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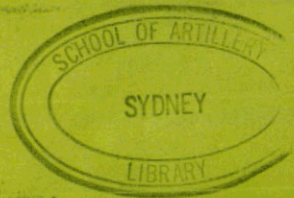
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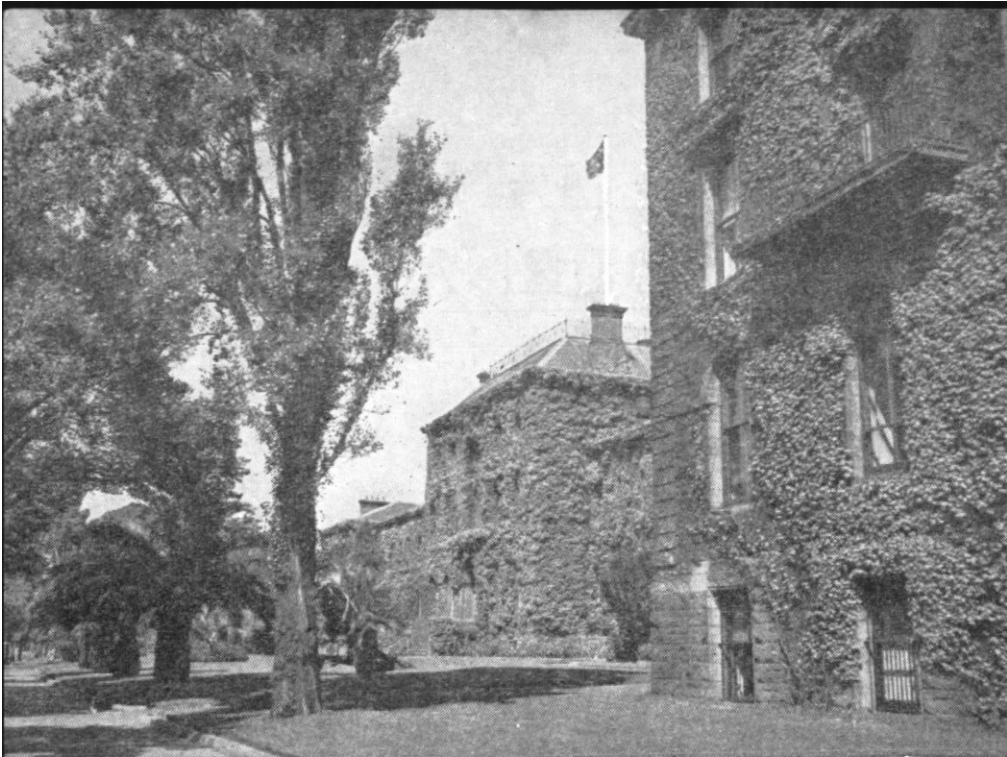
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THE WAR in KOREA

SUMMARY OF EVENTS,
MAY, 1951, TO JULY, 1953.

Captain E. J. Mulholland, M.B.E.,
Directorate of Military Intelligence, AHQ.

THE period under review can be divided into four definite phases: first, the enemy attempt in 1951 to break through, next, their subsequent withdrawal in the face of United Nations counter thrust. Thirdly, a period of resultant military stalemate with only limited offensives on either side, and finally the painfully long and devious peace negotiations ending in the Armistice on 27 July, 1953.

Enemy Offensive April-May, 1951.

On 23 April the enemy launched a general attack across the front with 39 divisions of approximately 400,000 troops and by the end of the month had broken through to a maximum depth of 40 miles and occupied a line running generally west-east some 10 miles north of Seoul. After a pause of a fortnight, the assault was continued, and except in the immediate Seoul area, registered

gains of 10-15 miles with up to 30 miles on the extreme east.

However, the enemy strength was spent in vain endeavours to break through the United Nations main line, and on 21 May the counter offensive commenced, which was to carry United Nations troops back to the 38th Parallel within a week. As a result of this one week's fighting, the enemy lost more than 100,000 estimated casualties, 12,000 prisoners and huge quantities of painfully mustered supplies, and found himself forced back north of his original start line.

At the end of this phase of the campaign, the United Nations were deployed along a line running generally 15 to 20 miles north of the 38th Parallel on the west and central sectors, and 35 miles north on the east coast.

United Nations Limited Offensives September-October, 1951.

From the end of May until October only sporadic fighting occurred with both sides adjusting positions, attending to lines of communication and generally building up supplies. It should be noted that Cease Fire negotiations commenced on 10 July, 1951. This period of relative stalemate gave some indication of the pattern the war was to follow, with few exceptions, for the balance of its course.

In September a limited objective offensive against North Korean troops was launched in the mountainous eastern sector. As a result of this operation, a North Korean Corps was relieved in the front line by Chinese formations. This was the first time such an event had occurred and was indicative of the decreasing ability of North Korea to prosecute the war, and the consequent expansion of Chinese interests.

The October offensive was of a similar nature to that in September, but was launched on the western and central sectors to adjust positions.

A vigorous drive to eliminate Communist guerillas operating behind United Nations lines was launched in December, 1951. Their strength was estimated at about 8,000 and included remnants of the North Korean army bypassed in the drive north from the Pusan perimeter in late 1950. Although not a threat to United Nations forces, their presence and activities were seriously undermining internal security in the Republic of Korea whose administration and economy had been weakened by the destruction of war and inflation. The operation

resulted in the death or capture of approximately 4,000 guerillas and a considerable improvement in security.

The Stalemate Period, Year 1952.

The war now developed into a virtual stalemate, with both sides occupying defensive positions which were constantly and elaborately improved. Ground contact in the first half of the year was limited to patrol activity and raids in up to battalion strength.

Towards the end of the year enemy activity increased in both frequency and strength employed. The enemy showed a great desire to seize and hold certain United Nations outposts, some of which were of tactical importance and closely linked to the Truce Talks (q.v.), while others were so insignificant as to justify the belief that the enemy object was to inflict casualties and so weary the United Nations of the struggle.

The logistic build-up by the enemy continued throughout the year, in spite of continuous air and naval interdiction by United Nations forces. The most significant and startling results were in the quantity and quality of artillery, both field and anti-aircraft.

Artillery as an arm was developed by the enemy from relatively insignificant proportions to a major factor, which was to be exploited to the full in the future. The quiet period was also utilised to the utmost in training, both in fire control technique and supply systems.

The large scale air interdiction programme, initiated and followed by the United Nations, set in motion the expansion of enemy anti-aircraft

artillery to such an extent that it became a factor to be reckoned with by the end of the year.

Events Preceding the Armistice, January-July, 1953.

During this period the enemy attitude changed from purely defensive to that bordering on all-out offensive. During the first three months he continued preparation and consolidation of an elaborate defensive system, concurrent with supply build up. The following month he indicated fear of a United Nations spring offensive and took steps, by the initiation of frequent limited objective attacks, to throw and keep United Nations forces off balance, and to gain intelligence of the believed impending assault.

The pattern of behaviour in May, June and July was decidedly offensive, culminating in a large scale action fought on the central front in July, where United Nations forces were forced to relinquish up to six miles over a twenty mile front.

In these pre-armistice actions, the enemy forcibly demonstrated the improvement in supply of all natures, and particularly artillery, he had effected over the preceding period. In the month of June the ammunition expenditure was 40 per cent. greater than in October, 1952, at which period he was considered at his peak, and he was still estimated to hold sufficient stocks to carry on offensive operations for 35 days and defensive operations for a further 21 days.

Armistice Negotiations.

After the defeat suffered in May-June, 1951, the enemy, through the Soviet Union, initiated steps on 23 June which led to the cease fire negotiations on 10 July at Kaesong.

These talks, which were to continue with wealth of charge and counter-charge, suspensions and breakdowns, led to the signing of the Armistice at Pan Mun Jon on 27 July, 1953.

The major points of contention were to prove the United Nations' insistence on the principle of no enforced repatriation of prisoners, the Communist desire to rebuild airfields in North Korea, and the supervision of the Armistice in respect of mutually acceptable neutral nations.

In July, 1951, agreement on an agenda for the conference was reached. In general terms it was:

1. Agreement on the agenda
2. Demarcation line between hostile forces
3. Measures to enforce the Armistice
4. Exchange of prisoners
5. Recommendations to the Government of both sides.

As a result of enemy charges of violations of the neutral zone around Kaesong, the conference was suspended during most of August and September, 1951, and as a result of representations by the enemy the site was moved to Pan Mun Jon in October and the talks resumed.

Agreement on the demarcation line was reached on resumption, but the measures to enforce an armistice were to prove a stumbling block for many long months. In April, 1952, the United Nations offered a solution to points 3 and 4 in which United Nations objection to the building of airfields in North Korea was dropped in return for Communist acceptance of the principle of no enforced repatriation. Agreement could not be reached on these points, and shortly afterwards (May,

1952) Communist prisoners in United Nations' hands rioted; the subsequent measures taken by the United Nations to restore the situation were eagerly seized on and used as propaganda by the Communists.

The conference continued meeting at intervals with long periods of recess until 8 October, 1952, when the talks were abandoned by the United Nations until such time as the Communists either accepted previous proposals or came forward with new, mutually acceptable suggestions.

The conference was resumed at Pan Mun Jon on 30 March, 1953, at the request of the Communists, and agreement was quickly reached on the exchange of sick and wounded prisoners. This exchange commenced on 20 April and was completed without incident.

On 7 May the Communists put forward proposals, which with minor modifications, formed the basis for the truce in July.

With the cease fire now imminent, the President of the Republic of Korea, Mr. Syngman Rhee, protested loudly and bitterly that his country was betrayed. In an apparent desperate attempt to prevent a truce, he released from custody approximately 25,000 Korean prisoners who had elected not to be repatriated.

The Armistice.

The armistice agreement provides for a withdrawal of 2,000 metres from the line of contact within 72 hours of the cease fire. During the withdrawal and/or within 48 days of the cease fire, all fortifications, obstacles and minefields, etc., must be salvaged or destroyed.

With effect from the truce, the entry into the country of warlike

stores and equipment is prohibited, items of such nature currently held may be replaced only when lost, worn out or evacuated. In a like manner personnel strengths may not be increased. Troops now serving may be relieved on a one for one basis within a ceiling of 35,000 a month.

A Neutral Nations Supervisory Committee consisting of delegates from Poland, Czechoslovakia, Sweden and Switzerland is established to police the armistice. This Committee will position teams in the ten (five for each side) designated ports of entry to ensure compliance with the conditions in respect of warlike stores and personnel.

The Commanders of opposing forces recommend to their respective Governments, "that a high level political conference be convened within 90 days of the armistice, to settle through negotiation the questions of the withdrawal of all foreign forces from Korea and the peaceful settlement of the Korean question, etc."

US-ROK Treaty.

Shortly after the signing of the armistice, the Governments of the United States of America and the Republic of Korea initialled a Mutual Defence Security Treaty. The major provisions of this treaty are that each Government contracts to come to the aid of the other in the event of its political independence or security being threatened by external sources; the Government of the Republic of Korea grants the right to the United States to dispose military forces in and about the territory of South Korea as mutually agreed.

Conclusions.

Militarily the Korean war has seen the emergence of China as a land

power. From the poorly equipped and badly led forces of the Civil war she has developed a significant army, balanced, both well equipped and officered, and with a considerable amount of realistic experience. That her higher commanders are capable of controlling a modern army making the best use of supporting technical arms is not, however, yet proven.

On the political front, the "settlement of the Korean question, etc.," is likely to prove as tedious and difficult as was the successful conclusion of the military campaign. One significant factor which will prove of increasing importance in the future is the acceptance of a commitment on the continent of Asia by the United States of America.

