-hand fighting. Battle is the pay-off; but the students of history and geopolitics have the best chance of writing the cheque. The nation whose leaders study war can converge the national effort onto the most decisive field.

The study of war develops a military way of thought, and an automatic application of the principles of war becomes part of the soldier's being, just as the rifle becomes part of the sniper. Thus the aim of the study of history is fulfilled, and the mental vision is stimulated to look over the hill, not only the shell-swept ridges of reality in front, but the shadowy ranges of the future beyond.

The advantages of successful war are doubtful; the disadvantages of unsuccessful war are certain. Real security lies in the prevention of war—and today that hope can come only through adequate preparedness.

—General of the Army, Omar N. Bradley.

★ NEW ★ AMERICAN EQUIPMENT

Extracted from Military Review, USA.

Steel Cartridge Cases.

The Army has announced that it is going to make cartridge cases out of steel instead of brass, to preserve strategic materials.

This is expected to save millions of pounds of copper and zinc in the course of large-scale production of cartridge cases for small arms and artillery ammunition.

The Army experimented with steel cases in World War II, but found that they tended to enlarge and split at the time of fire. Subsequent research has produced a steel case that performs as well as a brass case.

★ ★ ★

Bacteria-Free Plasma.

Blood plasma going to wounded Americans in Korea now is being made free of all types of bacteria through a newly applied technique of killing the germs by ultra-violet radiation.

In the last war, plasma was not irradiated, and many patients suffered infections, particularly yellow jaundice.

Helmet Replacement.

A new helmet assembly, consisting of an aluminium shell and shock-resistant plastic liner, designed to replace the present steel helmet and thin plastic liner, has been designed by the Army Quartermaster Corps and will be produced in limited quantity for field tests prior to standardization.

Fifteen per cent. lighter in weight than the present helmet, the new assembly is cut higher in front for better vision and lower in the back for neck protection. Unlike the present helmet and liner combination, where the principal protection is



afforded by the steel helmet, the impact resistance of the new combination lies principally in the liner. Preliminary tests indicate that the new liner, alone, affords as much resistance to shell fragments and falling objects as the present helmet and liner together. The aluminium shell, while affording additional protection, is intended primarily for use as a cooking utensil, shaving mug, and water bucket.

★ ★ ★

New Fire-Control System.

An improved radar fire-control system, which automatically will aim anti-aircraft artillery, contains an electrical "thinking machine" that calculates where a shell should be exploded to bring an enemy aeroplane down, and automatically aims the gun to do just that.

The new system, now being produced for the Army, is an outgrowth of the electrical gun used effectively during World War II. It can be used for firing either the 90-mm. or 120 - mm. anti - aircraft artillery weapons.

★ ★ ★

Anti-Malaria Pill.

Military personnel exposed to malaria will need to take only one pill a week instead of one a day as a result of a new anti-malaria pill.

During World War II, the standard anti-malaria pill was atabrine, which sometimes caused the skin to turn yellow. The new pill, aralen, is white, and causes no discolouration.

The treatment with the new pill is 2½ days, as against 7 days with the yellow atabrine pill.

Muslin Parachute.

A new expendable cargo parachute—made from strips of cotton muslin—has been developed by the Air Force. This 'chute will replace the old 24-ft. rayon cargo delivery parachute and—in clusters of three or four—is expected to do the job of a 64-foot nylon 'chute currently used for heavy cargo drops.

The cotton 'chute, costing only half as much as a rayon 'chute, will deliver 500 pounds of cargo from a plane travelling 175 miles an hour. Its rayon predecessor could handle only 300 pounds at 150 miles an hour.

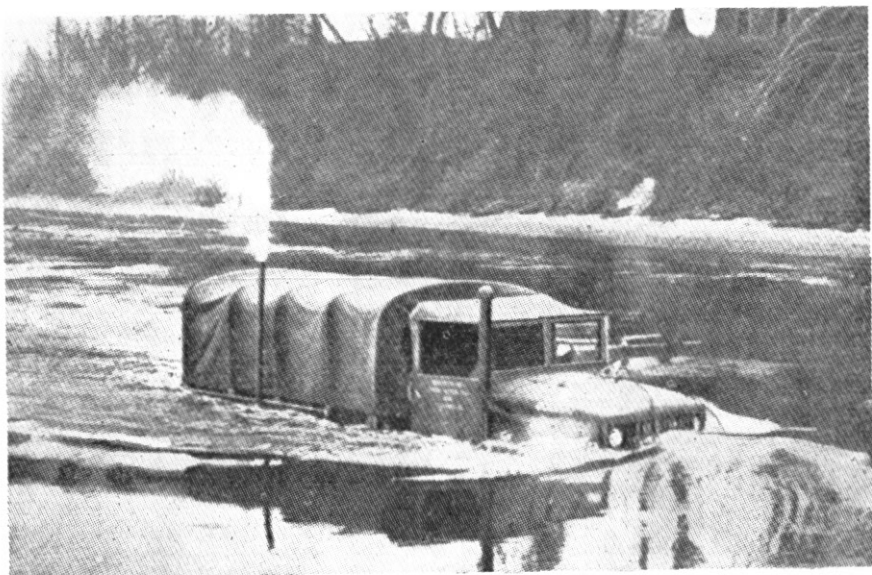
★ ★ ★

New Amphibious Vehicle.

The Army has awarded a contract for the production of its newest amphibious vehicle, the *Otter*. This vehicle, designed to travel in mud, through water, or over snow or land, is a bigger and better version of the World War II *Weasel*.

The *Otter* can maintain a speed of 30 miles an hour on land, carrying a two-man crew and a number of fully-equipped fighting men.





The Eager Beaver.

Details have been given of a new Army Ordnance vehicle designed to operate normally in sub-zero cold, blistering heat, or with its engine completely submerged in water. It's the "Eager Beaver," a 2½-ton truck powered by a 145-horsepower engine.

Tests by the Army Ordnance Corps have proved that the carrier will perform satisfactorily at 65 below or 125 degrees above zero, also with the engine completely submerged. A cruising speed of 60 miles an hour can be maintained on a straightaway road with a 5-ton load. It can also carry this same load up a 60 per cent. grade.

Carrying 2½ tons on terrain off the highways, the truck can cross a 7-foot-deep stream under its own power. This amphibian operation

is made possible by equipping the power plant with two 5-foot vertical extension pipes. One, known as "snorkel," is for air intake, the other, named "snorter," serves as an exhaust. Both protrude above water level.

As the engine is completely water-proofed, it is only necessary for the driver to keep his foot on the accelerator and his head in the air to proceed as though he were on dry land. The truck can be driven off a landing barge into surf and go into action immediately.

Direct power is delivered to all six wheels of the vehicle, which has a 154-inch wheelbase. The water-proofed engine can be shut off or started while submerged. All parts are treated to resist effects of dust, water, corrosion, and fungi.

Don't jump to tanks



Lieutenant-Colonel William R. Kintner, US Army.

DURING the first critical summer days of the Korean war, marked by the long retreat back to the Pusan bridgehead, the Soviet-made T34 tanks used by the North Koreans were a formidable menace. The impressive gains made by the North Korean tanks inspired considerable criticism of our Army's armour. Now that this particular "tank crisis" has passed we are in danger of not weighing these enemy successes with balanced judgment and concluding that this country's security requires tanks—tanks out of all proportion to their value to us. We like a simple answer to our military problems, and we know the American industry can turn out a lot of tanks. But let's not jump to simple conclusions or too many tanks. The first waves of Red tanks which rumbled across the 38th parallel had a heyday. None of our armour's arch enemies was available to the defence at the time these Red tanks chalked up their big gains. But once these enemies made their appearance, the invading tanks lost their effectiveness on the battlefield and their space in American headlines. The natural enemies of the tank form an air-ground weapons system comprising the land mine, the bazooka (with the shaped-charge warhead), artillery, the rocket-firing aircraft, and engineer units

equipped to neutralize or destroy paths suitable for tank travel. This system developed with surprising speed in Korea, and once it became effective, the T34 lost most of its potency.

Exploiting surprise, the North Korean Reds routed the poorly armed Republic of Korea forces. The chaos and disorganization of retreat left no time to sow minefields, demolish bridges or devise tank traps. U.S. units hastily thrown into action were not fully prepared to withstand the armoured attack. There were obvious deficiencies in training and equipment.

None of the elements of an effective anti-tank weapons system was initially present, and the rolling hills of central Korea became tank highways rather than tank traps.

In the resentment against our repeated losses, the significance of our tankless forces in the field struck the American people and a hue and cry arose for tanks and more tanks. Many of the Army's armour advocates led the swing with the axiomatic statement that the best anti-tank weapon is a tank. Even if the matter were limited to the issue of stopping a single tank, this appears highly questionable. The outcome of a tank duel would to a large degree depend on who fired first. It

could depend on the tactical situation as well. A tank on the defence, in a dug-in position, for example, has an advantage over an attacking tank that must silhouette itself against the skyline as it seeks out its opponent. This same advantage accrues to the more mobile and less expensive bazooka, utilizing cover and concealment to balance its lack of armour.

