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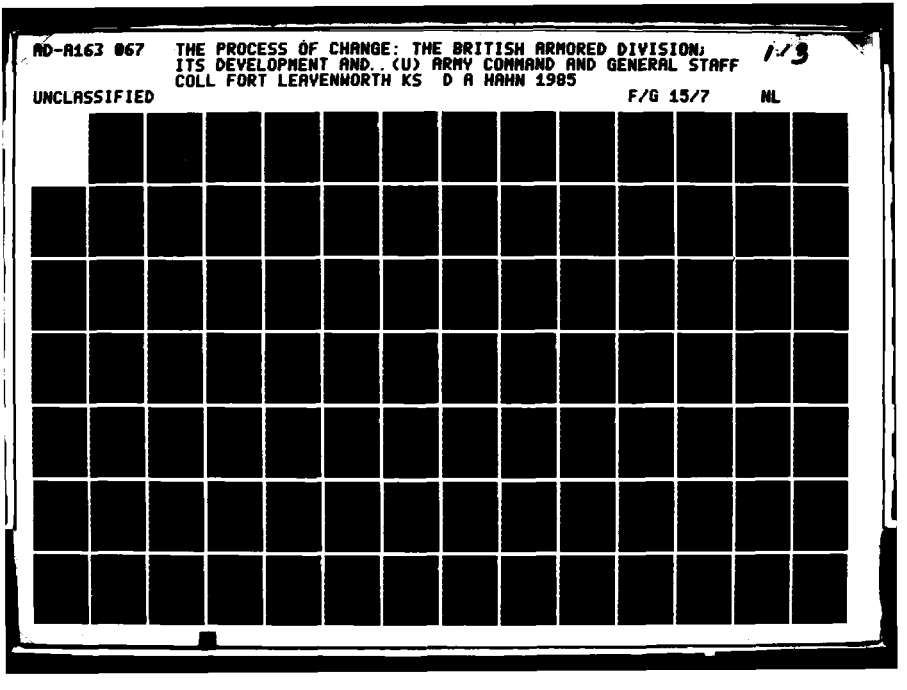

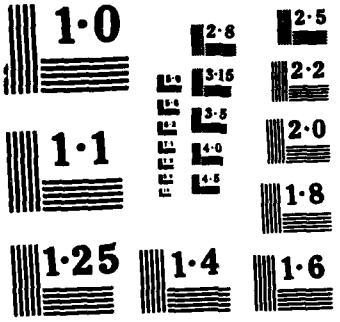

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THE PROCESS OF CHANGE: THE BRITISH ARMORED DIVISION; ITS DEVELOPMENT AND EMPLOYMENT IN NORTH AFRICA DURING WORLD WAR II

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

by

DANIEL A. HAHN, MAJ, USA
B.S., United States Military Academy, 1973
M.B.A., Southern Illinois University, 1983

Fort Leavenworth, Kansas
1985

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

THE PROCESS OF CHANGE: THE BRITISH ARMORED DIVISION; ITS DEVELOPMENT AND EMPLOYMENT IN NORTH AFRICA DURING WORLD WAR II, by major Daniel A. Hahn, USA, 240 pages.

This study analyzes the process of change in the British Army prior to and during World War II. It is an historical analysis of the development and changes in one of its major fighting formations during peace and war. The study looks at the key environmental factors, both external and internal which helped to shape the armored division in the formative years from 1926-1938. An analysis of how these factors affected the formulation of doctrine for armored forces in the British Army is made. Within this study, doctrine development was a key element which greatly affected the final form of the armored division prior to World War II.

During the war, this analysis focuses on the elements of doctrine, weapons and soldiers. Analysis of the campaigns in North Africa provides insight into the dynamic relationship of these three elements. The investigation demonstrates the key role which individual leaders play in the process of change.

This study develops a conceptual framework for the change process in an Army and concludes that this framework is valid during peace and war. The entire change process is much more dynamic during war and the capability of an army to adapt is a key factor in its success. This study explores the relationship between conceptual and physical change and concludes that resistance to new doctrinal concepts limits the effectiveness of physical changes in weapons, organizations and training methods.

ACKNOWLEDGEMENTS

I wish to express my deep appreciation to the members of my committee. First, for the patience they had with my work, and second for the many hours they spent correcting my initial manuscripts. Dr. Robert Berlin, as my thesis committee chairman, was especially helpful in organizing the committee and keeping me motivated to complete the project. Many thanks to LTC John Fulton, who was instrumental in helping me with my writing, both on this project and throughout the year as one of my seminar leaders. Colonel John Hart, as a British Army officer, was greatly appreciated for the insight into the British Army that he provided.

