ARMORED TACTICS FROM KADESH TO ISRAEL: A STUDY OF MOBILE WARFARE FROM BIBLICAL TIMES TO THE PRESENT

THESIS

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This thesis, through examination of the battles of Kadesh (1288 B.C.), Alam Halfa (1942), and the Arab-Israeli War (1967), attempts to determine the degree of similarity between tactical employment of the ancient chariot and modern armored vehicles. Sources include official analysis and records of participants and observers. This thesis proves that tactical employment of chariots and modern armored vehicles is clearly similar. Chariots were used to support infantry in the three conflicts examined. Also proved is that chariots were used almost identically with armored vehicles in exploiting a breakthrough, serving as reaction forces, making a reconnaissance, conducting retrograde operations, and holding or blocking enemy forces.

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CHAPTER I

INTRODUCTION

Is it either valid or possible to draw parallels between the chariot tactics of ancient Egypt and the armored tactics of the modern world? To answer this question it is necessary to examine representative conflicts from both eras. The Battle of Kadesh in 1288 B.C. has been chosen as a representative battle of the era of Egyptian chariot tactics. This battle, between the Egyptians and the Hittites, was selected for several reasons. It occured before the period in which cavalry overshadowed the use of chariots; but despite its antiquity, there is still enough known about it to trace its events.[1] It is also a battle in which chariots were not only extensively used, but may well have been the decisive factor in the outcome of the conflict. Although the battle is now generally considered a stalemate, its tactical intricacies offer a good example of how chariots were employed in ancient warfare.

Although armor was developed as a mobile force in World War I, it did not really reach full development until World War II. The desert of North Africa offers the best

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[1]James H. Breasted, Ancient Records of Egypt, 5 vols. (New York, 1925), 3:125.

opportunity to view armored tactics. The climate and terrain of both areas was generally suited to open warfare. The Battle of Alam Halfa in 1942 gives an excellent perspective of how armored forces were employed during World War II. In North Africa, there was a pure military atmosphere, for the most part unpolluted by civilian populations and the problems of "moral warfare." The desert war between Rommel's elite Afrika Korps and Montgomery's Eighth Army was a professional's war that was fought between two of the best armored forces of the modern world. To use any of the European battlefields as an example would be misleading, because the terrain, climate, and mode of warfare used in Europe resulted in entirely different technical and strategic techniques. Alma Halfa is, therefore, extremely useful as an example of modern armored warfare because it shows Rommel under heavy pressure, and this pressure forced him to make maximum use of his resources. In addition, by this stage of the North African campaign, Allied armor was equal to that of the Afrika Korps; that had not been true during previous German-Allied battles in North Africa.

The Arab-Israeli conflict of 1967 is the most recent mechanized war about which reliable source materials are currently available. This short war (or long battle) is shown in its entirety; because of its brevity it is also possible to cover all of its most important aspects. It is also, since World War II, one of the few wars or conflicts

in which armor and mechanized infantry were employed extensively and played a decisive role in determining the outcome of the conflict. This conflict was also fought on terrain and under climatic conditions similar to Kadesh and Alma Halfa. The terrain of the Sinai Peninsula and the North African desert offers, with few exceptions, ideal conditions for armored fighting vehicles. Even though the technologies of the periods discussed in this thesis are vastly different, it is possible to compare the chariot of ancient warfare with the modern tank or armored personnel carrier. (See Map 1, Battle Areas.)

Centuries before the birth of Christ, the principles of war had already begun to evolve. The first warriors were infantrymen armed with rocks, sticks, and other natural materials. The early infantryman, however, had many problems. He soon realized that when he got close enough to engage and destroy the opposition, the opposition had a good chance of doing the same thing to him. Thus, spears, arrows, sling, and similar weapons were developed.

The next problem the early infantryman encountered was that of mobility. This problem was solved to an extent by the domestication of the horse. The Assyrians were the first of the ancient peoples to utilize cavalry to its full capabilities.[2] The mounted soldier also had problems. He

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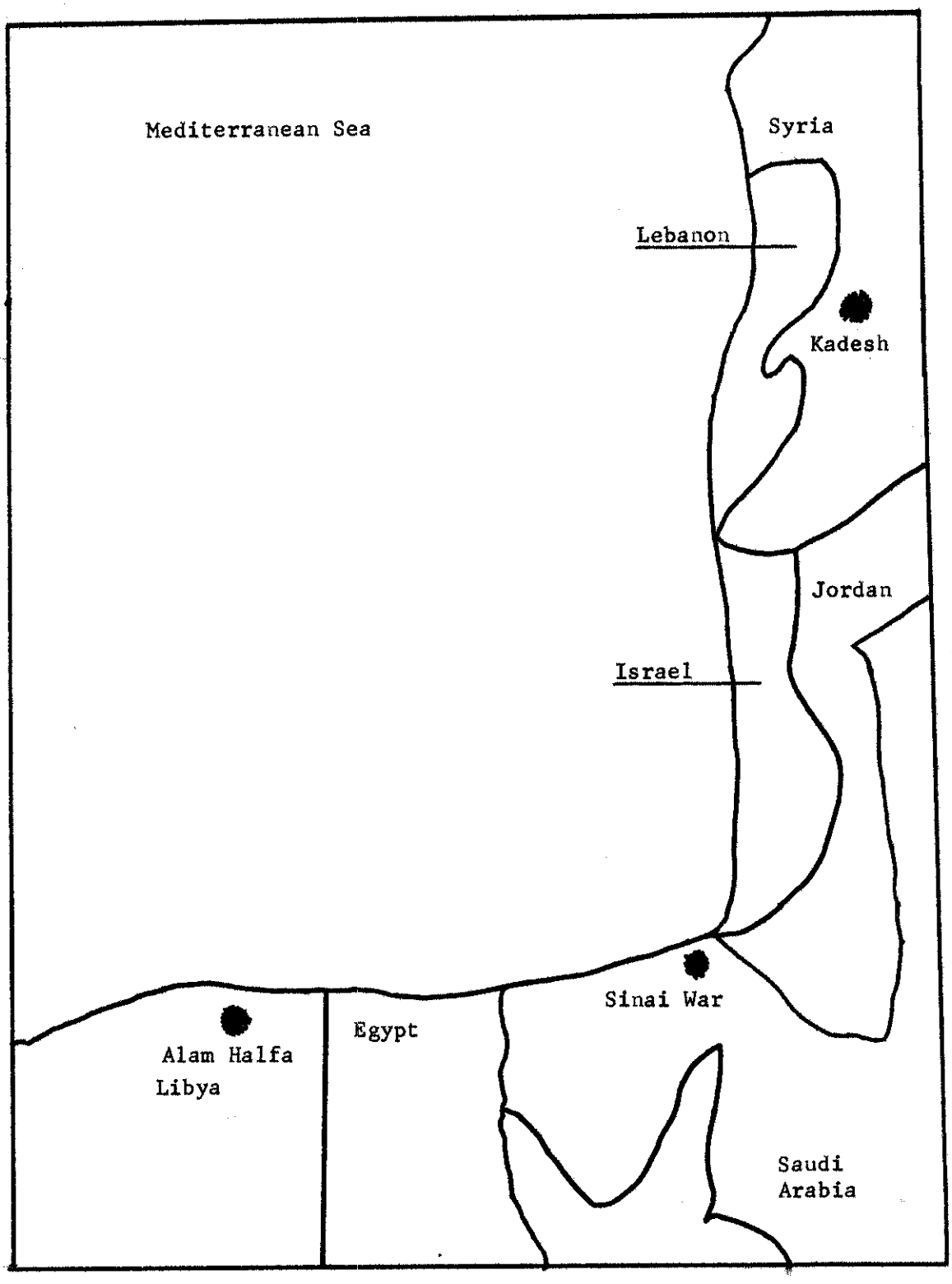
[2]Field Marshal Montgomery, A History of Warfare (New York, 1968), p. 52.

Map 1, Battle Areas



could move much faster than his counterpart on foot and arrive in much better physical condition for the battle, but he was also more exposed. Various types of armor were developed to try to solve this problem, but armor also had its drawbacks. If the mounted soldier had to dismount or was thrown from his horse, his cumbersome armor impeded his movements. In addition, the mounted soldier had no stable platform from which to fire his weapon. It took extensive practice for the early cavalryman to learn to fire his weapon accurately from horseback. If armed with a bow and arrow, the limitation of his ammunition supply was a severe problem. A man on horseback could carry few arrows. If he was armed with a spear, this problem was even more severe.

Therefore, early warriors began to experiment with chariots. The chariot offered many advantages to the armies of the ancient world. First of all, it provided a mobile firing platform from which it was much easier to use missile weapons at a considerable distance from the enemy. It also provided protection to its occupants, as well as providing a means by which several infantry soldiers could be transported to the battle and then dismount and fight on foot. Numerous extra arrows and spears could be carried conveniently. The impact

of chariots on ancient warfare brought new dimensions to the principles of war.[3]

The period during which the Battle of Kadesh was fought is known as the Period of the Patriarchs, which lasted from 2100 B.C. to 1570 B.C. In this period, the science of warfare advanced to new heights, particularly because of the introduction of the horse and light chariot and the perfection of the battering ram. Both caused the character of campaigns in open terrain and fortified positions to change considerably.[4] During this era, traffic and all intercourse in the Near East was virtually dependent upon two major factors: water and animals--notably horses. It was the introduction of the horse from Asia that possibly more than any one factor changed the face of international conflict in the Near East during the Period of the Patriarchs.[5]

This period left behind, in written documents and illustrated monuments, a history of the warfare that was waged. Among these were the battle of Thutmose III near Megiddo, Joshua's battle of conquest, and the Battle of Kadesh. Of these three, however, the only one in which we have a great

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[3]Yigael Yadin, The Art of Warfare in Biblical Lands: In the Light of Archaeological Study, 2 vols. (Jerusalem, 1963), 1:3-7.

[4]Ibid., p. 77.

[5]Frederick E. Adcock, John B. Bury, and Samuel A. Cook, The Egyptian and Hittite Empires, Cambridge Ancient History, vol. 2 (New York, 1924), p. 227.

amount of information concerning the organization and the tactical meaneuvering of chariot units is that of Kadesh.[6]

In spite of the fact that chariots revolutionized warfare, they were not always used in combat, and when they were used they were not always the decisive factor in the outcome of the battle.[7] This was because chariots were difficult to construct, and they could not be risked in any except the most important campaigns. The proper construction of one, which could take months, required the use of several different types of wood, although this was not a great handicap for there were extensive forests in the Near East during this period.

For centures, man has tried to produce a more maneuverable and powerful weapons system than the individual armed man, and the chariots of ancient times are a good example of this endeavor. The Egyptian chariots carried a crew of two, the driver and a bowman. The Egyptians developed their war chariots from models produced in Canaan, a theory indicated by the fact that the Egyptian words for chariot and horse descend from the Canaanite language. In addition, the Egyptian chariot in the first part of the XVIIIth Dynasty (1567 B.C.-1320 B.C.) is exactly like the chariots produced by the Canaanites. This chariot is often seen in the

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[6]Yadin, Art of Warfare, 1:90-113.

[7]Stanton A. Coblentz, From Arrow to Atom Bomb: The Psychological History of War (New York, 1953), pp. 77-104.

hieroglyphical wall drawings that depict the Canaanites bringing chariots to the Egyptian royal family as votive gifts.[8]

The type of Egyptian chariots used in the Battle of Kadesh had three main parts. These were the body, the wheels, and the pole or yoke. The body consisted of a wooden frame. From a side view, one side forms the upright front, and the other side forms the horizontal base with its rear resting on the axle and the arc forming the back. Its base is approximately one meter in width and approximately one-half that distance in depth. It is about 75 centimeters high in front, which would cover only the thighs of the chariot's crew. The front and bottom part of the sides of the body were armored with leather. The axle of the chariot was six centimeters thick in its center, and the total length between the wheels was 1.23 meters. This was 23 centimeters longer than the width of the body so that the clearance of each separate wheel from the laterals of the body was 11.5 centimeters. The total length of the axle rod was 1.53 meters. It was designed in this manner in order that the chariot would have greater stability on sharp turns. It served as a very primitive differential. Each of the wheels had four spokes, of which the thickness in the center was four centimeters. The chariot pole, which served to connect

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[8]Yadin, Art of Warfare, 1:3-6.

the horses to the chariot, was 2.5 meters long and was attached to the rear end of the body frame or chasis. This was done to give additional strength to an otherwise very frail structure. The pole was 6.7 centimeters thick at its strongest point, and was attached to the top part of the vehicle by leather bands. It is an item of interest that all wall paintings of chariots seem to emphasize this feature. The yoke is formed like a double convex bow, and is attached to the forward end of the pole by nails.

The Hittite chariot is known to modern historians only from reliefs portraying the Battle of Kadesh. It is not easy to be specific about the design of the Hittite chariot, because the Hittite forces were a coalition of several peoples. Some of the reliefs show chariots in which the axle rod passes under the center of the body, and others show a much taller chariot. In other cases, there is little difference between the Hittite and Egyptian chariots; both have the rod attached to the rear edge of the body case.

In combat, the Egyptian and Hittite, as well as the Canaanite chariots were harnessed to two horses. This presents a very curious situation. The proportion of chariots and horses captured was three to one (three horses to one chariot), which suggests that the idea of chariot employment here may have been two horses at the front, committed, and

one held in reserve. The horses were protected in battle by a special armor that covered their backs.[9]

After the expensive and difficult manufacture of the chariots themselves, the ancient kings still had to find suitable troops to use them. The kings could not simply take their regular infantry soldiers and put them in chariots. Special training was required, and usually members of the aristocracy formed the elite chariot forces. It took months or years to form them into a truly effective fighting unit. These may be some of the reasons chariots were not used more extensively in the warfare of the time. When troops that had received a reasonable amount of training in their tactical employment used them, they did provide a powerful combination of shock and missile tactics which greatly enhanced the strength of any ancient army. Toward the end of the period in which chariots were employed, some commanders had developed true expertise in using a combined arms team with a triple capability of chariots, infantry, and cavalry.[10]

If the chariot was so effective, then why did it disappear from warfare? Military historians have pondered this question. Some believe that it declined with the coming of the new civilizations in Europe and the downfall of the greater civilizations of the ancient world. They have

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[9]Ibid., pp. 80-93.

[10]Jac Weller, Weapons and Tactics: Hastings to Berlin (London, 1966), pp. 18-19.

suggested that the terrain in Europe was not suitable for use by chariots. This group of theorists think that the chariots went the same way as the "demi-cataphract house archers, the heavy foot archers armoured from helment to boots . . . ," and that the chariot was no longer practical.[11] As evidence of this position, they point to the fact that the Battle of Kadesh was the last one won by the Egyptian Empire (if one considers the Egyptians to have won). Some believe that the reason for the lack of victories after Kadesh was that the old Egyptian national patriotic army gave way to mercenaries, consisting chiefly of Nubians and men drawn from northern Mediterranean lands. Others think that the decline of Egyptian arms came from the ascendancy of iron weapons (1000 B.C.-100 A.D.) over those made of the softer bronze.[12] Iron, when formed into an arrowhead or spearhead, penetrates armor much better than bronze or the other, softer metals. No doubt, technical improvements did make their contribution to the revolution in tactics, and it would be naive to overlook them in any discussion of the subject. The introduction of the crossbow (400 B.C.-1600 A.D.) and cutting weapons of high quality iron capable of taking and holding an edge were significant. Years before the crossbow appeared, the

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[11]Arnold J. Toynbee, War and Civilization: From a Study of History (London, 1950), pp. 64-65.

[12]Major-General J. F. C. Fuller, A Military History of the Modern World: From the Earliest Times to the Battle of Lepanto, 3 vols. (New York, 1954), 1:8-13.

composite reflex bow, something like a recurved bow, had become common, and as widely used throughout the armies of the world as the rifle is used throughout the world today. It is likely that technical improvements in the bow made the chariot obsolete.

The Battle of Kadesh in 1288 B.C. gives valuable insight into the military trends and patterns of this period, with its royal armies of high quality and its commanders who were fully capable of handling and controlling large formations of chariots and infantry for extended periods of time. The various principles that these ancient commanders used are in accordance with the soundest principles of tactics and strategy used to this day, if allowance is made for the gigantic technological advances that have been made over a period of three thousand years. The commanders of ancient times faced many of the same problems of logistics, intelligence, operations, and personnel that modern-day commanders are still trying to solve.

As the centuries passed, fighting vehicles were for the most part neglected until the First World War. With the advent of the machinegun, the day of the unsupported infantryman on a conventional battlefield was over. In the First World War, however, armored vehicles were largely experimental. The basic idea of the tank was to breach enemy fortifications; the tanks of the First World War in Europe looked like terrapins trying to crawl up the side of a curb.

The most modern tank is a versatile fighting vehicle designed to attack and destroy enemy targets in combat. It is a full-tracked, armor-protected, fighting machine that can be employed in most conditions of terrain, weather, and visibility. Armament on most tanks consists of a main gun that fires with flat trajectory and direct fire. Usually the new tanks also have coaxially mounted machineguns, as well as the tank commander's machineguns. Some of the newer tanks even have dual-mode searchlights (white lights and infrared) and other night vision devices to enhance night operational capabilities.[13]

The construction of a tank is basically a compromise. Armor must be thick enough to stop enemy projectiles from destroying the tank, but the weight of the tank must not overly restrict the ability of the tank to maneuver over bridges and areas of poor ground. Armament is also a vital consideration. There are several different kinds of tank missions, and each one requires a different type of arms and ammunition. The inside of the tank can only hold so much war material. Fuel and water are also important. External fuel tanks have been tried by several armies (such as the Soviet's on the early models of the T34), but in most cases these have been found to be extremely hazardous, and

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[13]United States, Department of the Army, Tactics, Techniques, and Concepts of Antiarmor Warfare, FM 23-3 (1972), p. 59. (Hereafter cited as FM 23-3, Antiarmor Warfare).

they are usually jettisoned upon making contact with the enemy. In recent years, gasoline has been discarded in favor of diesel fuel because of the explosively flammable characteristics of gasoline. Air support, especially during the Arab-Israeli conflict of 1967, has solved many of the resupply problems of armored forces in the desert. With the advent of modern aircraft, however, tanks had to be provided with an antiaircraft capability. This usually consists of a heavy machinegun mounted on top of the turret. The ammunition that must be carried for this weapon must also be taken into account when considering the total weight of the vehicle.

The many ways in which a tank can be used are indeed varied, which explains the difference between a tank and a self-propelled gun. This difference is more by the function that the vehicle is to serve than the actual physical characteristics of the vehicle itself. In general, a self-propelled gun is more lightly armored and therefore lighter in weight than a tank, but this is not a complete definition because the weight of a modern self-propelled gun is frequently greater than the weight of a World War II tank. The function of the armored vehicle determines whether it is a tank or self-propelled gun. The purpose of a tank is to support the infantry with <u>direct</u> support, while the self-propelled artillery supports the infantry with <u>indirect</u> support. Tanks can fire as they are moving toward the enemy

and achieve some success in causing enemy casualties. Without doubt, the self-propelled artillery is also valuable because of its mobility, but it can generally not move and shoot at the same time with any real success. The maximum effective range of the heaviest self-propelled guns (in the American army the 175mm and eight-inch guns) is about 32,000 meters.[14] Therefore, to provide close and continuous fire support, the artillery must be able to move very quickly to keep up with the advancing infantry forces. Therein lies the value of the self-propelled artillery. Tanks, however, must move with the infantry to be of value, and often they provide support with their organic machineguns as well as their main gun.

Tactical conditions are similar for armor and infantry, but problems of command control are greater. The tactical principle of maneuver is more difficult when applied to an armored force because terrain and obstacles present even greater problems to an armored force than they do to infantry. Rain, for example, can turn an ordinarily passable area into a quagmire, or conversely, it can improve the ground-surface crossing of a sandy area. In the desert, maneuvering is extremely difficult because of the scarcity of landmarks. In many other types of terrain, landmarks

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[14]United States, Department of the Army, Field Artillery Cannon Gunnery, FM 6-40 (1967), Appendix A.

can be used as checkpoints, phase lines, and other tactical control measures, but in the desert these landmarks are for the most part nonexistent. The commander of an armored unit must plan his route march and approach march in detail to avoid becoming lost. Desert sandstorms can halt armored as well as cavalry columns. Once in combat, the primary means of communication is by radio, but frequently radios are unreliable, or are damaged during the course of the battle. Control of armored forces to any real degree in combat becomes almost impossible in the heat of battle, even more difficult than control of infantry in the same situation.

During the period between the two wars, the idea of the tank unit was formed.[15] To be really effective, tanks and infantry must support one another. There are many hazards that tanks face if they are employed without infantry support, and conversely, there is a much greater chance of the infantry accomplishing its mission if it has the support of armored forces. During World War II, the tank showed how it could influence the outcome of major battles. Rommel's Afrika Korps was a good example of a well-coordinated, balanced, tank-infantry team. In a desert climate, coordination between infantry and armored forces is important for

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[15]Peter Chamberlain and Chris Ellis, Fighting Vehicles (New York, 1972), pp. 23-32.

several reasons, chief among them the vulnerabilities of the tank.

Tanks have certain vulnerabilities despite their great size and firepower. Most soldiers do not appreciate a tank's inability to shoot in certain directions or the limitations of sight and hearing imposed on those inside. Even if foot soldiers realize that a tank has problems with visibility and hearing, they often fail to recognize that weapon "dead-space" is equally important. All tanks have limitations in their ability to depress or elevate the weapons mounted on the vehicle. The crew of a tank may be able to see dismounted enemies, but not be able to engage them without repositioning the tank itself. The amount of this deadspace varies with the type of tank, but is normally greatest on the sides and rear. The weight of thick armor restricts a tank's maneuverability, but a tank also has several other weaknesses.

The engine compartment is a particularly vulnerable area. A thermite or white phosphorous grenade can easily set the engine on fire. If a tank loses its mobility, it also loses a great part of its effectiveness as an offensive combat vehicle. A halted tank is sometimes easier to destroy than a pillbox fortification.[16] The suspension system, which includes the tracks or treads, is very easy to

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[16]FM 23-3, Antiarmor Warfare, p. 61.

sabotage. An explosive charge, or even the trunk of a tree, can seriously impair the movement of a tank. While a mine (except for one of enormous dimensions) will not destroy a tank, it will blow up a tread and cause the crew a great deal of difficulty in replacing the damaged part. Also, in the desert, tanks are difficult to conceal, not only from aerial attack, but from antitank artillery, rockets, and the fire of other tanks. The infantry can help the tanks by serving as their sensory devices because, if enemy contact is likely, the hatches must be secured, and this restricts hearing and visibility even more than under normal conditions. The new antitank capability of the infantry has increased the need for tank-infantry coordination even more.

Are there means available to the infantry to destroy or halt tanks? There most certainly are, and many of them are most applicable to a desert-warfare scenario. The sand of the desert is particularly suitable for burying antitank mines. Infantry, as well as engineers, can be used to perform this function.[17] Artillery and mortars, regardless of their caliber, are not really effective antitank weapons when utilized in their traditional role of indirect fire.

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[17]United States, Department of the Army, Engineer Soldier's Handbook, FM 5-13 (1969), pp. 107-109. In many armies, the function of removing mines is delegated by standing orders to the engineer corps, or "sappers" as the British call them. Considering the number of engineers and the respective number of mines, the corps of engineers could not entirely take care of this function, even if they had the desire to do so.