Whatever the problems still confronting the United Nations in Korea the war there has served as a warning to would-be aggressors that force will be opposed by the forces of at least a majority of the United Nations. It is to be noted that when the invasion of South Korea took place no machinery existed whereby effective and speedy counter-measures could be initiated. While this situation does still in fact exist (due to the shipwreck of proposals for an International Police Force) the emergency measures taken by the United Nations under the leadership of the United States give a measure of hope that aggression on the Korean pattern will not be repeated.

In my country, as in yours, men are proud to be servants of the State, and would be ashamed to be its masters.

—Winston Churchill, in a speech to the American Congress.

BALLISTICS



Reprinted from the Royal Australian
Air Force Training Bulletin.

DETEKTIVE story readers recognize a ballistics expert as a professor who identifies the bullet as having come from the gun found in the potting sheds. To others, a ballisticians is a brilliant scientist who does abstruse calculations on secret weapons. To a gunner who has troubled to think about it, a ballisticians is the man who provides the data for working out deflection allowances.

Where there's smoke there's fire. All these ideas have a grain of truth in them, but by no means the whole story.

In general terms, ballistics can be described as the science of the motion of missiles—of shells inside and outside guns, of rockets and of jet-propelled projectiles. In the widest sense it may deal also with golf balls, darts and perhaps even to some extent with aircraft and ships.

This article will deal chiefly with the warlike applications; but, where possible, illustrations from everyday life will be introduced.

The Divisions of Ballistics.

Ballistics is divided into four main sections, namely:

External Ballistics. which is the study of a projectile in its path through the air.

Internal Ballistics. which is the study of the motion of a shell until it leaves the gun, and similar problems.

Terminal Ballistics. which is the study of the penetration of solids by fast-moving missiles. This is a comparatively new branch of ballistics.

Fragmentation. which is the study of the behaviour of the fragments resulting from the detonation of shells and bombs.

Ballistics also embraces the study of blast waves and of the motion of bodies through water.

What the Ballisticians Does.

Before a new type weapon is designed and constructed for military use, its role, performance, weight and size are determined; and the types and maximum proportions of its attendant ammunition are laid down. The terminal ballisticians and the fragmentation experts give their preliminary views on the size and design of the projectiles. Then the external ballisticians calculate (if it is a gun) the approximate muzzle velocity required or (if it is a rocket) the maximum velocity. Next come the internal ballisticians, who calculate the pressures and the

stresses to be expected. Then the designer gets to work to see whether all these calculations fit in with the original requirement. Generally they do not, and much chopping and changing takes place until a satisfactory compromise is reached.

Then a prototype is produced to undergo very exhaustive trials. Maybe the propellant does not suit. It is the internal ballisticians' job to find the correct one. Again, another type of projectile may be required: once the external ballisticians and the shell designer have done their work, the internal ballisticians calculate what the charge could be.

Ranging trials are done, and from what would appear to the layman to be a very inadequate number of rounds, the external ballisticians produce voluminous range tables, and gives all the essential data for the fuze designers, and for an anti-aircraft weapon, he produces vast quantities of figures for the makers of the fuze-setters and predictors.

The fragmentation experts and the terminal ballisticians run their trials on the projectiles to see whether the results come up to what theory predicts. When everybody is as satisfied as he is likely to be, the weapon goes into service.

Some Ballistic Terms.

At later stages, it will be convenient to use terms which are familiar to gunners. They are introduced here for the easy reference of the reader. Refer to Figure 1.

G denotes the position of a gun, and T that of a target.

H is a point on the same level as G and immediately under T.

GT is the straight line from the gun to the target and is called



Fig. 1

the line of sight; the distance GT is called the slant range.

The line GH is the horizontal and the distance GH is called the range.

GVT is the path of the projectile and is called the trajectory.

The point where the projectile hits the ground (in this case the point T) is called the point of impact.

GS is the direction in which the projectile starts out and is called the line of projection.

V is the top of the trajectory and is called the vertex. At this point the projectile is moving on the level.

The angles at G have the following names:

HGT is the angle of sight.

TGS is the angle of projection.

HGS is the quadrant elevation.

The velocity as the projectile leaves the gun is called the muzzle velocity, and the velocity at any point of the trajectory is called the remaining velocity.

External Ballistics.

External ballistics is the study of the motion of projectiles in flight. Its object is to build up a complete theory to predict and explain the things described in this article.

The Factors Involved.

Because it is always there, we are inclined to forget the effect of

gravity, but it is true to say that it is the biggest factor in external ballistics.

The factor that makes a missile slow down is the resistance of the air, and until we have produced rockets that can go far outside the atmosphere, it will always be very important in ballistic calculations.

It is not much use sending off a missile with no very good idea of where it is going. In other words, a fairly high degree of accuracy is essential. This means that the missile must not be allowed to tumble through the air — it must be stable.

Effect of Gravity.

Let us try an experiment. Two balls of lead are thrown into the air in different directions, but to the same height. We suggest lead because it is very dense and in our experiment will not be much affected by air resistance, which we shall for the moment ignore. As long as these two balls go to the same height they will both be in the air for the same time, irrespective

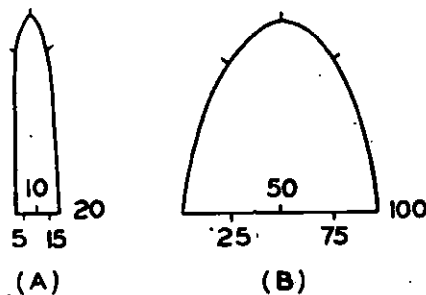


Fig. 2

Disregarding the effect of air resistance, objects thrown to the same height as in (A) and (B) will be in the air for the same time.

of how far away they are when they hit the ground. This is because the only thing affecting them, once they are in the air, is gravity, and gravity always acts downwards.

We conclude that when there is no air resistance, the vertical speed (up and down) is equal to that of a ball thrown straight up, and the horizontal speed is always constant.

Taken together, these mean that the trajectory in a vacuum is the same shape on the way down as it was on the way up. In a word, it is symmetrical.

Effect of Air Resistance.

When air resistance is taken into account, most of these conclusions are no longer exact, and in this section we shall see why.

First of all, the effect of air resistance is to slow down a projectile, and as a result its path becomes more curved as it moves farther from the starting point. The trajectory is no longer symmetrical, being steeper on the way down than on the way up.

The Ballistic Coefficient.

The factors which go to make up the carrying power, hence the Ballistic Coefficient, are the weight of the missile, its area of cross-section, its stability, its shape and the density of the air.

The weight: drop two balls of the same size, one made of lead and the other of wool, simultaneously from the top of a high building, and you will find that the lead ball reaches the ground first. This is because, other things being equal, its weight is greater. Therefore, the carrying power increases with the weight.

The area of cross-section: from the consideration in the above paragraph, we know that, for equal weights, the smaller the ball, the greater the carrying power. Therefore, the carrying power decreases with increase in the area of cross-section.

The stability: if the missile is any shape other than round—suppose it is shaped like a shell—then if it always goes nose first it will offer less resistance to the air than if it flies sideways on, or, for that matter, twists about in the air. Therefore, the more stable it is, the farther it will fly.

The shape affects the flight in a rather complicated way. This will be described later.

The density of the air: a missile would go much farther if there were no air to contend with, and the more air there is (i.e., the denser the air) the more resistance is offered to the flight of the missile, and the shorter will be the range.

If we plot on a chart the ratio Range/Ballistic Coefficient corresponding to the new gun Muzzle Velocities, the points become a narrow band which takes a well-defined form.

This is, indeed, very important, for it means that if we know the Range for a projectile at a certain Muzzle Velocity and a few Angles of Elevation, we can estimate pretty accurately the Ballistic Coefficient and hence the expected ranges for all other angles of elevation.

Sound waves consist of alternate high and low pressures. When a missile goes slowly through the air, the sound waves spread out all round it. If it is moving more quickly, but not as fast as the speed

of sound, waves bunch up in front and air vortices and turbulences form in the rear. If the projectile is moving faster than sound, the sound waves on each side are all bunched into one wave of high pressure, while behind it there is a trough of low pressure. The wave of high pressure is called the "shock wave" and it causes the "crack" which is heard when a shell passes at a speed of more than 1,000 feet per second (the speed of sound).

The effect of this building-up of a shock wave when a missile moves at the velocity of sound is to make a sudden increase in the air resistance. A diagram of the air resistance at shell speeds varying from rest to 1,000 feet per second gives the smooth course AB (see Figure 4), and if this course continued on in the same way it would go smoothly up to the point C. However, the resistance curve does not follow this course, but increases very steeply just at the velocity of sound and then gradually moves back towards the dotted curve, although it never reaches it.

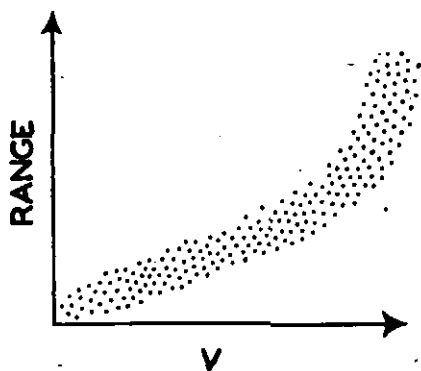


Fig. 3

Plot of Range/Ballistic coefficient corresponding to muzzle velocity.

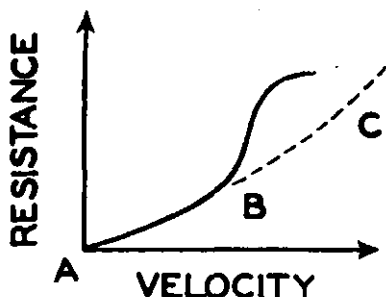


Fig. 4

Effect of air resistance. Point B is the speed of sound.

Ultra-high Speeds.

Very little is known about speeds beyond a mile a second (5,280 feet per second), but it is possible that there is another "cliff" at something a little greater than this speed.

When a shell moves at high speeds, the air cannot escape from in front quickly enough, and a very high pressure is built up in front of the nose. Since the air cannot get away, neither can the heat, so that the air is adiabatically compressed and the temperature rises so rapidly that the nose may go red or even white from the heat. If the shell is in the air long enough for the heat to be conducted back, the high explosives may blow up. Londoners saw this happening quite frequently during 1944-45 — many V2's exploded high in the air for this very reason.

Effect of Shape.

With great speeds, the bow wave actually moves back slightly from the nose, and if the angle of the nose is blunter than that of the bow wave, the resistance will be very great indeed. Thus the shape of the

nose becomes more important at higher speeds.

Base Drag.

The space behind the base of the shell, if it is moving slowly, will fill up with air as the shell moves along. With greater speeds, a vacuum which sucks the air along is formed behind the shell, slowing it down.

When the speed becomes very considerable — that is greater than the speed of sound — the shape of the base becomes less important than the shape of the nose, and streamlining does not have so much effect on the resistance as it does at lower speeds.

Skin Friction.

The effect of skin friction becomes important for larger missiles, and has to be considered in rocket calculations.

Stability and How It Is Obtained.

Yaw.

When a missile is not pointing exactly in the direction in which it is moving it is said to be yawing, and, as we have already seen, yaw increases the air resistance. Further, if yaw is allowed to vary, the projectile will probably miss the target.

Fin Stabilization.

No matter which way you throw a dart, or an arrow, or a thrower's knife, it will turn in the air and fly point first. It does this for two reasons:

- (a) The weight is concentrated towards the point. In scientific terms, the centre of gravity is towards the point.
- (b) The light tail-end has a big area on which the air can press. Again in scientific

terms, the centre of pressure is towards the tail.

What is done in practice is to make the projectile nose heavy, with large flat surfaces at the rear, along which the air can flow. If the missile yaws, the air blows against these flat surfaces and brings it back so that the nose again points in the direction of motion. As we have seen, the important points are that the weight must be well forward, and the resistance to the air must be towards the rear when the projectile is yawing.