Most importantly, my heart-felt thanks and sincere gratitude go to my wife and our two children. Carol was patient, uncomplaining and unwavering throughout this long year. Jennifer and Thomas sacrificed many hours with their father so that he could complete this project, and to them I am ever grateful.

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CHAPTER 1

INTRODUCTION

Background

During the First World War, Great Britain suffered 2,225,000 casualties; wounded and killed.[1] The shock and tragedy of WW I evoked many different responses from British society and the Army. However, all of these responses had one thing in common and that was a desire to avoid another war like the one they just fought. Within the Army, officers sought to discover what went wrong during World War I and to devise solutions which would prevent any future recurrence of the stalemate on the Western Front. For some officers this meant that the role of the British Army was to defend the homelands and the territorial frontiers of the British Empire. Other officers who saw the world war of 1914-1918 as an aberration and who wished to return to the pre-World War I Army supported this role.[2] A third group of officers, however, sought to develop new methods of fighting to restore mobility to the battlefield. This group sought dramatic changes in the Army and fought a tremendous struggle in trying to produce them.

Developments during World War I were the genesis of this last group's ideas. Many staff officers worked desperately throughout the war to find a way to break the stalemate. Several technological innovations occurred during the first war which had this intent, but the war ended before most of these ideas were completely developed.

One such idea was the "landship," better known as the tank. Colonel Ernest D. Swinton of the British Army was its inventor.[3] The hope behind this invention was that it would break the deadlock of trench warfare. In February 1916, seven months before the tank's initial employment, Colonel Swinton wrote the following in his concept paper on the use of this invention;

> ...if tanks are employed and are successful, it is thought that they will enable the assault to maintain most of its starting momentum, and break through the German position quickly.[4]

Swinton hoped to change the course of World War I with his invention but was unsuccessful. Initial expectations for the tank outran the Army's capacity of to assimilate it. The reason this occurred is because the tank was more than a technological innovation. Besides

the time required to overcome normal resistance to a new idea, and the time to train operators on its use, its employment required a new concept of fighting. Complete assimilation required the development, understanding and acceptance of this new concept.

Swinton personally recognized the need to integrate the tank with the other arms and to develop a new tactical concept for the attack. In his initial concept paper he stated,

> The necessity for the co-ordination of all arms to work together in the offensive generally requires no remarks here, but the desirability of the specially careful consideration of the subject in the case of an operation by tanks requires some emphasis, since the orchestration of the attack will be complicated by the introduction of a new instrument and one which somewhat alters the chain of interdependence of all.[5]

Swinton went on to explain that the tank could not win battles alone and was an auxiliary to the infantry. The tank's purpose was to destroy obstacles and machine guns because past battle experience had shown that the infantry could not overcome them and the artillery could not neutralize them. Success of the infantry was dependent upon the survival of the tank. As Swinton explained, the tank was vulnerable to enemy artillery

fire. Rather than have the friendly artillery fire on front line obstacles and emplacements, it was to neutralize enemy artillery thereby enhancing the survivability of the tanks.[6]

The tank's first use was during the battle of the Somme. Forty-seven machines were employed and most broke down before they crossed the start line. About a dozen tanks managed to attack, but infantry commanders, skeptical of this new idea, failed to support it with infantry. Any hope of exploiting the tactical surprise of its first use was lost.[7]

Subsequently, the British went on to employ the tank in many battles during the First World War with varying degrees of success. Although many of the attacks were patterned after Swinton's initial concept, the tank's period of use in WW I was too short to allow for its complete assimilation into the British Army. While a group of officers who worked with the tank forces during the war became advocates of the tank's potential for mobile warfare, a concensus on a concept of employment did not develop.

During the period between the First and Second World Wars, the tank faced a dual problem in assimilation. The first was a debate among the tank advocates as well as

within the remainder of the officer corps over the tank's purpose. The more visionary officers saw the tank as a revolutionary means of conducting war. Many other officers remembered the limitations of its use in the first war, and never saw it as anything more than an additional means of tactical support for the infantry. This debate led to considerable friction, and consequently the Army entered World War Two with several competing doctrines for armored forces. The story of how this occurred is told in succeeding chapters of this study.