Artillery rounds, as well as mortar rounds, are area weapons designed to impact and send shrapnel hurtling through the air to kill troops. Except for the extremely heavy mortars (107mm and larger), even a direct hit will not usually stop a tank. Artillery can be utilized in a direct-fire role, and, to be sure, if a tank receives a direct hit from an artillery round of any size, it may be badly damaged or even destroyed; but for the artillery to use their firepower in this fashion would expose it to direct fire from the tanks. Therefore, the use of artillery as a direct-fire weapon against tanks is not really practical. Used as indirect-fire support, the artillery cannot usually destroy tanks. The "eyes" of the artillery is the forward observer. A good observer, if he is supported by competent gun crews and an equally good fire direction center, can make a direct hit on an immobile tank with three shots; a tank that is moving is a far more difficult target.[18]

Artillery should not be confused with the "recoilless rifle." The recoilless rifle is a fairly new concept in weaponry. Again, in the counterattack, if the tanks have been withheld and then strike fast enough, they may find that the recoilless rifles have expended their ammunition in anti-personnel fire, or failing this, they may be able to overrun

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[18]United States, Department of the Army, Mortar Gunnery, FM 23-91 (1971), pp. 1-1 to 1-3.

the position before the enemy has time to achieve maximum use of the weapon.

Although the concept for employment of the recoilless rifles is a new idea in modern terms, Leonardo da Vinci actually had the idea for the basic weapon centuries ago, but the one he developed blew up, so the military minds of the time decided that the weapon was not a sound idea.[19] The concept of the recoilless rifle was set aside until the Second World War when infantry had to begin thinking seriously about ways to defeat armor. Recoilless rifles range from 57mm to 120mm, and defeat armor through use of the "shaped charge" principle. Basically this consists of building an antitank round that has a slight "stand-off" from the place on the surface of the armor on which it impacts. This causes the force to consolidate and burns a hole through the armor, causing pieces of hot armor to blow back through the crew compartments of the tank, which usually kills the crew. A second type of ammunition can also be used. This kind produces the "spalling" effect because it hits the turret of the tank so hard that pieces of armor chip off from inside the turret and kill members of the crew.[20] In recent years, even more sophisticated antitank weapons have been developed, but will not be discussed here, partially

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[19]Edward MacCurdy, The Notebooks of Leonardo da Vinci, 2 vols. (New York, 1938), 2:186-87.

[20]FM 23-3, Antiarmor Warfare, pp. 1-50.

because they are classified, but more so because they played no part in the conflicts this thesis will examine.[21]

During the last decade, the capabilities of the individual infantry soldier to confront and destroy armor with organic weapons have increased tenfold. During the last years of the Vietnam conflict, American and South Vietnamese units were able to encounter and destroy with light infantry weapons Soviet-built tanks such as the T54 and the PT76.[22] Infantry antitank weapons such as the American 3.5 inch rocket launcher, the German "Panzerfaust," and the Soviet RPG (Rocket Propelled Grenade) have frequently shown their effectiveness in destroying tanks.[23] North Vietnamese soldiers used RPG teams to great advantage in the northern section of South Vietnam. These teams made maximum use of the weapon deadspace of American armored vehicles. Frequently the North Vietnamese fired their antitank weapons from distances of ten meters or even less.[24]

Even before the advent of conventional infantry antitank assault weapons, ground troops had learned how to exploit the weaknesses and vulnerabilities of tanks. A good

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[21]United States, Department of the Army, TOW Heavy Antitank Weapon System, TC (1970), pp. 3-11.

[22]Colonel R. R. Battreall, "RVN Armored Forces and Soviet Tanks," Army Magazine, 3 (1973):3-8.

[23]FM 23-3, Antiarmor Warfare, pp. 61-73.

[24]Ibid., pp. 100-111.

example of this was Russian partisan tactics against German tanks in World War II:

> A barrier about a quarter of a mile in length of burning hay, straw, brushwood and other materials was put in the way of fascist tanks. In some places the fiery bulwark reached the height of ten feet and burned fiercely for two and a half hours. Coming against this wall of fire, the enemy armored machines changed their route, thus exposing themselves broadside to the Soviet antitank guns; 25 of 40 enemy tanks were fastened to the spot.[25]

Often tanks could be put out of action, if only by great individual courage and sacrifice:

> When the tanks came to rest in a square they were immediately surrounded by guerillas, who crept up on them, and put their machinegun barrels out of action with hammer blows. Guerillas learned very quickly that the angle of fire of a tank machinegun makes it impossible to hit a man crawling on the ground nearby. Although the guns were now out of order, the Germans still remained protected by their armor. Thereupon, blacksmiths came up and hammered away at the tanks until their occupants were forced to surrender.[26]

Many times natural fortifications and terrain could be used to halt the flow of armor:

> Near a small town in Central Russia, a guerilla group learned the route by which tanks were expected to pass on their way to a concentration point. The route led through a forest, and the Germans were moving at night. Tank pits were hastily dug, and an ambush was laid. The leading enemy tank fell straight into the trap. The second tank crashed into the first. The following tanks turned off the road, but three of them also fell into deep pits. When the rest turned back, they were showered with hand grenades. When several armored cars were reported to be approaching a bridge, guerillas

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[25]Major N. Cherkinov, "Incendiary Bottle and Fire Belt Field," Field Artillery Journal (November, 1942):851.

[26]"We Are Guerillas," Soviet War News, 3 (n.d.):24.

> dug a pit in the road and camouflaged it. Not far from the pit they hid themselves with a machinegun, grenades, and fire bottles. The German cars drove up to the bridge. The first one fell into the pit. The Nazis got down and began hauling the machine out again. Meanwhile, a few of the guerillas had quickly laid a mine in the road along which the cars had come. The hidden guerillas then opened fire and threw fire bottles. When the Germans saw that they were ambushed, they crowded into the two remaining cars and drove back. One of the cars then hit the hidden mine and blew up. The last machine was destroyed by hand grenades.[27]

Military missions of any sort are affected by the terrain. Both chariot and tank had to operate on terrain that military doctrine classifies into five factors. Any operation, whether by chariot or tank, has to take into account key terrain features, obstacles, cover and concealment, observation, and avenues of approach. These five factors must be carefully analyzed if one is to achieve success in military operations.

Key terrain is any natural feature, such as hilltop, bridge, or valley, which gives one force an advantage over the other. Control of key terrain features may be in the form of physical occupation and security, or by fire from various types of weapons. In the desert, the control of key terrain features is less important than in other geographical areas. Because of the nature of mobility in desert operations, key terrain features become limited to such features as mountain passes and areas near the coastal

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[27]Ibid., p. 125.

regions. Because of the importance of water in the desert, water supplies may become key terrain features.[28]

Obstacles are of two basic types. These are the natural obstacle and the man-made variety. Natural obstacles in the desert include areas with loose sand and mountains which impede the movement of men and machines. In modern warfare, artificial obstacles include mines and tank-traps, the effectiveness of which is increased greatly if they are covered by fire or observation, or both. Minefields can be used extensively in the desert because of the ease with which mines can be covered with sand. The soldier who installs the mines, however, often encounters difficulty in marking and recording the field. In other areas, landmarks can be used, but landmarks in the desert are rare.

Cover and concealment present unique problems in the desert warfare environment. The use of natural materials for camouflage is somewhat limited, but as camouflage becomes more difficult in the desert, it becomes more important because of the increased visibility and nature of open ground. Many modern armies have experimented with sand-colored camouflage covers for vehicles and fortifications. Forces must be dispersed to the maximum degree possible and still allow the commander to maintain control. Some cover and concealment of modern armored vehicles can

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[28]United States, Department of the Army, Desert Operations, FM 31-25 (1972), pp. 2-10.

be obtained by placing them in "hull defilade," the digging of a tank into the earth so that it can use its main gun. One problem inherent in this is that it does not prove all-round security. If the attack comes from a direction other than the anticipated one, the tanks must be uncovered to coordinate their firepower in the other direction.

Observation in the desert is generally good. The early morning does present some problems, however, because of a mist or fog that hangs over the desert for three to four hours after sunrise. Sandstorms may hinder observation during some seasons. The degree of observation at night, which depends upon the light of the moon and stars, is easier than in other areas because of the reflective capabilities of the sand. Observation at night by armored or mechanized forces may be enhanced by use of some of the night observation devices such as a starlight scope or an infrared light.[29] Observation at night can also be aided through the use of

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[29]United States, Department of the Army, Night Vision Sight Individual Weapons Mounted AN/PSV2 and AN/PSV2a, TM 11-5855-203-13 (1967), pp. 205-22. The use of a starlight device is preferred by most armies (which have both) because an infrared device can be detected by other infrared devices. The starlight scope, however, also has limitations; it uses the light of the stars, and if it happens to be a cloudy night, the use of a starlight scope is restricted.

illuminating devices or flares fired from artillery and mortars.[30]

Avenues of approach are the routes over which the offensive force meaneuvers to seize key terrain and attack the defending force. In making an anlysis of the terrain, the commander must decide which routes to and from the objective he can best use to accomplish his mission.[31] Some terrain aspects will favor the attacker, others will favor the defender, still others will be of no real advantage to either side. It is extremely important to the commander that he have up-to-date reconnaissance information about his avenues of approach.[32] Avenues of approach are even more important a consideration to the commander of vehicles than to the commander of an infantry force because there are some types of obstacles that infantry can cross that vehicles

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[30]Illumination rounds of ammunition can light up a considerable area (approximately a one-thousand-square-meter area), but they burn for only a comparatively short period of time. They are used primarily for on-the-spot requests for artillery or mortar support. They are useful in desert operations because there is not any real possibility that they are going to start a fire where they land.

[31]United States, Department of the Army, The Rifle Company, Platoons, and Squads, FM 7-10 (1970), pp. 3-7 to 4-1.

[32]United States, Department of the Army, The Infantry Brigades, FM 7-30 (1969), pp. 5-1 to 6-16.

cannot.[33] It can be argued, however, that vehicles are better prepared to cope with an ambush than is an infantry unit. Even so, the armored force commander must plan his avenue of approach with more detail than the commander of an infantry force. He must utilize his assets of increased firepower and speed and try to compensate for his lesser possibility of stealth.

The weather can play a vital role in the conduct and analysis of a battle. On the ground, heat can delay or even halt movement. Troops that are not from the desert areas take several weeks to adjust to the heat and difficult living conditions in the desert. Bad weather may impede the swiftness of movement, but it can also shield forces from enemy fire and observation. As well as having an effect on men, the weather affects the operation of weapons. The intense heat of the desert makes the cooling of engines an important consideration in the employment of armored vehicles. Lubrication of weapons and engines also

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[33]An armored commander frequently has to prepare the area that he moves through. This is little more than firing prearranged mortar and artillery support into a designated area before moving through with the main force. One favorite kind of technique of an infantry tank-killer team in covering an avenue of approach is to place a small mark on a tree with a piece of tape or a small amount of paint. When the tank or armored vehicle moves through and obscures the view of the gunners, all they need to do is fire. In addition to the on-call support from mortar and artillery units, the armored force commander in certain tactical situations can also make a reconnaissance-by-fire using the organic weapons of the tank.

becomes an important consideration. Heat will dry out a machinegun so badly that it will jam after only a few shots. Thus, the weather, especially in desert regions, presented special maintenance and logistical problems to both tank and chariot forces.

The order of battle is nothing more than the manner in which each of the participants in an engagement organizes and deploys its forces. A modern order-of-battle report often includes personality sketches of enemy leaders and special descriptions of the various capabilities of enemy equipment. Even in ancient days, commanders used the order-of-battle principle in planning their campaigns. The order of battle is important because it provides the commander with knowledge of the enemy, which is one of the first prerequisites for success in a battle. The type and disposition of the enemy forces will determine the opposing commander's course of action. Order of battle is the culmination of all the reconnaissance and intelligence efforts of an army. In modern times, nearly all countries maintain an "order of battle" book on every other army in the world, regardless of the relations they have with these countries.[34] In ancient times, there was no "order of battle" book as such, but records do show that even the earliest armies did keep

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[34]United States, Department of the Army, Aggressor Order of Battle Book, FM 30-103 (1966), pp. 1-8.

records and reports about the activities and capabilities of other armies.

Sun-Tzu, an ancient Chinese military theorist, summed up order of battle and the estimate of the situation some centuries before the birth of Christ when he said,

> Therefore I say: Know the enemy and know yourself; in a hundred battles you will never be in peril. When you are ignorant of the enemy, but know yourself, your chances of winning or losing are about equal. If ignorant both of your enemy and of yourself, you are certain in every battle to be in peril.[35]

After the estimate of the situation has been completed, the commander must next be concerned with perhaps the most difficult of the arts of war: the tactical meaneuvering of forces. To be completely successful, tactics must be characterized by aggressiveness and offensive operations. General Carl von Clausewitz realized this general principle in the nineteenth century, long before the advent of tanks, when he wrote,

> A fundamental principle is never to remain completely passive, but to attack the enemy frontally and from the flanks, even while he is attacking us. We should, therefore, defend ourselves on a given front merely to induce the enemy to deploy his forces in an attack on our front. Then we in turn attack with those of our troops which we have kept back.[36]

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[35]Sun-Tzu, The Art of War, ed. and trans. Brigadier General Samuel B. Griffith (New York, 1971), p. 84.

[36]General Carl von Clausewitz, Principles of War, ed. Captain B. H. Liddell Hart (Harrisburg, Pennsylvania, 1960), p. 16.

There are three basic methods of assault in which either tanks or chariots may be used. These are the attack on a foritified position, attack and combat on open ground, and attack against a strongpoint. The objective of an assault by a chariot or tank force combined with infantry against a fortified zone is to penetrate into key terrain with a minimal loss of personnel and time. In the case of tanks, they should be kept on the outer edge of the supporting barrage, and the first line of assaulting infantry should follow them about fifty meters back. Basically, armor is designed to help the infantry accomplish its primary mission: to close with and destroy the enemy by means of fire, maneuver, and manpower. The tanks must coordinate and base their attack on the infantry, not on the supporting artillery fire. Under no circumstances must the assaulting infantry be allowed to come between the supporting tanks and the enemy forces. If this should happen, the tanks in support are not effective. After the objective has been taken, the tanks can best be of use in the consolidation of the objective and in the hurried preparations for an anticipated counterattack by the enemy.

Attack and combat on open ground is the type of operation in which tanks or chariots can be employed to their maximum capability. In a tank assault, each platoon of tanks is assigned a sector of attack anywhere from 400 to 600

meters in width depending upon the specific terrain.[37] Tank-infantry coordination becomes increasingly important in this kind of situation.[38] In attacks over open ground, the infantry cannot be allowed to advance too far in front of the tanks because they will lose the valuable support of the tanks in case they encounter determined enemy resistance or enemy tanks. In the event of either of these circumstances, the tanks must be allowed to assume the dominant role. After the enemy has been forced from the battlefield, tanks or chariots are particularly useful in the roles of reconnaissance and security because of their mobility.

In assults upon a strongpoint, current military doctrine is to outflank the enemy and attack the strongpoint from the sides or the rear. In some situations, it may be possible to bypass it entirely. Due to certain terrain or tactical requirements, however, it is not always possible to do so. The chariot gave cover to an assault upon a strongpoint, but it had no main gun weapon like the tank's artillery. In this type of situation, the tank can frequently neutralize the objective by use of its main gun. Sometimes the fire of supporting artillery of the infantry's organic mortars can

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[37]Captain Joseph W. Vines, Tactics and Techniques of Tanks (Fort Leavenworth, Kansas, 1920), pp. 76-8.

[38]Infantry reconnaissance elements must precede the tanks to attempt to uncover pockets of resistance and potential hazards to the armored forces such as mines or organic infantry antitank weapons.

be used to achieve the same purpose. This of course varies with the type of strongpoint and the availability of support.[39]

Vehicles may also be used in a counterattack. Perhaps the best way to utilize them in this type of operation is to hold them in reserve when the enemy first attacks and then release them on the enemy at a crucial time when they are least expected. Because of the speed with which vehicles can move, compared to infantry, they can frequently strike the advancing enemy before the enemy has had time to regroup effectively and resupply its forces. If they can close with the enemy fast enough, the enemy may not be able to call for support. Chariots could be used in this role to even better advantage than tanks because the ancient armies had no really effective "anti-chariot" weapons.

Vehicles may also be utilized in such special tactical operations as advance guard, rear guard, and pursuits/raids. In the case of pursuits and raids, they can also be used

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[39]In the case of an extremely heavy fortification, or when the enemy is in deep caves or heavily reinforced bunkers, tanks must provide close and continuous support for the infantry in other ways. They can fire smoke rounds from their main gun to obscure the vision of the enemy, or fire their machineguns to keep the enemy in the bunkers engaged, while the infantry, chiefly by stealth, approaches the enemy position and neutralizes it with grenades, demolition charges, or flame throwers. This is especially true in a combat-in-cities situation. There have even been cases, in extreme situations, of tanks driving right on top of the bunkers and crushing them by placing the vehicle in neutral steer, a position in which the treads of the tank move but the tank does not go anywhere.

effectively for operations of a strategic nature. Part of their value in the advance guard comes from their being able to carry communications equipment more effectively than it can be carried on the back of an infantryman. It is also easier for accompanying infantry to break contact when serving as an advance or rear guard if they are supported by vehicles and they can ride on the vehicles to accomplish a breakthrough or a faster retreat, as dictated by the situation. The chief value of tanks or chariots in a pursuit is their speed and flexibility. The average modern tank company can move, even over rough terrain, at a rate of 10-15 miles an hour. Very few infantry companies (except for a mechanized or motorized rifle company) can move this fast. Even a mechanized infantry, or a motorized rifle company (as the Soviet Army calls them), cannot move this fast and retain the organic firepower that a tank company can achieve.

Tanks and chariots can also be used to achieve and maintain psychological dominance. They are extremely frightening to troops who have never been exposed to them in combat. They are even more terrifying when viewed by a civilian. By the technique of alternating crews, a tank commander can move a company of tanks several hundred miles in one night, strike and destroy a strategically or tactically important target, and be miles away before the enemy's reaction force can arrive. It is very difficult for most countries to guard all of their vulnerable areas with an effective antitank

defense; and even if the tanks that raid the oil storage dumps, factories, or other vulnerable areas are seen and eventually destroyed, they have already accomplished their mission and done their damage.

There appear to be certain parallels between the use of chariots in ancient times and the use of armored vehicles in modern warfare. The purpose of this thesis is to compare the tactical and not the technological similarities and differences of tanks and chariots. There are obvious differences. The ancient chariot had no main weapon that could launch a projectile miles toward the enemy as a tank can, but the way in which chariots were used to support infantry and to attack other chariots and foritified positions does suggest comparison and discussion. This thesis will examine the tactical use of chariots and the tactical use of tanks, both the unsophisticated models of World War II and the more technologically advanced versions used in the Sinai War, to see if the tactical principles that underlie their employment are similar.[40]

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[40]Although numerous publications from the United States Department of Defense were used in the preparation of this thesis, no connection should be made between the ideas expressed in this thesis and the doctrines of the Department of Defense or the United States Army.

CHAPTER II

CHARIOT TACTICS: BATTLE OF KADESH, 1288 B.C.

The Battle of Kadesh, in which Ramses II, king of Egypt, met the Hittites for the first time, was the culmination of the Second Syrian Campaign of Ramses II. It also provided nearly all we know of the beginning of his administration in Egypt. The battle is of particular interest because it is the first battle of history in which we are able to follow the tactics and dispositions of both the participating armies.[1]

The allied army under the Hittite king at Kadesh is estimated to have comprised 20,000 men. The Hittite chariot forces consisted of 7,500 men, and the rest were infantry and support troops. The allies of the Hittites also contributed troops, but the exact numbers of each are not known. The allied army had 2,500 chariots, but there is no information on these units that allows examination of how Hittite chariots were organized into smaller fighting units. This force was composed of the units from several nations, and it can be said with utmost certainty that each unit was

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[1]Breasted, Ancient Records of Egypt, 3:122-25.

no larger than 300 chariots, and most of them, for the sake of command and control if nothing else, were probably smaller.[2]

The Egyptians had four division, each of 5,000 men. This information is supported by the Anastasi Papyrus.[3] It is difficult to determine with any real accuracy the organization of smaller Egyptian infantry units. From biblical writings about other battles, the "Poem of Pentaur," and various monuments found in Egypt, it appears that they were based on the decimal notation. The smallest unit was the section, which comprised ten men. After this came the platoon of fifty men. There is really no precise information on the size of the company. It is known, however, that it did not consist of more than four or five platoons, which means that it was probably around 200-250 men. A batallion, whose total strength was not fixed but tailored to the tactical situation, usually consisted of four or five companies. In any case, it is clear that the units functioned together, and that they not only marched in specified formations but also fought in them, in the organization of the deep phalanx--straight ranks in close order.[4]

The documents of Tell el-Amama often mention units of fifty, thirty, and ten chariots. It is also known that both

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[2]Yadin, Art of Warfare, 1:101-13.

[3]Ibid., pp. 135-37.

[4]Ibid., pp. 101-14.

units of one hundred and units of thirty chariots were used at Anatolia, and the documents of the Nuzi mention units of fifty chariots under the command of a "captain of fifty." It seems from this that the basic chariot fighting unit consisted of ten chariots, and several of these units would make up a squadron of either thirty or fifty chariots. The largest tactical unit probably consisted of about 150 chariots. These were usually used in conjunction with the infantry divisions of expeditionary forces for support of infantry troops. Chariots caused a complete revolution in military tactics for this period of time. They also made possible the organization of highly mobile units with great initial striking power.[5]

Part of the superiority of the Egyptian chariots over the Hittite chariots lay in how the crew members were armed. The Egyptian charioteers were armed with a long-range composite bow which made them capable of long-range attacks, while the Hittite chariot forces were less mobile and were armed only with a short-range spear. Even from the reign of Thutmose IV (1420-1411 B.C.) the Egyptians had developed a special heavier chariot to provide greater stability for mounted operations. Chariots were extremely difficult and expensive to make, so they were not numerous; the Egyptians stressed the use of weapons from chariots in their military

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[5]Herman Kees, Ancient Egypt: A Cultural Topography (Chicago, 1961), pp. 133-34.

training. Egyptian arrows had bronze heads and could penetrate the armor of the time at short ranges. The Egyptian chariot forces spent hours practicing firing a bow from a moving chariot at full speed. This training apparently paid full dividends in combat.[6]

The Hittite chariotry was comprised of the nobility and the elite of the army, but it was differently organized than that of the Egyptians and employed different tactics.[7] One of the obvious major weaknesses of the Hittite's concept of employment of the chariot is that it was not intended for extended combat. That is, it could not function in battle for as long a period of time as the Egyptian chariot. One piece of evidence for this hypothesis is that there has never been a case of a wall drawing or any written document which describes a Hittite chariot as having any quiver or any other provision for the storage of extra spears or javelins.[8] This suggests one of two methods of employment. Either the chariots were meant to be used as a shock force to strike the enemy and win a short decisive battle, or else they were used to transport infantry to the battle and then let them dismount and fight on foot. This would help to account for the extra soldier in the chariots of the Hittites.