We are less concerned, however, with the variety of means available to stop a single enemy tank than with the place of armour in the American military machine. How much of our defence appropriations should be earmarked for armour in view of our strategic commitments abroad? What is the future of armour in the years immediately ahead?

Are tanks the new cure-all for American security that they might have first appeared as we looked over our shoulder at Korea? Before reaching a conclusion, let us briefly examine tank warfare in World War II and then analyze our strategic position in the present unstable world of today.

In France, General Patton's tanks wrote some glorious pages in the history of mobile warfare. Their magnificent dashes electrified the whole world, but these end-runs did not take place until after the German front had been shattered. In July, 1944, Patton's sweeps began when enemy aircraft had been almost entirely driven from the skies and enemy artillery, thinly spread over two massive fronts, was constantly under attack by our Thunderbolt fighters. The breakthrough opened rout conditions which permitted no time for German

mining or demolitions. Further, the terrain of northern France was tank country; in fact, it was the birth-place of the tank.

The spinning wheel of war successively brings varying combinations of fire power, armour and mobility to ascendancy. In the brief history of the tank, which has followed this cyclic pattern, Patton's epic brought the tank to the top of the wheel.

Earlier in World War II, German tanks had previously been highly effective against the Allies in France and the Low Countries. But the lessons of the German penetration of the hinge of the Maginot Line was eventually digested by the world. Guderian's blitz was concocted of a balanced combination of tanks and aircraft ideally designed to exploit the transient technical advantage then possessed by armour over fire power.

Against the Soviets, on the other hand, the German armour did not fare as well, especially after the force of the opening aggressive thrusts had been exhausted. It is true, of course, that the panzer divisions made important advances before the Soviets developed material and anti-tank tactics to cope with them. Eventually the Soviets deployed their armies in depth on a massive scale forming the land-island defence system, each island strongpoint almost an army itself and self-contained. As the Soviet defences and armour improved, the power of the panzer divisions declined. German armour was able to thrash around in the never-never land between these islands, but was subject to repeated losses all out of proportion to the damage inflicted on the Red forces.

Tanks in the desert played a crucial role. Yet estimates of their value changes almost as rapidly as shifts in the desert war's fortunes between the Afrika Korps and the Allies.

As a general rule tanks used in the jungle and in mountainous terrain were a relatively unsuccessful and unimportant factor. In fact, Churchill summed up their poor showing in Italy with the flat assertion, "Tanks are finished." This verdict seemed borne out in the subsequent Normandy battle by the failure of British armour to make ground at Caen. Then came the break-through and Patton's dash across France. Armour had made good. The misfortunes suffered during the ensuing winter might have erased this opinion had not the final campaign in Germany been so brilliantly sparkled by US armoured divisions.

Three facts stand out in assaying the triumphs of US tanks in World War II. They generally were superior in mobility and control, but inferior to German tanks in armour plate and guns. Secondly, our tank gains were always made under the protecting umbrella of decisive superiority in tactical air, which often overwhelmed enemy tank defences. Finally, opposing infantrymen did not possess bazookas or weapons firing shaped-charge shells. Nor were those weapons featured in the defence of France in 1940 or in the see-saw tank battles of the desert. The role they might have played in these battles and against us in our victorious march across France and into Germany cannot be assessed.

Against this survey, let us measure America's requirements for tanks at the present. We're not a nation dedicated to making aggres-

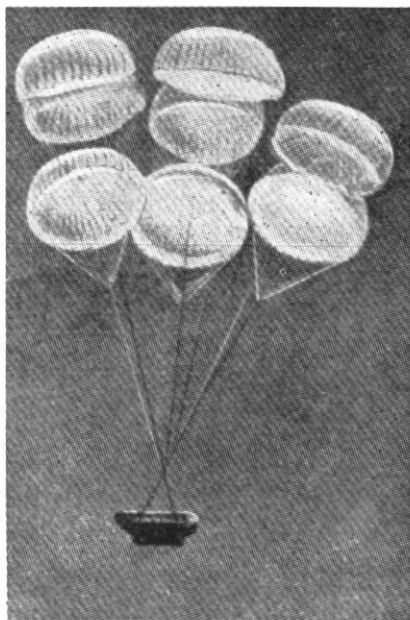
sion, but a country dedicated to a world-wide defence against it. We are not planning a surprise attack of hostile lines through which to release hordes of rampaging tanks. If total war replaces limited war, what we will need on land is a means of stopping the tide, the huge Red tide of armour and infantry which may move against us. We must hold this tide from engulfing many peoples all over the world who are not only our friends, but our essential allies, all of them needed if we are to win the great struggle. This calls for weapons which can meet the requirements of an initial defence against the vast infantry-tank forces of the enemy. Thousands of relatively inexpensive and highly mobile weapons will be needed to meet this vast world-wide demand. Whatever their individual design, they must collectively comprise an effective anti-tank weapons system.

Let us look at how such a weapons system might operate. Larger bazookas using the latest ammunition—rockets with shaped charges—are lethal at short ranges. In the hands of experienced soldiers with the ability and daring to close the range, these bazookas will make it unprofitable for tanks to forage alone where they cannot be protected by cross-fire of their brother tanks, or through overgrown country, where the bazooka can lurk behind trees, hedgerows or hillocks.

When massed in open country to protect themselves from the deprivations of the bazooka, enemy tanks will fall prey to flexible artillery concentrations and flights of heavily armoured, rocket-firing aircraft. If the battle terrain makes them road-bound, they will be stopped by demolitions, mines, and tank traps.

Will this combination of weapons hold armour at bay? It looked for a time as though the T34 type tanks of the North Koreans were impervious to the bazooka, but the 3.5-inch model quickly exploded this fallacy. The dramatic rush of these weapons to the field only emphasizes the fact that we cannot be lax in forging more effective weapons for the system needed to keep armour chained.

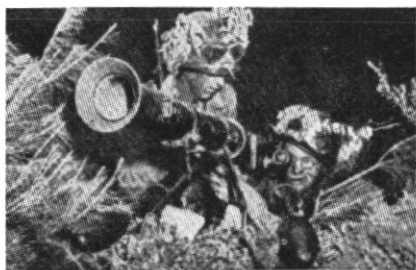
The shaped-charge shell is a nightmare to the world's designers of armour. It can be delivered not only by bazooka, but by artillery and rocket-firing aircraft as well. This effective refinement in the design of the projectile concentrates the force of the explosion in the desired direction, rather than having it expended in all directions equally. It represents a threat to armour which can only be met by much heavier armour plate than any now employed. While the effect of even this projectile can be lessened by inclining the surface of the armour to effect a glancing impact, such inclined surfaces cannot be presented to all projectiles fired frontally, from a flank or from the air. Improved resistance to the penetration of these projectiles might be made by expensive processes which harden the steel surfaces, but at this stage of technical development, the race between explosives and armour



seems one-sided. The methods of delivering the explosive forces that man has created have already far surpassed the protection that can easily be afforded by armour plate.

From this we must conclude that in the foreseeable future, tanks will either be extremely heavy, expensive, road-bound, and slow, or not really tanks at all, but virtually personnel- and weapons-carriers, providing protection only against small-arms fire.

Fortunately, the weapons system we have briefly described fits the global requirements imposed by a strategy of initial defence. Land mines and demolition equipment are relatively inexpensive and simple to emplace. They are easily transported overseas and can be stockpiled near where they are likely to be used. In contrast to the tank, weapons such as these, if captured by an enemy over-running our po-



sition, could not be transformed into a two-edged sword and used effectively against us while we are on the defensive. The more expensive items in this system such as self-propelled artillery, are highly mobile and can be kept in reserve to meet major threats as they develop. Because of their high mobility, unarmoured artillery pieces are less susceptible to capture. These are the type of ground defensive weapons that we need now and should concentrate on obtaining in quantities.

The nature of America's armour programme must be considered in conjunction with our over-all requirements in tactical air. If we are ever to meet the massed manpower of the Communist empire on anything approaching an equal basis we will need to develop tactical air power far in excess of that available to our forces in Korea. For the initial defensive phase of any future conflict the Army's weapons must be designed to contain the enemy's armour tide on the ground while tactical air delivers the Sunday punch from the sky.

Command of the air is still an essential prerequisite of victory for our forces. (It should be obvious by now that the ratio of our divisions to those of the enemy must also be greatly improved.) Without a guaranteed command of the air, our entire military position will crumble. Yet we cannot simultaneously support a large tank programme and a vast tactical air development programme. At this critical moment, we should accelerate the production of rocket-armed aircraft capable both of fighting for mastery of the skies and of blasting enemy tank columns before they reach the line of contact. Assign-

ing a relatively low priority to armour is the other side of the tactical air coin.

The expensive tank (in terms of labour and material) must wait until our operations are more nearly ready to use them. Then they can be of the latest style, less vulnerable to the weapons that are lying in wait for them, and specifically designed for the area where they are to be used.