The second problem which faced the tank in the assimilation process was the resistance to change. It competed with traditional ideas about fighting. As an example, the British Army maintained a horse cavalry corps on the Western Front throughout the first war, but never employed it.[8] Even so, the cavalry continued to have its advocates after the war, and they persisted in proclaiming the cavalry's usefulness in modern war almost until the outbreak of World War Two.

Of greater significance, the traditional cavalry concepts of war in the British Army continued almost without modification even after the horsed cavalry units became armored units, and the vestiges of these concepts persisted well into the third year of WW II. Field

Marshal Montgomery made the following statement when issuing instructions to one of his Corps commanders before the battle of Alam Halfa in 1942;

> The point was, he said to me, that our armoured formations are too brave. They always attack. And all the Germans do is withdraw their 88s behind the line and then knock out all our tanks...
> So the cavalry really are hunting the whole time. They're after the fox. They'll go, they'll always attack. That's their one element.[9]

Montgomery was referring to the tendency of former cavalry units to charge into German anti-tank guns. They refused to accept and perhaps failed to recognize the need for a new fighting doctrine.

Problem and Significance

The preceding narrative introduces the subject of this study and is an indication of the difficulties which the British Army had in assimilating change. The process of change for any large organization is complex; but for an army with a mission to defend a nation's vital interests, the word "complex" does not properly define how difficult this process really is. There are two significant reasons for this extreme difficulty. First because the interests of the nation are at stake, many

issues require consideration and interest groups throughout the entire nation often have inputs into the process.

The second reason is probably even more difficult to understand, particularly during peacetime. The army must correctly project the future nature of war. Since there is no model for this projection, individuals in the army must analyze past wars for relevent lessons and at the same time avoid being trapped by the past. Given the degree of difficulty in projecting into the future it is a foregone conclusion that flaws will exist in the vision of future war. Therefore, the army must be prepared to adapt quickly when war occurs. Developing flexible indiviuals and organizations which can easily adapt to change becomes a requirement for the military organization.

Major-General A. E. McNamara, a British general officer and member of the committee assigned to study the lessons of World War One, summarizes these ideas about preparing for future war and change very succinctly in the committee's report.

> In looking back at the war and all its lessons we must not overlook the most important lesson of all, viz., all wars produce new methods and fresh problems. The last war was full of surprises-the next one is likely to be no less prolific in unexpected

developments. Hence we must study the past in the light of the probabilities of the future, which is what really matters. No matter how prophetic we may be, the next war will probably take a shape far different to our peace-time conceptions.

In order to cope with this upset to our preconceived ideas our leaders must be versatile, mentally robust and full of common sense and self-reliance.

To produce this sort of mentality must be the object of our training.[10]

Thus, change becomes a central issue for all modern armies. A goal for the American Army, for example, is to minimize turbulence while developing an organization that is compatible with change. It is hoped that this study will provide an understanding of how one army developed and changed one of its major fighting formations during a particular period of time. The central thesis of this study is that understanding the process of change is essential to long range military planning of any type to include war planning. An army unprepared to adapt and assimilate change quickly will face great difficulty in time of war when the process of change focuses on short range issues and is consequently more dynamic.

The scope of this study includes an analysis of key factors and their effects during pre-WW II British armored force development, and the further development of British armored divisons during the first three years of

war. During the pre-war years, the analysis focuses on external and internal environment and its effect on armored doctrine, tank development and armored force organizations. The external factors considered are economic resource availability, public and political opinion, strategic policy, and the external threat for which the Army prepared. The internal factors considered are those Army institutions which had both a functional and social impact on the Army. These include the Army branches of service, the regimental system and the War Office, which was the governing institution for the Army. Other significant internal factors which this study addressed are the peacetime training exercises and the contributions of key individuals. All of these factors influenced armored doctrine development, and shaped the final form and capability of the early armored divisions of the war.

During the war years, the analysis focuses on the dynamic relationship of doctrine, weapons and soldiers. Doctrine is the body of ideas which governs how leaders and soldiers employ organizations and technology in battle. The aspect of weapons includes the significant technological changes in the tank which affected the capabilities of the armored division. The soldier

dimension includes all areas which affect the human element, but primarily focuses on training, education, unit cohesion, organization and leadership.[11] The analysis during the war years demonstrates how this relationship was in continual turmoil because of the rapidity of change in the weapons and soldiers portion of this triad. It demonstrates that doctrine will not change with the same rapidity because individuals are resistant to new ideas. As future chapters will show, leaders had considerable difficulty adapting to new war fighting concepts.