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[6]Montgomery, A History of Warfare, pp. 38-43.

[7]George Maspero, History of Egypt: Chaldea, Syria, Babylonia, and Assyria, 3 vols. (London, 1922), 3:140-47.

[8]Yadin, Art of Warfare, 1:80-93.

In the case of the Battle of Kadesh, it seems likely that they were designated to transport the troops to the battle so they could dismount and function as infantry.

At approximately the end of April in 1288 B.C., Ramses marched his army northward from the fortress of Tharu on the Egyptian frontier. (See Map 2, Disposition of Approach March.) This army consisted of about 20,000 men, in four divisions. A simplified order of battle was probably the division of Amon, which formed the advance under the immediate command of the Pharaoh; and the divisions of Re, Ptah, and Sutekh followed Amon in the order listed. The army marched through what is now Palestine and along the Phoenician coastal roads and passed into Amor. There, Ramses II stopped and formed an elite vanguard of picked men from the division of Amon.[9] Thereupon his army departed from the coast and took one of several possible routes, the most likely of which was the valley of Litani. Regardless of which route Ramses took, his army soon reached the high ground on the east side of the Orontes River, where the high valley (Buka) descends on the level plain around Kadesh, about a day's march south of the city. The Egyptian army took up its position here, and despite intensive reconnaissance efforts on the part of the chariot forces, found no trace of the enemy. (See Map 3, Disposition of Forces.)

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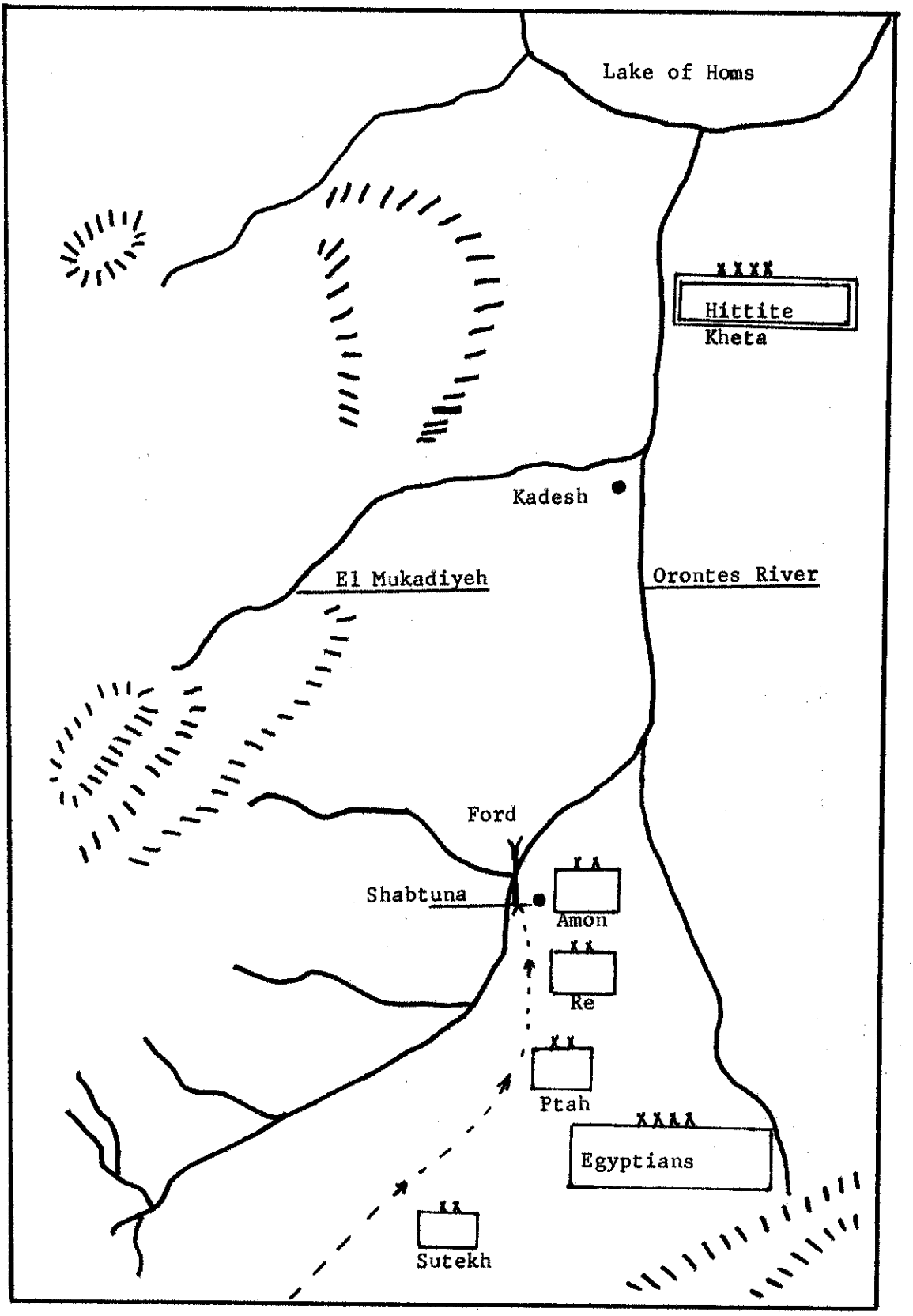
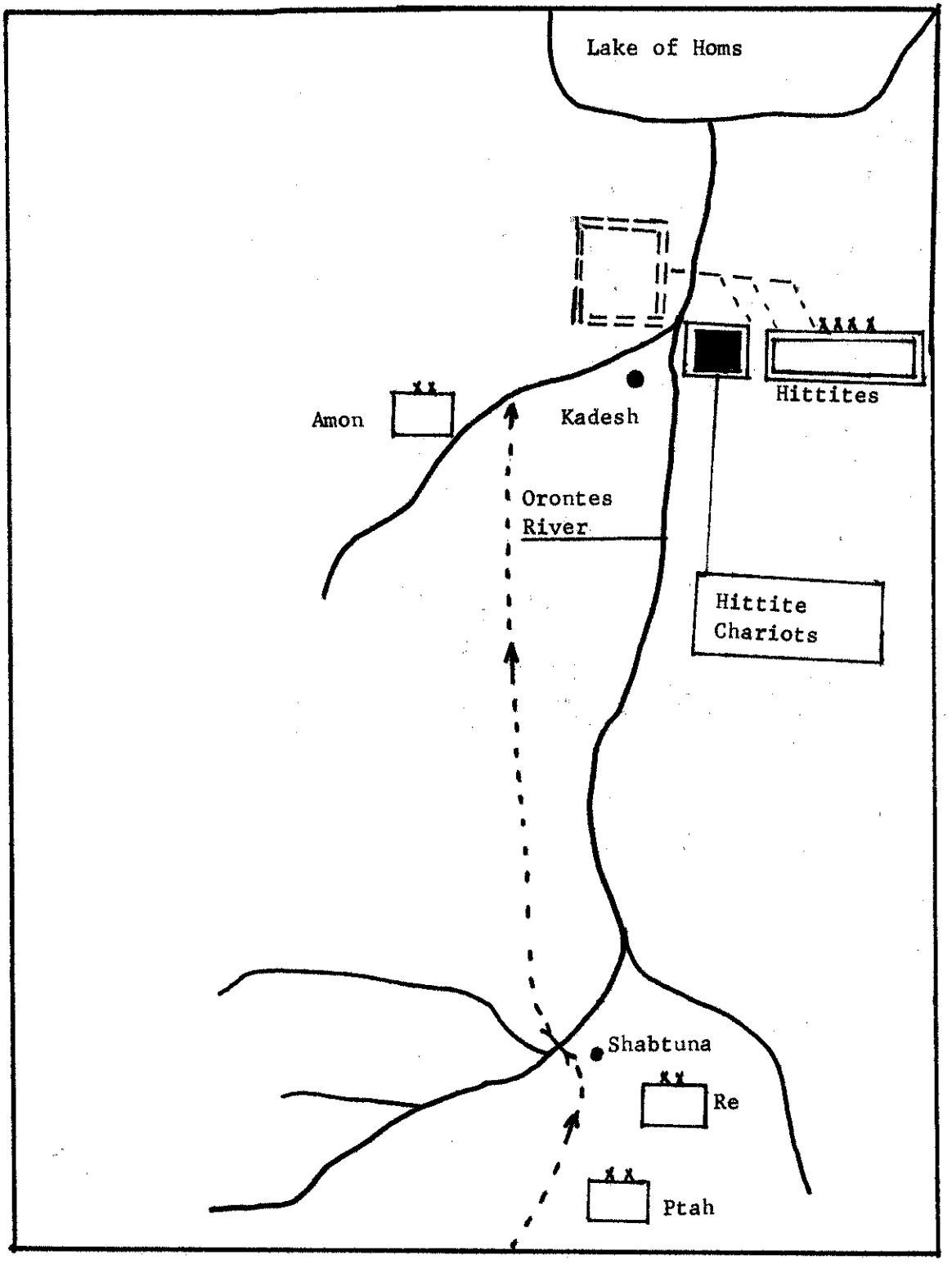
[9]Breasted, Ancient Records, 3:125-35.

Map 2, Disposition of Approach March



Map 3, Disposition of Forces



The army moved on the next day in search of the elusive Hittites and reached a ford in the river just south of Shabtuna. The first contact with the enemy was made at a small town called Ribleh, about seven miles south of the site where the main battle would be fought. Ramses II was informed by two men from the Shasu-Beduin tribe that the Asiatics (Hittites) had retreated far northward to the province of Aleppo. Ramses, while a fair tactical commander, was apparently not well-versed in military intelligence and believed what these two men told him. This is among the oldest recorded deceptions in military history because the Hittite king had paid these informers to give this misleading information to the Egyptians. Perhaps Ramses II readily believed the false news because he wanted to believe that the Hittite army had fled before his advance.[10]

Acting upon the information given to him by these two enemy agents, Ramses crossed the Orontes River to the west side at Shabtuna, and left his other three divisions on the eastern side, disposing their forces along the road to the south. Soon the division of Re crossed at the same ford that Ramses had used for his initial crossing. This left about two miles between Amon's advance guard, formed of chariots, and the rear guard. Ramses continued northward quickly in an extended line, and the other two divisions

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[10]Ibid., pp. 125-40.

(Ptah and Sutekh) were left in reserve, marching south of Shabtuna, a disposition that created a wide gap between the two portions of the Egyptian army.[11]

In the meantime, the Hittites with an army of perhaps 20,000 men, consisting of the combined forces of the north Syrian princes under the command of the Hittite king combined with a large number of mercenaries from Asia Minor, were concealed northwest of Kadesh. The Hittite king used the city to hide his movement and, as Ramses drove on to the western side of the city of Kadesh, the Hittite commander shifted his fighting positions to the east and southward with extreme speed by using his chariots to transport the ground troops. While doing this, he was careful to maintain cover and concealment by constantly keeping the city between his forces and the advance of the Egyptian forces. To do this he had to move his army across the Orontes River. Ramses was not prepared to make an assault at the moment. As a result of improper reconnaissance and poor selection of terrain and an avenue of approach, he was advancing alone with only his "household troops." This term is taken literally from the documents, and is one of those words that really has no equivalent in English. It probably meant a staff headquarters and the personal elite guard and slaves of the Pharaoh.[12]

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[11]Ibid., pp. 135-57.

[12]Ibid., pp. 130-38.

The "household troops" took up positions northwest of the city, the area from which the Hittite king had just moved. (See Map 4, Initial Contact.) The Hittite commander skillfully maneuvered his forces to higher ground and selected good defensive terrain. He was situated with a strong defensive position (the city of Kadesh) on his right, in case he needed to retreat, and had gained an extremely favorable position for attack against the right flank of the Egyptian army. The proper utilization of this advantage would mean victory for the Hittites. The division of Amon arrived and set up temporary defensive positions. Shortly after setting in their positions, the reconnaissance elements of the Egyptian army captured two of the enemy's scouts and were able to torture some information from them. The Egyptians learned that the Hittite army was not in retreat to Aleppo but instead was in the immediate vicinity in defensive positions. Ramses was badly scared by this turn of circumstances and called upon his reizier (adjutant) to send a group of horsemen to bring up reinforcements by chariot.[13]

Combat troops are always taught to expect the worst, and in this case the worst became a reality. The Hittite king kept his infantry in reserve and sent his chariot forces to launch an assault on the Egyptian army.[14] The chariots

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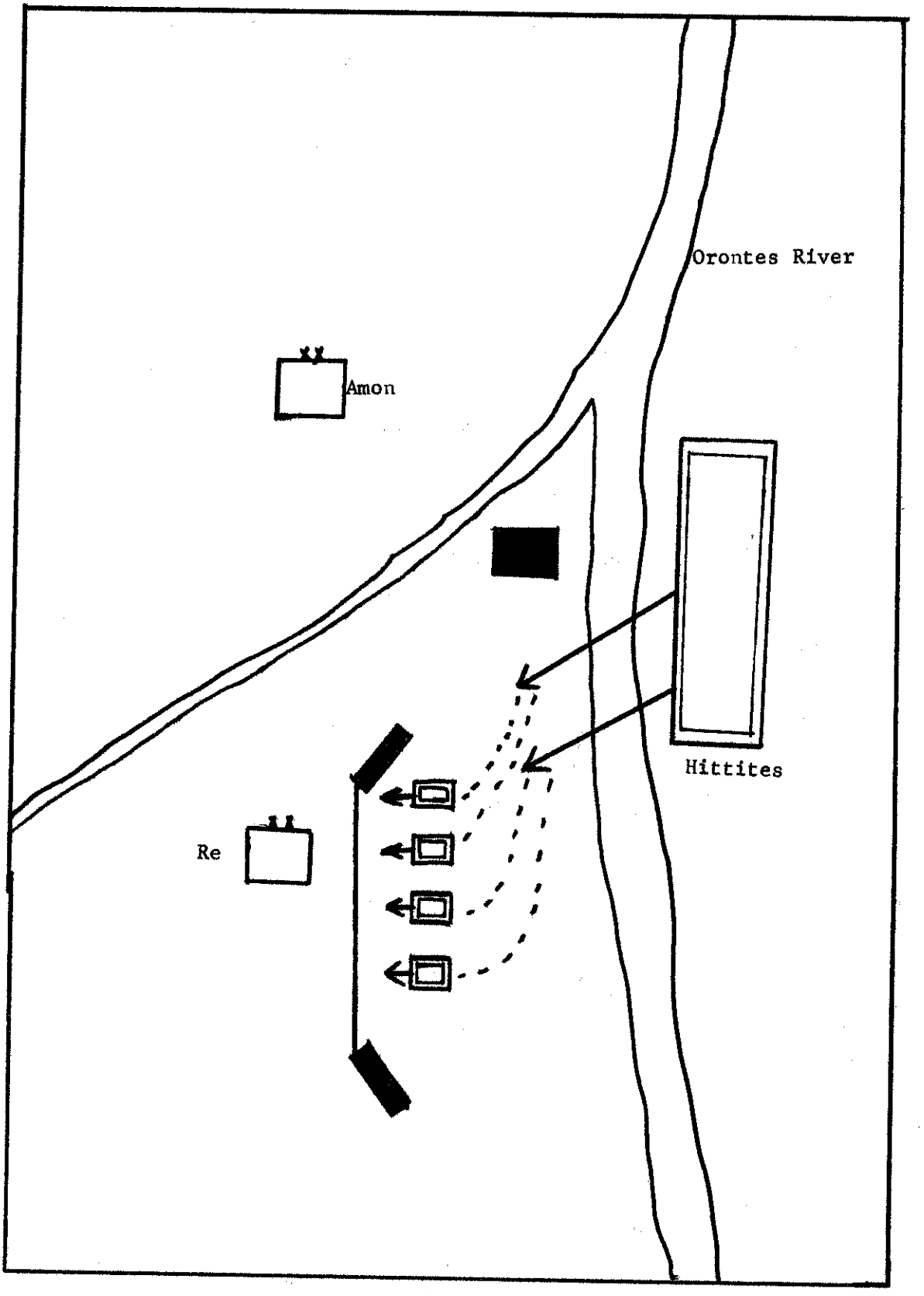
[13]Ibid., 141-57.

[14]Ibid., p. 129.

Map 4, Initial Contact



attacked in mass from the south and sliced through the center of the Re division while the division was still marching. This move caught Re entirely by surprise.

In ancient warfare, the organization for battle and combat formations was of special importance. Evidence for this is given by what Great Cyrus of Persia said when he was warned by his scounts that the Egyptian phalanx was one hundred men deep: he answered them, "If they are too deep to reach their enemies with their weapons, what good are they?"[15] Indeed, the forces of Re were not of great value until they were formed in combat order. They fled northward toward where the division of Amon was camped, but Re's commander did retain enough presence of mind to send a messenger to give Ramses a report of the situation. (See Map 5, Hittite Assault.)

The Hittite chariotry was used very effectively in this attack on Re's division. They were well disciplined and their fire control and coordination was excellent. They came upon the Egyptians so rapidly that even while Ramses was holding a staff meeting in his tent, reprimanding his officers for their poor efforts at reconnaissance and finding the location of the enemy, the first of the chariots began to enter the western edge of the camp. Some members

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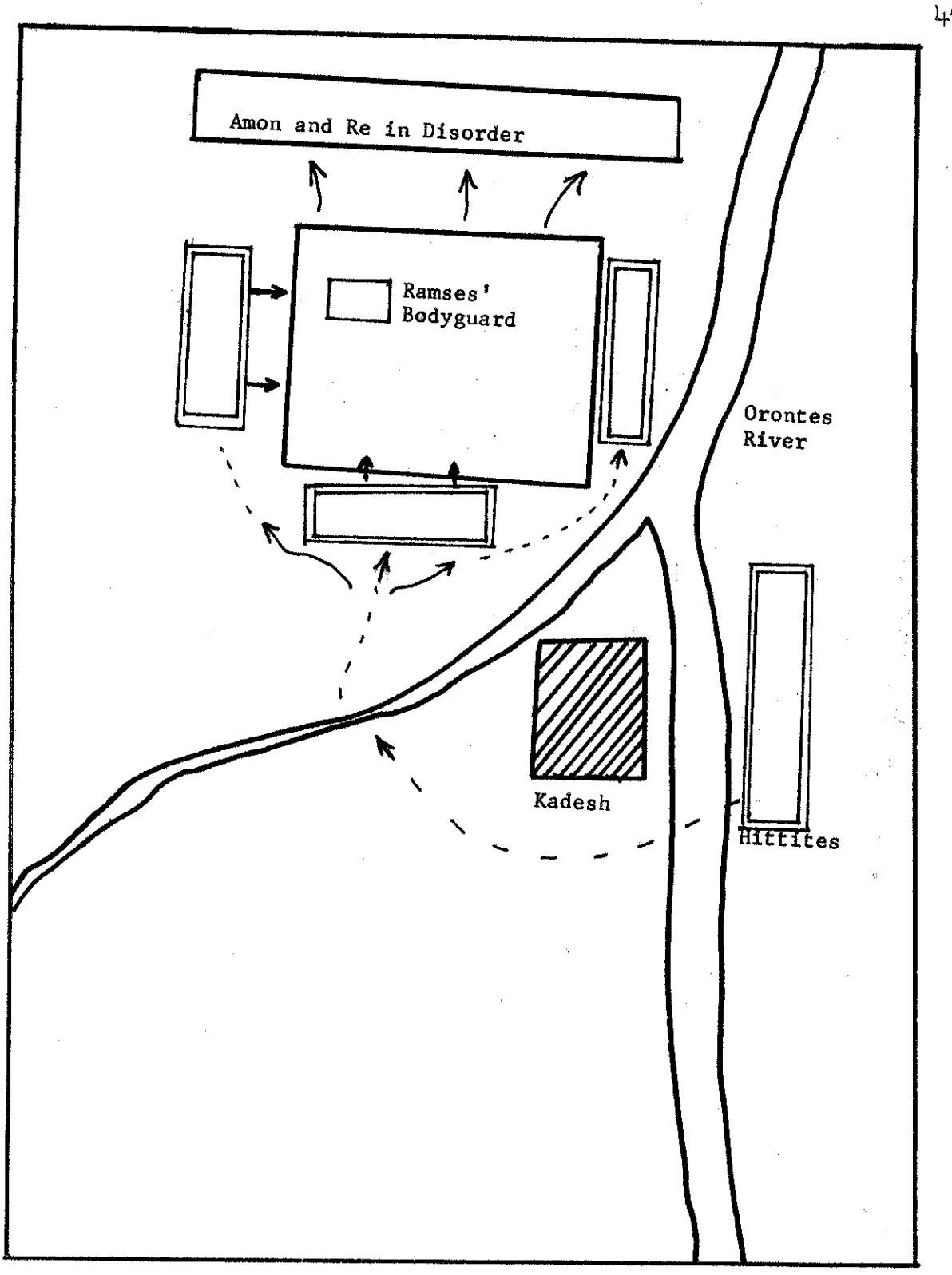
[15] S. L. A. Marshall, Men Against Fire: The Problem of Battle Command in Future War (New York, 1966), pp. 50-51.

Map 5, Hittite Assault



of the royal family were even driven over the western barricade into the inner perimeter of the camp by the most advanced of the chariots. The Hittites attacked the Egyptian defensive position in a double-envelopment assault. The first of the hostile invaders were dragged from their chariots and slain by the panic-striken Egyptian troops, but the retreating troops from the division of Re now began pouring into the camp and caused the whole camp to join in their unorganized and totally unexpected retreat. Meanwhile, the double envelopment of the Hittite chariotry had moved even closer to its objective and was still advancing toward the badly disorganized and shaken Egyptian forces that were fleeing the camp. This assaulting force of Hittite chariotry consisted of the 2,500 chariots, with an estimated manpower of 7,500. Ramses now had with him only his personal bodyguard, and the Hittite forces began to close their envelopment and came upon the surrounded forces from four sides. At this moment, Ramses was surrounded and cut off, even from the troops that he had brought with him from the division of Amon.[16]

On the western side of the camp where the majority of the soldiers from the fleeing division of Amon had been chased, the Hittite chariots were now pressing deep into the camp. On the east, the enfolding wing of chariots was

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[16]Breasted, Ancient Records, 3:125-30.

evidently the weakest. Here, Ramses displayed his skill as a combat leader and led his forces out of what was a potentially very dangerous situation. Rallying his troops, he charged into the approaching wing of chariots that were now pressing deep past his inside perimeter; his eventual objective seems to have been to fight his way out and to rejoin his southern divisions. This unexpected assault gave the Egyptians a reprieve from disaster and allowed Ramses to observe how the enemy was situated against him to the south. Therefore, after making a quick analysis of the situation, Ramses massed the tiny force that he still had under effective command and control and pushed the assault against the enemy's thin line on their extreme right flank. The Egyptian force did this very quickly, before the Hittites had time to shift their forces to the weak spot after their rapid advance northward. Ramses charged so recklessly into the scanty line of Hittite chariots that he pushed them into the river north of the city. Of course, during his breakthrough, he had to abandon his camp. The Hittite forces, especially the charioteers (who were for the most part professional soldiers), were mercenaries who fought for the highest bidder. They were well disciplined when they wanted to be; but when they saw the rich treasures that were left behind in the camp of the Egyptians, they did not want to be disciplined. They wanted to stop the assault and plunder the camp, which they did. According to some

sources, it is this diversion that unquestionably saved Ramses from being pushed into the sea.[17]

Now begins the real mystery of the battle. A group of troops, nearly impossible to associate with any of the four Egyptian divisions, suddenly appeared and effected the rescue of the badly outnumbered Egyptian troops. In translation from the "Poem of Pentaur," these men are called "recruits." Most sources list them as having come from the land of Amor. It is not always agreed upon whether or not they were supposed to be inhabitants of this region or whether they had been sent there for training. In any event, they entered the camp that had been abandoned by the forces of Ramses and slew the plundering Hittite mercenaries to the last man. This gave Ramses an opportunity to display his outstanding qualities as field commander even more. He regrouped these new forces and charged six times into the mass of the Hittite chariotry that had remained between him and his reinforcements approaching from the south. The advance of the Hittites was finally halted. But now the Hittite king struck what should have been the death blow for the Egyptian forces.[18] (See Map 6, Egyptian Breakthrough.)