Spin Stabilization—Gyroscopes.

To withstand the high pressure in a gun, the base of a shell must be very strong and therefore thick and heavy. To fly through the air as efficiently as possible, a shell must have a pointed nose. It therefore has everything wrong according to our criterion of stability—although its centre of pressure may be well back, its centre of gravity is even farther back. Therefore to make a shell stable, we must bring in some new principle, and we introduce the idea of gyroscopic stabilization.

Gyroscopic Motion Applied to a Shell.

The shape of a shell is such that, if it is yawing, the effect is as if someone was trying to pull the nose upwards. This will tend to make it move in the direction towards which its topside is spinning—in other words, towards the right.

The actual motion is complicated, but the final result is always for the shell to point to the right. This makes it move slightly to the right of the direction in which it is aimed, and unless allowance is made for this, it will tend to land to the right of the target. This tendency to move towards the right is called drift.

Effect of Density of Air.

Previously, we have said that the denser (and hence the more viscous) the air, the greater is the resistance factor. The density of the air decreases as the height above sea-level increases. Therefore the carrying power of a missile increases with height. If the projectile can be pushed right up into the upper atmosphere, where the air resistance is very small indeed, it may be made to go very much farther. This is a principle that is used when very long ranges are wanted—for instance with the V2 which was fired at London. Once the V2 was about fifty miles up, there was practically no resistance at all.

Very Long Ranges.

Wind.

When any weapon is fired at a long range, or at high angles of elevation, it is most important that the first round should be as near as possible to the target, particularly as most long-range weapons have very large and expensive missiles. This means that the firer must have, in addition to all the usual information required for firing under ideal conditions, as reliable information as possible on the strength and direction of the wind.

Wind affects different missiles differently. During the early stages of a rocket's flight, while the fuel is still burning, the rocket turns and flies into the wind. When the fuel is burnt the nose of the rocket still points into the wind, but the whole rocket is moved bodily with the wind. A mortar bomb behaves like a rocket after "all burnt," while a shell is not affected quite so much because its lateral wind resistance is smaller than that of a finned projectile. For high-angle

fire, wind corrections may be quite large because the shell is in the air long enough for the wind to affect its flight.

Rotation of the Earth.

A point on a spinning ball moves more quickly as its distance from the axis is increased. In this way, an object on the earth's surface can be said to vary in speed from being stationary at the poles to about

twenty miles a minute when it is moved to the equator.

For this reason, and the fact that the earth's rotation is always to the east, very long range projectiles will fall to the west of the target.

Adjustments in this case affect range in the easterly and westerly directions, and require adjustments in azimuth for northerly and southerly firing.

When a man has climbed by hard effort to a ridge from which he gets a fresh vista—if only of further ridges beyond—he will usually find, when he tries to tell of it, that those who have remained contentedly in the valley insist that there is nothing beyond what they can see.

—Liddell Hart.

SYNTAX

Warrant Officer N. F. Clarke, L.A.S.A.,
Australian Army Educational Corps.

UNDER this somewhat forbidding title the text-books tell us that syntax is concerned with the construction of sentences and go on to expand the subject in the puzzling jargon which seems to be especially favoured by the grammarians. This does nothing to whet the student's appetite for more and often produces reaction against a subject which is an important element in the art of oral and written expression.

Language is the first and greatest of the social bonds and for this reason alone it might well take precedence over every other study quite apart from the fact that it is the basis of most known studies. Misunderstanding of language is among the chief of the world's woes. In a country like Australia it is normally forgotten that English is not the only language in the world: this is not to say that the ability to speak a variety of languages necessarily makes the speaker any wiser. The inhabitants of small countries are obliged by circumstances to learn several languages which is, in effect, learning a new set of symbols, for language is artificial and a matter of convention.

The study of grammar is part of the study of the functions which go with the use of words. Words are audible and also visible indications of thought though as used by many people, especially politicians, they

are often practically devoid of sense. It is almost as impossible to define a word as it is to define a thought. Most educated people would consider themselves able to explain the meaning of a word: a little reflection may raise doubts. Defining the meaning of a word is rather like defining a man in terms of his viscera which adds up to the definition of a corpse: a "has been" rather than a human being. The word "water" can be defined in terms of chemistry and physics, but if we consider the phrase "water ripples" the word "ripples" can only be defined very loosely indeed. Here the incidence of light, the surface of the water and a time factor are involved. If "rippled" was substituted for "ripples" there is an alteration of meaning in the time sense. This gives rise to the question: is "ripples" to be taken as a different word from "rippled"? Much unnecessary classification is avoided by adopting the convention that there is only one word "ripple" which is modified in practice by the speaker or the writer. A word may not only possess a variety of forms but also a variety of meanings: a kettle "sings," a bird "sings," and a man "sings." Further, if we can judge by the controversies of learned men today, there is no guarantee that the same meaning will be attached to comparatively simple

words like "freedom" and "democracy." However, in a well constructed sentence an extremely vague word moves in a fairly restricted sense.

Most languages are constructed of sentences which may consist of one word or one hundred and fifty such as may be found in Burke's "Letter to a Noble Lord." It is now the fashion to favour short sentences which certainly deters the speaker or writer from rambling among loose subordinates: a wearisome style to the reader and frequently an unintelligible style to the listener. On the other hand an uninterrupted series of short sentences in Mr. Hemmingway's manner can become extremely irritating. The longer sentence which develops meaning balanced against shorter sentences which punch the points home make the ideal combination. A single word such as "come," "go," "no," "goodoh" or "whacko" may be full of meaning although a further context is implied. Questions and replies fall into this category: "Who is your favourite pin-up?" "Greer." "What, Garson!" This inevitably leads us to ask the question: "What is a sentence?"

At school we were led to believe that a sentence required a verb to function effectively as such; however, sentences without verbs are not uncommon. "More haste less speed" contains no verb. A strictly modern sentence: "The higher the temperature the more rapid the movement of the molecules" contains no verb. "Is" might be inserted but it is doubtful if the meaning would thereby be made any clearer. A verb may be understood in the saying: "Out of sight out of mind" but there may be no agreement as to what verb is understood. Indeed,

the introduction of a verb might be positively confusing. It is perhaps for this reason that the verb may be omitted where the purpose of the sentence is to convey a universal truth. Sentences constructed with the imperative form of the verb have no formal subject, e.g., "Come up and see me some time." Suppose one is supplied: "You come up and see me some time" may have a rather ominous significance; "Come up and see me some time you" is distinctly disagreeable. It is possible that "you" could be inserted by way of emphasis but threats are not usually associated with pronouns. Newspaper headlines frequently omit subjects, e.g., "Oppose Lotteries." Who is to oppose lotteries appears to be quite irrelevant. An act is not a sentence. "May look at kings" is not a sentence, but linked with "cats" it becomes such.

In ordinary written English both subject and predicate are formally expressed, therefore, it is announced that a sentence must have a subject and a predicate, the latter word meaning what is asserted or proclaimed. In order to vary the monotony of the subject-verb-predicate sentence an inverted construction may be used to emphasise the important member of a sentence but the nature of the English language encourages extremely rigid ideas about word order upon which it depends if sense is to be extracted from sentences. It is for this reason that it is sometimes difficult to disentangle the precise meaning of some writers. Thomas Gray, who is considered to be one of the most learned of the English poets, wrote: "Now fades the glimmering landscape from the sight." His "Elegy," by which poem he is chiefly remembered, is full of this kind of irregularity which

is employed to obtain smoothness and rhyme. A good writer will use an abnormal word order not because he has to do so but because he wishes to do so. Gray is forced into this position. The word order is reversed in such a sentence as "Crack went the whip, out rushed the man" to produce a dramatic effect.

A sentence may not have a formal subject but it must have a notional subject, that is to say, something to think about. The same is true of both predicate and object. The object may be the most important part of a sentence notionally but, formally and naturally, it is part of the predicate. The predicate is commonly defined as: "that part of a sentence on which the action of the verb performs" but if we consider the sentence: "I feel sorry," we realise that what in fact is the object of the verb is really the subject. In the sentence: "I smell a rat," it can hardly be said that the rat is performed upon by the verb since it is probably quite unconscious of what is going on. In order that there may be a formal subject the verb must be transitive and the object may be said to limit or determine the action of the verb. "I saw her reading" is vague and general, but if an object were supplied it would be quite definite as: "I saw her reading a poster."

Sentences are not defined by any distinction of form but by intention, purpose or meaning. The factor to be stressed in considering one or more words which may convey a meaning is **context**. The art of speaking and writing depends to a great extent on the amount of meaning which can be packed into a word

in accordance with its context. Written symbols do not correspond to spoken symbols for in the latter meaning is often implicit in the tone of the voice, gesture and physical environment. This aspect of language was considered at some length in "Spoken English." "It is raining" is a sentence which can be reduced to one word, "raining," which, in a given context, can be understood. It might mean "Raining?" or "Raining!" and its meaning would be clear provided it was supported by a physical context. Colloquial speech tends to be briefer and more ambiguous than written communications. This does not mean that colloquial forms are wrong and written forms right for, provided both achieve their object without a diversion of attention either to bad pronunciation or spelling, both have their place. If an obviously colloquial form is written it may divert the reader's attention from content to form. Frequently, however, colloquialisms are reprehended too severely, particularly in schools where, for some obscure reason, meretricious and pompous literary forms are unduly praised. If the Bible was translated into the literary style of leaders in the daily papers it would make curious reading, for it must be remembered that the Authorised Version of the Bible was nearer to colloquial English than than it is now. Except for the lyrical quality of his blank verse Shakespeare wrote the language that 17th Century Englishmen spoke. If in doubt about the mode of expressing thought always argue from spoken usage to written usage and not the other way round: while the two usages are distinct they are necessarily ultimately linked.



THE HEARTLAND

Major G. M. F. Wood,
Australian Intelligence Corps.

The Geographical Pivot of History.

Who rules East Europe commands the Heartland,
Who rules the Heartland commands the World Island,
Who rules the World Island commands the World.

These runes are an effective precis of the Pivot Area or Heartland theory which has attracted world attention since it was formulated in 1904.

The author, Sir Halford Mackinder, had long been interested in a number of simple geographical and historical facts, all well known but never before synthesised. These facts he embodied in a paper called "The Geographical Pivot of History" which he read to the Royal Geographical Society in 1904.

Hitler's geopolitical chief, General Haushofer, called this paper "the most brilliant survey of world-political drives."

Global Facts.

Mackinder found that three-quarters of the world's surface was

covered by water and only one-quarter by land. Of this one quarter, over one-sixth consisted of the vast triple-continent of Europe-Asia-Africa, which he named The World Island. This World Island contained no less than nine-tenths of the world's people and the bulk of its raw materials.

The remaining one-twelfth of the land's surface was composed of the outlying double continent of the Americas, the single continent of Australia, and other smaller islands.

He also noted that of the land masses of the world a remarkably large amount, almost three-quarters, was located in the northern hemisphere and even those land surfaces which did project over the rim of the equator had a tendency to taper

off to the south. Further, the lands south of the equator, notably Australia, South Africa and South America, were so widely separated that the lateral communications between them were of less importance than those to the north.

Turning to the history of mankind he agreed with the accepted theory that civilisation could not have begun elsewhere but in an area which provided the following requirements:

- The fertile valley of a large river basin subject to annual flooding and silting.
- A temperate warm climate with little seasonal variation and not too great a rainfall.
- Strong natural barriers guarding the inhabitants such as deserts, marshes, mountain ranges or the sea.
- The isolation of the community guaranteed by those natural barriers for a long period of time to permit the nascent civilisation to mature.