We do, of course, need tanks today for infantry divisions, and armoured units already in existence or proposed for early mobilization. These units are designed to use tanks which give them the balanced power needed for tactical flexibility in the defence. But the vast numbers of tanks we may find necessary for a great-land offensive should not be bought today. Ample time to manufacture these does not exist. Time can be found for the protracted build-up (a necessary prerequisite to the launching of such an offensive) only if we find means to stabilize the initial defensive line. To build vast numbers of tanks now would be to deny our allies the defensive weapons they so sorely need, and to perpetuate our present critical shortages of tactical aircraft and artillery and bazookas.

American industry has the capability of turning out a lot of armour, but the manufacture of a large number of tanks, particularly with industry not geared for full-scale war production, would deprive us of more urgently needed munitions. For every unnecessary tank and its crew we should substitute a rocket-firing aircraft and pilot.

To match the 40,000-odd tanks marshalled by Communists would require hundreds of thousands of

men to man them and more to support their effort. Even if we tried to make the tanks and recruit the tankers we would not be able to use them without putting a lot more coal on the fire. Tanks are not flown across oceans as are tactical aircraft; they are not loaded as easily as artillery and bazookas. They have to be deck-loaded on most vessels which can carry only a few. Their large-scale employment would step up our bridging requirements. It would require a great effort to place them where they could be used. They would also necessitate a very sizable effort to resupply them for they expend great quantities of POL and ammunition.

In a possible war, we will be competing with an enemy who is fighting on interior lines of communication, using relatively short land hauls for resupply instead of transporting it across oceans. A large-scale armoured programme would result in our playing the enemy's game with the cards stacked against us. It would be an endeavour of containing him tank for tank rather than skilfully cutting away his strength.

The tank may be an ideal tool for an aggressor. With tanks the aggressor can come thundering into battle against weak forces with no warning when and where he chooses. He will employ them in that way, unless he is opposed by an anti-tank weapons system capable of blocking this type of power play.

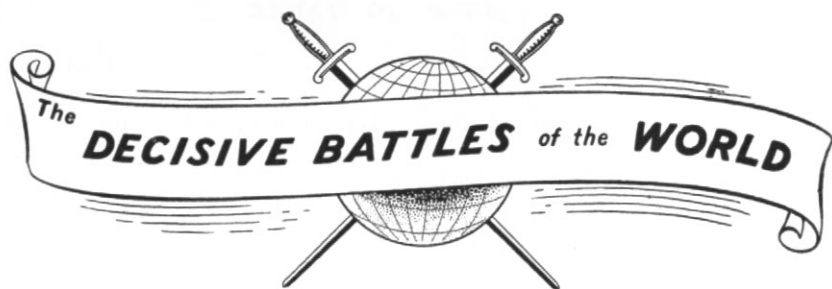
Because the tank is primarily a weapon of the offence, and that its use on the defence is greatly limited and extremely expensive in comparison with other weapons, tanks do not represent the same dividends

for American priority-conscious defence dollars.

But even in recognizing its value on the offence, let us also realize that the speed of offensive warfare is ever increasing and threatens to leave the tank, as we know it today, far behind in rapid attacks of the future. Airborne troops, permitting the strategic encirclement and by-passing of strong-points, may mean more than tanks in tomorrow's war. The tank and anti-tank requirements of airborne forces approximate those of Western armies today. Airlift to haul heavy tanks into the landing area does not exist; yet enemy tanks represent the greatest single hazard to an airborne operation. The period between the initial drop and the establishing of a solid perimeter defence is the most crucial phase of the airborne battle. This initial defence, like the initial strategic defence of the free world, must be compounded from a successful combination of rocket-armed fighters in the sky and lightly, but powerfully, armed soldiers on the ground. Hence, successful airborne operations may emerge from the same combination of weapons now required to safeguard the free world from Communist armour.

To summarize: A major tank development programme at this time would conflict with the more essential tactical air programme; would impose added burdens on overladen logistical supply lines; could not overcome the immense Soviet armour lead; would interfere with the rapid arming of our allies, and run counter to the current armour-vs-fire power trend.

So let's take another look before we jump to tanks.



HASTINGS, 1066

IN the dark interregnum which intervened between the final break-up of the Roman Empire and the emergence of Western Civilization, the art of war, in common with all other arts, declined to a low level. All that the Romans knew of strategy and tactics, of organization and administration, was submerged in the social and political chaos which followed the collapse of the imperial authority. In military affairs, as in many other things, men had to begin again at the beginning, and relearn arts and crafts which had been common knowledge in earlier centuries.

Initially the feudal system was a social and military necessity. It provided the only known means by which men could live and protect themselves against the attacks of predatory neighbours and the incursions of the tribes pressing in from across the old boundaries of the empire.

It is important for the military student to bear in mind that during its rise, and at its zenith, the feudal system imposed obligations which worked in both directions. If the lower orders of feudal society owed

certain obligations to their lord, their lord owed clearly defined obligations to them. One of the most important elements in the social contract was the lord's obligation to fight for his people, to defend their lives and property against all comers. This obligation extended from the apex to the base of society, and exercised a profound effect upon the organization, armament and tactics of the military forces of the Middle Ages.

The problem of subsistence dominated the lives of the early feudals. The disintegration of the state had destroyed the old commercial organization and disrupted communications. Each little community had to live on its own resources, to win its food from the soil as best it could. Even when the fragments grew into larger units food production demanded most of the time and energy of the population.

As a result of these conditions men could engage in military service for only short periods at a time. Consequently the standard of training and efficiency fell away to a low level. And, because industry and craftsmanship had declined,

weapons and equipment deteriorated. All this was in sharp contrast to earlier times, when the Roman state had been able to keep large, well-equipped armies in the field for long periods, and, at the same time, maintain the population at a reasonable standard of living.

In consequence of these conditions regular military service tended to become both the privilege and the obligation of the higher strata of society. The feudal lords, great and small, were the only ones who could devote much time to military service, and they were the only ones who could afford to provide themselves with weapons and equipment of quality. And because they preferred to ride rather than to walk, the art of fighting on horseback tended to develop at the expense of fighting on foot.

As the feudal system developed each feudal lord was able to maintain a regular band of retainers ready for immediate action. Like their lords, the retainers were mounted soldiers, armed and equipped on a scale commensurate with the wealth and status of their master. Consequently continental mediaeval armies usually comprised a hard core of heavily armed and armoured horsemen, supported by a mass of ill-equipped and ill-trained peasantry. In field operations cavalry became the dominating arm.

Mediaeval strategy was governed by the difficulty of maintaining large forces for any considerable period. It became necessary to establish a large number of fortified places, which, on the Continent, took the form of strong castles and walled towns. These fortified places performed a dual role. They preven-

ted an assailant from rapidly overrunning the defence, and they served as firm bases from which the armoured horsemen could mount a counter-stroke. The general effect was to restrict the movement of large bodies, to reduce mobility, and to confine strategy within very narrow limits.

In the tactical field action tended to a stereotyped pattern. The decisive act was the charge of the mounted knights. The unarmoured peasantry provided archers and pikemen and the static garrisons for castles and towns.

Arms and Armour.

In the eleventh century the continental knight usually wore a shirt of chain mail, which covered his body from neck to knee. He wore a close-fitting iron helmet, from which hung an apron of mail to protect his neck. He carried a large kite-shaped shield, a shape which gave the maximum protection, visibility and freedom of action to a mounted man. His weapons comprised a heavy cutting sword, a lance, and sometimes a spiked mace or a short battle-axe.

The infantry were unarmoured; at the most they had a leather helmet and a leather jerkin for the upper part of their bodies. In addition to their bows they often carried an axe, which could be used as a missile as well as a personal weapon for close combat. Some had pikes pointed with iron, while only a few had swords of good quality.

In England feudalism developed on somewhat less elaborate and less rigid lines than the continental system. In the military sphere the main difference lay in the fact that

the Saxon conquerors, who came first to raid, and then to settle and mingle with the native population, never took kindly to the horse. In England infantry was the dominant arm. There were few horsemen and they played but an insignificant role in military affairs. The horse was used for locomotion, not for battle. The chieftain might ride to the field, but almost invariably he dismounted to fight.

At this period England was far behind continental Europe in archi-



English Soldier.

tectural and engineering skill. Their fortifications usually took the form of palisades of timber or brushwork protected by ditches. Their armour was inferior and their weapons simple. They used a short thrusting spear, the sword and the battle-axe.

The Anglo-Saxon battle was a simple affair. The antagonists faced each other on some convenient piece of ground, ranged in close line, but not so closely packed that spears could not be hurled or swords and axes swung. Their round shields were held in front to form a wall after the Roman fashion. The king would take the centre, with his banner flying above his head and his well-armed earls around him. On either side the levies of the shires would stand. After hurling their spears the adversaries would close and hew at each other over the wall of shields until one side gave way.

The Issues at Stake.

The events leading up to the battle of Hastings are too well known to need detailed recapitulation here. However, a brief outline is necessary because some of those events had an important bearing on the nature of the operations.