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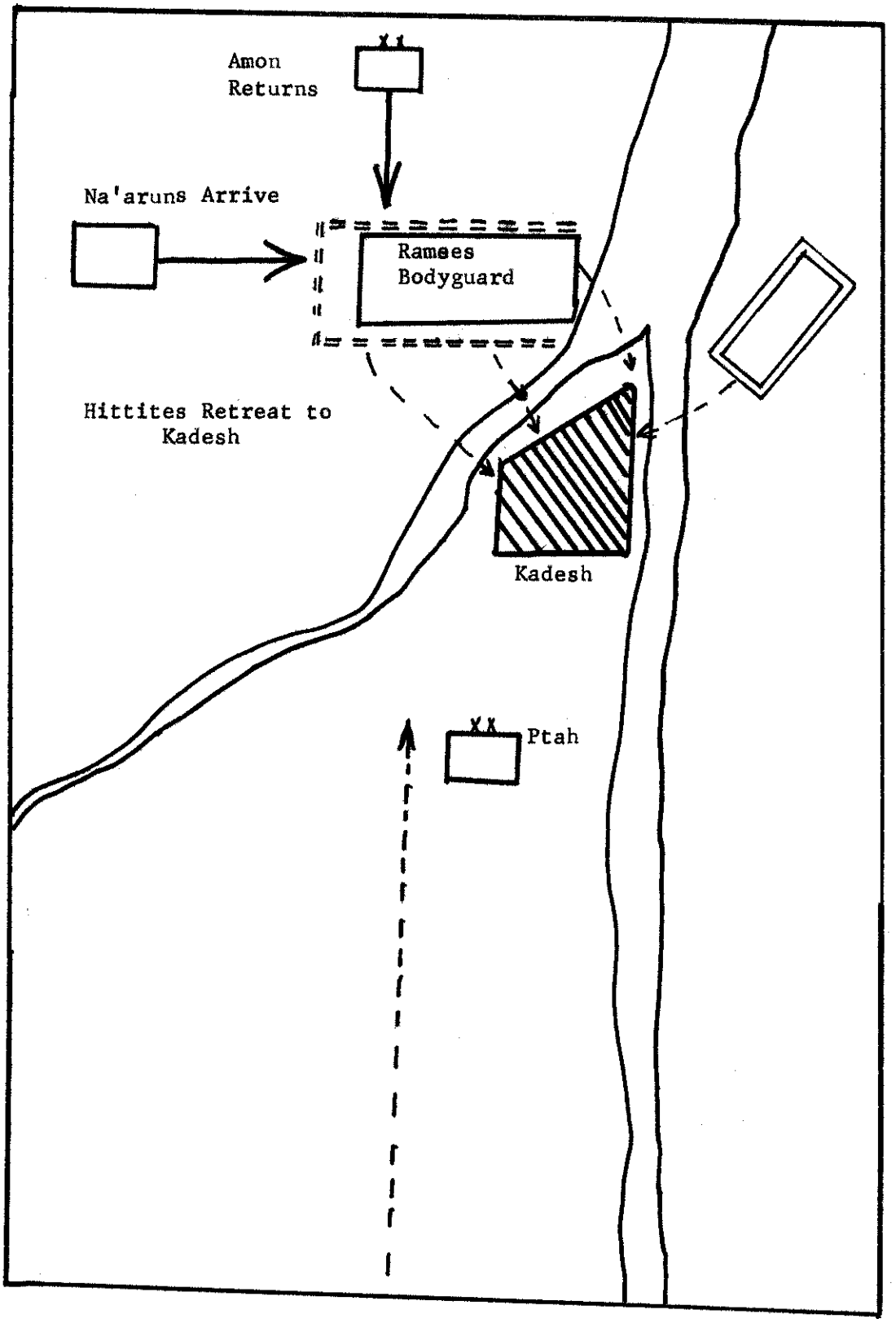
[17]Ibid., pp. 142-47.

[18]Ibid., pp. 135-47.

Map 6, Egyptian Breakthrough



A thousand additional chariots were sent into the battle from the reserves that the Hittites had formed from their allies and left behind. Ramses and his small force had now maintained themselves for more than three hours against overwhelming forces and had been holding their own against them. There can be little doubt that in this battle there was much confusion and lack of coordination between the field leaders of the chariot units, but there is also little doubt that the arrival of these additional thousand Hittite chariots should have defeated Ramses. The tide of the battle, however, was changed by the arrival from the south of Ptah's division. This attack from the rear was not expected by the Hittites, and it quickly decided the outcome of the battle. The Hittite chariotry was forced to break contact and quickly withdrew and fled into the city. Some of them were caught between the closing lines of the Egyptian forces, some were captured, and many more were killed trying to fight their way out of the encirclement. The Hittite king never committed the 9,000 infantrymen that he had held in reserve. The exact reason for this has never been determined, but most military historians agree that it was a mistake that may well have lost the battle, or at least denied victory to the Hittites.[19]

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[19]Ibid., pp. 150-55.

It is also not clear whether Ramses attempted an assault upon the Hittite infantry; it is a question about which the documents simply do not provide an answer. The "Poem of Pentaur" says that there was a second battle the next day, but in comparison with other sources, this idea of a second battle seems unlikely. It is known that Ramses made no attempt to assault the city of Kadesh, partly because his army was running out of supplies and partly because he wanted to return home to enjoy the cheers he would receive as a war hero. Ramses apparently was the type of military leader who was at his best as a company or batallion field commander but who actually did not really grasp the fundamentals of intelligence, strategic planning, and staff organization. Despite his great personal courage and his demonstrated ability to lead a small unit in combat, the entire planning of the battle was a fiasco. His failure can be clearly demonstrated by his leaving the entire division of Sutekh too far away to reach the battle and be of assistance. With even a little rudimentary planning, coupled with the personal heroism of the encircled Egyptian troops, the battle could have been a decisive victory for Ramses instead of a stalemate. His lack of reconnaissance, or the poor quality of his reconnaissance units (the result of poor training--a responsibility of the commander), is evident from the fact that an entire Hittite army was able to

conceal itself from all reconnaissance efforts of an entire Egyptian army that was well equipped and armed.

The Hittite king, for his part, apparently experienced problems of coordination between the chariotry and the infantry and a large problem of control over his forces during the battle. For example, the charioteers stopped to sack the Egyptian camp instead of pressing the attack and destroying Ramses and his forces. He should have exercised more control over this group of troops during this important phase of the battle. If the troops that stopped to plunder the deserted Egyptian camp had pressed onward and retained the intiative, the Egyptians most probably would not have been able to regroup and break through the enemy lines to rejoin their other forces and relieve them from what was almost certain slaughter.

An evaluation of the role of chariots in this battle must be examined from the basic elements of mobility, firepower, and, of course, security. The Egyptian chariots had a crew of two--one man to drive and one to shoot a bow. The spear was not commonly a weapon of the Egyptian charIotry. The Hittites added a third man to the crew, known as a shield bearer, whose main function was to give some protection to the others, which suggests that the Hittites were, at least in theory, more effective in their employment

and tactical use of chariots.[20] Actually, this impression is incorrect. The superiority of the Egyptian's tactical employment became quite obvious while the mercenaries of the Hittite forces were looting and plundering the camp of Ramses. This was when they were attacked by what loosely translates from the "Poem of Pentaur" as recruits. These individuals, however, were far from being recruits in the modern sense of the word: they apparently were superbly trained, or possibly even seasoned troops from Na'arun.[21] Again, the point of origin of these troops and the purpose that Ramses really intended them for is open to debate.

The after-action report for the Battle of Kadesh is not particularly difficult to write. The techniques of combat and the general trends of strategy and tactics adhered to by both sides are readily discernable. The Hittite king, or chief of Kheta (as the "Poem of Pentaur" calls him), took a defensive posture and was successful in drawing the Egyptian forces deep into his territory. He analyzed the terrain in a most professional manner, and made excellent use of key terrain and avenues of approach and withdrawal. The base at Kadesh provided him with a secure place to which to retreat in case his assault failed. The Hittites seemed to have used their chariots to transport infantry troops

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[20]Major General Walter M. Hutton, "Future of Armor," Military Review, 43 (December, 1968): 15-22.

[21]Breasted, Ancient Records, 3:125-35.

within hand-to-hand-combat range rather than to fight from the chariot.[23] This kind of tactic could easily succeed against a group of troops on the march, not organized in combat formation, or troops on the march that had neglected the prime requirement of approach-march security. The initial plan of the Hittite king was a good one. It was fairly well executed; but he failed to anticipate and prepare for all kinds of eventualities, a necessity for a successful commander. The counterattack by the Egyptian chariots was what saved the forces of Ramses. The Hittite king failed to win a decisive victory and very nearly met with defeat. Although he did have the foresight to designate a secure base to move to,and save his forces, he was fortunate, indeed, that Ramses did not have the resources or time for extended siege operations. The distance from Syria to Egypt by modern-day standards is not great, but in ancient times, it was a trip that could take weeks or even months with a large army. The logistical problems that would accompany this situation are obvious. In fact, the general staff of the Egyptian army was more concerned with this aspect of logistics than it was with strategy, tactics, intelligence, operations, or any of the other functions normally associated with a general staff.[24]

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[23]Ibid., pp. 124-37.

[24]Cyril Aldred, The Egyptians (New York, 1961), pp. 172-73.

In contrast to the Hittite king, Ramses appears to have had little grasp of strategy, but this judgment when viewed only in the narrowest sense may be misleading. The "Poem of Pentaur" and various wall inscriptions provide most of what is known of the battle.[25] The actual terrain has changed a good deal; it has been almost three thousand years since the battle was waged. It is imprudent to assume that the Egyptians provided any kind of objective or unbiased account of the battle. In fact, it is doubtful that they ever intended to do so. The "Poem of Pentaur" is a self-confessed polemic, which reads more like the citation for a decoration than a historical account of the battle.

In his attempts to glorify the personal heroism of Ramses, the scribe may have tended to underrate what strategic and tactical prowess the man actually did have. The almost spontaneous arrival of the Canaanite Na'arun formation (the recruits) is not even mentioned in the general chronicles of the battle. A good case can be made against Ramses for racing toward Kadesh without maintaining effective security, but he was at least somewhat aware that a Hittite force could strike on his flanks. Therefore, he kept the Na'arun unit in reserve to guard a strategic flank and to deal with such an eventuality. This theory can perhaps be substantiated by the fact that, although the Na'arun forces

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[25]Breasted, Ancient Records, 3:125-35.

were composed of both chariots and infantry, they were apparently predominantly chariot forces. What this indicates is that the force was meant to be highly mobile and have the ability to strike hard and fast. The organization of his force tends to indicate that Ramses did have at least some idea of what he was doing and that, far from just blundering ahead, he did use the Na'aruns as a sort of "reaction force" that could move very quickly to any point of the area of operations and perform the kind of operation it had done at Kadesh.[26]

That Ramses may indeed have had an excellent grasp of tactics may be substantiated by a terrain analysis of what the area looked like in 1288 B.C. Kadesh is now known by the name of Tell Neby Mind. It lies in the angle formed by the Orontes River as it flows northward and a small tributary which enters from the west. Its enormous strategic importance was because of its position near the avenue of approach from the high, level valley between the Lebanons. This valley, or at least the approach to it, was known as the Bika. Every northbound army had to pass along this route if it wished to avoid going through the narrow route, which was not an expeditious way to travel because the area was intersected by river mouths along the Phoenician coast. This formed an area that would have been

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[26]Yadin, Art of Warfare, 1:108-12.

difficult for infantry to cross, and probably almost impossible for chariots. Therefore, the unique arrangement of terrain tended to canalize any force that passed through it. In short, a commander leading an army through this area had little alternative but to pass through Kadesh. Kadesh had been captured once by a predecessor of Ramses, but had since fallen under Hittite control.[27] Even a most naive tactician or general would have realized that any enemy leader with any sense of ground would have discerned that Kadesh was key terrain. It was one of the most important, if not the most important, piece of key terrain in the entire area. Ramses should well have realized this factor and kept his reaction force of Na'aruns to be used if he anticipated being ambushed or surprised in this area. This idea is further substantiated by the fact that the arrival of these troops appears to have been more by design than by a sheer fortuitous coincidence.

This entire battle is full of examples of how Ramses and the chief of Kheta employed their chariots much the same way that modern commanders employ armored fighting vehicles. One of the best examples is the way in which Ramses used his Na'arun chariots as a reaction force. This use of chariots as a reaction force has many parallels in modern warfare. Ramses used the chariots from the division of Amon to make

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[27] Sir Alan Gardiner, Egypt of the Pharaohs: An Introduction (London, 1961), pp. 230-45.

his reconnaissance. Although the reconnaissance was not all that it should have been, there are many times in modern warfare that armored vehicles have been used for the same purpose, often with as little success. Ramses' chariots were also used to exploit a breakthrough after the Na'aruns achieved initial success in relieving Ramses' beleagured force. This action also has many parallels in modern warfare. The Hittite chariots also are analogous to the use of modern fighting vehicles. The Hittite king used them to shift his forces speedily to better fighting positions and defensive terrain, thus enhancing the mobility of his forces by the use of fighting vehicles. He also used them to accomplish a faster retreat into Kadesh after his assault had failed. The Battle of Kadesh is a perfect example of the parallels between the chariot and the modern armored vehicle.

CHAPTER III

ALAM HALFA: ROMMEL AND THE AFRIKA KORPS

Centuries passed, and the Battle of Kadesh was long past and forgotten by most people. The art of warfare, however, continued to develop, and weaponry became much more sophisticated. Until the nineteenth century, the means of warfare progressed steadily, and finally reached a relatively stable point. In the nineteenth century, tactics had become comparatively standardized. The cavalry charge had become the vogue until the development of the primitive machinegun in the latter part of the century. World War I marked the transition of "clean" warfare into filthy warfare. Poison gas, flamethrowers, improved artillery, machineguns, and the tank became elements of warfare that had to be considered when planning an operation. A need for a device such as the tank arose during the trench warfare of World War I in France and Flanders. Some people have at least theorized that man got the idea for the tank from the tortoise, and, indeed, the World War I tank possessed many of the same problems of the tortoise.[1] It was slow-moving and could be destroyed or crushed fairly easily. The main

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[1]Ralph E. Jones, George Rarey, and R. J. Icks, The Fighting Tanks from 1916-1933 (Old Greenwich, Connecticut, 1969), pp. 1-3.

purpose of the tank in the First World War was to breach fortifications.[2]

In Germany, a young officer, after distinguishing himself in ground combat in the First World War, had become intrigued by the idea of armored warfare.[3] Already an extremely accomplished tactician, even as a young man, Erwin Rommel had written an incisive work on infantry tactics known as Infanterie Greift An (Infantry Assaults).[4] Rommel's background, until the period between the two wars, was in infantry. Now, largely through his own efforts and study, he had become an armor officer. Rommel's crack desert troops, who were destined to become the famous Afrika Korps, were trained by Rommel in sandy areas of Germany. It is a common misconception that every German soldier in North Africa was in the Afrika Korps. This error will be quickly corrected by talking to any German who was a member of the Afrika Korps; to this day in Germany, many of them still carry a kind of identity card that shows they were members of the unit. At Alam Halfa, the Axis forces included not only the Afrika Korps, but also regular German units and some Italian infantry and armored forces.

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[2]B. H. Liddell Hart, The Tanks: The History of the Royal Tank Regiment and its Predecessors, Heavy Branch, Machinegun Corps, Tank Corps, and Royal Tank Corps 1914-1945 (New York, 1959), pp. 34-36.

[3]Brigadier Desmond Young, Rommel: The Desert Fox (New York, 1965), pp. 18-21.

[4]Ibid., p. 16.

North Africa was a professional's war that was fought by elite units of both the Allied and Axis forces. The British army in the Battle of Alam Halfa included units from New Zealand, South Africa, India, and other parts of the British Empire. The best efforts of both sides can be viewed in this battle, the turning point of the war for North Africa. Rommel's tactical ability was taxed to its maximum extent to compensate for a shortage of supplies and a lack of cooperation from the Italians.[5] The British officers had to perform to their utmost, simply because they were facing an aggressive and determined enemy of much experience and skill. Many of the German soldiers in North Africa had prior experience in the Polish or French campaigns on the European continent. The British army had a hard time at the beginning of the North African desert campaign because their tanks and infantry still had to learn to work as a team rather than as two separate forces. Because of strong traditions in the British army, and the rivalry between fusiliers and dragoons, this cooperation was not as easy as in some armies.[6] Through expensive lessons, however, this technique of operation was learned. At Alam Halfa in August, 1942, the British forces

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[5]Ronald Lewin, Rommel as Military Commander (New York, 1968), pp. 237-38.

[6]Field Marshal Montgomery, The Memoirs of Field Marshal The Viscount Montgomery of Alamein, KG (New York, 1958), pp. 101-102.

were probably at their peak of effectiveness. The troops were seasoned and experienced but not yet worn out. This was the background for the most decisive battle of the war in North Africa.

In August, 1942, the German-Italian armored forces had reached a crisis. The only thing certain was that a decision had to be made one way or the other. The Axis presence at Alamein was creating an enormous reaction from the American-British war production. It was clear from the number of convoys spotted in the Red Sea and the Gulf of Suez that the allies were winning in the competition to build up supplies. Even more important were the vast numbers of allied troops that were pouring into North Africa. It was clear to German intelligence experts that the Eighth Army (the comprehensive name applied to British forces) would soon be able to attack.[7] The Axis' supply situation was causing them great concern. The penalty for the failure to capture Malta was now being imposed. Perhaps even more of a hindrance were the air attacks by long-range Royal Air Force bombers. The bombers interfered with shipping in the Cyrenacian ports, and the coastal traffic that led towards Bardia and Mersa Matruh was frequently attacked. On the 8th of August, Tobruk had been heavily bombed, which caused permanent damage to

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[7]Major General Fredrich W. von Mellenthin, Panzer Battles: A Study of the Employment of Armor in the Second World War, trans. Hans Betzler (Norman, Oklahoma, 1956), pp. 140-41.

many of the German supply installations there. The major German supply bases of Benghazi and Tobruk were both far from the actual front, and this placed an almost crushing load on the Axis transportation network.[8]

One factor involved in this was a shortage of locomotives. The railroad between Tobruk and El Daba could be used only to a very small extent.[9] The only logistical factor which worked for the Axis was the large British supply dumps that had been captured in Egypt and Cyrenacia, but even these could not indefinitely support Axis operations at Alamein. Some German generals blamed the incompetence or ill will of the Italian shipping authorities for the massive logistics problem that had arisen, but there would have been a logistics problem with or without the Italians.[10]

The general staff of the Germany army studied the problem and considered several solutions.[11] One was to withdraw all nonmobile formations to Libya and to leave only armored and motorized divisions in the area of imminent contact. The British tended to excel at the static form of warfare, but in mobile operations, Rommel had proven more effective.

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[8]Ibid., pp. 141-42.

[9]Ibid., pp. 140-41.

[10]Sherwood S. Cordier, "Alam Halfa--Last Chance in North Africa," Military Review 50 (1970):64.

[11]Ibid., p. 68.

As long as the Axis did not try to defend one locality, and pursued a policy of a mobile rather than an area defense, they could probably hold up the British drive toward Cyrenacia for a long time. The key factor that must be observed here, however, is that Hitler would never have accepted a solution which involved surrendering even a small amount of ground. Therefore, the only real choice the generals had was to try to make a successful drive to the Nile while sufficient strength remained to make the attempt. It must be emphasized that by August, 1942, the German generals never believed, even in their most optimistic moments, that the Axis forces still had the power to break through to the Nile.[12] The accepted ratio for a successful assault or attack is 3:1,-that is,three elements in assault for each element in defense. The German general staff was informed that in armored strength the British had a marked superiority of 3:1 and in air power of 5:1. It was later found that Axis intelligence sources had overrated the British superiority in armor. The Axis forces had a total of 229 German and 243 Italian tanks, while the British had about 700.[13] However, no mistake was made in the estimation of British air power, and there is little doubt that the logistical problems connected with an advance toward Cairo would be impossible for

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[12]Mellenthin, Panzer Battles, pp. 141-42.

[13]Ibid., p. 142.

the Axis to cope with under existing conditions. There were many other factors that made the offensive ill-advised. The Eighth Army had a superiority in artillery support, and their front was now protected with extensive minefields. These minefields had been placed so much in depth that a direct or frontal attack of British fortifications would not be feasible, and the shortage of fuel and other supplies made a flanking movement impossible.[14]

The British order of battle here consisted of the 9th Australian (infantry), the 1st South African (infantry), the 20th New Zealand (infantry), the 5th Indian (infantry) Divisions, the 23d Armored Brigade (tank), the British 44th Division (infantry), the British 10th Armored Division, and the 7th Armored Division also British.[15] The British 50th Division (infantry) was standing by at this time, but took no part in the actual battle. Montgomery kept his tanks in reserve and made use of their main guns as supporting weapons. The British used a total of 164 Grant tanks in hull defilade position at Alam Halfa. The defensive positions of the British in the north were held by the 9th Australian, 1st South African, and 5th Indian Divisions, under the command of Lieutenant-General W. H. C. Ramsden as XXX Corps commander. To the south, the left flank was held by the XIII Corps under Lieutenant General Brian G. Horrocks. The New Zealand

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[14]Cordier, "Alam Halfa--Last Chance in North Africa," pp. 68-69.

[15]Ibid., pp. 69-70.

Division was on the critical edge on the south of Ruweisat Ridge at Bad el Qattara and Alam Nayil. On the eastern end of the Ruweisat Ridge was the 23d Armored Brigade, which consisted of one hundred Valentine tanks.[16] Defending the Alam Halfa Ridge was the fresh 44th Infantry Division, the 10th Armored Division under the command of the ablest British tank leader Alec Gatehouse, and the artillery, a concentrated mass of guns consisting of 57mm antitank cannons. A very comprehensive fire plan had been thoroughly preregistered for on-call supporting fire. In total, the British had massed 350 tanks on the front line, of which 164 were Grants.[17] Against this, Rommel had 243 immately inferior Italian tanks, and 203 German tanks, 166 of which were the better Mark III's and IV's.[18] (See Map 7, Battle of Alam Halfa.)