These were the geographical facts needed for a civilisation to evolve and Mackinder pointed out that the river valleys of the Nile, the Euphrates and the Indus all fulfil these conditions perfectly and were the seats of the earliest civilisations.

History and Geography.

The more he studied these and other necessarily more complex facts, the more convinced he became that historical development was to some extent predictable, being guided and controlled by hard and unalterable geographical facts.

He began to compare history with geography and found his attention

being continually attracted, as though by a magnet, to the pivot or heart of the great land mass of Euro-Asia. History, he concluded, "was geography in motion" and added "unless I wholly misread the facts of history, I would go further and say that the grouping of lands and seas, and of fertility and natural pathways is such as to lend itself to the growth of empires, and in the end of a single world empire."

That sentence contained the bed-rock of his Heartland theory.

He contended that Europe and European history was subordinate to that of Asia, and that Europe evolved as a result of grinding compression between two great mobile powers, one on land and one on sea.

The land power was, of course, the Mongols, the terrible horse riding tribes that issued from "the unknown recesses of Asia, by the gateway between the Ural Mountains and the Caspian Sea, in all centuries from the fifth to the sixteenth."

The sea mobility was that of the Vikings and Saracen raids along the coasts of Europe.

Mackinder likened the sea raids to an anvil and Europe to the metal forged as a result of the "great Asiatic hammer striking freely through the vacant space." These hammer strokes of "ruthless and idealless horsemen" continued at intervals for over a thousand years and included the barbarian invasions of the Huns, the Avars, the Bulgarians, the Magyars, the Khazars, the Patinaks, the Cumans, the Mongols and the Kalmuks sweeping "over the unimpeded plain . . . all the settled margins of the Old World sooner or later felt the expansive

force of mobile power originating in the Steppe."

A Russian chronicler of the period said—"Whence they come, God only knows, and whither they went, God only knows; but while they were here they were terrible." In one morning, on the plains of Hungary, Jenghis Khan left 70,000 European dead and then reduced three-quarters of the country to ashes.

In Afghanistan, after the fall of besieged Herat the warriors of the Khan killed, burned and destroyed for a week until there were over a million and a half corpses within the walls of the city.

The Heartland Defined.

The fastness from which these raids began was the probable cradle of mankind—"the continuous land mass of Euro-Asia." Measuring some "21 million square miles, or half of all the land on the globe," it was wholly inaccessible to ships, but, because of its unimpeded nature, favourable to the mobility of the horse-riding nomad.

It consisted of Russia-in-Asia, Sinkiang, Mongolia and the inland regions of the Middle East. To this area, freely accessible only from the west and bounded on the north by ice, on the east by desert and wilderness, and on the south by mountain or high plateau, Mackinder gave the name "Pivot area" which he later changed to the more striking term "Heartland" (see Figures 1 and 2).

He explained that "the concept does not admit of precise definition on the map for the reason that it is based on three separate aspects of physical geography which, while reinforcing one another, are not exactly coincident." They are the

great lowland plain, the navigable rivers which have no ready exit to the ocean, and the grassland zone.

Mackinder contended that the mobile horse-riding powers controlling this region held the strategic advantage until the development of western seapower. This seapower and sea borne commerce eventually overcame the Viking and Saracen raiders and permitted the European nations to contain Euro-Asia by a maritime mobility operating along the verges of the land mass.

Because of their very nature neither of the intruding pressures had overwhelmed Europe. The power of the horse riders "was conditional on the Steppes, and necessarily ceased in the surrounding forests and mountains." The force of the sea raiders was "effective only in the neighbourhood of the water." The barbarian invasions were therefore challenging and stimulating, rather than overpowering, and thus Europe evolved.

Mackinder argued that the so-called westward march of Empire was caused by this western sea mobility, and he agreed that the seat of power had moved slowly westwards along the shores of the Mediterranean. He regarded this movement, however, as "a short rotation of marginal power around the south-western and western edge of the pivotal area." Surely the most succinct expression yet of the glory that was Greece and the grandeur that was Rome.

He stated that the pendulum even then (in 1904) was set on the return swing, as Russia colonised eastwards and developed her transcontinental railways, giving back to the land power some of its ancient, lost

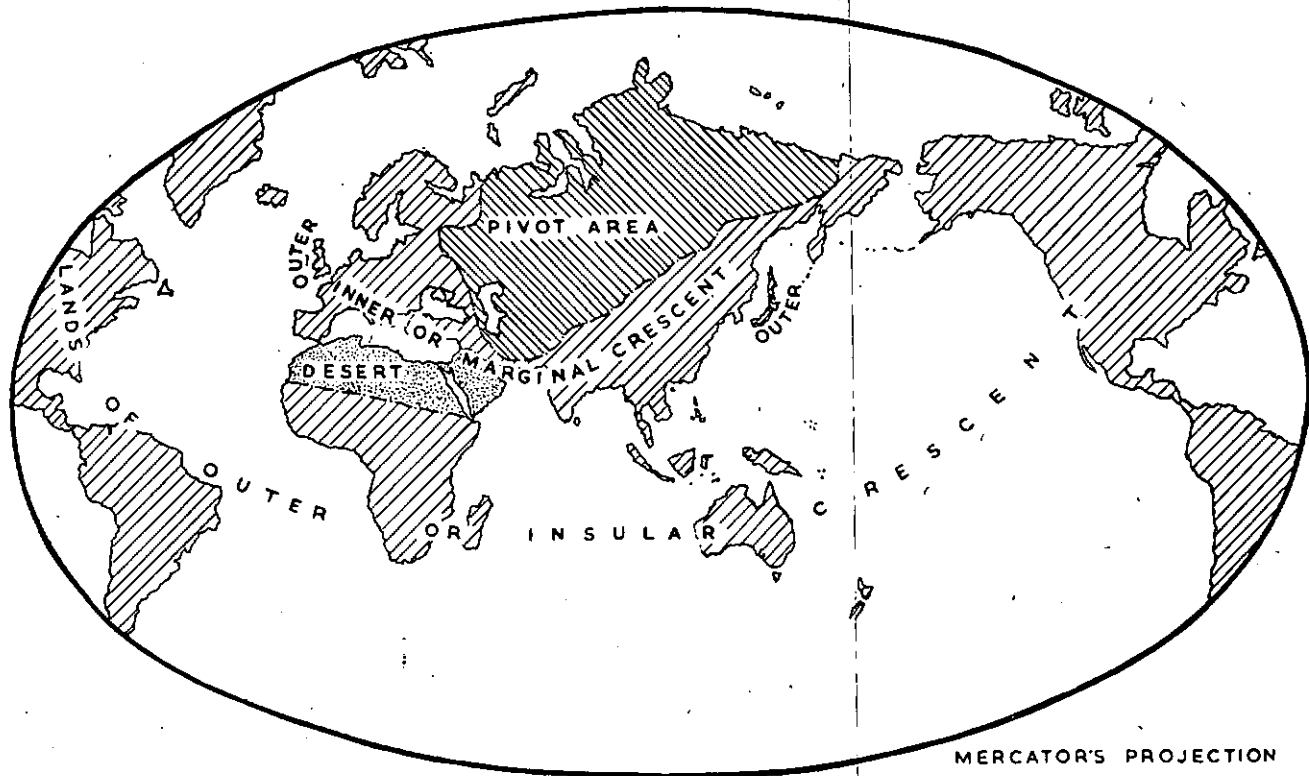


Figure 1

The Natural Seats of Power.

**Pivot Area: Wholly Continental. Outer Crescent: Wholly Oceanic.
 Inner Crescent: Partly Continental, partly Oceanic.**

mobility. "The century will not be old before all Asia is covered by railways," he said, and added, "Russia replaces the Mongol Empire . . . and the spaces within the Russian Empire and Mongolia are so vast, and their potentialities in population, wheat, cotton, fuel and metals so incalculably great that it is inevitable that a vast economic world, more or less apart, will there develop inaccessible to oceanic commerce . . . nor is it likely that any possible social revolution will alter her essential relations to the great geographical limits of her existence."

Mackinder then summed up by saying—"the oversetting of the balance of power in favour of the pivot state, resulting in its expansion over the marginal lands of Euro-Asia, would permit of the use of vast continental resources for fleet-building, and the empire of the world would then be in sight. This might happen if Germany were to ally herself with Russia, or if the Chinese, for instance, organised by the Japanese, (were) to overthrow the Russian empire and conquer its territory . . . they would add an oceanic frontage to the resources of the great continent, an advantage as yet denied to the Russian tenant of the pivot region." This was his thesis as stated in 1904.

The Theory Re-Examined.

After the first World War, in 1919, he developed his theory in a book called "Democratic Ideals and Reality." To influence the Versailles Peace Conference with these ideas he renamed his "Pivot Area" "The Heartland" and publicised the well-known runes quoted earlier.

In his book he quoted numerous historical examples of a land power

defeating a sea power if it had reasonable parity and mobility, and he predicted that in the next war land-based aircraft would render the Mediterranean untenable to shipping.

In any case he pointed out that "seapower is fundamentally a matter of appropriate bases, productive and secure" on a plain such as the English plain "the real base historically of British seapower." Later he was to show that air power needed the same powerful and protected land base from which to operate. The growth of road, rail and air transport would, he emphasised, eat away at the advantage held for so long by the oceanic powers and would give strategic mobility back to the land.

All this was published in 1919 and as we know England took little heed of his warning, but in Germany his ideas of land-based expansion and mobility met an immediate response. The Germans enthusiastically agreed that their country "occupies the central strategic position . . . in Europe" that the Heartland does "in the world at large," and Mackinder's theory became the real basis of Nazi geopolitik.

The Heartland Expanded.

In his book Mackinder divided "Europe into East and West by a line so drawn from the Adriatic to the North Sea that Venice and the Netherlands may lie to the west . . . but so that Berlin and Vienna are to the east." He had previously defined both the Heartland and the World Island in his paper of 1904. For "purposes of strategic thinking" he now expanded his Heartland to regions "which, under modern conditions, seapower can be refused

access." These included the basins of the Black and Baltic Seas, and the plateau or uppermost valleys of the Chinese and Indian Rivers. He said "There is one striking physical circumstance which knits it graphically together; the whole of it . . . lies under snow in the winter time . . . At midwinter, as seen from the moon, a vast white shield would reveal the Heartland in its largest meaning."

In 1943, four years before his death, he finally surveyed his conception which remained basically unaltered. He agreed that it was now sufficiently accurate to say that the territory of the USSR was equivalent to the Heartland where nature offered "all the pre-requisites of ultimate domination of the world."

He was confident "that the formula sought had been found" and said—"The conclusion is unavoidable, that if the Soviet Union emerges from this war as conqueror of Germany she must rank as the greatest land power on the globe. Moreover she will be the power in the strategically strongest defensive position. The Heartland is the greatest natural fortress on earth. For the first time in history it is manned by a garrison sufficient both in number and quality."

That was his final statement on "the subject of the Heartland, the citadel of land power on the great mainland of the world" and one which he said was "more valid and useful today than it was either twenty or forty years ago."

Criticisms of the Theory.

It is now some 50 years since Mackinder first expounded his theory and many criticisms have

since been made against it. Some are based on what are considered original defects of conception or conclusion, while others are on changes which have since occurred. Let us briefly discuss some of these.

Seapower.

Every man, no matter how objective, is influenced in his thinking by contemporary events. Mackinder wrote when seapower was the greatest factor in world strategy and Britain had the greatest navy in the world. In his day Britain, with the tacit assent of the USA and the Netherlands, was able to control the handful of gateways to the oceans of the world and so regulated the maritime commerce of the globe. During this period it was not possible for a single ton of shipping to move from one ocean to another without the consent of the British Navy.