In the course of time the Duke of Normandy, in western France, had become one of the most powerful nobles in Europe. Originally invaders from the north, the Normans had brought active and adventurous minds to the development of their new domain. They were capable soldiers, good organizers and sound businessmen. Through a happy blending of these qualities they made the dukedom into a strong, prosperous feudal community.

King Edward the Confessor of England was childless and the nearest collateral heir was a puny, unpromising boy, unlikely to be fitted to hold the turbulent earls in check. It was generally expected that Earl Harold, head of a powerful noble house, would succeed to the throne.

Some little time before Edward's death Harold was at the court of William, Duke of Normandy. The

astute and ambitious William seized the opportunity to exact from Harold an oath to the effect that on Edward's death Harold would assist William to obtain the crown of England. From the military point of view it is immaterial whether or not the oath was exacted under duress, or by trickery. When the time came for its fulfilment Harold was in England and had no chance to state his version of the affair to continental rulers and Church authorities.



Norman Knight.

William, on the other hand, had every opportunity to assert that his projected expedition was akin to a "holy war" undertaken to punish a prince who had broken an oath solemnly and publicly given. On this plea he obtained the blessing of the Church and drew to his standard many nobles great and small, who, together with their retainers, were attracted by the idea of acquiring spiritual merit as well as material wealth. This happy combination, the result of *shrewd foresight*, provided a broad and firm base for the high morale which actuated William's army.

William was not the only claimant to the throne of England. Pleading a compact alleged to have been made in an earlier reign, Harold Hardrada, king of Norway, asserted that on Edward's death the English throne became his. This claim was rejected by the English, and the threat of military action which Hardrada now hurled across the North Sea was not, at first, taken very seriously.

Preparations.

William prepared his expedition with great thoroughness. The prosperity of Normandy enabled him to lay in provisions for the concentration and maintenance of a large army. His personal wealth, backed by the support of the Church and numerous powerful nobles, enabled him to equip his army on a superb scale, and to build a large fleet to carry it across the Channel. A large proportion of the 50,000 men he aimed to land in England were *knights and their squires*, mounted and equipped in accordance with the best standards of feudal France. The remainder were archers and pikemen.

William's plan for fighting his way ashore if the English met him on the beaches is unknown. However, he did make careful arrangements for protecting the beachhead. He constructed a number of wooden forts to be transported in sections. On landing these were to be erected to cover the disembarkation of the main body and the stores, and, in the event of defeat, to cover the withdrawal to the ships.

Harold was faced with the same problem which nearly always confronts the commander defending a coast against an expected invasion. William had the choice of numerous suitable beaches along the south coast of England. Harold had no means of telling which one his adversary would select. To garrison them all would leave him weak everywhere and without a central reserve. In any case the nature of his military organization did not permit him to keep large forces under arms for an indefinite period.

Harold met these conditions by assembling a considerable fleet to cruise in the Channel to dispute the passage with the invader. At the best they would break up William's fleet; at the worst they would give reasonable warning of the direction of the attack. On land he concentrated in Sussex a body of earls and other people who could be kept under arms. The rest of his fighting men remained at their daily work, but were warned to be ready for *instant action*. Through the local authorities complete arrangements were made for smooth and speedy mobilization. In the circumstances it is hard to see how these plans could have been improved upon.

Although the threat from Norway was not regarded so seriously as the

one from Normandy it was not entirely neglected. For the defence of the north Harold left in Northumbria a force under the command of Earls Edwin and Morcar. As events proved, however, Hardrada had spared no effort to make his enterprise a success, and had assembled a fleet of nearly 500 vessels manned by the best warriors of Norway.

Battle of Stamford Bridge.

Throughout the months of June, July and August the English fleet cruised in the Channel. The last days of August brought heavy storms, and on 8 September Harold ordered it to London to revictual and refit. Seven days later came news that the Norsemen had landed in force and had taken Scarborough. Harold was compelled to commit the defence of the Channel to the winds, which had hitherto served him well, and to move north with his whole army. He covered the 200 miles in eight days, and promptly brought Hardrada to battle at Stamford Bridge, seven miles from York.

Although surprised by Harold's early arrival, the Norsemen fought fiercely. It was a stand-up battle fought on the blow for blow principle. Neither side could make headway. At length Harold, resorting to stratagem, caused part of his army to give way and quit the field. Their immediate foes followed up their apparent advantage, and Harold promptly hurled a body of troops into the gap. The slaughter which ensued was terrific. The Norsemen who escaped required only 24 ships to carry them away, though they had brought upwards of 300 into the Humber. Norway was crippled for a quarter of a century.

The Norman Landing.

Meanwhile the wind in the Channel had abated while the English fleet was still in the Thames. William seized the opportunity, made a good crossing, and effected an unopposed landing at Pevensey on 28 September.

Having secured his beachhead, William moved to Hastings and constructed a fortified camp. There was nothing to prevent him moving directly on London, but he resolved to conserve his energy and fight the major battle, which he knew must soon take place, near his base. He threw covering detachments well to the north, and let loose his army on the agreeable pursuit of looting the immediate countryside.

Tidings of the Norman landing reached Harold at York on 1 or 2 October. He immediately marched south with his best troops, ordering the northern levies to follow as quickly as possible. He reached London on 7 or 8 October, and it would appear that at first he intended to wait there for reinforcements from the Midlands to arrive. However, irritated by reports of Norman brutality and emboldened by his recent victory, he resumed his march on the 11th. It would seem that a few days delay would have at least doubled the size of his army.

On receiving news of Harold's approach William called in his detachments and foragers to the protection of his entrenchments. His army was ashore; he had a firm base; all he now required was information about his opponent's intentions and the size of his army.

Harold arrived in the neighbourhood on 13 October. Having taken

stock of his adversary he decided that an immediate attack was out of the question. He was outnumbered, his men were very tired, and would stand no chance in an assault upon an entrenched camp defended by archers and mounted knights. Accordingly he took up a strong position near Senlac and prepared to fight a defensive battle.

The Senlac position was a strong one, well calculated to give the maximum advantage to the defending army of infantrymen. Its right flank was protected by a deep ravine, the left was covered by a dense wood, the front ran along the crest of a slope difficult for mounted troops to charge over. Woods in the rear provided rallying points for any troops driven from the field. In the time available the only fortification possible was the erection of a brushwood fence across the front.

Battle of Hastings.

Early in the morning of 14th October William led his army from Hastings and deployed it in three divisions opposite the English position. Each division was formed in three lines, the first comprising archers, the second footmen armed with pikes and swords, while the mailed knights were in the third.

Harold formed his line of battle with his best and most heavily armed troops in the centre and his more lightly armed and less experienced troops on the flanks. According to some authorities the whole of the first line was composed of heavy troops, but this is not at all certain.

Both commanders took station in the centre of their lines.

When all was ready the Norman army advanced. As soon as they

came within range the archers opened fire. Having but few bowmen the English were unable to make any reply until the Norman archers came within range of their javelins and throwing axes. Under a rain of these missiles the Norman archers withdrew. The pikemen then advanced to the breastwork, but were repulsed with heavy loss.

Full of confidence the mailed knights now rode up to the breastwork, there to encounter better infantry than they had ever met before. The English did not yield an inch; their swords and axes cut down men and beasts in great numbers. The Norman left division recoiled down the hill in disorder, many knights being unhorsed in the marshy ground at the bottom of the slope. All along the line the assault wavered and gave way, though the centre and left withdrew in good order.

A great mass of the irregular troops on the English right hotly pursued the Norman left. William saw the opportunity and wheeled the horsemen of his centre against the ragged mass. Few of those impetuous English regained their lines.

William reformed his disordered squadrons and began a second general assault. This time they had some success, particularly on the weakened English right, but at the end of an exhausting and bloody struggle the unbroken line of English spears and axes still crowned the slope.

William now ordered a large body of his troops to wheel about and retire in seeming disorder. A considerable number of English fell into the trap and followed them. Again they were assailed on the flanks and cut to pieces.

Harold's army was now much depleted and somewhat shaken. But they closed the gaps steadily and refused to yield. The most daring onsets of Norman chivalry could not break the serried ranks around the English standard.

William now changed his tactics. Re-grouping his army, with his archers posted in suitable fire positions, he launched a series of mounted attacks, interspersed with periods of high trajectory arrow fire. The English could make no reply to this maddening and destructive fire. Their supply of missiles ran out, every charge had to be beaten off with swords and axes. The stubborn ranks closed up their gaps and refused to yield.