Rommel probably would have given up the offensive; but in the end, he accepted it because of Kesselring's assurance that he could fly in 90,000 gallons of gasoline a day, and that a large tanker (ship) was due in Tobruk toward the end of August. In order to be fair, it must be said of Kesselring

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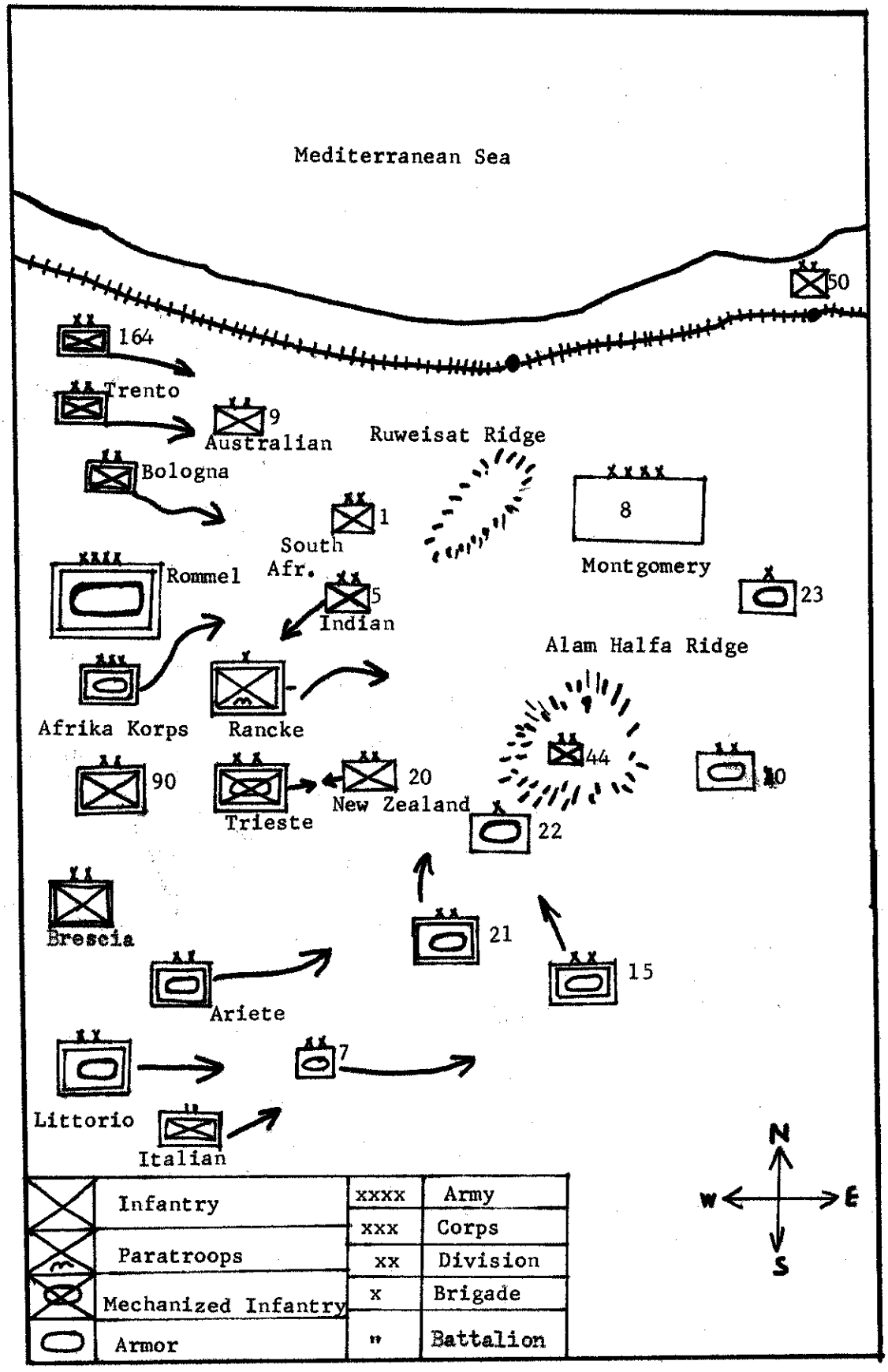
[16]The British Valentine tank weighed 26.5 tons with either a 2 pound gun or 75mm gun, depending on the model, and had a maximum speed of 15 miles per hour.

[17]Cordier, "Alam Halfa--Last Chance in North Africa," pp. 70-71.

[18]The Mark IV German tank weighed 24.1 tons and had a speed of 26 miles per hour on roads and 18 miles per hour cross-country. Armament consisted of one 75mm main gun and two MG34 machine guns.

Map 7, Battle of Alam Halfa



that his air forces did indeed provide the fuel they had promised, but 90,000 gallons a day simply was not enough fuel. Most of it was consumed on the way to the front, and gasoline was becoming as precious as gold to the Axis forces. Then came the major catastrophe. The large tanker was sunk by a submarine off the coast of Tobruk harbor on 31 August 1942.[19] The rapidly diminishing supply of gasoline made it imperative that the Axis forces attack as soon as possible. A delay of even a few weeks or days would have been disastrous. On the night of 30/31 August 1942, they launched an attack in order to take advantage of the full moon.[20]

In August, 1942, there had been significant changes in the British chain of command. General Alexander had replaced Auchinleck as commander of all British forces in North Africa, and General Montgomery had taken over command of the Eighth Army.[21] Air Marshal Coningham was now in command of all British air forces. This change improved the British command. General Auchinleck had been an excellent strategist, but he apparently was not competent in tactical detail, and he was an inferior field leader. General Montgomery had immediately appraised the situation and found the Eighth Army to be deficient in three major areas: training,

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[19]Mellenthin, Panzer Battles, p. 142.

[20]Ibid., p. 144.

[21]Ibid., p. 140.

equipment, and leadership. He made the supply area the province of his superior, General Alexander, who proved to be an extremely capable logistician. To offer an example of a way in which Montgomery improved training and leadership, he visited a camp and decided to inspect one of the batallions. Upon arrival at the batallion, he asked to see the batallion commander. Montgomery asked him who was in charge of training the junior officers (captains and lieutenants) in the batallion. The batallion commander replied that the batallion executive officer was in charge of this function. Upon learning this, Montgomery went immediately to the executive officer and asked him how he went about training the officers in the batallion. The executive officer replied that this was a function that he knew nothing about because it was the duty of the batallion commander. It was evident that nobody had bothered with this function and that the batallion commander was not carrying out the duties of his command. Montgomery relieved the commander. To be relieved was for a British officer a fearful disgrace, but Montgomery was determined to find someone who could obtain results.[22]

During the night of the 30/31 August, the Italian infantry, reinforced (the German source uses a stronger term which implies that the Germans were there to keep the

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[22]Montgomery, Memoirs, pp. 102-103.

Italians from running away) by the 164th German Infantry Division and other German units, were to hold the front from the sea to a point about ten miles south of the Ruweisat Ridge.[23] The Italian Armored Force, the Afrika Korps, and the 90th Light Infantry Division (German) were to move around the British left flank and move on the Alam Halfa Ridge. The Alam Halfa Ridge was key terrain and was well in the rear of the Eighth Army. The capture of this ridge would decide the fate of the entire battle. An annex to the battle plan stated that in case of success the 21st Panzer Division was to move on to the key Egyptian port city of Alexandria, while the 15th Panzer Division and the 90th Light Infantry Division moved on to Cairo.[24]

The attack began to encounter difficulties from the start. The first problem that the advancing Axis infantry walked into was mines. German reconnaissance had revealed the presence of minefields in their surveillance of British positions, but even so, they had not expected anything so extensive as the number the infantry encountered. The minefields in this sector where the German infantry attacked contained about 150,000 mines, many of which were booby-trapped.[25] The German sappers (engineers) eventually were

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[23]Mellenthin, Panzer Battles, p. 143.

[24]Ibid., p. 143.

[25]General Erwin Rommel, The Rommel Papers, ed. B. H. Liddell Hart and Lucie and Manfred Rommel (New York, 1953), p. 276.

able to clear lanes through the minefields at the expense of much manpower and time; in many cases, it required three attempts to clear the mines. Like all military men of any competence, the British had their minefields covered by both fire and observation. The Royal Air Force dropped flares that illuminated the area and bombs that created moderate casualties. The illumination provided the area with targets for the grazing fire of British machinegunners. The Germans could not use their tanks to breach fortifications because tanks had become more precious than human lives.[26]

The first report from the Afrika Korps was a disappointing one for Rommel. Because of the unexpected depth of the minefields, it had been unable to reach its objective.[27] The British had defended their positions with an unusual amount of tenacity, even for British troops. This tenacious defense together with the protective minefields gave the British time to take countermeasures against the German assault. As if things were not already bad enough, Rommel then received the news that General von Bismarck, commander of the 21st Panzer Division, had been killed, and General Nehring, commander of the Afrika Korps, had been seriously wounded.[28] Rommel's initial plan of having the motorized

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[26]Ibid., pp. 276-77.

[27]The Rommel Papers, p. 277.

[28]Mellenthin, Panzer Battles, p. 144.

forces advance thirty miles east by moonlight and then strike north at dawn had not worked; the strike force had been held up too long by the minefields, and the element of surprise, upon which the plan was based, had been compromised. Rommel was now debating whether or not to break contact.[29]

Suddenly the Axis situation improved. The Afrika Korps, under its new leader, General Bayerlin, made a substantial advance to the east. A heavy sandstorm had blown up during the day, and though it made the movement of troops and vehicles more difficult, it gave the necessary protection from British bombers.[30] General Bayerlin took advantage of this opportunity to advance. With the British armor now in battle formation, however, it was not possible for the Axis to continue with their envelopment to the east. If they had done so, their flanks would have been under an immediate threat from the 7th Armored Division in the south and the 1st and 10th Armored Division in the north. This forced Rommel to make an earlier turn to the north than previously anticipated.[31] The objectives of the attack were now focused on Hill 132 for the Afrika Korps and Alam Bueit-Alam Halfa for the XX Italian Corps. Aerial reconnaissance had revealed to the Germans that the ridge was now heavily

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[29]Ibid., pp. 144-145.

[30]Ibid., p. 145.

[31]The Rommel Papers, p. 277.

fortified. Realizing this, Rommel requested that General Kesselring place heavy air strikes on the ridge for the next few days.[32]

The Afrika Korps had now taken on more ammunition and refuelled; however, this process took a great deal of time. The advance was resumed at 1300 hours on 30 August 1942. A heavy sandstorm accompanied the attack, and the initial assault went well forward. The Italian Littorio Division advanced, but the Ariete and Trieste Divisions were caught in the minefields. The XX Motorized Corps, as a result, was unable to begin its advance until 1500 hours and was behind and to the left of the Afrika Korps. Rommel tried his best to encourage the Italians to catch up with the Germans, but was not entirely successful.[33] Sandstorms continued, and they produced both beneficial and detrimental results to both sides. For the Axis forces, the storms shielded them from the devastating air attacks of the Royal Air Force; but they also made the advance go slower, use more fuel, and turned the existence of the troops into a hellish one. Because of the heavy, unexpected depletion of fuel, the attack on Hill 132 was cancelled at 1600 hours.[34] The XX Italian Corps was still far behind, but the German 90th

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[32]Ibid., pp. 277-78.

[33]Ibid., p. 278.

[34]Ibid., p. 278.

Light Infantry Division had reached its objective. The reconnaissance batallions provided protection to the south and southeast. Much of the trouble that the Axis forces had encountered was due to faulty intelligence; British counter-intelligence had planted a false map in disputed territory, and according to German officers involved in the battle, this map was accepted as genuine.[35]

The Alam Halfa Ridge was defended by the 44th Infantry Division and the 22d Armored Brigade. The Grant tanks of the 22d Armored Brigade were dug in hull defilade and had excellent artillery support.[36] The Afrika Korps made an assault, supported by Stuka aircraft, with Mark IV tanks in the lead. Although very determined, the German assault was turned back, but it inflicted heavy casualties on the British. The German forces were now hindered by the fact that the supply lines for their assaulting elements ran right through the lanes in the British minefields and were, therefore, canalized for continuous pounding by artillery and air strikes. On the morning of 1 September, Rommel found his supply of gasoline so low that he had to limit the attack on Alam Halfa Ridge to the 15th Panzer Division. The supply lines for the Axis forces were continually harassed and interdicted by the 7th Armored Division. It became

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[35]Mellenthin, Panzer Battles, p. 144.

[36]Ibid., pp. 144-45.

increasingly plain that a frontal attack offered virtually no hope of a favorable result. Under a normal situation, Rommel would probably have been able to outflank the British, but the shortage of fuel prevented him from using one of his favorite tactics.[37]

Montgomery now massed the 10th Armored Division at Alam Halfa and had nearly 400 tanks in this key area. The very existence of the prized Afrika Korps was now at stake. Fuel supplies had become so diminished that Rommel's primary objective now was to save his forces rather than to capture Cairo or Alexandria.[38] All through the 1st of September, the German tanks stayed immobile and were subjected to constant pounding by British artillery and air strikes. Finally, on the morning of the 2d of September, Rommel made the decision to begin a retrograde operation, or in plainer language, a retreat.[39] Even in retreat, however, the Afrika Korps was severely handicapped by its lack of fuel. This shortage made a full-scale retreat out of the question. This period of time from the 2d to the 3rd of September would have been an excellent time for the Allied forces to attack, and many military experts have severely criticized Montgomery

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[37]Ibid., pp. 145-46.

[38]Ibid., p. 146.

[39]The Rommel Papers, pp. 279-80.

for not doing so.[40] But, except for the sporadic harassing operations from the 7th Armored Division, Montgomery made no concentrated effort to counterattack at all. By the morning of the third of September, Rommel's force was in full retreat to the east, at the cost of leaving behind fifty tanks, fifty field and anti-aircraft guns, and about 400 other assorted vehicles. On that night, the New Zealand Division attacked southwards toward Deir el Munassib. The Axis forces managed to stall the attack, but only after bitter and costly combat.[41]

After the first of September, Rommel's forces were only able to conduct a few limited-objective assaults. Tank for tank, the 15th Panzer Division outgunned and outfought the British in the assault for the Alam Halfa Ridge, but the lack of gasoline caused Rommel's Mark IV tanks to become little more than so much junk. The supporting artillery of the British also caused the Germans many problems, and Rommel estimated that the British had a 10:1 advantage during the actual conduct of the battle.[42] During the first of September, Rommel's fuel supply was almost entirely expended, and toward the end of the day the Axis forces had only a day's supply of gasoline left. Rommel's fuel supplies

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[40]For example, Mellenthin, Panzer Battles, pp. 145-46.

[41]The Rommel Papers, p. 283.

[42]Mellenthin, Panzer Battles, p. 142.

were entirely inadequate; the fuel that was supposed to reach him never did. At best, 5,000 tons of gasoline were supposed to arrive in order to support the tactical operations of the Axis forces. Twenty-six hundred tons of it were sunk before it reached the shores of North Africa; 1,500 more tons were still in Italy; and this vital supply of fuel could never have reached Africa in time, even if the British had not interfered with the shipment. Although Rommel was a man of unusual personal courage, he was far from being a fool. After weighing the facts, he decided to retreat to the line El Toque-Bab el Qattara by stages.[43]

Montgomery had made an excellent analysis of the situation and acted well on the intelligence provided to him. He had wisely strengthened his northern flank on the front of XXX Corps and did this by using a maximum number of mines, wire, and field expedient fortifications in order to conserve his troop strength for the southern area for the right moment.[44] Montgomery spent the day before the battle making a careful terrain analysis and recognized that there were two areas that should be considered as really key terrain. These were the Ruweisat Ridge and the Alam Halfa Ridge. Montgomery believed that it was highly probable that Rommel would attempt to make the British armored forces

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[43]The Rommel Papers, p. 280.

[44]Montgomery, Memoirs, p. 95.

attack him. Montgomery believed that the best way that he could compensate for this was to hold firm in the Alamein position and make Rommel assault the high ground. He was determined to fight a static battle and not move his forces. Later, during the day before Rommel's anticipated offensive, Montgomery met with the general who was commanding the 7th Armored Division, whose primary zone of responsibility was the southern sector. The main topic of discussion between Montgomery and the commander of the famous "Desert Rats" was who was to control the committal of armored forces in the attack. Montgomery's will prevailed, and he ordered the British armor to remain in hull defilade and not be released or committed under any except the direst circumstances.[45]

Montgomery was determined to make his defenses so strong that no elaborate reactions would have to be made to counter Rommel's assaults.[46] Montgomery reviewed this problem thoroughly with one of his principal advisers, General de Guingand, and they decided to establish the general headquarters for the 44th Division in a position that would allow direct control of the defense of the Alam Halfa Ridge. The 44th was to be supported by tanks, whose real role in the battle was more to deliver supporting fire than assault fire. Montgomery also asked that the 51st Division be sent

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[46]Ibid., pp. 95-96.

to him from Suez as well. He left the tactical details for the defense of the southern sector to the XIII Corps, and requested General Alexander to order that General Horrocks be flown from England to assume this task. General Horrocks had served in the old 3rd Division of Montgomery's as a batallion commander and had proved to be a man of much tactical ability. Perhaps above all, Montgomery provided the Eighth Army with the personal leadership and charisma that was so badly needed at that time to raise the morale of the British forces.[47] Montgomery's intelligence staff was positive that Rommel's assault would be launched on the southern flank and would be followed by a left "wheel," a turning movement.[48] Acting upon this information, Montgomery decided to hold the Alam Halfa Ridge with the 44th Division and to position his tanks to the southern extreme of its western end. It was obvious to Montgomery that Rommel's forces would not be able to outflank his forces and move to Cairo. As a matter of fact, it would have been most advantageous to the British if Rommel had tried to do so, because then Montgomery's force of 400 tanks could have attacked Rommel's forces from the rear. It was then that Montgomery decided that the extreme edge of his southern flank, the 7th Armored Division, should be mobile and contain

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[47]Ibid., pp. 101-102.

[48]Ibid., pp. 98-99.

a wide frontal sector of defense and responsibility. As the Axis attack progressed, they would give way and then bring supporting fire upon the enemy as the Axis forces turned left.[49]

It is true that one of the most influential factors in favor of the British forces during this battle was the Desert Air Force, under the leadership of Air Marshal Coningham. Evidence for this is seen in his decision to bomb Tobruk immediately after Rommel's assault commenced, so that Rommel's last hope for logistical support would be diminished.[50] After the battle started, Montgomery realized that Rommel's forces were in a great deal of trouble. He ordered the New Zealand Division to thrust southward so that they could close the gap and thereby seal off retreat along the avenue of approach through which the assaulting forces had come. Rommel saw what was happening and began a furious attempt to withdraw.[51] At this point, Montgomery called off offensive operations. General Horrocks protested this action, but Montgomery pointed out that the Axis forces occupied the area of the original British minefields and several good points of observation. Therefore, Montgomery argued that it would be wise to lay new minefields before continuing offensive

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[49]Ibid., pp. 99-100.

[50]Cordier, "Alam Halfa--Last Chance in North Africa," pp. 65-66.

[51]Montgomery, Memoirs, pp. 99-100.

operations. As for the observation points, Montgomery wanted Rommel to be able to see the preparations being made on the southern flank because they were only a feint.[52]

Montgomery answered the criticism levelled at him for his failure to counterattack by pointing out two major factors:[53] first, the standard of training in the Eighth Army at this time was not up to his expectations; second, his forces were still ill equipped. He also stated that he did not wish to force Rommel to withdraw all the way back to the Agheila position because that would lengthen the range for his artillery.[54] The use of tanks for static defense in this battle was a marked change in British armored doctrine. In battles previous to this one, the tanks had been used as a mobile force, and at the time, according to Montgomery, they were too inexperienced to handle this kind of tactical situation. The Battle of Alam Halfa was a confirmation that Montgomery's ideas would work.[55]

Rommel gained the impression that Montgomery was a very cautious man who was not prepared to take risks.[56] He was also very impressed by the close coordination that Montgomery

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[52]Ibid., p. 100.

[53]Mellenthin, Panzer Battles, p. 146.

[54]Ibid., pp. 146-47.

[55]Montgomery, Memoirs, pp. 105-106.

[56]The Rommel Papers, pp. 280-81.

was able to achieve almost consistently between the armored forces and the Royal Air Force. Particularly devastating to the Axis forces was the illumination of the battlefield at night by magnesium flares that the British Wellington bombers dropped. Montgomery kept his tanks in static positions, and let the air force and artillery bring their maximum supporting fire against the assaulting German and Italian armor. German air power, although severely handicapped by its small numbers, was able to disperse the 10th Indian Division on its approach march and help beat back the determined but futile attacks of the New Zealand Division against the German Rancke Brigade and the Italian Brescia Division. A night attack by allied infantry against the Italian X Corps was extremely costly to the British; the Italians were able to take over 200 prisoners, including a British general.[57]

In a letter on 4 September, Rommel summed up the futility of the German situation:

> Some very hard days lie behind me. We had to break off the offensive for supply reasons and because of the superiority of the enemy air force--although victory was otherwise ours. Well, it can't be helped. Made a quick call at H.Q. for the first time today, even had my boots off and washed my feet. I'm still hoping that the situation can be straightened out.[58]

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[57]Ibid., pp. 280-81.

[58]Rommel to his wife, ibid. p. 282.

Rommel blamed the failure of the attack on poor German reconnaissance efforts that had failed to show that the British forces in the south had been concentrated in great strength. He also, of course, later realized that to attack was poor judgment, because of the power of the Royal Air Force and the lack of gasoline supplies.[59]

German-Italian casualties in the battle were severe. They included 570 dead, 1,800 wounded, and 570 prisoners--a total of nearly 3,000 men. Perhaps the equipment losses were even more of a cause for concern. The Axis lost 50 tanks, 15 field guns, 35 anti-tank guns, and 400 trucks. According to Axis reports, they had taken 350 prisoners and incapacitated 150 British tanks. General Alexander's reports indicate that British losses amounted to 1,640 men killed, wounded, and missing in action, as well as the loss of 68 tanks, 18 anti-tank guns, but no field guns. The British estimated the losses they inflicted on the Axis as having killed or wounded 4,500 troops and 300 taken prisoner. They found 51 tanks on the battlefield, 42 of which were German, and 30 field guns, as well as 40 anti-tank guns.[60] Rommel says that the most important lesson he learned from this battle was that if the enemy achieves almost total

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[59]Ibid., p. 285.

[60]Ibid., p. 283.

control of the air during an operation, and maintains it, nearly all ground maneuver is useless.[61]

This battle became known to the German troops by the slang term of "Sechstagerennen," so called because of a six-day race that had become a famous sport event in Germany. It was termed so because time was of the utmost importance, and the British were able to wage successfully a war of attrition from the air, coupled with artillery support on the ground.[62] In his "Rules of Desert Warfare," Rommel states that armor is the core of the motorized army. He further develops this precept to include the precept that tanks should be kept in reserve to deal the coup de grace. They should be preserved as war is waged against the enemy tanks with all other means available. He pointed out that the major requirements of the tank are maneuverability, speed, and a long-range gun. He did not believe that thickness of armor could compensate for firepower from a heavy, long-range gun. The artillery, he believed, was also of great importance and must be able to achieve and maintain both fire superiority over the enemy and close and continuous fire support. The role of the infantry was subordinated to that of the army, and it was useful only for defensive operations. He did believe, however, that the future of the

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[61]Ibid., p. 286.