He foresaw a steady erosion of this seapower by the newly invented forms of land and air mobility—the locomotive, the motor vehicle in all its forms, and the aeroplane. He knew that every major invention alters the relationship of man to his environment and a nation continuing to rely solely on seapower would be doomed.

"Democracy refuses to think strategically unless and until compelled to do so for purposes of defence" he argued, and in an endeavour to force his countrymen away from their traditional pre-occupation with the sea it seems possible that he over-emphasised certain factors in his Heartland theory.

Mercator and Polar Projection.

One of these is his use of a Mercator projection to illustrate his theory. This type of map owes its

long dominance to being a good seaman's chart, giving true bearings of one point in relation to another, and thus suited to the maritime powers.

Mackinder's use of the Mercator outline in his famous map copied in Figure 1 was somewhat concealed, perhaps deliberately, by his enclosing it in an oval frame instead of the customary rectangle.

Each century has its own geographical perspective and even Mackinder could or would not break with the Mercator projection which becomes progressively distorted as it leaves the equatorial regions. This is the more remarkable as Mackinder was a map-wise man. He was one of the first geographers to think spherically and proposed great circle air routes as early as 1918.

Perhaps his use of a Mercator map was intentional because a polar projection complicates the Heartland theory considerably. As viewed on a globe or a polar map (Figure 2), it will be seen that the Americas are not "outlying islands" but are joined to the Heartland in the north by the polar ice, and the Arctic Sea contracts from a vast stretch clear across the top of the map, as shown in the Mercator projection, to a slightly larger northern Mediterranean. The summer limit of pack ice is as shown in Figure 2 but for much of the year it stretches unbroken from Russia to Canada.

If we assume, therefore, one of Mackinder's basic dictums that "the Heartland includes all regions which can be denied to seapower" then to his Heartland we must add the polar ice and much of the North American continent. If this is accepted then Soviet command of the Heartland is still far from complete.

The polar map does highlight the accumulation of land masses in the northern hemisphere and the pivotal position of the Heartland, but it indicates also the centrality of Europe, Greenland and Northern America.

Air Power.

Air power is a third and increasingly important medium of mobility whose pattern and limits are not yet clearly defined.

Mackinder acknowledged the rise of air power but contended that it would increase the internal mobility of the Heartland and that it was primarily a land-based weapon in any case. This appears too simple a dismissal of the third mobility, which could breach the barrier of polar ice and lay the Heartland open to attack from the north by air. Moreover, if air power in the future can compete economically in the field of logistics with sea and land power it is possible that the fringe nations may continue to contain the Heartland by permitting air power to inherit the marginal and outflanking role traditionally held by the sea.

The air question is of course a major one, perhaps the major one, and can be answered only by the passage of time.

Climatic Influences.

Two other points where modern thought disagrees to some extent with Mackinder is firstly, his emphasis on the role of sea power in containing Euro-Asia and removing the threat of the barbarian raids and, secondly, the influence of sea mobility on the so-called westward march of Empire.

Most historians today consider that the barbarian raids ceased for a number of reasons, some of which were:—

Use by the western peoples of gunpowder, muskets and cannon.

Lack of manpower and leaders.

Spread of pacifist religions amongst the barbarians.

And, probably the chief reason, the slow improvement of climate over the whole of Euro-Asia permitting the nomads to return to their former life and locality.

In regard to the so-called westward march of Empire, contemporary thought discounts, to some extent, the influence of seapower and considers climate to be the major cause.

The movement is of course north-

west rather than west and centres of power and civilisation appear to have moved slowly but steadily in that direction in search of a colder and stormier, and thus more invigorating climate. In any case Vienna, Paris and Berlin cannot be classed as maritime cities and have all figured prominently in the march of Empire.

It may be argued that the current theory favours Mackinder in that there can be fewer habitable areas on earth that are colder than the Heartland. To discount this the westward tendency or continuation of the "marginal rotation" is significant, in that it not only means increased storminess but perhaps a

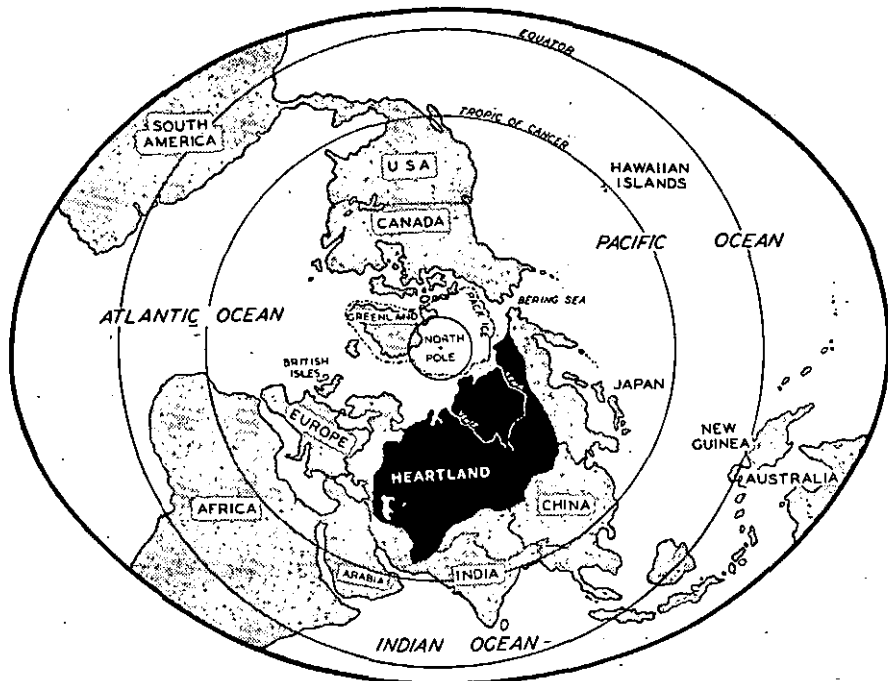


Figure 2

rejection of the vast continental interior where the climate may be too severe for the best human development.

Ellsworth Huntington has pointed out that cyclonic storms bring rapid and invigorating, but not severe, changes of temperature. The only areas regularly and frequently stimulated by the type of storms considered climatically desirable are the United States and Western Europe; they are irregular or seasonal in most other parts of the world.

Man's increasing control over his environment may mean that the Heartland can terminate this marginal tendency of the centres of civilisation and draw it into the continental interior. There is insufficient evidence so far to indicate a tendency of this kind, and in our own day Edinburgh, Stockholm and Copenhagen represent extreme north-west marginal regions where remarkably high standards of culture and living have recently been achieved.

The Theory Today.

To turn now to the present time, how does modern thought regard the Heartland theory?

Contemporary writers appear to consider that the intrusion of western technology into the East is of greater consequence historically than the phenomenon of the barbarian invasions of the West which so impressed Mackinder. They acknowledge the geographical realities of the Heartland theory but consider mere control of a strategic or pivot area is no longer the sole and sound basis for world domination.

Fairly general agreement has been reached that the following factors are quite as important as the geo-

graphical realities of location, size, shape and climate, for nations engaged in total war:—

Vigorous, trained and ample manpower.

Effective political and social organisation and leadership.

Access to plentiful resources of food and raw materials.

Ample supplies of up-to-date war material.

Industrial capacity and technological development.

Victory, they say, tends to the nations having the greatest balance of these factors, so let us run this yardstick over Russia.

There is no doubt that the manpower of the Heartland countries is growing with extraordinary rapidity. Moreover, the Soviet makes little or no distinction between men and women when considering human energy. In 1950 the Russian population was reported to be 200 million and demographers estimate that it will reach 225 million by 1970. Further, they believe that numbers, in the militarily important 18-25 year old group, will increase steadily from 1955 to about 1961.

In the peak year of 1961 nearly 19 million Russian youths will be of prime military age, then the decline in wartime births will become apparent. Viewed from the short term, therefore, there may be a period of great danger from Soviet aggression during the latter part of the 1950's when the Soviet can expect large inductions into her Armed Services for several years. During this same period the Western democracies will reap the lean human harvest of the depression and post-depression period.

Three stimulants to Russian birth-rates are:—

The aftermath of the social revolution.

Colonisation of the vast spaces of Siberia.

The industrial revolution.

These stimulants are now probably past their peak and much of the Heartland appears to have too severe a climate for greatest human increase. Further, it has generally been found that urbanisation and increased standards of living tend to arrest population growth after a period.

Balancing all considerations it would appear that the current population gain will decrease somewhat, and vast areas of the Heartland will always remain sparsely populated.

The strong party control and leadership of all political and social organisations has been amply demonstrated in peace and war; the area may in fact suffer from too great a rigidity and concentration of power in the hands of a few.

The USSR has immense potential resources, perhaps third only of those of North America and Europe, but her stockpiles of up-to-date war material appear inadequate for a long struggle.

The major shortcoming appears to be an inability to keep pace with the continuous spurts of North American and European industrial capacity and technological development. When this is added to the immense distances and the poor communications within her territory Russia appears to be seriously behind the democratic nations in the foreseeable future.

Let us now consider what has happened to the alternatives which Mackinder contended might become a danger to the maritime powers,

but which have not materialised so far.

Germany has neither allied herself with, nor has she successfully dominated Russia. Indeed the reverse is partially true in that the USSR has an uneasy command over eastern Germany. The surrender of the Japanese disposes, for all contemporary purposes, of the other alternative, that of control of Russia by the Chinese under the organisation of the Japanese.

The effect of a Communist China allied to the Soviet is impossible to assess until some catalytic event clarifies the relationships between the two. The combination of these two nations would guarantee a continuing abundance of hardy, frugal manpower of frightening proportions. It appears certain, however, that China will retain her independence. This may not give the Soviet sufficient command over China, especially in times of trouble. It would appear that historically China is not a predatory nation and has tended to retain sovereignty by absorption rather than aggression.

The First Dictum.

Let us therefore examine the runes written by Mackinder and check them against the world of today.

"Who Rules East Europe Commands the Heartland."

If we accept Mackinder's definition of the Heartland this now appears practically true. The USSR "inherited the Mongol crown" and expanded through the fringe territories in an immense crescent until she met containing pressure. In Eastern Europe by various methods she acquired almost all the lands defined by Mackinder. Her

pressure on countries along her new borders is firm and relentless. Chinese suzerainty in Sinkiang is now a matter of name only and the same appears true of Mongolia also, while Soviet pressure on Tibet increases daily. The Soviet now controls nearly $8\frac{1}{2}$ million square miles or one-sixth of the land surface and about one person in every eleven is a Soviet citizen.

Russian industrial and communication developments in Southern Asia presage greater pressure to come in this vital area. In fact it would appear that Russia believes in the infallibility of Mackinder and is following his original plan to world power.

Second Dictum.

"Who Rules the Heartland Commands the World Island."

This second dictum seems open to serious doubt. If the major requirements for command include manpower, resources, industrial and technological development and war material, then a power based on the Heartland proper appears to have little prospect of expanding an empire at present, unless she controls also the advanced and vigorous peoples and the immense resources of Western Europe. This possibility appears to be receding at present.

The integration of Western Europe into a single defence community, in opposition to the Heartland, does not appear to have occurred to Mackinder. This, of course, is possibly a result of the times in which he lived, when a federation of those acrimonious and individualistic states would have seemed unthinkable. Without control of Western Europe, which is still in overall terms one of the

richest areas in the world, it is difficult to see how the USSR can capture the other marginal areas and so command the World Island.

Further, if we accept the realities of the polar projection and add portion of North America to the World Island, the prospects of the Heartland attaining to the second dictum are further discounted, and a change of the concept may be necessary before command of the World Island is in sight.

In the last half century the rise of power, technology and wealth in the United States has been stupendous. The USA, which even now has only about 6 per cent. of the world's people, controls upwards of one-half of all its wealth.