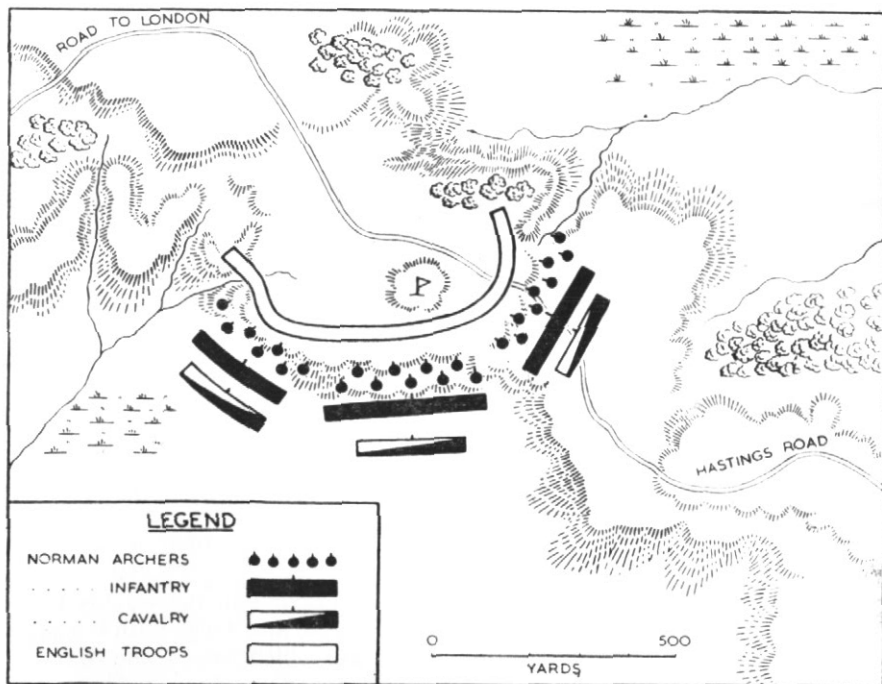
And so the long afternoon wore

on. Harold probably hoped to hold on till evening, then withdraw through the woods. In this he might have succeeded had he not been struck down by an arrow late in the afternoon. The disorder caused by this disaster enabled a body of Normans to burst into the circle at last. All was now over. The survivors slipped away through the woods in the gathering gloom.

There was no further serious resistance. William tidied up his battered army, and advanced to London, where he was crowned King of England on Christmas Day.

Comments on the Operations.

From first to last William showed his great capacity as a general and



Battle of Hastings—First Phase.

his keen insight into the character of the men who gathered around his standard. His call for the support of feudal France was a nicely blended appeal to the noblest and the basest instincts of mankind. And, when spirits flagged with the tedium of waiting for favourable weather, he whipped up enthusiasm with elaborate religious ceremonials, interspersed with pronouncements assuring wealth and power to all *who followed his fortunes*. Seldom has an expedition set forth in such a high state of morale.

Certainly the Norwegian intervention, coinciding as it did with fair weather and the absence of the English fleet, was a stroke of luck which enabled him to make an unopposed landing. It has been claimed that he did not make the best use of his good fortune, in that he did not immediately advance on London, which he could probably have reached before Harold. But William was not seeking a mere geographical objective. His ultimate aim was the English crown, and to attain that he would have to inflict a decisive defeat upon Harold, and, if possible, kill him. Consequently his immediate aim was to bring about a battle in circumstances most favourable to himself.

As soon as he had secured his lodgment area, William had the choice of two risks. If he advanced he would lengthen his communications while shortening those of his adversary. In the event of defeat he would be far from his base and faced with a retreat through a hostile countryside. If he remained near his base he would give Harold time to concentrate a large army and allow him liberty of action. This surrender of the strategic initiative

was not so serious as it may seem at first sight. William was well aware that, because of his great superiority in heavily armed mobile troops, the tactical initiative would lie with him—provided he kept on ground suitable for their employment. Besides, he could not have known what was happening in the north. Until he heard the result of the Norwegian descent he did not know whether he would have to fight Harold or Hardrada. In view of these considerations it seems that his decision to let whoever won in the north come and fight him in the area he had selected was the wisest course.

In the period of waiting he kept up morale by whetting his troops' appetite for loot, but he was careful to guard against surprise, by throwing strong covering detachments far and wide. The moment he heard of Harold's approach he concentrated his army.

Throughout the battle William displayed flexibility both in the intellectual and physical sphere. When his first plan failed he resorted to stratagem. When that failed to win decisive success he produced the novel combination of fire and movement which finally carried the day. The fact that he was able to effect these changes shows that his army, despite its heterogeneous nature, must have been well trained and disciplined.

There was no pursuit to comment on. For all practical purposes the English died to a man around their king.

In preparing to defend his kingdom Harold was faced with the same problem which besets the Western world today — *how to keep the wheels of industry turning, and, at*



ENGLISH ATTACKED ON BOTH SIDES. A STUBBORN RESISTANCE



LAST STAND BY THE ENGLISH AROUND HAROLD WHO IS STRUCK IN THE FACE WITH AN ARROW

DRAWINGS FROM THE BAYEUX TAPESTRY. — This well-known Tapestry presents a unique and valuable picture of Norman life. In seventy-two scenes it illustrates the events which led to the Norman Conquest of England, beginning with Harold's visit to Bosham on his way to Normandy, and ending with the Norman victory at Hastings.

the same time, keep in a state of constant readiness forces strong enough to meet attacks almost certain to occur at unpredictable times and places. Modern genius has not improved on his solution.

It seems a fair criticism to suggest that Harold's management of his fleet was faulty. Even if the fleet failed to win a naval victory, it could reasonably have been expected to impede the crossing and give due warning of the time and direction of attack. It would seem that portion of the fleet should have been kept constantly at sea. Had this been done William might not have landed in such good shape, and Harold might have had time to complete his mobilization.

To march 200 miles in eight days, fight a hard battle and get back to

London by 7 October, was no mean feat. It proves that the English troops kept under arms were well trained and disciplined and in good physical condition. And it strongly suggests that Harold's administrative arrangements were sound and thorough.

Harold's decision to march from London without waiting the few days for heavy reinforcements was unwise. Perhaps the decision was forced on him by political considerations; perhaps his recent victory had made him over-confident. Whatever the reason, this neglect of the Principle of Concentration was a major cause of his defeat.

Harold's tactics were nicely calculated to make the best use of the characteristics of his troops. They were formidable in defence, but not

likely to meet with much success in an attack on the better equipped Normans. The ground on which he elected to fight gave him protection on both flanks and rear. His foe would have to attack him frontally or make a very wide detour, a manoeuvre which feudal chivalry did not permit.

At the Battle of Hastings the stationary tactics of the phalanx of axemen failed decisively before William's combination of archers and cavalry, despite the fact that the ground was favourable to the defence. The lessons of the battle are unmistakable. The best of infantry, armed only with weapons for close fighting and without any supporting arms, were helpless before a capable general who knew how to combine the horseman and the archer. The knights, unsupported by the bowmen, might have surged for ever against the impregnable shield-wall. The archers, unsupported by the knights, could easily have been driven off the field by a general charge. United by the skillful hand of William, they were victorious.

Results of the Battle.

In the course of time the English absorbed their conquerors. And with them they absorbed a relationship with continental Europe which

was to play an important part in the subsequent development of world history.

It may sound paradoxical, but it is no exaggeration to say that England owes her liberties to her having been conquered by the Normans. It is true that the Anglo-Saxon institutions were the primitive cradle of English liberty, but by their own intrinsic force they could never have founded the enduring free English Constitution. In all probability the Anglo-Saxon system of polity, if left to itself, would have fallen into confusion. Out of that confusion would have arisen first an aristocratic hierarchy, like that which arose in France; next, an absolute monarchy; and finally a series of anarchical revolutions.

It was the descendants of the Norman conquerors who led all the free men of England in the constitutional movement which resulted in the signing of Magna Carta, that fundamental statement of the rights of man, which today, after the lapse of seven centuries, remains the corner stone of the liberties of all the peoples of the Anglo-Saxon race.

[This is the eighth article of the series, "Decisive Battles of the World." Next month we shall consider Joan of Arc's defeat of the English in 1429.—Editor.]

"Untutored courage is useless in the face of educated bullets . . ."

—General George S. Patton, US Army.

GEOPOLITICS of the INDIAN OCEAN

S. P. Sharma.

THAT geographical factors considerably influence the politics of a country has long been recognised by political thinkers, but the formulation of ideas on the subject into a science is of recent growth. In particular, Geopolitics as a handmaid to the science of warfare has been quite familiar to German thinkers for decades now. But even as long ago as the 4th century B.C., Chanakya showed unmistakable glimpses into the truths of this science. Thus, he clearly defined the lands and boundaries desirable for any kingdom in the interests of its security. Early British administrators in India also, like Warren Hastings, had fairly clear ideas of the necessary land frontiers of India.

It was not until the time of Lord Curzon, however, that the question was taken up for serious study, and put on a scientific footing. But only danger from the land was considered at that time; the sea itself was supposed to be a barrier against the enemy. This was, of course, a mistake; but the explanation lay in the fact that the Royal

Navy was overwhelmingly powerful at the time, and had indeed been so for such a long period that nobody could conceive of deterioration in its position. Times, however, have changed. The Japanese exploits in South East Asia during the last war have brought out prominently that the sea is only a means of communication, not a barrier to invasion. British naval power, besides, in the East, has lost its pride of place, and lastly, India and most of the other countries of South and South-East Asia have attained political freedom. Accordingly, the naval defence of the countries in the region has ceased to be a matter primarily concerning distant European powers, and become one of immediate interest to themselves.