[62]Ibid., p. 286.

infantry was in the field of mechanized or, as he put it, "mobile" forces.[63]

Although the principles that Rommel enumerates in his "Rules of Desert Warfare" are basically sound, he could not apply them effectively against the British at Alam Halfa. It was rare indeed that the new Mark IV German tanks could find targets for their 75mm guns that had a maximum effective range of only 1,200 meters. These guns, like most main tank guns, were designed for use in a direct-fire role, and the dug-in hull defilade positions taken by the British Grant tanks at the Alam Halfa Ridge made the effective use of such weapons very difficult.

The British General Wolfe once said that war is "an option of difficulties." Such was Rommel's case at Alam Halfa. Theoretically, there were three courses of action open to him. He could have retreated to a point where he could have obtained at least a reasonable amount of logistical support, he could have defended the position he then occupied, or he could have launched a major offensive or assault. Because of political considerations Hitler forced upon him, however, it is fairly obvious that Rommel had no choice. He had to attack and hope for either a miracle or a British blunder.[64]

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[63]Ibid., pp. 197-200.

[64]Kenneth Macksey, Tank Warfare: A History of Tanks in Battle (New York, 1971), pp. 190-92.

Logistical problems alone probably caused Rommel's defeat. Without the badly needed gasoline, his tanks could not perform the tasks that might have led to an Axis victory. Trucks bore the burden of supplying Rommel's tanks. The trucks were a mixture of about 85 percent British and American and 15 percent German and Italian. Obtaining supply parts for the repair of the captured American and British trucks was simply not possible. Soon, over 35 percent of the total available trucks were in the repair shop, which in itself would cripple any modern army, especially with a supply route that stretched over 350 miles. Moreover, this supply route was constantly pounded by British air support.[65]

The German Luftwaffe was far less effective. A German Air Force general, Otto von Waldon, had to admit that

> The value of strategic bombing apparently was lost on the German air force. Designed and trained as a tactical air force, the Luftwaffe was powerless to return British strategic bombing, raid for raid. Of course, the acute shortage of gasoline was felt most keenly by the German air arm.[66]

It is also necessary to remember that German units were under strength by some 16,000 men, 210 tanks, and at least 1,675 other assorted vehicles, most notably trucks. It was also necessary to ration artillery ammunition.[67] In addition

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[65]Cordier, "Alam Halfa--Last Chance in North Africa," p. 63.

[66]Ibid., pp. 63-64.

[67]Ibid., p. 64.

to these problems, many of Rommel's best veterans were being forced to return to Germany because of ill health, thus causing Rommel to have to reach for the ultimate resources of his tactical ability. He tried to employ the ruse of making the British think the attack would come from the north by placing dummy tanks there, but unfortunately his luck failed, and the British spotted them as fakes, which reinforced their belief that the first major Axis thrust would come from the south. More than anything else, Rommel formulated his plan of attack on the idea that the enemy would not anticipate an Axis armored advance over the unfavorable terrain in the south. Basically, it was the "feint and thrust" tactic that Rommel had previously employed against the Allies with notable uniformity. In this situation, Rommel did just what he least desired to do. He forfeited both the elements of surprise and speed that were necessary for the completion of his mission.[68]

In fairness to Rommel, the Eighth Army was skillfully handled at Alam Halfa, and the Germans were outnumbered and outgunned. Despite airplanes and artillery, both Rommel and Montgomery made use of tactical principles that have been truisms even before the Hittites and Egyptians clashed at Kadesh in 1288 B.C. Montgomery used his tanks as a blocking force. The means that he used to block the attacking Axis

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[69]Ibid., p. 69.

forces were different from the chariots of Kadesh, but the principle was still the same, and the idea behind their employment was also the same. Rommel, while trying to use his tanks as the maneuver force, suffered from many of the same ills that had plagued Ramses II centuries ago. Foremost among these seems to have been faulty or incomplete reconnaissance of the area. Ramses II's scouts failed to detect the presence of the enemy, while Rommel's scouts failed to discern the magnitude of the British minefields. Ramses and Rommel both had to deal with the problem of overextended supply lines. This overextension caused Ramses to fail to achieve a decisive victory, and caused Rommel to suffer a defeat from an army and general that were as logistically superior as they were militarily inferior.

CHAPTER IV

THE ARAB-ISRAELI CONFLICT OF 1967

Since World War II, technology has greatly enhanced the capabilities of armored vehicles. This new technology has added new concepts to armored warfare and tactics as well, although most of the wars that have been fought since the end of the Second World War have been insurgencies or guerilla wars in which armor and tanks did not play a really significant role.[1] There have been close to three hundred such insurgencies since the end of World War II. To be sure, tanks were used both in Korea and Vietnam, but in neither of these wars did armor play a decisive role. For the most part, combat since World War II has been the "war of the shadows," with terrorism, propaganda, and subversion its principal weapons. This was true of every part of the world but the Middle East. The newly founded state of Israel has fought the Arab states on four separate occasions since its creation in 1948.[2] When the Jewish state was first founded, it had to fight for its independence; later, in 1956, it again fought with the Arab states to keep from

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[1]Arthur Campbell, Guerillas: A History and Analysis (New York, 1967), pp. 1-5.

[2]This thesis was in draft before the Ocotober, 1973, Arab-Israeli War, and little reliable information about the 1973 war has been released.

being pushed off the map; in 1967, the United Arab Republic, under the leadership of General Gamal Abdul Nasser, attacked Israel and met with a serious defeat; finally in 1973, the Israelis survived another Arab onslaught. The seven-day war of 1967 presented the finest in tank and armored tactics in present times.

It was a surprise to no one when the long-simmering blood duel between the Arab nations and Israel broke out on June 5, 1967. The major portion of the fighting was over by June 8, 1967. How was a small nation like Israel, with only a small population, able to defeat the combined forces of the United Arab Republic? Egypt, Jordan, Syria, and Iraq were made to look foolish and incompetent. After the war, the Arab military was a favorite topic for jokes in military circles. This Israeli victory was amazing in view of Arab superiority, not only in numbers, but also in equipment. The Arabs were armed with the best equipment that the Russians had to offer. They also had Russian advisers to show them how to use the equipment.[3] One hundred thousand of the best Egyptian troops were deployed in the Sinai Desert on the 117-mile border between Egypt and Israel. Many more thousands were massed in the Gaza strip along Israel's Mediterranean coast. Nine hundred of Egypt's 1,200 Soviet-built tanks were also in the Sinai Desert.

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[3]Newsweek, 5 June 1967, pp. 41-42.

Israel's army consisted of 800 tanks of American, British, and French origin, and 300,000 men.[4] This force had to be organized to fight against the Egyptians on the west, the Jordanians on the east, and the Syrians in the north. Seventy thousand Jordanians were well entrenched in field fortifications and armed with the latest weapons from Soviet Russia.[5]

Even against these large and well-equipped forces, the numerically inferior Israeli forces, in less than 60 hours, routed two enemy armored divisions, five tank brigades, and perhaps a dozen armored-artillery regiments (self-propelled guns). Israeli losses were almost insignificant in comparison to the damage inflicted on the enemy. Of the 1,100 tanks and self-propelled guns the Egyptians committed in the Sinai and Gaza sectors, almost 800 were either destroyed or captured intact.[6] Nearly 2,500 armored vehicles--tanks, armored cars, self-propelled guns, and armored-personnel carriers--were used by both sides in one of history's most decisive armored campaigns.

The IDF (Israeli Defense Force) had realized the impact of armor in the Sinai Campaign of 1956. Since that time, they had revised and greatly improved their armored corps.

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[4]New York Times, 6 June 1967, p. 3.

[5]Newsweek, 19 June 1967, pp. 33-35.

[6]New York Times, 1 June 1967, p. 8.

[7]Ibid., 14 June 1967, pp. 4-5.

Its overall excellent technical level permitted it to perform diverse combat missions. Among these were breakthroughs to enemy localities, enveloping movements over terrain normally considered inaccessible, and reconnaissance. In the ten years since the last campaign, Israeli strategists and tacticians had made detailed preparations for the next war. Israeli commanders had made air reconnaissance and based much of their terrain analysis on personal experience. Their intelligence regarding potential battlefields was much more accurate than that of their Arab counterparts.

The Israeli Chief of Staff, General Itzhak Rabin, had not only produced an excellent master battle plan he had also carefully thought out solutions to virtually every alternative that could arise.[8] The initial plan of the Israelis was to penetrate through Rafa, the hardest core of defenses south of the Gaza strip, and then to loose the armor to cut into the middle of Sinai and link up with the second thrust directly through the Umm Gataf-Abu Agueila complex.[9] (See Map 8, The Breakthrough at Rafa.) Once the hard core had been penetrated, the columns would rush for the high ground on the west of the peninsula and take care of the remaining Egyptians as they withdrew. On paper, this plan

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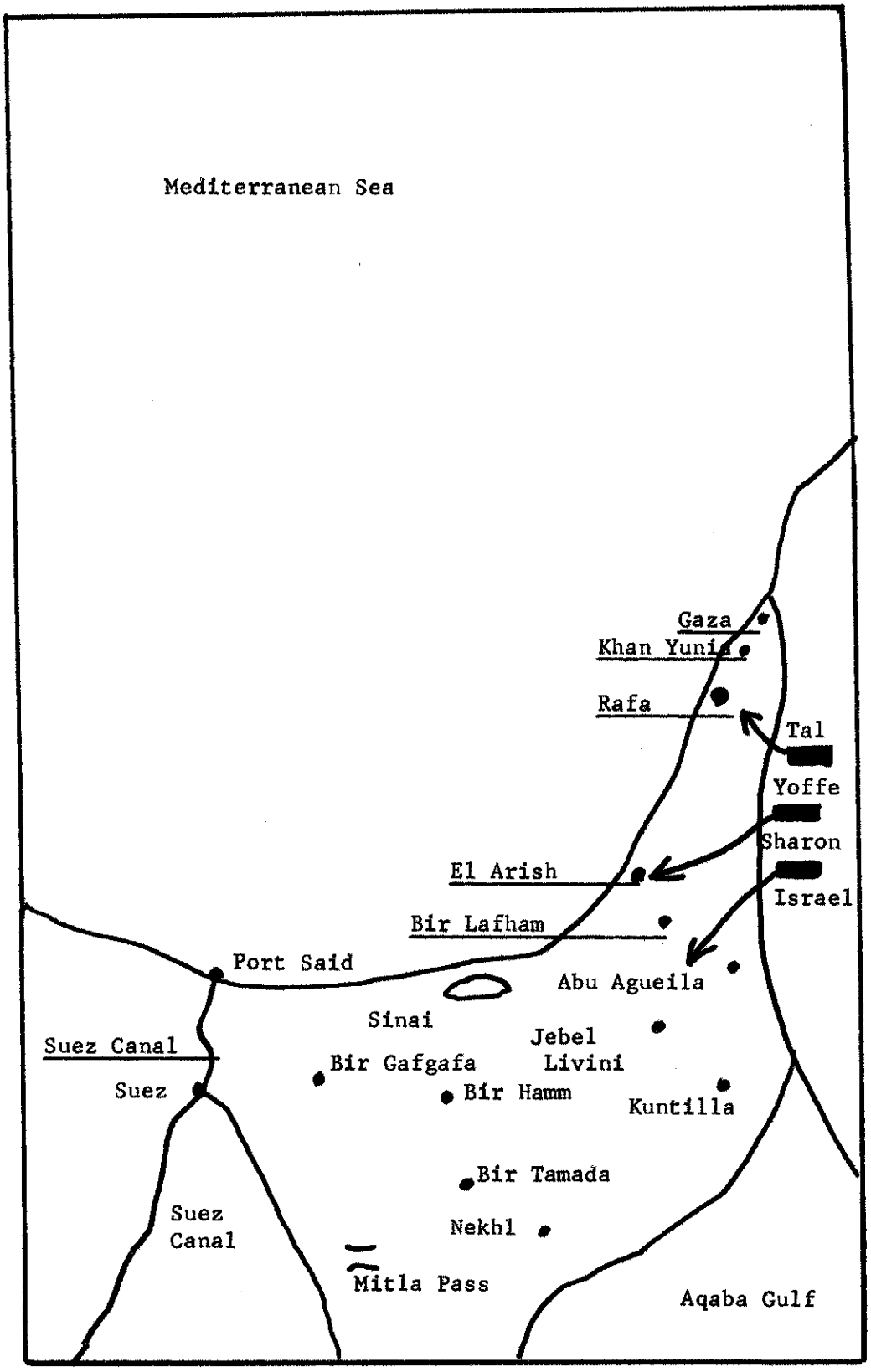
[8]Major General J. M. K. Spurling, "Some Reflections on the Israeli Campaign, 1967," Army Quarterly and Defence Journal 96 (1968):98-99.

[9]Ibid., p. 100.

Map 8, The Breakthrough at Rafa



did not look as if it would be feasible because of manpower requirements; however, in practice, the IDF proved the experts wrong.[10]

On June 5, the Egyptians began shelling twelve Israeli fortifications, thus committing the first offensive action. Later, during the same day, Brigadier General Yesha-Yahou Gavish, chief of the South Command, gave the order for the IDF to attack all along the front.[11] Meanwhile, in the north, Brigadier General Israel Tal's division advanced into the base of the Gaza strip against the Egyptian Seventh Division. Tal's plan concerning this objective was to divide his force into two parts, one part to search and clear up the Gaza strip and the Palestinian Liberation Army, while the other part maintained pressure westward along the coast to El Arish. In the middle, General Ariel Sharon's reinforced division was to push directly west into the Umm Gataf defensive bloc. Brigadier General Avrahan Yoffe's two armored brigades and support units would move around through the northern desert to Umm Gataf and would break into Abu Agueila. Meanwhile, in the south, a separate brigade would essay a delaying action to stop, at least for awhile, the Egyptian Force Shazali in front of Kuntilla. This action was necessary to prevent the Arab forces from pushing across

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[10]General Moshe Dayan, Diary of the Sinai Campaign (New York, 1967), pp. 154-55.

[11]William Stevenson, Strike Zion! (New York, 1967), pp. 1-5.

Israel into Jordan. If Sharon and Tal could push through their initial assaults with a fair degree of success, the Israeli armor would have comparative freedom of maneuver.[12]

During the first day of offensive action, nothing went as planned for the Israelis, although the results were astonishing. Tal's armored division knifed through Khan Yunis, and despite much confusion which is always associated with the beginning of a battle, two Israeli armored batallions were able to reach El Arish.[13] During the night of 5 June, Tal fought to clear a route to his isolated batallions in El Arish. By sunrise of 6 June, although Tal's leading elements were making a reconnaissance-in-force of the El Arish airfield, his division was strung out in contact with Arab forces all the way back to Khan Yunis.[14] By noon of 6 June, the Israeli forces had breached the Bir Lafham position south of El Arish, and had cleared the city. Tal then sent one armored-task force along the coastal road.[15] This armored task force made contact with six T54 tanks, but broke through them and moved thirty miles to the west.[16]

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[12]Jac Weller, "The Breakthrough at Rafa, June, 1967," Army Quarterly and Defence Journal 96 (1968):176-78.

[13]Ibid., p. 178.

[14]Ibid., p. 179.

[15]Stevenson, Strike Zion!, p. 59.

[16]The T54 is a Soviet Medium Tank with a weight of 36 tons. Its battle speed is 30 miles per hour, and armament consists of a main 100mm gun, (2) 7.62mm machineguns, and one 12.7mm Degtyraev heavy machinegun.

This task force reached the Suez Canal on the morning of 7 June. Tal's other two brigades regrouped and pushed toward the Jebel Livini positions behind Abu Agueila.[17]

Brigadier General Sharon's forces launched an assault on Umm Gataf on the night of 5 June. The Israeli forces had spent the day clearing their way through outlying fortifications. On Russian advice, the Umm Gataf complex had been heavily fortified. It lay astride the center axis of advance and was supposedly unflankable.[18] Sharon had prepared a very complex assault. Included in his plan of attack and scheme of maneuver were both an infantry flanking movement across loose dunes and an attack by helicopter paratroops on the Egyptian artillery base. The infantry was to infiltrate the trenches of Umm Gataf, thus opening the way to the center for Israeli armor. Both Rabin and Gavish had serious doubts about this plan of attack because these moves were to take place at night with no tactical air support. Sharon went ahead with the assault, however, and early in the morning of 6 June, Israeli armor began to move inside the Egyptian defensive complex. As in all night combat, the fighting was very confused, but by dawn the last

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[17]Jac Weller, "The Breakthrough at Rafa," pp. 181-82.

[18]Ibid., pp. 177-78.

Egyptian Soviet-made T54 tank had been destroyed. The way was now clear for the forces of Generals Tal and Sharon.[19]

The Egyptian Force Shazali now pulled back from its position in the south. Brigadier General Gavish desired to halt the retreat of this force before it could escape to the west. He ordered Sharon across country to Nakhl to block the Egyptian withdrawal. After crossing terribly rugged terrain, Sharon did indeed arrive just in time to stem the Egyptian withdrawal.[20] The Force Shazali, at one time the pride of the Egyptian army, was now strung out over twenty miles. It was being harassed and pursued from the rear and was ignorant of the presence of Sharon's newly arrived forces. The Egyptians drove straight into the killing zone of the Israeli armored ambush. The initial volley from the Israeli tanks blew up ten T54s. The Egyptian armor was forced to a standstill. It could not push through, turn back, or even get off the road. During the afternoon, Sharon's forces pounded the Egyptians with salvo after salvo of fire from heavy guns. Israeli jets (French built Mystères and Mirages) strafed the stalled Egyptian vehicles without mercy. This tank massacre continued, leaving burning Russian tanks stretched for miles along the Nakhl road. Sharon's forces pushed on toward the Mitla Pass, and by the next night they had run out of targets.

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[19]J. Bowyer Bell, The Long War: Israel and the Arabs Since 1946 (Englewood Cliffs, New Jersey, 1970), pp. 416-17.

[20]New York Times, 9 June 1967, p. 9.

Tal's batallions had moved southward to Bir Hama and then west on the central axis of advance to Bir Gafgafa. During this maneuver, fifteen of his light AMX tanks were attacked by sixty Egyptian T54s moving from the west.[21] Tal immediately called for the supporting fire of his artillery to provide cover for the AMXs and dispatched a company of Shermans to assist the outnumbered AMXs.[22] At least five more T54s were seriously damaged, and the rest left the scene. A company of Israeli Centurion tanks bypassed the AMXs and moved out of radio communication range.[23] They encountered thirty more T54s, but destroyed ten of them with the loss of only one Centurion.[24]

The Israeli forces kept constant pressure on Egyptian resistance, and soon Tal's vanguard reached the Suez Canal. In their wake, the advancing forces destroyed one hundred tanks, including sixty T54s, which brought the total Egyptian tank losses to 275 against an Israeli loss of fifty. Brigadier General Yoffe now had the mission of pushing Egyptian

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[21]Bell, The Long War, pp. 418-19.

[22]Ibid., p. 418.

[23]The AMX French tank weighs about 30 tons. Maximum speed is 30 miles per hour, and armament consists of a 75mm main gun and a 7.5mm machinegun.

[24]Bell, The Long War, p. 419. The Centurion Mark III is a British tank, weighing 40 tons. Its speed is 23 miles per hour. Its main armament is a 75mm main gun with a coaxial 7.62mm machinegun.

armor toward the two heavier armored divisions of Sharon and Tal. Instead, the exact opposite happened. Yoffe's 1st Brigade under Colonel Ishador Shadmi moved across the desert north of Umm Gataf toward the road south of Bir Lafham. As Colonel Shadmi arrived on the road, he discovered that his column was exposed on several sides. An hour after dark, an Egyptian armored brigade blundered into his position. The first fire from Israeli guns destroyed a T54 and blew up seven Soviet-made Molotov trucks. This illuminated the rest of the brigade and made their withdrawal from the immediate area of operations imperative. They pulled back into the El Arish area, and both sides began an all-night artillery and tank duel. At first light, Shadmi found that he had lost one tank and that his Egyptian enemies had left twenty-four burning hulks on the battlefield.[25]

The vital road to Jebel Livini was now opened. Shadmi began to move. By this time, he encountered only very sporadic resistance. The road was heavy with burning Egyptian vehicles, and command and control among Egyptian forces had almost dissolved. At 1600 hours on 6 June, Shadmi began his assault against Jebel Livini, which resulted in a confused tank battle ending with the Egyptians fleeing to the west on 7 June.[26]

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[25]Ibid., p. 418.

[26]Ibid., p. 418.

Gavish flew in and had a meeting with Tal and Yoffe. It was decided that two divisions would move west in parallel areas of advance. Bir Hassna was to be Yoffe's first objective; at 1100 hours that morning, Colonel Bar-Am's batallion of Centurion tanks took the designated objective and kept heading south. The road south had been heavily mined, and it took Colonel Bar-Am's tanks three hours to reach the Bir Tamada junction which was located only four miles away. On his way there, he destroyed twelve T34s and T54s and passed fifty-one more tanks that had been destroyed by air strikes.[27] Using nine tanks as an advance guard, Colonel Shadmi moved down the Bir Tamada road straight in front of a disorganized mob of Egyptian armored forces. Keeping his second batallion in support, Colonel Shadmi opened fire on the confused Egyptian forces. Over one hundred soft-skinned vehicles (trucks and ammunition carriers) were set on fire before the remaining Egyptian forces retreated south toward the Mitla Pass.[28] Colonel Shadmi's forces entrenched themselves at Bir Tamada, and spent the day ambushing small groups of Egyptian vehicles as they desperately tried to escape.[29] Meanwhile, Bar-Am with his small group of Centurion tanks had moved on down into the

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[27]Ibid., p. 419.

[28]Ibid., p. 419.

[29]Ibid., p. 419.

Mitla Pass to block the last chance of Egyptian escape from the Israeli killing zone.[30] He maneuvered his forces between groups of T54 Egyptian tanks and stopped the last hope of the Egyptians conducting a successful retrograde operation.[31]

The burning Egyptian vehicles were a beacon to Israeli jets. Bar-Am's nine tanks and a battery of 105mm cannon opened fire on the Egyptian forces which had been both massed and canalized. The desperate Egyptian tankers now charged his position head on in a frontal assault with twenty-two T54s on line; through extremely skilled gunnery on the part of Israeli tankers, all of them were blown to pieces. A few Egyptian half-tracks were able to outflank the Israelis and escape, but no tanks were able to bypass this defensive position. During this entire blocking operation, the total losses of Bar-Am's forces were only one man killed and four wounded.[32] Virtually all of his tanks had sustained minor damage but none of them had lost its fighting capacity. Most important of all, the Arabs had been defeated in their only chance to escape from the murderous terrain and heat of the Sinai Peninsula. By the next morning, Brigadier General Yoffe had managed to move three columns through the mountain passes and down to the canal

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[30]Jac Weller, "The Breakthrough at Rafa," pp. 180-81.

[31]Bell, The Long War, p. 419.