ENDNOTES

1. Brian Bond, British Military Policy Between the Two World Wars (Oxford: Clarendon Press, 1980), p. 10.

2. Brian Bond, pp. 35-74. Shelford Bidwell and Dominick Graham, Fire-Power: British Army Weapons and Theories of War, 1904-1945 (London: Allen and Unwin, 1982), p. 150.

3. Richard A. Preston and Sydney F. Wise, Men in Arms A History of Warfare and Its Interrelationships with Western Society (New York: Holt, Rinehart and Winston, 1979), pp. 267-268.

4. From "Notes on the Employment of Tanks," by Colonel Swinton as recorded in J. F. C. Fuller, Tanks in the Great War, 1914-1918 (London: Murray, 1920), p. 52.

5. From "Notes on the Employment of Tanks," by Col. Swinton, Fuller, p. 52.

6. Fuller, pp. 52-53.

7. Preston and Wise, pp. 267-268. James L. Stokesbury, A Short History of World War I (New York: Morrow, 1981), pp. 155-156.

8. Preston and Wise, p. 271.

9. Sir Brian Horrocks, commander of XIII Corps at the time of the battle as quoted in Nigel Hamilton, Monty: The Making of a General, 1887-1942 (New York: McGraw- Hill, 1981), p.643.

10. Great Britain. War Office. "Report of the Committee on the Lessons of the Great War" (October, 1932). This quote is from the final summary of the report made by Major-General A.E. McNamara, a member of the committee on the Lessons of the Great War.

11. Colonel Huba Wass de Czege, "Preparing for War: Defining the Problem," (Unpublished article from School of Advanced Military Studies, Course 11, Ft. Leavenworth, KS. 8 May 1984), pp. 1-25. Colonel Wass de Czege's article influenced these ideas. This article provides an excellent analysis of this relationship and the need to integrate these three areas into all change.

CHAPTER TWO

"THE ENVIRONMENT"

INTERWAR CONFUSION

The British Empire employed over 8.5 million soldiers on all fronts during World War I. Of these, nearly 5.5 million saw action on the Western Front in France with a peak strength for Empire armies of 2,700,000. At one point in the war, the British Army had over 2 million soldiers in France, but by the end of the war this total dropped to just under 1,800,000. Clearly British strength began to wane by 1918. After fielding the largest army in her history which saw a wartime expansion from 6 to 61 infantry divisions in France alone, Great Britain was near exhaustion. The cost was even more mind boggling and the British people as well as the Army would not forget that quickly, if ever. British casualties amounted to approximately 750,000 dead and 1.5 million severely wounded. Financial costs to the British government and people were staggering. During the last six months of the war alone, the average daily cost was L7.5 million.[1]

These statistics are a backdrop for any consideration of British war preparations between the two world wars. It was this experience which shaped the environment that surrounded the development of armored forces in the British Army. Most of the factors of environment acted as constraints to limit the development of armored forces and their doctrine.

Several key environmental factors were external to the Army. The most important factor was the general revulsion against war which society felt. Society expressed this feeling in many forms besides pacifism and disarmament. There was a desire to return to life as it was before the war. In military strategy, it meant a return to the task of defending the Empire and there was no public support for the preparation of an army to fight on the continent of Europe. National will reflected public indifference to war preparation and this directly affected the political will of the Government to allocate money for defense. There was not a major shift in the political will of the government until 1937 when Neville Chamberlain became the first interwar Prime Minister to recommend an increase in defense spending. Political indifference affected more than budgets. Only weak political support existed for changes or reform in the

Army including modernization. This lack of support led to a gradual erosion of the Army's morale and forced its members to look inward.[2] While this feeling of apathy for war preparation manifested itself in many ways, there was a general concensus of the public, politicians and members of the military. They would not fight another war like the last one.

Since there was little support for the return of a British Army to the European continent, the Army's principal mission after WW I changed. During most of the interwar period the primary missions of the Army were imperial and home defense. This lack of a continental commitment was another major external factor that affected the development of armored forces.[3]

The War Cabinet issued the following guidance to the Service Minisisters in August 1919 and made this new mission a reality.