Mackinder seemed to recognise this movement of world power in the latest paper he wrote before his death when he spoke of "a second geographical concept" which balanced the Heartland. This he called "the basin of the Midland Ocean—the North Atlantic—and its dependent seas and river basins" including Western Europe, the United Kingdom and Eastern United States and Canada. Mackinder was over 80 years of age by this time and his writing on this section is somewhat obscure and was intended perhaps as a measure of insurance against the possible failure of his Heartland theory.

To modern eyes this second concept may appear as a more realistic pivot area for world dominance than one based on the Russian Heartland.

The Third Dictum.

"Who Rules the World Island Commands the World."

This third and final dictum

appears to be acceptable. The World Island equals two-thirds of all the land surfaces and nine-tenths of the population of the world, including most of the nations with the highest rate of increase.

If this whole island could be brought under one centralised power pivoted, say, on Western Europe, rather than the Heartland, there appears little doubt but that it could inexorably bring the "outlying islands" under its domination and the Empire of the world would then be in sight.

Toynbee.

Mackinder's assertion that world geography "is such as to lend itself to the growth of empires and in the end to a single world empire" seems to be fairly generally agreed upon and was supported by the British historian A. J. Toynbee recently.

Professor Toynbee, who has worked harder than most men to trace the fluctuation of the world's past civilisations, and to examine the reasons for their rise, decline and fall, was asked to give his prediction of the world in 2002 A.D.

"Within half a century" Toynbee predicted "the whole face of the planet will have been unified politically through the concentration of irresistible military power in some single set of hands."

Whether this unification will come through a world war or without it, he would not say. Nor was he ready to predict in whose hands "the irresistible military" power would rest.

Conclusion.

From our examination, therefore, it would be unwise to reject Mackinder out of hand. There have been reports recently of the British

Admiralty's alarm at the increasing size and power of the Russian fleet which recalls Mackinder's warning on the "use of vast continental resources for fleet building."

Much that he predicted has been verified by the passage of time, but many of his fears have proved groundless and some of his arguments have been confounded.

Nevertheless the theory of the Heartland remains one of amazing prescience, a yardstick for measuring conceptions of world power, containing factors which cannot be overlooked.

We can perhaps leave it with an agreement that we can accept two of his runes as being substantially correct, but the vital second step "control of the World Island" is at present, fortunately, little more than a red glow on the global horizon.

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The MILITANT CHARACTER of BOLSHEVISM

Translated and condensed by the Military Review from an article by Eberhard von Pfister in "Wehrkunde" (Western Germany).

IS the loud peace propaganda of the Kremlin being used only as a camouflage for aggressive aims, or does it arise from a genuine conviction of the detestableness of all war and the blessedness of peace? Anyone attempting to find the correct answer to this question must not only take into account Moscow's policy of the moment, but also the permanent Communist ideology. This determines, in spite of all subtle moves and changes in political tactics, the final strategic objective of the Soviets.

Communist Doctrines.

The four prophets of communism—*Marx, Engels, Lenin, and Stalin*—established doctrines for the problems of war and peace, as well as for all other situations in life. These doctrines constitute the uniform pat-

tern for the thinking and attitudes of the people of the Soviet Empire, and holds them to certain fixed views as regards war, pacifism, and the use of power.

Neither Marx, Engels, Lenin, nor Stalin provided any evidence of a fundamental and universally pacific attitude; instead, all concurred in the use of force and weapons.

Engels occupied himself so intensively with military studies that his friends jokingly called him the "General." His articles concerning military and political questions of his time received recognition even in professional circles. Marx willingly bowed to his judgment in these fields. Engels had participated in the fighting in Baden, as an officer in the ranks of the insurrectionists, and, therefore, most of his military and

political theories dealt with the problems of civil war and armed insurrection.

Engels wrote a series of articles in 1852 under the name of Karl Marx, and which were printed in the "New York Tribune," in which he stated:

". . . Insurrection is an art the same as war . . . Once an insurrection has begun, act with the greatest of resoluteness and assume the offensive. A defensive attitude spells defeat for any rebellion . . . Surprise your adversary . . . seek daily for new, even though small, successes . . . Force your enemies to retreat before they are able to concentrate their forces against you. In short, in the words of Danton, the greatest master we have yet had of revolutionary tactics: 'Boldness, boldness, and still more boldness!'"

Marx and Engels both advocated compulsory military service. At their motion, the 1866 conference of the International Working Men's Association passed the following resolution:

"We propose universal national rearmament and universal instruction in the use of arms. We accept, as a temporary necessity, small standing armies which shall serve as schools for officers of the armed army. Every man fit for military service is to serve for a short while in these armies."

In an article written in 1870, Engels defended the French irregulars in the Franco-Prussian War and advocated partisan warfare. He used as a model the Prussian "Landsturm" Regulations of 21 April, 1813, in which, as he stated:

". . . Every man fit for military service, who is not already serving

in the ranks of the regular forces of the Landwehr, is ordered to prepare himself for the holy warfare of self-defence, which allows the use of every means. The Landsturm will harass the enemy both in his advance and his retreat, giving him no opportunity to rest, attack his ammunition and provision transports, his couriers, his recruits, and his hospitals, launching surprise attacks on him at night, destroying his camp followers and his detachments, crippling him, and bringing uncertainty into every one of his movements. . . . This law can indeed be designated as an exemplary manual for irregular forces."

The enduring influence of Engels on Lenin is well known. Both shared the love for military organization. In 1915, in an article entitled "The Collapse of the Second Internationale," Lenin wrote:

"Let us take the modern army. It is one of the good models of organization. And this organization is good only on account of the fact that it is elastic, but, at the same time, is able to impart a unified will to millions of men."

Lenin repeatedly attacked pacifism and the possibility of total disarmament. As examples, we can quote excerpts from some of his articles and speeches:

"Let the snivelling and sentimental bourgeoisie dream of disarmament. But as long as there are oppressed and exploited human beings in the world, we must not strive for disarmament, but for the universal armament of peoples." (Army and Revolution, 1905.)

"Do not listen to the sentimental whimperers that are afraid of war; there is still all too much in the

world that has to be eradicated by the use of fire and the sword, for the freeing of the working classes." (The Collapse of the Second Internationale, 1915.)

"War is nothing accidental, it is no sin, as the Christian divines think. Rather, it is an unavoidable feature of capitalism . . . The warfare of our day is a peoples' war . . . Refusal to submit to military service, a strike against war, is simply stupidity, a lamentable and cowardly dream of an unarmed struggle against the armed bourgeoisie." (Situation and Missions of the Socialistic Internationale, 1914.)

"The existence of the Soviet Republic alongside the imperialistic states, permanently, is unthinkable. In the end, either the one or the other will conquer. But until this end comes, a series of fearful clashes between the Soviet Republic and the . . . states is unavoidable. . . ." (A speech on the 8th Party Day of the Bolsheviks in 1919.)

These views of Lenin still influence Soviet thinking today.

Stalin's views on the subject were quite similar, and are seemingly reflected in a passage from his complete works, which were published in 1950:

"We are by no means against all war; we are only against imperialistic war, for the reason that it is a counter-revolutionary war. We are, however, for the anti-imperialistic, revolutionary war of liberation, regardless of the fact that such a war . . . is not possible without fearful bloodshed. . . ."

Malenkov has expressed his views on this subject. In a speech in 1949, celebrating the anniversary of the Russian Revolution, he stated:

"What does history teach us? World War I brought to our country the victory of the great Socialist October Revolution. World War II brought the Peoples' Democratic Government in Central and Southern Europe, and victory to the great Chinese nation. Can there exist any doubt about it that a third world war will be the grave of capitalism?"

It should be evident that the maintenance of peace is, for the Soviets, never a matter of heart, but always a matter of impassionate, calculating policy. Their present peace offensive signifies only a new form of tactics in their permanent fight against the Western world.

Estimate of the Situation.

Sir David Kelly, the former British Ambassador to Moscow, has given the following estimate of the situation:

"In 1949, the Politburo came to the conclusion that the catch-words of 'class' and 'economic struggle' no longer possessed sufficient drawing power, and that the only solution that would appeal to all men was the word 'peace.' The basic thought in its ingenious simplicity was to stir the populations up against their governments in the matter of freedom, thus creating a revolutionary situation that would not necessarily lead to strikes and construction of barricades, but rather could lead to the circumstance that the great masses would demand the formation of more progressive coalition governments outwardly united under the banner of 'Everything for Peace'; in reality, however, under controlling communistic influence, an experiment for whose success Czechoslovakia has proved a classical example."

Military Preparation.

While Moscow outwardly affirms its love of peace, it carries on, at the same time, over its entire sphere of influence, total military preparation of the masses. This task falls to the lot of the great pre-military mass organizations, which have been established in all the satellite states along the same lines as the Soviet "Volunteer Associations for the Support of the Army and the Air and Naval Forces." Thus, for example, the "Association for Co-operation with the Army" was formed in Czechoslovakia in 1951. This association has more than 4,000 subordinate work groups within its sphere of activity.

Moreover, basic military training has been made compulsory in all Czechoslovak schools. The pupils must learn to read maps, to estimate distances, and to march by maps. In biological instruction, they are taught protective measures against biological warfare. In the singing classes, they learn battle and marching songs of Czechoslovakia and the Soviet Union. The gymnasium periods are expected to heighten the courage of the pupils by increasing

their feeling of responsibility for the fulfilment of their tasks and by accustoming them to discipline and co-operation. In the secondary schools, the pupils receive pre-military training in such subjects as tactics, marksmanship, army regulations, military geography, signal communications, and first aid.

It suffices to give the Czechoslovak example, for all satellite states follow more or less the same programme. From early youth on, the militant ideas of bolshevism are instilled in the populations. The entire national life and especially the education of the young generation, serve the aims of military training. Soldierly concepts and duties are constantly and systematically driven home, and thinking and sentiments accustomed in such a way to the possibility of a war that the transition from cold to hot war is quickly possible without any special propagandistic preparations.

Whatever fine words Communist diplomacy may make use of for purposes of camouflage, bolshevism continues to maintain its military character, which has distinguished it from its very inception.

OPERATIONS in **DARKNESS** and **FOG**

Gunther Blumentritt, General of Infantry,
Former German Army.

How do military commanders and troops react to darkness and fog in warfare?

What were the German experiences under these conditions in World War II?

In the future, how will night and fog affect:

1. Ground warfare?
2. Air warfare?
3. The tactics of the ground forces, especially tanks and motorised troops?

Naturally, I can give only my own personal experiences and views on the subject.

Generally speaking, it may be said that the night is no man's friend! On dark nights and in dense fog, visibility is poor or non-existent. Night, therefore, affects the imagination as well as the nerves. The tendency is to imagine dangers

which do not exist. All senses are strained to the utmost, and quite harmless objects, sounds or movements seem sinister. If hunger, fatigue and combat excitement are added, all of these influences are intensified and there is just a narrow gap separating the troops from panic and mass hysteria.

Even well-disciplined troops are not entirely free from the influences just described. Distances seem greater, all objects appear larger, and calculations of mileages and time requirements are faulty, which explains why civilised man in particular dreads the night, for life in the cities has estranged him from nature. At the same time it explains why less-civilised people, who live close to nature, are not afraid of darkness. It further explains why, even in civilised nations, hunters, lumbermen, farmers, and others who spend long periods close to nature adjust themselves far more readily

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to night conditions than the townsfolk, whose nights are spent with others under artificial light.

Often the dread of night results partly from a faulty education of children, who are told gruesome bedtime stories. No wonder that they also retain an aversion to darkness in adulthood.

In actual fact, night has no terrors for men close to nature. On the contrary, the open sky is beautiful and calming to them. All that is necessary for the removal of an aversion to night is to train young people properly, to bring them out of the cities into the open country, where they may learn to appreciate nature at night. These facts are of extraordinary importance for the soldier, and for our military requirements!