[32]Ibid., p. 419.

at Chalufa Pas Sudar and the Little Bitter Lake.[33] On 7 June, Sharm el Sheikh was taken without resistance.[34] The paratroop jump was cancelled and convering Israeli forces met near Abu Zenima on 8 June.[35]

Even the remarkable armored victories in the Sinai did not really compare with those to the east. In planning the potential combat operations during the previous months, all the tacticians of Israel had agreed on one matter: Jordan and Syria could be ignored. Once a "blitzkrieg" air strike had disposed of their forces, the Israelis expected no more than an occasional artillery barrage or patrol. The central front commander, Brigadier General Uzi Narkis, expected to play an almost entirely defensive role during the war.[36] In short, with most of her army in the Sinai, Israel neither anticipated nor desired action in the east. On Monday morning, almost as soon as the action in the Sinai began, the Jordanians fired artillery and mortar rounds into Jerusalem's new city, Mount Scopus. In the north, Jordanian artillery hit the Israelis' major air base in that region.[37] Narkis sent word to Colonel Ben Ari's armored brigade to move

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[33]Ibid., pp. 419-20.

[34]Ibid., p. 420.

[35]Note the mission that armor is being used for in this operation.

[36]Bell, The Long War, pp. 420-21.

[37]Ibid., p. 420.

forward into the Jerusalem corridor and interdict the road between Ramallah and Jerusalem.[38] A brigade of paratroopers shifted from their original Sinai mission, moved on Mount Scopus, and were to link up with Ben Ari's armored brigade. All night Ben Ari's columns pushed through the steep hills. In doing so, they had to fill tank ditches, remove mines, and even lever their tanks over rocks.[39] Here the Arabs had made a major mistake. Obstacles and minefields lose almost all of their real effectiveness unless they are covered by fire and observation. At dawn, Ben Ari's brigade was able to cut the Jerusalem-Ramallah road, and it dug into the key terrain on the high ground in time to face a counterattack led by twenty Patton tanks. From this initial action, there developed a three-hour fire fight during the course of which the Israelis destroyed twelve of the Patton tanks. The commander of the remaining tanks made a command decision and retreated. Ben Ari now maneuvered south to meet up with Colonel Mordechai Gur's paratroopers in Jerusalem. Once they reached this objective, they were ordered back to take Ramallah and to meet another column coming from Latrun. Ben Ari sent forty tanks straight down the road to Ramallah. In the city, they were met by heavy sniper and machinegun fire but encountered no defense that could stop an armored column.

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[38]Ibid., pp. 420-21.

[39]Ibid., p. 420.

The next day Jordanian resistance began to go to pieces. The Jordanian defenses were stretched too thin and were under the constant harassment and interdictory fire of Israeli guns.[40]

Ben Ari now sent one batallion north and two east toward Jericho. At 1830 hours the next day, Ben Ari's columns moved into Jericho, and the push from the north toward Jemin on 5 June had progressed on to the south. On 7 June, the Israelis moved into Nablus and then divided to clear the northern half of the west bank up to the Jordan River. This assault through the west bank wiped out the Arab Legion.[41]

The Israeli accomplishments in this war can be appreciated more fully with an examination of the forces on 4 June, 1967:

Arab Total	Israeli Total
Infantry--500,000 men	Infantry--300,000 men
Armor--2,000 tanks	Armor--800 tanks
Aircraft--850 airplanes	Aircraft--450 airplanes

These statistics are deceptive. In fairness to the Arabs, the central position occupied by the country of Israel afforded certain strategic advantages because of the short lines of communication and supply.[42] The Arabs were divided

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[40]Ibid., p. 421.

[41]Ibid., p. 421

[42]New York Times, 18 June 1967, p. 6.

by political feuds, as they have been for centuries, and at this time many of the United Arab Republic's best troops were occupied in Yemen.

This six- or seven-day war (depending upon who is doing the counting) lasted in actuality about 130 hours. In this brief period of time, Israel smashed an entire military alliance, severely damaged Soviet prestige in the Middle East, and captured territory that amounted to four times her own size. Israel was able to do all this partly because, instead of rigid divisions with an intermediate headquarters, the Israelis utilized the task force, task group, and combat-team concept. These varieties of organization were more flexible, and above all, allowed the rapid transfer of fighting formations from one force to another, or instant shifting of direction, emphasis, and axis of advance from one sector to an entirely different one. The Jordanian army, in contrast, not only was deficient in organization but it also lacked reserves, a supplementary line of defense, and tactical air support.[43]

The Israelis had abandoned all attempts to standardize equipment. A typical Israeli task force used around ten different kinds of tanks ranging from Pattons, AMX13s, Centurions, several types of Shermans, and even captured

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[43]Leo Heiman, Under Fire: Israel's Twenty Year Struggle for Survival, ed. Donald Robinson (New York, 1968), pp. 361-62.

T34s and T55s. Artillery batteries were composed of at least seven different calibers, manufactured by four different nations. Each Israeli column had enough organic transportation to carry a three-day supply of fuel, ammunition, and spare parts. If a unit expected to stay in contact (battle) for more than three days, more supplies could easily and swiftly be airlifted by transport planes or helicopters. Each column was also equipped with mobile maintenance units, largely composed of city mechanics drafted for war service along with their wreckers and shop tools. Every reservist who owned a car was encouraged to bring it with him. One of the first vehicles to enter El Arish was a convertible red Mustang with a machinegun mounted on top. In contrast, the Egyptians, Syrians, Iraqis, and the rest of the UAR had standard Soviet equipment, except for the Jordanians who used largely American and British equipment.[44]

Israeli doctrine had gone through many changes since 1956, but its basics remained the same, that is, psychological shock designed to unsettle the enemy coupled with unexpected moves at unexpected times. Inherent in this doctrine is the granting of operational control and initiative to field commanders, and constant assault without rest. From the moment the Israeli forces went into combat, the officers and men did not stop to sleep until the war was

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[44]Ibid., p. 365.

over. The Israeli field commanders were given much freedom in the planning of their own tactical moves. As long as they were in keeping with the broad outlines of the war plan. On the southern front, an armored task force attacked the Arab positions frontally and fought its way through defense lines by weight of armor and firepower, a very different approach than the more common Israeli tactic of indirect attack or envelopment.[45] This maneuver used the frontal assault option of penetration. The first objective was to punch a hole of comparatively small scope in the enemy lines, rush through, and then fan out in several directions behind enemy lines. After this, they were to link up with other task forces which would either break through or infiltrate (as the situation required) enemy lines in other sectors. By doing this, all centers of Arab resistance would be crushed while mobile Israeli forces of paratroops, mechanized infantry, and tanks would race for the key terrain near the Suez Canal.[46]

The success of this "fanning-out" strategy made possible complete Israeli air supremacy. The Egyptians took meticulous care to protect their flanks because they anticipated repeating their encirclement maneuver of 1956.[47] The frontal

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[45]B. H. Liddell Hart, "Strategy of a War," Military Review 48 (1968):80-82.

[46]Heiman, Under Fire, p. 366.

[47]Ibid., p. 366.

assault and penetration on the southern front were the last thing they expected from Israel.

On the other hand, the Israelis did not expect to have to fight on their central front, at least to any great extent. The key word on this central front was improvisation which is perhaps what separates a great military leader from an average one. General Uzi Narkis admitted that he did not really expect the Jordanians to attack. The Jordanian assault, however, came at an opportune time; it began just as Israeli paratroopers had boarded airplanes to jump behind Arab lines in Sinai. Instead of making this combat jump, the Israeli paratroops disembarked from the airplanes and were rushed in convoy toward Jerusalem. An armored brigade was dispatched to reinforce the paratroops, and regional defense units and reserve infantry batallions were organized into combat teams.[48] The northern front was able to assist by sending a force to attack the over-exposed right flank of Jordanian defenses. It required about five hours of hard fighting to capture operational initiative from the enemy, and at dusk, the first avenues of penetration had been forced through Jordan's wavering lines of defense. These avenues of penetration allowed the Israeli tanks to move through and

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[48]Ibid., p. 366.

seize key terrain, including ridges and road junctions in the enemy's rear areas.[49]

On the northern front, the situation was different. The border here was a sharp contrast to the flat plains on Israel's eastern side with the high Syrian ridges and with the natural obstacle of the Jordan River. The Syrian flanks were given some protection by the Mount Hermon Range in the North, and the Yarmuk valley in the south. These terrain features eliminated the possibility of anything but a direct frontal assault toward higher ground. In addition, the factors of heavy enemy fire, barbed wire, and multiple lines of fortifications had to be considered. It was decided here by the Israelis to base their strategy on the tactical premises of attrition and surprise. Attrition was to be achieved by making maximum use of aerial and artillery support for one hundred hours. Surprise would come with their utilization of fire and maneuver and deception.[50]

The Israeli tactical doctrine for the twenty years preceding this war had been influenced primarily by three men. One was General Yigael Yadin, Chief of Staff of the General Staff, in the period from 1949-1951. He evolved the triple concept of outflanking, bypassing, and surprising. Another was General Moshe Dayan, who was chief of the Israeli armed

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[49]Major General R. L. Shoemaker, "The Arab-Israeli War," Military Review 48 (1968):56-59.

[50]Heiman, Under Fire, p. 366.

forces from 1954-1958 and is credited with the "assault by willpower" theory. His theory emphasized the concept that all officers, from second lieutenant to general, must move in front of their men and set a high standard of personal example for their troops. According to Dayan, even brigade commanders must spearhead their assault, while leaving an executive officer behind to handle administrative details.[51] A second aspect of this concept is that officers and men must go with no sleep or hot food until the enemy is defeated. This doctrine assumes that no army can keep fighting twenty-four hours a day for several days, and that one side is bound to collapse.[52] Dayan, in this, has modified the theory of du Picq, a nineteenth century French military expert.[53] In effect, the army with the stronger willpower or motivation wins. The third man who influenced Israeli tactical doctrine was General Itzhak Rabin, the present chief of staff, who evolved the "human steamroller" concept. He constantly trained the Israeli army in assault techniques, emphasizing close tank-infantry coordination. These assault techniques also put much emphasis on the use of the submachinegun, grenade, and demolition charge.[54]

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[51]Ibid., p. 367.

[52]Ibid., pp. 366-67.

[53]Colonel Ardant du Picq, Battle Studies, trans. B. H. Liddell Hart (New York, 1960), pp. 53-74.

[54]Heiman, Under Fire, pp. 367-68.

The tactical concepts of the 1967 war were a synthesis of the ideas of these three men. In defensive operations, the tactical trend was to keep the forward lines as lightly manned as possible. This called for maximum utilization of reserves and regional defense forces. The regular army or operational forces were held in strategic places for a decisive counterattack. In offensive operations, the principle of mass was strongly emphasized. The heaviest centralization of manpower, firepower, and armor was placed at decisive penetration areas. Inherent in this is the tactic of leaving certain defensive areas exposed, thereby taking great risks.[55]

Total war in the twentieth century has come to rest on a nation's ability to utilize its total resources. In 1967, Israel had a population of 2.5 million, and had around 250,000 to 300,000 personnel in the armed forces. Even taking the more conservative estimate, this means a mobilization figure of 10%, one of the highest in the world, and has caused some expert to compare Israel to a modern-day Sparta. In contrast to this, the Arab military alliance had a total population of 60 million. If the UAR had been able to mobilize even 5% of its total, the potential of three million soldiers might have smashed Israel by sheer weight of numbers

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[55]Spurling, "Some Reflections on the Israeli Campaign, 1967," pp. 99-100.

if nothing else. It would have required the Israeli army to sustain a kill ratio of 10:1.[56] Even with the demonstrated skill of the individual Israeli soldier, this figure staggers the imagination.[57]

The Israeli high command realized, of course, that the basis of success in waging war in the Sinai desert would be found in air supremacy. At 0745 hours on the 5 June 1967 the UAR had a heavy numerical superiority in combat aircraft (by conservative estimates--2:1). In less than two hours, Israeli aircraft were in complete control of the air. The Israeli aerial "blitzkrieg" was formulated on a careful estimate of the situation and a precise knowledge of Egyptian capabilities. Israel executed a synchronized attack against approximately a dozen selected Egyptian air bases. Tactical aircraft from Tel Aviv smashed Egyptian bases in the Sinai and the Suez Canal zone. Egyptian bases along the Nile River Valley were destroyed, and the new, sophisticated MIG21s never had a chance to get off the ground in most cases.[58] The presence of the Soviet Navy's 3rd Squadron in the Mediterranean Sea was of no real significance; it was not at combat

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[56]U.S. News and World Report, 12 June 1967, pp. 32-33.

[57]Ibid, p. 35.

[58]Leo Heiman, "Armored Forces in the Middle East," Military Review 48 (1968):11-12.

strength, and was more a base for Soviet advisers than anything else.[59]

Total casualties and equipment losses suffered by both sides were,

Personnel Losses

Arab Countries: 15,000 killed, 50,000 wounded, 11,500 captured

Israel: 679 killed, 2,563 wounded, 16 captured

Aircraft Losses

Arab Countries: 441 aircraft destroyed

Israel: 21 aircraft destroyed

Tanks

Arab Countries: 670 destroyed, 100-300 captured intact

Israel: 61 destroyed

Economic Loss

Arab Countries: 700 million dollars in weapons, aircraft, supplies, and ammunition, plus hundreds of millions in interrupted oil sales, Suez Canal revenue, and tourists

Israel: 100 million in military equipment, lost business, salaries, and so forth[60]

In addition, Israel, through capture, gained a great arsenal of military weapons and equipment. Approximately 300 Russian tanks are now in use in the Israeli Army.[61] They also

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[59]Ferdinand Otto Miksche, "The Soviet Union as a Mediterranean Power," Military Review 48 (1968):32-33.

[60]U.S. News and World Report, 26 June 1967, pp. 30-32.

[61]Ibid., pp. 35-36.

captured a complete missile base equipped with Soviet surface-to-air rockets, literally hundreds of artillery pieces and field guns with more than 70,000 tons of ammunition (largely Soviet made) and other vehicles, and a large share of the supplies and equipment of seven Egyptian divisions. Reliable intelligence reports suggest that the Soviets by 1973 had replaced about 80% of the equipment lost by Egypt.[62]

Of all the factors, both political and military, which were influential in the victories achieved by Israel in the last three wars against the Arab nations, none is probably more important than their ability to use armor and mechanized infantry effectively. Even in the small border clashes over the last five years, armor has been used by the Jews with great efficiency, and the possibility of an even greater potential exists. Israel's tacticians of armored and mechanized infantry stress three major principles: mobility, flexibility, and concentration.[63]

Three kinds of mechanized infantry exist in the Israeli army: those designed to support armored operations, those designed for conventional types of infantry operations, and those organic to airborne (paratroop) units for special

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[62]Howard C. Reese, "Search for Equilibrium in the Middle East," Military Review 48 (1968):29-30.

[63]These are known in other countries as maneuverability, economy of force, and mass.

missions. The first IDF armored brigade of 1948 was primarily composed of mechanized infantry, either in the armored cars of British origin or American "half-tracks" of World War II vintage. It was mechanized infantry, not tanks, that played the dominant role in 1948. Perhaps the Jews learned to use mechanized infantry in support of armor more by necessity than by design. In both 1956 and 1967, Israel used armor and mechanized infantry to a maximum extent in inflicting their devastating victories upon the Arabs. This became especially clear in the war of 1967. At Tel el Faher in the Golan Heights, for example, riflemen took maximum advantage of the protection offered by moving in armored-personnel carriers, and then were moved close enough to make assaults into the Syrian trenches on foot.[64]

Both the Chief of Armor in Israel, General Tal, and the Chief of Airborne Forces (paratroops) realized that on an operation such as a deep penetration, it is less efficient and more dangerous to send tanks alone than if they have the support of mechanized infantry. The basic mission of mechanized infantry assigned to armor in the IDF is not only to perform the basic mission of the infantry but also to perfect the technique of the deep penetration. In recent years, because of the need for punitive operations into Arab territory, this kind of mission has become even more significant.

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[64]B. H. Liddell Hart, "Strategy of a War," pp. 80-81.

Even with the advent of mechanized warfare, there are still times when modern man is forced to fight on foot, especially during attacks on a fortified position or during combat in cities. In 1967, war witnessed both these tactical situations on numerous occasions, but this does not discount the idea, nor should it, that infantrymen can fight effectively from the armored-personnel carriers themselves. Virtually all APCs are equipped with at least one heavy machinegun and two or more light machineguns.[65]

The organic firepower of such weapons is greatly enhanced by the fact that, where the individual infantry machinegunner can carry only a few hundred rounds at best, an APC can carry thousands of rounds, as well as comparatively unlimited supplies of water, grenades, and explosives. Some have suggested that perhaps the term "armored cavalry" better fits the role of the actual APC than the term "mechanized infantry" does. The entire Israeli concept of war depends on speed--to arrive first with the maximum number of men and equipment possible and maintain the initiative while massing the heaviest firepower on the enemy.[66]

Clearly, the concept of mechanized infantry and armor working together is one which future military historians

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[65]Colonel Irving Heymont, "The Israeli Reserves: Minutemen of the Desert," Army Magazine 23 (1973):14-16.

[66]Jac Weller, "Mechanized Infantry in Israel," Infantry Magazine 62 (1972):33-34.

will note. Many of the major divisions, in fact, most of the major divisions, of the American army are now mechanized, or at least have that capability. The advantages of using mechanized infantry, both independently and to support armored operations, are obvious, especially in desert warfare. The current APC of the American army (which is widely used in Israel) is not entirely satisfactory. Its aluminum armor seems to be one of the major objections to this vehicle because of its lower protective power compared to that of heavier steel vehicles. Most casualties suffered by the infantry in combat are caused by shrapnel (at least in conventional warfare) and secondarily by small-arms fire. The amphibious capability of the APC in the desert can be traded for the advantage of more and heavier armor and, therefore, afford the infantryman a greater degree of protection than he has enjoyed in other wars.

A truly perfect or near-perfect APC, or even a tank, has not really been designed for desert fighting. The three leading countries in the field of armor development and research are the Soviet Union, the United States, and West Germany. Because of the terrain in which any of the three anticipate combat (western Europe and so forth), most of the current developments in weaponry of this nature include considerations toward producing an armored amphibious, or at least semi-amphibious vehicle; and because of other considerations (such as the ability to cross bridges), the weight

of a tank or APC must sometimes be limited, thus sacrificing armor protection for mobility. The Soviet PT76 amphibious tank was used to a very limited extent in the 1967 war in Israel and was not very effective in the desert, mainly because of its light armor protection.[67]

With the clear possibility of more hostilities in the Middle East, perhaps there will be more emphasis placed by the major powers on the development of vehicles suited for combat in the environment of a desert, rather than development of armored vehicles designed to fight in western Europe, the marshes of the Soviet Union, or the jungles of Southeast Asia. Before either the standard Soviet fighting vehicles or the American armored machines could be used for any period of time in the desert, significant changes would have to be made in their technical and tactical performance.

The 1967 war in the Near East shows how tanks were used in many kinds of tactical and strategic operations. Although chariots could not have been used in the specific methods that tanks and other armored fighting vehicles were, there are clear analogies here. Tanks were used, along with other vehicles, to exploit the breakthrough at Rafa. This move can be compared to the use Ramses II made of his chariots at Kadesh to exploit the breakthrough of his Na'arun troops. The Israelis used their armored-fighting vehicles to ambush

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[67]Bernard Perrett, Fighting Vehicles of the Red Army (London, 1969), pp. 22-23.

the retreating Arabs in such areas as the Mitla Pass. These vehicles were employed exactly in the same kind of tactical maneuver that the Hittite king used in 1288 B.C. to ambush the advancing Egyptian columns. These two examples point out the analogies in the tactics of chariots and armored-fighting vehicles.

CHAPTER V

SYNTHESIS AND CONCLUSION

There is probably no subject in military history that has been as thoroughly argued and discussed as tactics. Instructors at the infantry and armor schools of the world argue that there are certain principles of war that can be applied to warfare. Grizzled field leaders tend to discount these statements and venture the idea that there are no principles in battle, only improvisation. Nevertheless, certain principles do clearly underly all military operations.

It is my belief that the modern armored vehicle, as employed in tactical situations in the desert, is analogous to the ancient chariot. General Yigael Yadin believed that it is erroneous to compare the chariot to the tank because the chariot was not used to breach fortifications.[1] Although it may be true that the chariot was not used to breach fortifications, it is not really the purpose of the modern tank either. The original purpose of the tank in World War I was to rip through the barbed wire while remaining impervious to machinegun fire.[2] The antitank mine,

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[1]Yadin, Art of Warfare, p. 58.

[2]B. H. Liddell Hart, The Tanks: The History of the Royal Tank Regiment and Its Predecessors, pp. 1-8.

however, made this function of the tank almost obsolete because it immobilizes the tank (usually by blowing off one of the tracks or treads) and repair is difficult under normal conditions, much less under enemy fire. On the rare occations, especially in desert warfare, when tanks are used to overrun fortifications, their employment must be preceded by a very careful reconnaissance. General Yadin, by pointing out that chariots were not used to breach foritifications, has demonstrated a similarity between armored vehicles and chariots, not a difference. Modern desert warfare gives few examples of situations in which the primary purpose of tanks was to breach fortifications.[3]

In the Battle of Kadesh, it is clearly shown that infantry, chariots, and long-range archers functioned in coordination as an ancient form of combined-arms team with a triple capacity. The modern combined-arms team of the infantry, armor, and artillery must function in well-coordinated movements. The high degree of mobility the chariot forces that saved Ramses II showed could not have been achieved without the Egyptian infantry delaying the Hittite forces long enough for the chariots to arrive.[4] Perhaps coordination was even more important among the three basic combat arms in ancient times because of the primitive

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[3]Yadin, Art of Warfare, I:58-59.

[4]"Poem of Pentaur," Ancient Records of Egypt, 3:146-47.

communications. This same coordination was equally important to Rommel's Afrika Korps in 1942 at Alam Halfa because after armored forces began to run out of gasoline they could not support the infantry, and without this vital support the assault on the Alam Halfa Ridge failed. Ramses II, unlike Rommel, was not forced to conduct an extended long-range operation; if he had done so, he might have encountered many of the same problems that Rommel did. The horses and chariots could not have been sustained in the operational readiness necessary for a holding (siege) operation.

In planning for combat operations, the ancient tacticians faced many of the same problems and conflicts that planners of modern armored operations have to solve. Although certainly the materials used to build a tank and a chariot are different, similar considerations such as weight and mobility must be taken into account while designing either as a combat vehicle.

The Egyptians used the chariot like a tank; the Hittites used the chariot more nearly like an armored cavalry unit. The Egyptians apparently counted highly on the shock value and speed of the chariot; the Hittite chariot, manned with three not two soldiers, was used as a strike force. In the modern armored cavalry, an armored fighting vehicle transports the troops to close-combat range. The advantages of this tactic were clear to the Hittites even in 1288 B.C. The modern-day line soldier carries at least sixty to eighty

pounds of equipment; his counterpart in 1288 B.C. carried close to the same weight. By the time an infantryman assaults by fire and maneuver and reaches his objective, he is worn out.[5] If he can be transported, he arrives at the battle still strong and more able to accomplish his mission. If the enemy is able to assault with a sufficient mass of troops, he has a good chance of overrunning a position before the opposing force can react. This is particularly likely when the defender does not pay attention to detail and provide rear and flank security. This is probably what the Hittites planned to do to the Egyptians when they attacked Ramses II's approach march to Kadesh. In this attack, the chariots of the ancient armies relied on the same factors that the tanks of World War II and the war in 1967 did. Surprise, shock, and speed are the basic ingredients that accompany any successful armor or chariot attack. The ancient chariots, moreover, faced the same problems of command and control that modern tanks do today.