The time has thus arrived for a scientific study of the Indian Ocean as it affects the politics of the countries bordering on it; in other words, for the formulation of the Geopolitics of the Indian Ocean.

German writers have paid most attention to the science, and have naturally approached it from their

own angle. In planning their world strategy the Nazis arrived at the conclusion that the Power that controlled the heart of Europe would be able to dominate land, sea, and air everywhere. Mackinder, a great writer though he was, nevertheless thought only in terms of Europe. For him, the World Islands was bounded by the Atlantic and Pacific Oceans. The Indian Ocean was only a link-area.

Haushofer studied the Pacific by itself, and embodied his thoughts in his "Geopolitik of the Pacific," a book which formed the basis for much of Japan's naval strategy during the last war. Similarly the Atlantic has also been studied in meticulous detail. But the Indian Ocean has, as yet, been neglected. The reason probably is that during the last two hundred years and more, the political centre of gravity has been in Europe, and countries of the Indian Ocean played only a secondary, and indeed, a passive, part. But today they are regaining their stature after centuries of torpor. They have become, or are fast becoming, political entities with thoughts and view-points of their own. In short the time has come for a systematic attempt at studying the Geopolitics of the Indian Ocean.

The oceans of the world are, of course, divided only by artificial boundaries. But science has made it possible for certain powers to obtain control over large sheets of water and to claim special rights over them as *against* other powers.

The Home Fleet and the British Pacific Fleet of the United Kingdom, for instance, and the Atlantic Fleet and the Pacific Fleet of the USA, are not mere names indicat-

ing geographical location; rather they show that the powers concerned claim certain rights in specified parts of the water regions of the world.

In this respect, the Indian Ocean has some peculiarities which are noteworthy. The Arctic and Antarctic, encircling the poles, have little connection with inhabited land. The Atlantic and the Pacific Oceans, running north to south, are gigantic waterways without any vast land areas jutting into their expanses. On the other hand, the Indian Ocean, with oceanic currents like the others, and vast as well, is more or less a land-locked sea. Bounded by Africa on the west and by Burma, Malaya and Indonesia on the east, it contains the huge land-surface of India projecting into it for thousands of miles.

The presence of narrow straits at the western and eastern entrances to the Indian Ocean makes the task of *guarding* it comparatively easy. Bab el Mandeb marks the entrance to the Red Sea and it can be controlled by land on either side. On the east, the Straits of Malacca, which lead to the vast expanse of the Pacific, are also flanked on either side by land, from which egress and ingress into the Indian Ocean can be effectively watched.

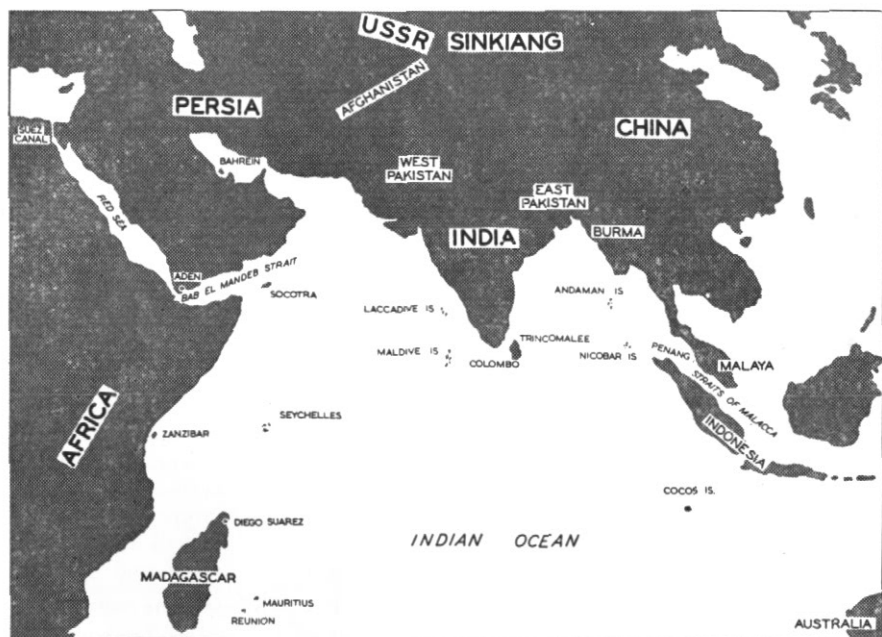
This feature has considerably influenced the maritime history of the Ocean, just as two other features have done. The distribution of the islands in this region, and the long distances between them are remarkable. Ceylon, with its two fine harbours, Colombo and Trincomali, may, for strategic purposes, be considered a part of India. Madagascar, with its fine harbour at Diego

Saurez, is so situated as to provide an ideal cover to the south-east coast of Africa. The other islands of naval and maritime importance are Socotra, on the Arabian coast, Zanzibar and Seychelles, on the East African side, Mauritius and Reunion, on the tropic of Capricorn, the Laccadives and Maldives, in the Arabian Sea near India, the Bahrein, in the Persian Gulf, the Andamans and the Nicobars, in the Bay of Bengal, and Penang, in Malaya.

From immemorial times, these islands have played quite a prominent part in the maritime history of the Indian Ocean, and despite changes in the nature and power of the weapons of naval warfare, may yet do so. Not merely their distribution, but their distances also have a bearing on strategy. The Andamans are more than 700 miles from India and 300 miles from

Burma. Mauritius is more than 2000 miles from Ceylon. Socotra about 1000 miles and Penang nearly 1300 miles. Control over these outposts of the Indian Ocean can exert a large influence, beneficial or baneful, on the countries of the region.

In the same direction lies the importance of the bays and bights of this oceanic area. The Persian Gulf in the north-west corner is a land-locked sea, commanded by Ormuz at the entrance. With the valleys of the Tigris and the Euphrates and the historic country of Mesopotamia in the hinterland, it has played a very prominent part in the maritime history of the Arabian Sea. The seasonal monsoons of this sea have themselves favoured its becoming a highway of commercial intercourse for more than 3000 years, with the Hindus, the Arabs and the Phonicians all having shared in it.



The Gulf of Aden formed by the south-western coast of Arabia in the north, and a projection of Africa in the south is of great strategic importance. Towards the west, it ends in the Straits of Bab el Mandeb, and towards the east lies the island of Socotra, which controls the entrance to it. For hundreds of years, the Gulf has harboured Arabian pirates, who had a protected and well-nigh hidden port in Aden.

To the east of India, the Bay of Bengal, enclosed between India herself on the one hand and Burma and the Malay peninsula on the other, is subject to periodical monsoons. This region also has been the scene of maritime activity from the dawn of history, when Hindus went out from the east coast of India and colonised the numerous islands of South-East Asia. Farther east is situated the Gulf of Malacca, the narrow end of which is dominated by the island of Malacca. The entrance to it can be controlled from the Nicobars.

The wind currents of the Indian Ocean have largely influenced the navigation of the region. During the era of the sailing ship, the monsoon regulated the time of trade activity. Thus, following the south-west monsoon, ships from the Arabian and Red Sea ports sailed for India during well defined periods of the year. And similarly, the return of the monsoon after a period of calm determined the navigation season in the Bay of Bengal also. Apparently, the sea-faring peoples of the Indian Oceanic region had made a proper study of the winds, and were able to make full use of them.

Another distinguishing factor fa-

cilitating early navigation in these areas is its essentially tropical character; there are no icebergs found in it as in the polar regions, nor heavy mists or fogs impeding traffic on the seas.

These factors led in turn to the very early growth of civilisations. Increasing evidence is becoming available to show that the Indian Ocean was the earliest centre of oceanic navigation. European writers, with a natural and perhaps an unconscious bias in favour of Europe, have long held that the Aegean Sea was the area where navigational tradition first originated. But it is now known that there was maritime intercourse between Nenevah and the West Coast of India. Again, the Indus Valley civilisation of nearly 5000 years ago shows remains which could have come only from the Red Sea region, and they could have come only by the sea. Nearly 200 years before Hippalus, in 45 AD, discovered the regularity of the monsoon in the Arabian Sea, the Hindus had sailed across, discovered Socotra, and navigated the Red Sea. The whole of the west coast of India, from Broach to Quilon, was studded with innumerable ports. And Peryplus mentions that when Red Sea ships arrived in Indian ports, they were met by Indian Government pilots and moored in regular basins. The peoples that shared in these sea-voyages were, however, not merely the Hindus, but also the Arabs of the Arabian coast-line, and Asiatic Greeks. While across the Arabian Sea, the Hindus were only navigators, across the Bay of Bengal they were both navigators and colonists.