It is no wonder that for a long time military leaders disliked the night and avoided exposing their troops to the influences of darkness. Unless it was impossible to do so, combat was usually called off at nightfall and not resumed until daybreak on the following morning.

It is interesting to note in the history of night battles that even well-disciplined, regular troops have been reluctant to expose themselves to the hazards of darkness, while less-civilised nations and those taking part in "illegal warfare" actually welcomed night as their ally.

Colonial, Indian, and similar wars prove this statement, and it is due to this fact that in these semi-civilised wars the well-organised, regular troops were often wiped out by the irregulars and the "close-to-nature" fighters.

A striking example of what is meant can be found in eighteenth-

century history, when Indians serving under the French General Montcalm attacked and massacred British regular troops withdrawing from Fort William Henry.

Another of the hundreds of examples which could be cited is that of the three Italian brigades, under General Baratieri in 1896, which, while marching at night in Abyssinia, were attacked and scattered by the Abyssinians.

It is thus quite natural that colonial troops or white troops which had fought against colonial tribes were far superior in night fighting to the excellently organised but too highly civilised troops on European soil.

Until about 1900, the German military leaders were against night combat and combat in large forests because of a reluctance to expose the strict discipline and the precise, rigid formations of their units to the uncertain and confusing influences of darkness.

What was feared above all, however, was disorderliness. That was why the old German Army was poorly trained for night action until about 1900.

Two events then brought a *volte-face*. These were the Boer War (1899-1902) and the Russo-Japanese War (1904-05). All German observers in these wars reported on the night battles they had witnessed. Our training manual of 1906 took due cognizance of this fact, and training in night combat became popular.

The superior night training of the British and Russian armies of that time forced Germany to improve training in night combat still further. The subject also was given more attention in military literature

during the years preceding World War I. Thus, when I joined the Army, in the spring of 1911, it was already necessary to show by record that the three months of basic training had included 12 night exercises.

World War I proved the increasingly important role of night operations in modern warfare. It was the British and the French colonial troops who first taught us the necessity of night combat, but the Russian soldier was still the best to learn from in this field. The Russian troops had undergone long and excellent training for night combat, and they applied in practice what they had learned. They were the ones who taught us what real night combat meant!

After World War I, the Reichswehr energetically took up training in night fighting and in the exploitation of darkness. Manoeuvres lasted all night and all training in night combat was systematised. This continued from 1933 until 1939, and much time was devoted to night training. Finally, in World War II, night had become an ally, and it was exploited to the utmost.

Once again it was the Soviets who remained our superiors in employing night as a weapon. An army order of the Soviet's Marshal Timoshenko was captured in 1941 in which he admonished his troops to make greater use of night operations, fighting in large forests, and close, man-to-man combat. He considered these three types of combat to be the strong points of the Soviets and the weak points of the Germans—who placed too much reliance on their technical armour. At night and in the forests, he continued, mechanical equipment loses some of its glamour, whereas hand-

to-hand fighting remains an inherent strength of the Soviets.

Marshal Timoshenko's estimate of the Germans was quite correct. However, during the first battles with the Soviets in 1941, the German troops adapted themselves very quickly to night operations, fighting in forests, and man-to-man combat, and even surpassed the Soviets in these three types of combat after 1942.

What, then, are the conclusions that are to be drawn, what lessons can be learned for the future?

Operations at Night.

Operations in the German sense of the word mean action or movement, for military purposes and intentions.* They may also aim at the initiation of tactical battles, and, likewise, at break-throughs, encirclements, outflankings, attacks, or retreats. To operate consequently means to move with a definite purpose. Nights, especially light nights, are ideal for daring operations! A modern, resourceful, and bold commander will happily exploit the dark of night, and will move purposefully with his troops under its cover in order to gain operational advantages over a night-shy enemy. The following are a few examples from my personal experience during World War II:

* The term "operations" has a more specific meaning in German military language than in English—covering the intermediate sphere between strategy and tactics, and being applied to generalship in the handling of forces in the field. The German sense is best expressed in the now little-used term "grand tactics." In the German Army, the distinctive sense given to "operations" and "operational" helped to develop the idea of manoeuvre in contrast to battering-ram tactics—to sheer massing of superior weight in men and weapons. But it tended to overshadow the importance of strategy, and the extent to which action in the field is subject to factors of a wider kind.—*The Rommel Papers*, edited by B. H. Liddell Hart.

The Polish Campaign.

In the Polish campaign of 1939, which was strictly mobile warfare, the commands of Army Group South and of the Eighth, Tenth, and Fourteenth Armies used the night in order to advance. Our strong tank and motorised units learned how to drive at night, instead of resting. Only in this way did we succeed in gaining an absolute operational advantage over an enemy, who, in true Eastern fashion, also moved confidently and purposefully at night. Had we rested during the nights, the movement-minded, night-experienced, and courageous enemy would have escaped easily.

The great flank movement of strong motorised forces on Warsaw was carried out at night, as was the advance of the Fourteenth Army into Galicia. There was no timid reconnoitring to the left or right. The Germans simply moved right through the gaps in the enemy lines during the night, and, consequently, on the next morning found themselves already far in the rear of the perplexed enemy, at a vital road junction, rail line, or river crossing.

Of course, there was no uninterrupted night-driving at 20 miles an hour. Things were not done in that way. The advance can take place at a maximum speed of about 6 miles an hour, and bit by bit, in "leaps" followed by halts which are sometimes of several hours' duration. First, the armoured reconnaissance has to be advanced, mine obstacles must be removed, and destroyed bridges repaired, before further movements are possible. Frequently only the advance parties or strong reconnaissance detachments are on the move, while the bulk of the motorised division halts. It all depends on the

situation, the energy of the commander, and on the fitness of the troops involved. The main point, however, is to *advance* or *move*, even if only slowly and with long pauses.

The Campaign in the West.

Our campaign in the West in 1940 also owed its quick successes to night movements. Our tank and motorised divisions made good use of the night and were aided by the many excellent roads.

I shall mention only the 7th Panzer Division, then commanded by General Rommel. For propaganda purposes it was called the "Phantom Division." Rommel did not differentiate between day and night. Several times during this campaign he drove straight through the enemy forces with his entire panzer division without any regard for the enemy or adjacent German troops. Frequently at night this division was under fire from all sides. Rommel paid no attention! His demands on his subordinates were extreme, however he usually was with the advance guard of one of his motorised columns, energetically moving ahead. In Africa, he repeated this performance, and also used the nights in the desert for ruthless advances into the enemy's rear. However, his tactics were not unique. Our other commanders in the armoured forces acted much the same in 1940. During the second half of the campaign our tanks simply drove by night through the gradually disintegrating, gallant enemy. The tank divisions took no notice of any firing that might be going on on their right or left. By daybreak they were deep in the rear of the enemy, and, naturally, they continued their drive during

the day. They were frequently 60 to 90 miles behind the enemy lines, and, therefore, had to rely completely on themselves for days at a time.

The Campaign in the East.

In the East, in 1941-42, this principle was maintained, and the German panzer armies as much as possible used the nights to continue their advance. However, the advances were no longer as bold and did not penetrate as deeply as had been the case in 1939 and 1940. The restricting causes were:

1. There were few good roads in the Soviet theatre of war. During rainy weather these roads became completely impassable within two hours. The tanks then bogged down in the thick mud, sinking down to the upper rim of their caterpillar tracks.

2. The huge, frequently almost primeval, forests and swamps offered the Soviets opportunities for mining and blocking the few roads that existed.

3. Vital supplies, such as fuel, could be moved forward only with extreme difficulty.

4. The Soviets knew their country very well and the resistance they offered was entirely different from that offered by the Poles or the French. Tough and unperturbed, they remained in their forests and swamps for weeks, even long after the armoured divisions had passed through. This proved a serious difficulty and endangered the movement of supplies to an ever growing extent.

These peculiarities of the Soviet theatre of war, the extreme indifference of the Soviet to threats from

the flanks and the rear, as well as the considerable night experience of this tough and not easily perturbed enemy, hampered the nocturnal movements of our forces. Nevertheless, we attempted to advance by night, just as ruthlessly as we had done, under more favorable conditions, in 1939 and 1940.

The Winter Offensive.

The Soviets, on the other hand, during their great winter offensive of 1941-42, started from the Moscow area and moved like a pack of wolves under cover of night and fog. During the bright moonlit nights of the East one could see the long, dark marching columns of Soviet infantry, cavalry, sled units, and motorised columns irresistibly advancing over the icy, snow-covered fields: all in constant motion, unperturbed by our far advanced fighting fronts. It was due to these night marches of the Soviets that, in the winter of 1941-42, strong Soviet cavalry forces were located in the large forests north-west of Roslawl, while the real fronts were still far away to the east on the Nara River.

The mistake of the Soviets was that *tactically* they never fully exploited these nocturnal operational movements in our deep rear!

Wane in Night Operations.

For the reasons so frequently set forth, it was not possible for the German forces in 1944, after the invasion in the West, to take advantage of any opportunities for operational action that may have presented themselves. Nights were, therefore, no longer of any great importance to us for operational movements.

However, after the allies had crossed the Seine River at the end

of August, we often wondered why their strong motorised forces never attempted to drive east and north-west during darkness just as our forces had done in the opposite directions in 1939 and 1940. In a few days their spearheads could have reached the undefended West Wall (the completely unmanned western frontier of Germany) at a time when the German front, shattered in many places, was still fighting far to the west.

It is difficult to recognise moments that are operationally advantageous. However, it has been proved that a modern high command must make ruthless use of the night for movement, if it wishes to achieve sweeping success and to crush the enemy quickly. In the final analysis, this is the purpose of any operation. Admittedly, this requires a command that is willing to take risks, and that again is a matter of character and training.

I am quite aware that the problem is more involved than it sounds here and that it has nothing to do with courage in the normal meaning of that word. Acting along these lines is rather the final product of a certain school of thought, which needs a certain amount of time in order to become fully effective.

Night Break-Through.

We come now to the question of when one should cease moving at night as though the enemy did not exist.

The definite point for a halt is, of course, before reaching unshaken, continuous enemy front line, or before a fortified position. Here, the mobile operation will be interrupted temporarily by the tactical necessity of achieving a break-through.

To drive through such an enemy front at night is just as impossible, if not more so, than during the day-time. The necessary conditions must first be created by tactical action.

Timing.

It is generally known that the right time to change from tactical battle to operational movement is a difficult choice. In practice, it will always take a few days for the higher level command to recognise that the time has come for resuming night operations. Very often it will be the daring commander of an armoured division or corps who grasps the situation and acts accordingly, carrying along the higher command by his action. This again is a matter of training. Such action is impossible without accepting some measure of risk and it reflects the advantage of not exercising too rigid a command control.

To keep the troops moving forward at night also calls for toughness and temperament. It is only natural that the troops tend to be cautious, and this must not be held against them. Napoleon showed what can be demanded in this respect.

The higher commander's place will then, temporarily, be close behind the body of troops that is to advance during the night. No results can be expected from encouraging written orders.

Night Armoured-Airborne Action.

In my opinion, the future belongs to night-time action of combined armoured-airborne forces, to be undertaken when an operation is well under way. It is up to modern-minded general staffs to calculate such combinations and to lay their plans accordingly. That fairly

large-size night landings by airborne are possible was proved in the West as early as 1944. These landings, however, served tactical combinations in the rear of an enemy. In the future, it should be possible to support night moves of armoured forces on an operational scale by co-ordinated landings of parachute and glider troops, also on an operational scale, during the night. In this respect, future possibilities can be considered unlimited in view of the fact that modern aircraft can transport even tanks. Furthermore, it should be possible to co-ordinate the action of armoured forces and night bombing planes. Modern leadership must revolutionise its thinking, must exploit the technical possibilities, and not remain bogged down in the old ways of thought.