Dependence on logistical support is also a factor that both the tank and chariot have in common. In the Battle of Alam Halfa, the German forces could not achieve victory because of a lack of gasoline and because of over-extended supply lines. The chariot troops had to cope with the same problems, except that they were concerned with water and

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[5]Yadin, Art of Warfare, 1:81-82.

fodder rather than with gasoline. Even the most ambitious of the ancient field commanders could not hope to carry sufficient supplies of water to sustain their horses and men. Therefore, avenues of approach had to be carefully planned to coincide with the available water resources. Deserts are nearly always lacking surface water.[6] The supply of water in the desert is one factor that the commander can never take for granted. In 1942 and 1967, the local water sources were still prime military objectives, just as they were in 1288 B.C. Often they are of great strategic as well as tactical value. In North Africa, for example, ever since ancient times, water draining from the higher slopes across plateaus has become the lifeline of many of the small villages and communities of the desert. The destruction or poisoning of water supplies must be considered as a human problem as well as a military one.

Another problem that makes chariots comparable to tanks is that it is necessary for the commander to provide for maintenance. The chariot had to be serviced on the march, during operations, and after battle. The wheels and other parts of the vehicle broke easily and had to be repaired, just as the parts of tanks and armored personnel carriers have to be replaced on a regular basis. It must be emphasizes that this problem was just as great a one for the

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[6]United States, Department of the Army, Desert Operations, FM 31-25 (1972), pp. 1-5.

chariot commander in 1288 B.C. as it is to the modern tank commander. Special chariot repair shops were established to satisfy the need for this requirement, and mobile maintenance workshops were just as much a part of the army of Ramses II as they were of Rommel's Afrika Korps, or of the Israeli army of Moshe Dayan. One of these mobile maintenance units for chariots is clearly depicted in the relief showing the fortified position of Ramses II at the Battle of Kadesh. At one side of the armed camp, a chariot "mechanic" is repairing a chariot pole, assisted by two of his helpers.[7]

Still another problem that has plagued both ancient military men and their modern counterparts is the training required to employ mobile forces to their maximum effectiveness. It is easy to teach a soldier to drive a tank or an armored personnel carrier down a road; it is quite another matter to train him to drive an armored vehicle in combat. The method of training on the ancient ranges of Egypt is well described in the reports on the military skill of another Egyptian Pharaoh, Amenhotep II, the son of Thutmose III.[8] Great stress was placed on special combat skills such as firing while moving at full speed. Combat in ancient times required just as much skill, if not more, to stay alive as it does today. Contrary to popular belief, the modern

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[7]Yadin, Art of Warfare, 1:89.

[8]Maspero, History of Egypt, p. 147.

infantryman or tanker must be a highly trained technician, a professional in his trade. A truly skilled soldier must have at least a year of combat experience, or really hard combat-oriented training, before he becomes a valuable asset to his army. The training of soldiers in the more technical aspects of warfare played a significant role in 1288 B.C.

Ever since the Sinai Campaign of 1956, in which the Egyptians suffered a devastating defeat, they had based their defense on a system known as "linear dispositions."[9] This system is basically Russian in origin. In its employment, armored dispositions are used to defend or block the axes of advance. Misleading in its name, a linear disposition is not a single line, but is a defense in depth. It consists of three major sections: a forward defense line where the main fighting forces and weapons are assembled, an extended rear defense line that also can be utilized as a second or supplementary line of defense and can serve as a base from which to launch counterattacks, and common to both of these lines, a series of trenches which extend the full length of the linear disposition between two lines--a specially organized antitank force. The primary mission of the special antitank force is to destroy whatever force should happen to penetrate the defenses, and secondarily, to provide

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[9]Dayan, Diary of the Sinai Campaign, pp. 133-34.

covering fire for counterattacks. Theoretically, the basic strength of the linear disposition is that it cannot be outflanked. That is, an enemy that attacks a deployment of this type is forced in theory to make a frontal assault, thus exposing itself to heavy fire from the supporting artillery. The forces that break through the first line of defense have the antitank locality to contend with, and if this line is penetrated, the attacking units come into contact with the secondary line of defense.[10]

This idea of multiple lines of defense with a reserve held back in the event of the enemy overruning the first line of defense was not first seen in the 1967 war, nor is it even peculiar to the Russians. Ramses II used a rudimentary form of this type of tactic at Kadesh, withholding his striking force until the vital moment and then releasing it upon the oncoming Hittites. This point can be argued both ways because it is impossible to determine whether Ramses II held the Na'arun force in reserve by accident or by design. Some interpret Ramses' actions as a very carefully planned military operation, while others believe that this force was led to the scene of the battle by chance, and it was only good fortune on the part of Ramses that they arrived on time.[11] The same basic idea underlies both the

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[10]Shabtai Teveth, The Tanks of Tammuz (New York, 1968), pp. 114-18.

[11]J. H. Breasted, A History of Egypt: From the Earliest Times to the Persian Conquest (New York, 1924), pp. 433-34.

Battle of Kadesh and the Seven Day War of 1967: keep forces in reserve to supplement the efforts of the primary lines of defense. Montgomery also understood this principle and applied it well and soundly during the Battle of Alam Halfa in August, 1942. The argument Montgomery presented to some of his most important subordinates during the preparation for the battle demonstrates this point. His argument centered on whether Alam Halfa, at least from the British viewpoint, was going to be a purely defensive battle. General Montgomery's idea was that it should be because if forces were committed too early they might be needed in another sector of the battle area before the battle was over.[12] This appears to be an adaptation of the theory of "linear disposition" of forces. There is a possibility, however, that if Rommel had received adequate supplies of gasoline, he could have penetrated the British defenses, although he would have been unable to exploit his victory decisively.

That both tanks and chariots can be used for defense in depth is one of their common strengths. Their limitations are similar, too. Perhaps the most severe is found in the vital area of reconnaissance. The Egyptians of Ramses II experienced many of the same problems with reconnaissance that Rommel and Tal did in the twentieth century. The advancing Egyptians at the Battle of Kadesh were deceived into

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[12]Montgomery, Memoirs, pp. 109-10.

believing that the disposition of the Hittite forces was much farther north than they were in actuality. If Ramses had been using an effective or even an aggressive system of reconnaissance, he would not have been deceived so easily. The chariots, however, could move only so far from their columns without becoming lost or running short of water. The chariot also made much noise when it was in operation, and the dust and sand that it kicked up made observation difficult. Exactly how land navigation was accomplished by ancient armies in the first place is somewhat of a mystery. The trek from Egypt to Kadesh is not a short one even by modern-day military standards, but there is no record of any of the four Egyptian columns ever becoming lost. This feat is amazing even when contrasted with the navigational technology of modern-day armies.

Similar problems in reconnaissance were encountered by the Germans in World War II. Months before the Battle of Alam Halfa, they had learned the importance of reconnaissance in the desert. The British forces supposedly had been crippled, and no one (including the British themselves) had anticipated their quick recovery because of the heavy losses they had suffered during the retreat from Agheila.[13] At the fight for Alam Halfa, however, a lack of gasoline as well as

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[13]J. A. I. Agar-Hamilton, The Sidi-Rezeg Battles, 1941 (London, 1957), pp. 5-6.

increased security requirements hampered Rommel's reconnaissance efforts. Likewise, immediately before the 1967 Arab-Israeli War, General Tal's forces were forbidden to conduct either air or land reconnaissance.[14] It is not difficult to see why tanks, or even the lighter armored personnel carriers, would be limited in their ability to perform reconnaissance missions and how these limitations are similar to those of the chariot. First of all, it is difficult to remain unobserved by enemy soldiers. Tanks in movement can be heard from many miles away, especially if a soldier drives a stake into the ground and puts his ear next to it.

Like the chariot, the tank is also greatly hampered in reconnaissance efforts by limitations in its crew of hearing and visibility. Even the sense of smell, which can be a most useful tool in a reconnaissance operation, is greatly impaired by the stench of gasoline as well as by other odors that are found on the inside of a tank. Dust would similarly obscure odors in a chariot. Because of their limitations in the role of reconnaissance, tanks have sometimes been used in an operation known as a reconnaissance-in-force. In this type of operation, enemy forces and their dispositions are discovered by making contact with the enemy, and most likely by drawing fire. Although thought by some to be more

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[14]Teveth, Tanks of Tammuz, pp. 115-16.

effective than a long-range or standard-batallion reconnaissance mode of operation, it is certainly more dangerous, and is the same role that was adopted by the chariots of ancient times.[15]

Perhaps the greatest similarities between the ancient chariot and its modern-day counterpart the tank can be found by examining each of the principles of war. There are nine generally accepted principles of war, although they are by no means inclusive, and they vary according to climate, terrain, and the specific tactical situation. The nine basic principles are--objective, offensive, mass, economy of force, unity of command, security, surprise, maneuver, and simplicity.[16]

Before initiating combat action, the leadership of an army must agree what the action is to be initiated against. Although this may sound like an oversimplification of terms, the number of military operations that have failed simply because there was some sort of misunderstanding in regard to the objective is surprising. Objectives may come in many forms; but, generally speaking, they are usually located on key terrain. When deciding upon an objective, the most important question is what good will the seizure of terrain do for the forces involved. At the Battle of Kadesh, for example, the walled city of Kadesh was located in a strategic

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[16]Robert J. Icks, Famous Tank Battles: From World War II to Vietnam (New York, 1972), pp. 3-4.

position near the Orontes River. Whoever held this position was able virtually to control the surrounding area. That was why, although the Egyptians did force the Hittites and their allies to retreat, the Egyptians did not really achieve victory in the fullest sense of the word; despite their losses, the Hittites were able to retain control of at least some key terrain. This same principle applied to the Battle of Alam Halfa. The key to success or failure in this battle rested upon the ability of the British forces to gain and maintain control of key terrain in the area on and surrounding the Alam Halfa Ridge. The objective in the Israeli-Arab War of 1967 was to become the Sinai peninsula and the Gaza strip. These areas were particularly important to Israel which, because of its comparatively small land mass, lacked what is known as strategic depth. Other countries with strategic depth have been able to relinquish large areas of key terrain and still retain enough land mass to meet the enemy on the time and ground of their choosing. In 1967, Israel could not do this. It was of paramount importance that the Jews were able to use their armored forces to seize key terrain almost immediately.

At Kadesh, although Ramses could control the surrounding terrain, he could not use his chariots to seize the city itself. Rommel could not seize key terrain on and around the Alam Halfa Ridge because of artificial obstacles (mines) in the area and his lack of fuel. Thus, the British were able

to achieve supremacy of the area and win the battle. In the Arab-Israeli War of 1967, the speed of the Israeli reaction forces was instrumental in seizing the objectives, just as the speed of the Na'arun reaction force of Ramses II enabled them to arrive in time to force the retreat of the Hittite assaulting forces. The speed and flexibility inherent in both armored and chariot forces are common to the principle of objective.[17]

In any tactical situation, the spirit of the offensive must be manifested from the start and maintained in order for a victory to be both fast and complete. What this amounts to is keeping in motion and advancing toward the enemy. Continuous movement must be maintained because once the attacking force halts, they are usually the only ones taking casualties. As long as the momentum is maintained, the other side is also taking casualties and gradually relinquishing key terrain. Perhaps this phrase was foremost in the mind of General Moshe Dayan when he used the phrase "no matter what cost." This principle applies equally to chariot and armored forces because essentially they are both designed for offensive rather than defensive operations. Mobility is the concept behind the operation of both of these weapons. It is said that once a tank is halted it loses some of its effectiveness. This depends, of course, on whether the tank is

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[17]United States, Department of the Army, The Infantry Brigades, FM 7-30 (1969), pp. 5-1 to 5-5.

in an offensive or defensive posture. In the case of a chariot, perhaps this claim is even more applicable because of the limited range that the organic weapons of a chariot have. A tank can always be used as an artillery piece if it is halted, but it is difficult to use a chariot from a stationary position. Corollary to this idea is that either one, once halted, becomes an easy target.

Ramses II readily used the principle of offensive when his base camp was attacked by the Hittite forces. Instead of trying to fight a strictly defensive battle, Ramses II rallied his forces and assaulted in a spirited counterattack. Without this aggressively carried out counterattack, it is doubtful if even the timely arrival of the Na'arun reaction force could have saved the Egyptians. On the other hand, at Alam Halfa, Rommel could not maintain the offensive against the British because of his fuel shortage, and therefore he could not realistically even hope for a stalemate. Rommel's assault was well intentioned but lacked the material support to make it a success. Montgomery has frequently been criticized for his failure to follow up the unsuccessful German assault and in turn to assault the Germans as they retreated. Rommel was unable and Montgomery was unwilling to use the spirit of the offensive in this situation. In 1967, the Israelis were able to grasp the initiative from the start and to keep it till the end. From the time that the Israeli Air Force destroyed most of the Russian-built Egyptian

airplanes on the ground until the Israeli line troops moved up to the Suez Canal, the offensive was clearly held by the Israeli armies. Offensive is a moral and psychological concept as well as a physical principle of war, and it must be maintained in armored and chariot operations.

Mass is an extremely important concept when dealing with any kind of tactical operation; it is particularly so in an armored tactical situation. Tanks must be massed in force in order to achieve the most beneficial results from them. A tank operating alone is an easy target, and the old axiom of safety in numbers applies here.[18]

Armored forces must be able to move rapidly in order to lend support to areas where they are needed the most. No matter how sophisticated they become, the primary mission of tanks is to support the infantry. In recent years, with the emphasis on mechanized or motorized infantry, that mission has become even more clear. Even though one army may have more tanks at its disposal than the army opposing it, if the opposing army can muster more force (mass) at a given time and in a vital situation, it will be more likely to be victorious. Mass is making the best possible use of one's resources. It also consists of planning and careful allocation of given items of equipment, men, and time. Ramses II

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[18]There are many antitank weapons in the inventory of the infantry, but the psychological preparation of soldiers to use these weapons is a very complex project.

used a rather primitive form of the principle of mass at Kadesh when he decided to strike hard at one portion of the cordon which the Hittites had placed around his camp. This massing of his forces gave the Na'arun reserve sufficient time to move into the battle area and add sufficient driving force to the push which Ramses II had started.

The Sidi Rezeg battles of 1941 showed that Rommel understood the principle of mass. But inherent in modern warfare is the reality that much of the outcome of the battle is decided by an abundance of supplies, weapons, and machinery rather than by the quality of personnel involved in the struggle. The Germans would have had difficulty achieving a satisfactory assault on the Alam Halfa Ridge, even if Rommel had been able to obtain plentiful supplies of petrol. The reasons for this are twofold. The first is that the British, under Montgomery's guidance, were fighting a defensive war at this stage. Second is the fact that the British used landmines very well in this battle. The minefields were laid so well that German reconnaissance efforts failed to determine the real extent of the mines in their avenue of approach. This failure had disastrous results for the attacking German forces and perhaps would have had even more disastrous results if the German attack had been really well massed since massing forces in the middle of a minefield is actually worse than not massing them at all. In the 1967 war, the principle of mass was used more on a strategic

level than on a tactical level. That is, from their resources and manpower the Israelis were able to mobilize a much greater percentage of their population than the Arabs were. Any achievements in gaining mass on the tactical level by the Israelis were only a reflection of the overall strategic and national mobilization.

Maneuver is probably the single most important of the principles of war for tanks and chariots. Maneuver is closing with and engaging the enemy. Command and control are essential because an armored or chariot formation has to work as a team. The ability to accomplish a maneuver with any degree of competence is not easy to master. There are many outside factors that dictate different courses of action, and maneuver frequently must be delegated down to company, platoon, or even squad level. Perhaps one mistake that Ramses II made during the actual fighting of the Battle of Kadesh was that he did not rely enough on his subordinate elements for maneuver. One of Rommel's great strengths was his sense of maneuver. He demonstrated this ability both in France in 1940 and in North Africa, but his ability to maneuver was sorely restricted during the Battle of Alam Halfa. To restrict an armored commander's freedom of movement is generally to cause him to lose the battle or at least cause him to fail to achieve a decisive victory. The Israelis fully realized the principle of maneuver and for that reason they gave great independence of action to their subordinate

commanders during the 1967 war. The Israeli tactics of maneuver were both quick and continuous, with a unified goal in mind: the halting of the Syrian and Jordanian armies and an extended nonstop push toward the Suez Canal.

Unity of command is the tactical principle that is probably the hardest of all to accomplish in armored warfare. The reason for this is that the commander of an armored or chariot force is almost always on the move. There is no place inside a chariot or tank to display situation maps, intelligence reports, and so forth. The armored commander has had to rely on his subordinate commanders to a great degree, and the same was true of the chariotcommanders. Actually, it was possibly more applicable to the chariot commanders because they had no radios, smoke grenades, or other modern communication conveniences. If, in fact, Ramses II held the Na'arun force in reserve as a reaction force, as some believe he did, he must have had a great deal of confidence in the leader of this special group. Unity of command was necessarily lacking in the army of Ramses II. While a strong field commander himself, he did not appear to be able to control effectively or make maximum use of his subordinates. Rommel also had problems with unity of command, primarily because of the Italian forces with which he had to operate in North Africa. There was no real cooperation between the Germans and the Italians; this led to many difficulties and made bad problems of command and control even

worse. On the other hand, the British, under the firm hand of Montgomery, had unity of command which had the qualities of both strength and continuity. The Israelis were successful in the 1967 war through the practical use of unity of command. Sufficient leeway was given to field commanders, but a common purpose was kept in mind at all times. The Arabs did not have any problems concerning the area of command and control because they had no command and control from the beginning. If the combined forces of the United Arab Republic had been able to effect a synchronized attack against Israel, it is doubtful that Israel would have emerged victorious.

The best example of economy of force is that no one wants to send a battalion to do the job that a squad can accomplish. This computation is difficult to make with armored or chariot forces because it is sometimes difficult to decide how many tanks or chariots are required to obtain the desired results.[19] Subsidiary to economy of force is the truism that a leader must control his forces. If allowed complete freedom of action, an average body of troops will stop to plunder, burn, and rape at their leisure. The Hittite commander experienced this problem with his troops as they overran the Egyptian camp. Instead of exploiting their

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[19]Mass and economy of force are similar but differ in that mass is having enough personnel to accomplish the mission while economy of force is having the most economical utilization of men and resources.

initial success, they stopped to plunder the riches of the camp, including the concubines. This careless act gave Ramses II the chance to show his ability to exercise economy of force by taking the remaining forces that he had deployed in the immediate vicinity and pushing back the waves of Hittite troops that were flowing over his defenses. At Alam Halfa, Rommel was caught in a dilemma. If he tried to use economy of force as it should be used, he ran the risk of not being able to mass the forces and supplies, to effect even a substantial delaying action, much less win the battle. In this situation, economy of force was not compatible with the mission that had been placed upon Rommel. Since Montgomery was fighting a purely defensive battle, he really had no substantial concern with economy of force. In the 1967 eruption of hostilities, the Israelis were masters at economy of force if for no other reason than because they had to be. The attack that the Israelis anticipated was much worse than the attack the Arabs actually launched. The Arabs were consistently caught in situations where numerical superiority alone gave them no real advantage; psychological warfare played an important role.

When troops lose a battle or a war, the blame for the loss is likely to be focused upon anything but the troops themselves. It is usually on either their equipment or their leadership, or sometimes both. Untold numbers of T55 Soviet-built tanks were captured not only in perfect working

order but with the initial round of ammunition still in the main gun. It is difficult to determine the number of tanks that were captured in this fashion. Some have speculated that the reason the guns were not fired was because the Egyptian crews were poorly trained, or even cowardly. It is doubtful that those speculations are true. In the first place, the 100-millimeter main gun of the T55 is a simple weapon to operate, and a raw recruit could be taught to fire the weapon. As always, the charge of cowardice here is more racist than anything else. Even in the 1967 war, Arab troops fought with great courage and sometimes with extreme tenacity.[20]

The simplicity of an operation frequently means the difference between failure or success. Even the best trained, best equipped army, with the highest morale can be defeated if its scheme of maneuver and its concept of operation are too complicated and cannot be applied in the context of the situation at hand. A standard axiom of the American army is, "An order that can be misunderstood <u>will</u> be misunderstood." The concept of simplicity is not really relevant to the Battle of Kadesh. It is likely that neither the Egyptians nor the Hittites did anything to violate this principle because in ancient warfare the variables were fewer than in the Battle

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[20]History is full of example of troops that fought with extreme bravery, but were denied victory because of poor organization, training, supply, or leadership.

of Alam Halfa, or the 1967 Arab-Israeli War. At Alam Halfa, Rommel's scheme of maneuver was really not too complex, but his concept of operation most certainly was. It was caused by too many uncertainties. If the Luftwaffe had been able to fly the number of missions that Kesselring had said it could, if the Italians had been able to deliver the amount of fuel by ship that they had said they could, the outcome of Alam Halfa could have been much different. The more variables on which one bases an armored or chariot operation, the more things there are to go awry. In 1967, both sides kept their plans reasonably simple, but the Israelis were able to implement their plan faster and with a far more professional competency than the Arabs. Perhaps the main reason they were able to implement their plan so rapidly was the common purpose of mission that Israel obviously manifested--the survival of a Jewish state. In contrast, the only common goal that the Arabs manifested was the destruction of the Jews. In its essence, the Arab-Israeli War was a retelling of Aesop's fable of the fox and the rabbit: the fox was running for his supper, and the rabbit was running for his life.

Security and surprise are two distinct tactical fundamentals that are interrelated and inseparable. Sun-Tzu once stated that all warfare is based on deception.[21] The Hittites used a very effective ruse against the armies of Ramses II.

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[21]Sun Tzu, The Art of War, p. 106.

Informers were sent deliberately by the Hittite king to mislead the Egyptians about the exact location of the Hittite forces. The misinformed Egyptians continued to advance in a relaxed manner because they believed the Hittite forces were far to the north so that it would be several days before any actual fighting occurred. The Hittite plan was good. They were going to let the Egyptians blunder into a trap. It was only the personal leadership and heroism of Ramses II (and the possibility that he planned for the reserve force) that saved the Egyptians at Kadesh. Rommel's attempts at secrecy and surprise at Alam Halfa failed. Montgomery anticipated Rommel's attempt at a feint, and he met Rommel's plan correctly. In the Sinai Campaign, the Jews were able to launch attacks on the Arab airfields before the war was even started. The Israelis, in contrast with the Arabs, had a highly developed system of intelligence which allowed them to obtain initial victories in the war. The well executed Israeli ambush of the retreating Arab colums illustrates the incompetence of Arab intelligence.

Thus it is my thesis that while technological differences may exist among tanks, and most certainly do exist between tanks and chariots, the tactical purposes for which the chariot was intended more than a millenium before the birth of Christ are basically the same ones for which the modern armored vehicle is intended. Even in the time of Ramses II, the infantry was still the basic branch, and the

chariot was designed to assist the infantry in the performance of its mission. Although the initial development of the tank in World War I was to support the infantry by breaching barbed wire and machinegun fire, the purpose of the tank involved in infantry support during World War II, particularly the North African campaign, was far different and much more varied than simply breaching fortifications. It was expected to fill a variety of roles such as reconnaissance, security, screening, covering, and attacking. Those same concepts on how to employ armored vehicles were clearly shown in the 1967 Arab-Israeli conflict. Chariots and tanks are essentially similar.

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