Subsequent maritime activity in the Indian Ocean, as facilitated by

the geopolitical factors noted above, must now be glossed over in the interest of brevity. In summary form, the Hindus controlled both the Arabian Sea and the Bay of Bengal up to the 13th century AD, when the Arabs took over the supremacy from them. They in turn gave place to the Portuguese early in the 16th century. By the way, it is worthy of note in this connection that their great Admiral Albuquerque, with remarkable foresight, fixed the security naval frontiers of India at Socotra and Ormuz in the west, and at Malacca in the east.

The Portuguese were displaced by the Dutch and the French in due course till the British at last established themselves as the masters of the Indian Ocean; in fact, they virtually converted it into a British lake.

This position obtained till the close of the 19th century. Then, Japan occupied Formosa and the USA the Philippines, both the countries thus entering the Pacific as naval powers. On the west, France occupied Madagascar, and Italy walked into Eritrea, thereby getting an opening into the Indian Ocean. Germany also did the same by obtaining East Africa, but in addition, she sought to come to the Persian Gulf by means of the projected Berlin-Baghdad Railway. World War I, however, eliminated her as a possible rival to Britain in the Indian Ocean.

The Second World War has again changed the political pattern in South and East Asia. Japan today has been humbled, but it would be folly to take it for granted that she will remain so for long. China, even under Chiang Kia Shek, sought to

revive her naval prowess of old, but under the present Communist regime, she may safely be expected to set about the task with more vigour and determination.

The USA is well established in the southern Pacific, and her growing power and influence are only calculated to entrench her more firmly in that area.

In the meantime, the position of Britain has been deteriorating. She is no longer the mistress of the seas. India, Burma and Ceylon have become independent. And in Malaya, she is having plenty of trouble. To the west of India, the Middle East is a great source of rivalry over oil between her and the USA, while the countries in the region are becoming increasingly restive over their political impotence.

More significant still is the fact that countries in Soviet Asia are making rapid industrial progress and will soon be in need of a sea-outlet for their exports. For this purpose, Vladivostok is too far away for them, while the warm waters of the Persian Gulf are very inviting. In this context, India needs to do some hard thinking. The mountain barrier to her north precludes all brisk trade activities with countries beyond it, and she is therefore more dependent on the seas for fruitful commercial intercourse with foreign countries than may at first sight appear. It is this geographical feature of her situation, with all its facilities and difficulties, that she must take full account of in planning her political and economic progress. Such, from the Indian point of view, is the problem presented by the Geopolitics of the Indian Ocean.

Dispersion is not the Answer

Colonel Maddrey A. Solomon, Artillery,
US Army.

THE atomic explosions of World War II, coupled with the subsequent test shots in the Pacific and Nevada proving grounds, leave no doubt that atomic weapons have changed radically the over-all concept of warfare. While it is difficult to assess accurately the exact change that atomic bombs and shells will cause on the battlefield, it appears realistic to believe that many World War II military weapons and tactics are becoming obsolete rapidly.

When new weapons appear, military and scientific minds immediately begin a search for a defence against their use. In fact, the race usually begins before the characteristics of the weapon become general knowledge. The atomic weapon, however, is such a radical and monumental divergence from the usual that defensive thinking, thus far, has produced negligible results when compared with the offensive capabilities of the weapon. One thing, apparently, has been agreed upon—**surface warfare concepts** will require some changes if victory is to be won against an enemy possessing an atomic capability. This fact may prove equally true in the conduct of war in the air and under the sea.

The simple statement, however, that changes are in order because of atomic developments is not sufficient. Some type of defence against, or nullification of, atom bombs and shells is required. Defeatists attempt to simplify the problem, to some extent, by recommending the elimination of certain types of military operations. Amphibious warfare falls in this category. This is absurd! What is being suggested is the end of **surface warfare**. Unfortunately, the same defeatist thinking embraces airborne operations and large land campaigns.

Dispersion.

To those who would oversimplify the problem, the way to minimize the effects of an atomic attack is to employ the staid and standard defence against everything — dispersion. This is a concept with which every military person has been indoctrinated throughout his service. It implies the spreading of troops and material over a wide area so as to deny the enemy a concentrated target. It is advanced as a cure-all, as a method of reducing casualties, when advancing through artillery fire. It is employed as a worth while manoeuvre to be used when small-arms fire suddenly falls in the vicinity of a formation, and it

is a means to save supplies from being destroyed by a single bomb or shell. In short, it is a comfortable, and apparently irrefutable, answer to our problem.

Obviously, dispersion does have some merit. It is an essential fundamental of military technique. It will always have a place in military teachings and in the execution of battlefield tactics. However, dispersion is **not the answer** against atomic weapons. Battles cannot be won by dispersed forces.

Concentration of Force.

Throughout history, successful military commanders have been guided by the principles of war. They are: The objective, simplicity, unity of command, the offensive, manoeuvre, mass, economy of forces, surprise, and security. While methods of execution have changed with time, the basic principles have remained firm. Among these principles, mass, or the concentration of force, always has been a prime requisite to success. Dispersion, on the other hand, is a technique and not a principle of war.

Field Marshal Montgomery, speaking to his officers just before his highly successful African campaign, is reported to have said, "A sure way to victory is to concentrate great force at the selected place and at the right time. . . . Dispersion of effort, and of resources, is fatal to success." This was a restatement of the principle of mass as practised successfully by Alexander, Hannibal, Caesar, Napoleon, Washington, Lee, Forrest (" . . . Git thar fustest with the mostest"), Foch, and, without, exception by the outstanding Allied and Axis commanders in World War II.

Korea.

The value of the successful employment of mass proved itself again in the current Korean War. The initial assault by the North Koreans, in June, 1950, was preceded by a definite concentration of force. The result, now well-known, was an immediate and overwhelming victory for the Communists. The strategy employed by the United Nations' troops, when defending the Pusan beachhead, also was guided by this principle. As a result, every assault made by the North Koreans was repulsed by a concentration of force at the point of greatest danger to the defence.

The Allied landing at Inchon, in September, 1950, is another example of employing mass at the right place and time. In fact, this effort, by numerically inferior United Nations' forces, is a monument to the correctness of the principle. One of the greatest hopes for success that the United Nations has against aggressors possessing numerical superiority will be achieved by a concentration of force.

Continuing the examination of the Korean action, Chinese Communists entered the War with a concentration of their forces, with the result that the United Nations' formations were forced to withdraw far below Seoul in January, 1951. It is interesting to note that the Chinese used the principle of mass against troops that not only possessed the atomic stock pile, but had available the means to deliver atom bombs on the target. It is significant, in conducting modern warfare, that the Chinese did concentrate and were successful. Whether or not the atom bomb was employed against them is not the issue.

Almost six years have passed since the world became aware of the deadliest military weapon that man has ever devised. During this period, it can be assumed that great developments have been made in improving atomic weapons. Yet, in the face of this new, devastating means of destroying an enemy, the forces continued to wage war in Korea, and to disregard not only the weapon, but also the suggested means of defence against its employment.

While military thinkers are doing their utmost to find a defence against atomic attack, they have yet to develop an acceptable answer. The concept of dispersion is leading the field. Again, this is not the solution—for victory. It is only a passive means, comforting, for the present, in the thought that something might be salvaged. However, in my opinion, dispersion on the level necessary to thwart the effects of atomic explosions is a sure way to defeat. It divides the force—men and materials—required to win. Further, dispersion in the offensive, as well as in the defensive, spells doom.

World War II Examples.

While dispersion can be employed by small units—squads, platoons, and companies—it is physically impossible to employ it from the viewpoint of a large-scale operation. For example, consider the landings in Normandy on 6 June, 1944. Let us assume that the Germans had possessed the capability of delivering the old-fashioned Hiroshima-type atom bomb in the landing area. This bomb had a destructive capacity of about four square miles. Using this now obsolete figure, disperse the Allied forces landing in this opera-

tion. If the dispersion necessary to present an unprofitable A-bomb target had been used, the forces would have been spread, approximately, from Cherbourg to Le Havre. It follows that no force at all could have been concentrated against the Germans. Obviously, the Allied invasion of Europe would not have been successful.

Using similar deductions, the break-through at Saint Lô could not have been accomplished if General Bradley had employed dispersal tactics. Likewise, from the German viewpoint, assuming that the Allies had an atomic capability at that time, there would never have been a Battle of the Bulge. Numerous other examples could be given. They appear unnecessary due to the obvious fact that dispersal is not the answer.

The Solution.

If dispersal is not the solution as a defence against atomic attack, what is the answer? Will future wars merely be a slugging match in which each side destroys the other? Have nations reached the point where they can no longer impress their will upon another without physically destroying themselves? These are profound questions. Each deserves an answer. But, for military thinkers, there is really only one question. What is the strategic and tactical technique to be employed against an enemy who also has the capability of delivering at atomic attack? The solution is twofold—**calculated risk** and **atomic superiority**. Each of these solutions is of utmost importance and each requires an analysis.

Calculated Risk.

A calculated risk will assume great importance in the military

technique of the atomic age. It is a risk that must be defined clearly and which must be readily and easily understood. Further, whether or not a calculated risk should be taken must always be decided before beginning the operation. The result of taking a calculated risk cannot be given as an excuse for a defeat. Any intelligent evaluation of the risks involved, in the future, must be a reason for success. The result will be a monument to the genius of its employer.