As early as 1944 the Germans were considering in advance, or rather were anticipating with fear, that allied armoured forces, operating far behind their lines, would appear at the West Wall or on the Rhine in combination with strong airborne forces. However, 1944 proved too early for that, but there seems no reason why such a combination should not take place in the future. Technically, it is possible if operations and tactics keep pace.

In view of the immense technological and material potentialities available to the United States armed forces, and in view of the enterprise of American military leadership, I can very well conceive that such possibilities of the future definitely do exist and that, operationally speaking, the night could be turned into day.

That the night can be illuminated at will was proved during the past war, when the rays of searchlights

reflected from the sky and bright and long-burning flares were used to light up entire areas.

In any case, the exploitation of the night for operational movements is a modern necessity. Exercises and combined manoeuvres should be good training.

Movement Behind a Friendly Front.

Operational movements at night behind a friendly front are such a matter of course and so well known that there seems no necessity to make special reference to them in this article. Such movements include, among others, nocturnal changes of position, regroupments, and false marches for operational purposes. All of these have been undertaken by audacious commanders.

Fog.—Natural fog and smoke screening are considerably less favorable for operations than darkness.

A moonless night is much better than a dense fog. Science and technology admittedly can provide possibilities of seeing at least something in fog, but on the whole, according to my personal experience, a really thick fog is bound to bring movement to an enforced halt. Fog also rules out, for the present, combined armoured and airborne operations.

Moonlit Nights.—There are almost no difficulties encountered in operations on moonlit nights. An experienced motorised unit can drive on roads during the night almost as well as during the daytime, only with considerably less speed and with several stop-overs. Airborne troops, especially parachute units, can land almost as safely on a moonlit night as they can by day.

Dark Nights.—Movement is hampered on dark nights, but it is not impossible. Many halts and very slow driving are necessary. However, even under these circumstances, it proved possible in the East during 1941-45 to advance about 12 miles on an average night along roads, which is better than not moving at all. However, the marching technique, reconnaissance, and tactics of such nocturnal operational moves are considered to be outside the scope of this article.

Strategic Air Force Operations.

Since the air force is the service which will decide the outcome of future wars, it also must consider the night as being of particular importance. World War II proved that large-scale air raids during the night and even during fog are both possible and effective. In fact, the dark of night even increases their effect—especially as regards morale. The future will witness still further improvements in night air raids.

During the last year of the war the difficulties of flying in winter, particularly on cold nights, gradually decreased. Meanwhile, the terrible danger of icing has been greatly diminished and nowadays it is even possible to fly in the vicinity of the North Pole.

The difficulties of co-ordinating air action at night with the movements of motorised troops on the ground are no longer insurmountable. The best thing to do is to develop special night air forces, which are specifically trained for co-operation with ground troops.

During the severe winter of 1941-42 on the Moscow front, our dive bombers flew in the worst of

weather and at temperatures ranging around 20 to 30 degrees below zero Fahrenheit. Airfields were in poor condition and icy, and only inadequate equipment was available to prevent the freezing of fuel and the failure of the steering mechanism. Today, all these shortcomings are things of the past, particularly for the progressive-minded great powers. Even highly specialised types of aircraft, carrying the most up-to-date weapons, can fly at night, even in winter, without difficulty.

Since winter warfare has become so increasingly important, special attention should be paid to training in combined air-ground manoeuvres during cold winter nights. Communication between air forces and motorised ground forces today presents no difficulties and the equipment of airfields for night flying has long ceased to be a problem. The situation can be further improved by the organisation of special night detachments for the meteorological service.

I can, therefore, well imagine that combined air force-ground force manoeuvres at night nowadays would be a particularly up-to-date feature, and their value would be greatly increased if they were extended to last several nights in succession.

Night Ground Force Tactics.

At the tactical level, the night has long been an extremely important factor. Tactical regroupings, unit transfers, and the forward movement of replacements and supplies during the dark of night are common practice, as are night-time tactical moves in preparation for an attack, movement into defence positions reconnoitred during the day,

disengagement, and retreat. All of these uses of the night are well known.

The only question that remains open is that of the possibility of conducting major, decisive battles at night. There can be no doubt that situations do arise in which a decisive major battle can be risked at night after thorough preparation. A few such cases can be found in past history.

The German Offensive of 1918.

It is true that the German offensive of March, 1918, which was intended to decide World War I, only started at dawn on both sides of St. Quentin. We laid down an artificial smoke screen and nature, by coincidence, assisted with a dense natural fog beginning at 0500 and lasting until about 1100. Nevertheless, the German Eighteenth Army succeeded in its attack within a few hours under these unusual conditions and over-ran the British positions, which were organised in great depth. Fog, it must be remembered, is an even greater handicap than the darkness of night.

We see, therefore, that in the future the night also will be exploited tactically for major attacks, but only after the employment of air forces, armoured forces, and massed artillery has been carefully and minutely planned and calculated in advance.

Present-day commanders and general staff officers must be able to handle these problems and handle them with thorough efficiency since in a night attack the attacking waves and the forward movement must be timed to the minute in order to integrate, hour by hour, the action of the many types of weapons.

If badly planned, a major night attack, which is aimed at distant objectives, is bound to fail and may lead to panic and catastrophe.

As early as in World War I, the Russians favoured the night for their frequently large-scale attacks in which infantry forces were employed in as many as 15 to 18 attack waves. In 1914 and 1915, this was especially the case. However, because they were poorly executed, many of these nocturnal mass attacks broke down, with heavy losses for the Russians.

By World War II, however, the Soviet Army had learned its lesson. Its night attacks were better prepared, and, as previously mentioned, in the icy winter of 1941-42 before Moscow, they attacked our Fourth Army almost always at night, and succeeded in gaining ground.

That the night is a good time for reconnaissance and that well-prepared night attacks with limited objectives can succeed in capturing specific positions and specific areas is no longer new.

New, however, is the fact that the night can also be exploited in the future for large, decisive tactical attacks. I can well imagine that an enemy who is aware of his inferiority in the air will tend strongly toward exploiting the night, especially the long winter nights, in order to make up for the superiority of his adversary in the air.

During the invasion of 1944 we did not experience night attacks in the full sense of the word. There was usually a lull in the fighting during the nights, which in June were short. However, even during the autumn of 1944, at the German frontier, real large-scale night

attacks were not nearly as effective as in the East. This was probably because of a reluctance to accept the hazards inherent in every night battle, and there was also no necessity for the allied command to incur these hazards, because the air force was far more effective during daylight and the tanks could drive with more security then.

In the future, however, I believe large-scale night combat will play an important role in warfare.

Future Requirements.

An entire book could be written on the training and other requirements for night action, but that would be beyond the scope of this article.

However, on the basis of my personal experience, I should like to mention briefly these few facts:

1. Only well-disciplined and well-integrated units are suitable for the conduct of daring and far-reaching night operations, of the type described, with any hope of success. No success can be expected with troops of militia character, who have been trained only briefly, since night undermines the solidarity of a poor military unit to an alarming degree.

2. Leadership from the commander down to the non-commissioned officers must be firm and sure.

3. A good army, which has had continuously successes, will be tremendously bolstered by daring night operations, and its performances will surpass expectations. On the other hand, a force which has been through unsuccessful operations is unfit for large-scale night action—it will not respond. Army units which have experienced several defeats in night action remain shy of the night for a long time. For instance, we

had in the Fourth Army an excellent infantry division which had been attacked at night by the Soviets at Smolensk and on the Desna River, suffering heavy losses in both attacks. As a result, this division remained unreliable in night combat for a long time.

4. Small, well-composed combat parties are frequently more successful in daring night operations than large formations. The effectiveness of such combat groups, far in the rear of the surprised enemy, is usually far more than their actual striking power.

5. Motorised troops have a great advantage over the old-fashioned infantry divisions in that they are able to drive, and, therefore, are less exposed to fatigue. The drivers can be changed two or three times during the night. Formerly, night operational missions frequently failed because the infantry and cavalry divisions were already over-fatigued by combat and march movements during the day, and were simply not able to continue in action at night. No matter how hard an ambitious and active commander would prod, admonish, or command, the exhausted soldiers simply remained sleeping by the roadsides. Motorised troops, however, are much better equipped for this sort of thing. The life of a well-conditioned motorised unit on the march is very different from the unenviable lot of an infantry division on foot. The personnel of a motorised unit quickly learn to sleep in their vehicles! On prolonged stops they sleep even more than while driving!

6. For an advance into the rear of the enemy by operational night marches, the advancing force must be split up into several marching

groups. It would be ridiculous, for example, to start an armoured division on a night march on one or two parallel roads. Movement is slow, and the columns are often 60 miles in length. The bulk of the division hardly gets a chance to drive and the result is only senseless fatigue. Consequently, the advance must take place in three or four columns. Where the road network makes this impossible, it is much better not to drive with the entire division on one or two roads, but to push forward advance detachments. The division itself can start smooth driving at dawn.

7. Night marches naturally frequently encounter road mines, demolished bridges, road blocks, or enemy anti-tank fire. Since at night motorised troops are able to move only little by little, slowly, and interrupted by stops, bicyclists are very useful for reconnaissance work because bicycle reconnaissance is almost noiseless. Under enemy fire the bicyclists immediately dismount. They drive without noise, and they see and hear better than personnel in reconnaissance tanks, or on motor-cycles. When close to the enemy, tanks at night do not drive any faster than bicyclists. Strange as it may seem, our experience with reconnaissance bicyclists ahead of motorised units was good. A party of 10 or 12 men, including some special engineers, is sufficiently strong for these purposes. They are not supposed to fight, but to reconnoitre and investigate the road. They are usually given a 30-minute start ahead of the marching column. Next follows a group of engineers, infantry with heavy weapons, anti-tank guns, and a few reconnaissance tanks, all on light cross-country vehicles. Behind this light detach-

ment follows the armoured spearhead of the marching column.

In winter, the Soviets also sent cavalry detachments, sometimes accompanied by infantry on sleds, ahead of their motorised columns advancing along the snow-covered and frozen "roads," in order to provide reconnaissance and security. These Soviet columns frequently covered astounding distances over the endless snow-covered plains, particularly at the deep open flank of my Fourth Army on the Oka River during the December nights of 1941. Captured Soviet motor vehicles showed us how vehicles should be built to be able to drive in columns over completely frozen snow fields. German vehicles were less suitable for this purpose.

Much of the success of the Soviets was due to the ruthless Eastern fashion in which their troops were pushed forward. Thus, it was during one of these nights that we intercepted a radio message which read, in substance, as follows:

"My troops are on the march for the third night in succession, and they will not be able to reach Kaluga tomorrow morning, as ordered."

The intercepted reply stated, "You will act as ordered. Otherwise I fear for your health."

That is Soviet leadership. However, they did not reach Kaluga in spite of all, since 60 tanks from our 19th Panzer Division launched an attack from Malojarslawetz across the snowy plains on the moonlit night and drove them back to the frozen Oka River at Aleksin. Nevertheless, during the winter before Moscow, countless nocturnal episodes of this type gave evidence of the super-human efforts expended at night on both sides.

Conclusion.

In World Wars I and II, contrary to expectations, armies frequently turned the night into day. An enemy traditionally as well trained in night combat and in night movements as the Soviets could be met only in the same fashion. We soon, and with full success, measured up to such standards of night warfare in both wars.

A war of the future should, in my opinion, exploit the night tactically and operationally to a still greater degree. This will be facilitated by up-to-date technical equipment.

A dauntless leader, commanding troops who have been trained for night fighting, is likely to achieve great, and even decisive, successes by fully exploiting the night.