A calculated risk, from a military viewpoint, may be defined as a command decision, made after an estimate of the situation, that an operation will be conducted against acceptable odds.

The commander, having assumed the responsibility for such a fateful decision, then turns to the planning for the operation. At the highest level — theatre, army group, and army — this planning must be meticulous so as to include the most minute details. No longer can the so-called "broad brush" be employed. A complete blueprint of the operation must be constructed. Every possible contingency must be foreseen. Every capability of the enemy to deliver an atomic blow must be plotted as to place and time. The resulting losses must be calculated carefully. Replacement units must be ready to fill the gaps. Nothing must be left to the imagination. All aspects of the operation must be based on realistic plans — nothing on unanticipated chance or hope.

After the plan is completed and the odds are calculated, the commander then must make a second decision—shall the operation be undertaken? If the calculations prove that the losses are unacceptable, or

that the mission cannot be accomplished, the decision is negative. Conversely, if the plan reveals, by war gaming, that the mission can be accomplished with acceptable losses, the operation order is issued. Thus a calculated risk is taken with full cognizance of the cost and the results to be attained. This is the only way in which successful surface operations can be conducted in the future — without atomic superiority.

Atomic Superiority.

Atomic superiority divides itself, logically, into two types—complete and local. Each requires a definition.

Complete atomic superiority, as the name implies, means that one nation has an atomic capability while its enemy does not. Either the enemy does not possess a stock pile or his stock pile and means of delivery have been destroyed completely. It is doubtful that complete atomic superiority can be established in the early stages of a war.

Local atomic superiority, on the other hand, may be defined as the ability of one nation to employ atomic weapons in a given area of operations while its enemy is denied that capability. This will be the condition usually sought. It is the most probable of attainment.

The question then logically follows—how can local atomic superiority be won? Admittedly, it is a stupendous task, but necessity may require its attainment.

Local Atomic Superiority.

In order to win local atomic superiority in an area of operations, absolute command of the air is a primary and essential requisite. This means that no enemy airplane ca-

pable of carrying an atom bomb will be permitted to fly over the given area on a bombing run. This, too, is most difficult to accomplish. But, unless the decision is to fight on the ground with an unrealistic degree of calculated risk, the difficult air mission must be accomplished. There is no other choice.

Further, if local atomic superiority is to be gained, the enemy must be incapable of launching atomic missiles against the operation. This, also, will require a tremendous effort. The pinpointing of the launching sites, their subsequent destruction, and the prevention of the construction of new missile launching areas, all add to the difficulty of the operation. Should bombardment from the air prove incapable of accomplishing local atomic superiority, airborne troops must do the job.

In a like manner, enemy artillery, capable of firing atomic shells, must be rendered useless. This may be accomplished by counter-battery operations, air bombardment, employment of drone planes and missiles, partisan warfare, and, if necessary, airborne troops.

The winning of local atomic superiority will not be an easy assignment. A great deal of force and time will be expended in such an operation. It is not, however, a question of expenditure of force or time. If surface warfare is to be conducted, and it is believed that such warfare is a definite requirement if we are to win any future conflict, some degree of local atomic superiority must be accomplished. Therefore, if the calculated risk alone is unacceptable, the commander has no choice but to accept the battle for local atomic superiority.

Intelligence.

Accurate and timely intelligence is necessary in the execution of military operations. In the atomic age, such intelligence assumes even greater importance. This especially is true while the commander is preparing his estimate of the situation, when the advantages and disadvantages of taking a calculated risk or of obtaining atomic superiority are being considered. Intelligence must take the "guesstimate" out of the estimate, for there can be no guess work whatsoever. Intelligence will have to produce the absolute answer.

Logistics.

Everything in this analysis pertains to logistical as well as to tactical operations. A few items, however, demand additional emphasis.

It is impossible to consider operations, in future surface warfare, without thinking of the means with which to execute those operations. In atomic defensive considerations, the ports, depots, lines of communications, transportation facilities, and many other items are of utmost importance. While dispersal is a partial solution, it is not the answer. The same considerations—calculated risk and atomic superiority—must be taken into account. Again, a logistical estimate, culminating in the commander's decision, must rule. There is no easy or short-cut method. Losses from atom bombs must be acceptable and replaceable, or the operation must wait for the attainment of a degree of atomic superiority.

The Answer.

From the foregoing, it may appear that surface operations, in a future war, can be conducted only

by taking a calculated risk or after a long and laborious effort, in which some degree of atomic superiority is attained. This is not necessarily true. The solution lies in a combination of each of the essentials—calculated risk and local atomic superiority.

The situation probably will be one in which the surface operation cannot be conducted initially because the odds are unacceptable. Then, in the same manner as air superiority was won in World War II, the ground operation must wait for the attainment of local atomic superiority. At some time during the operation to gain local atomic superiority, the odds will become acceptable. At that time, with the calculated risk carefully considered, the ground action will begin. This will be the answer, the winning combination, for successful ground or surface operations against an enemy possessing an atomic attack capability.

Execution—Attack.

In the execution of surface operations in the atomic age, the man on the ground still will play his prominent role. Accepting this fact, the planning for the operation must take place well in advance so that all ranks may be indoctrinated thoroughly in the scheme of manoeuvre and in every detail of the proposed action. Every man, from private to general, must know and understand the degree of atomic superiority attained and the amount of calculated risk involved. Individuals, from the rifleman to squad and platoon leaders and company commanders, and all others involved in front-line action, must understand that speed is the essence of the successful execution of an

attack. They must penetrate and operate in the enemy's area as quickly as possible. Herein lies not only the key to success in the engagement, but also the best chance for survival against an atomic attack. The enemy will find it most difficult to employ atomic weapons against a moving, unlocated target.

Execution—Defence.

During the period that the battle for local atomic superiority is being fought, the defensive will have to be assumed. It is in this phase that the evaluation of this calculated risk to be taken will be of paramount importance.

First, the terrain to be occupied must be chosen carefully. This ground should be easily defensible by the **smallest possible number of troops**. Advantage must be taken of natural cover and concealment. In addition, elaborate underground shelters must be constructed.

An almost certain sign that something is about to happen would be a withdrawal of the front-line enemy troops. For this reason, patrolling must be active and contact with the enemy must be maintained. Should the enemy withdraw, the friendly front-line troops must advance and maintain contact, leaving their present defensive position vacant or occupied by a reserve in case of an emergency.

The reserve must have counter-attack plans for every contingency. It must never occupy the same area for a period of more than 12 hours. Movements must be made at night. Enemy intelligence must never be able to locate a reserve area. It must change constantly.

In the same manner, artillery and division supply points must never

occupy their positions for too long a period. Admittedly, the movement to new locations, to a great extent, will be dictated by the availability of such areas.

The greatest necessity in conducting a defence against atomic attack is identical to that for offensive action, namely, all ranks must be indoctrinated thoroughly as to the degree of calculated risk being taken. There is only one answer; the mission must be accomplished. At all times, the force must be able to concentrate against the point of greatest danger to the defence.

Flexibility.

With local atomic superiority a fact, the calculated risk understood thoroughly, and with clear, concise orders issued and supervised execution taking place in accordance with the plan, it would seem that victory is inevitable. Such is not true necessarily. There is one more essential ingredient—flexibility.

Flexibility means the ability to adapt and to modify, and to adjust to changing conditions. It will be humanly impossible to foresee every possible contingency. There may be an error in the evaluation of the calculated risk. The enemy may deliver, by some ingenious means, an atom bomb or shell at a critical time or place. And, of course, we may become involved in defending ourselves against that ace of the battlefield, a well-planned and brilliantly executed counter-attack. It follows, therefore, that battlefield tactics in the atomic age will be more demanding on the ingenuity of the commander. The flexibility of the command, among other things, will determine the greatness of the leader.

Conclusion.

Atomic warfare is, without doubt, the most revolutionary in the history of mankind. Probably it will remain so for centuries to come, enjoying the same prestige as the invention of gunpowder. There is no simple defence against the employment of atomic weapons. A nation, if it desires to survive, must find some means of overcoming the devastation produced by man's ingenuity. In finding this answer, however, seemingly simple and easy solutions are to be avoided. They do not exist.

Certainly, the value of spreading our forces so as to eliminate a profitable target must not be underestimated. However, it is not the answer to the problem. To win, there must be a concentration of force—the employment in mass of men and superior material. Many other solutions will be discovered as future studies are made. For the present, however, it appears that no other solution approaches the answer as closely as the calculated risk coupled with local atomic superiority.

As divisions departed for Normandy, in June, 1944, General Eisenhower wished them Godspeed with these words: "When you hear airplanes overhead in France, don't worry about them. They will be your planes."

The Supreme Commander of World War III also must be able to say to his men: "When you hear airplanes and missiles overhead, don't worry about them. The planes will be yours and the missiles will be going out."