> It should be assumed, for framing revised Estimates, that the British Empire will not be engaged in any great war during the next 10 years, and that no Expeditionary Force is required for this purpose.... The principle functions of the Military and Air Forces is to provide garrison for India, Egypt, the new mandated territory and all territory (other than self-governing) under British control, as well as to provide the necessary support to the civil power at home....[4]

This directive became known as the "Ten Year Rule." Although its original intent was apparently to serve as a guide for determining budget estimates, the idea that no war would occur for 10 years became a part of strategic policy. The rule remained in effect until 1932 and further limited the possibility of a continental commitment. It was an idea which many Army and government leaders held almost until war in Europe began. On July 8, 1926, Field Marshal Lord Milne, the Chief of the Imperial General Staff (C.I.G.S.) from 1926-33 issued written guidance to the Expeditionary Force Committee stating that,

> a continental war is of extreme improbability; preparation must be directed towards a sea voyage and operations in an underdeveloped country, and it is therefore unnecessary to have more than a small portion of the Expeditionary Force ready to take the field at short notice; one should aim to raise a mixed force of about one division with some cavalry and tanks.[5]

In 1933, near the end of General Milne's term as C.I.G.S., he told a General Officer Conference that he hoped there would not be another major British intervention in Europe and that the proper role for the Army was Imperial Defense.[6] Even as war became a distinct possibility,

the priorities of imperial and home defense persisted. On November 23, 1937, the Secretary of State for War, Mr. Leslie Hore-Belisha wrote to the Prime Minister:

> My views, after the fullest survey, including a visit to France, is that our Army should be organised to defend this country and the Empire, that to organise it with a military prepossession in favour of a Continental commitment is wrong....[7]

Earlier in October 1937, the Cabinet asked Sir Maurice Hankey, an influential member of the Chief of Staff Committee, a subcommittee of the Committee of Imperial Defence, to provide his recommendations on strategic priorities. He gave first priority to the Royal Air Force in a defense and deterrence role, second to the Navy and third to the Army with a low priority for an Expeditionary Force. He recommended that the Territorial Army should not be a reserve force for the Expeditionary Force. Finally, on December 22, 1937, Sir Thomas Inskip, the Minister for the Coordination of Defence, reported to Cabinet that the priorities should be home defense, particularly for air defense, protection of imperial communications, defense of British territorial possessions

and cooperation with any British allies to defend their territory.[8]

These comments are representative of the thoughts of many leaders who wished to avoid what they believed was the great mistake of 1914; the commitment of a large army to the continent of Europe. The comments of these key leaders shaped strategy for the Army. This strategy meant that the Army did not concentrate on armored force development, particularly in terms of an offensive force. Empire and Home Defense did not require mechanized or armored forces.

Even without a policy to return to Empire defense, the realities of the situation immediately after the war would have required the Army to devote its energies and manpower to this mission anyway. Overseas commitments actually increased as a result of the war and a return to the Cardwell system was necessary.[9] This replacement system was politically imposed and was another external factor with which the Army contended during the period before World War II. The Cardwell System imposed constraints on modernizing or converting units to armored forces.

Many reformers such as J.F.C. Fuller thought the Cardwell system was a tremendous burden on the Army.[10]

There was a continual struggle to balance the number of home service replacement battalions with the overseas battalions. Between 1922 and 1928, the system was out of balance by more than 14 battalions. This was true even though six battalions in the Rhineland, some short-tour battalions in the Mediterranean and the Turkish Occupation Force were considered "home service" units. The balance was briefly restored, but after the Abyssinian War in 1935 and Palestine crisis in 1936, the system was again out of balance by 14 battalions and remained that way until the outbreak of World War II.[11] This created problems for anyone advocating the development of armored forces. Since there was a shortage of home units in the system there were none available for conversion to armored units. In addition, because replacement units had to mirror overseas units, it was impossible to convert any home units to armored battalions without also converting the units stationed overseas. Attempts to convert units overseas were made but without success.

With the largest contingent of the overseas forces stationed in India, any plan to create a large armored force had to include the Army in India. While the Army made attempts to prove the usefulness of tanks in India, financial difficulties prevented the acceptance of the

idea. Under the existing system, Indian taxes supported all forces in India. Also the Indian Government perceived these initiatives to be British Government attempts to control the force structure of the Indian Army.[12]

While the Cardwell system frustrated those individuals striving to reform the Army, austere budgets imposed even greater constraints on the creation of armored forces. The economic situation dictated this austerity after the war. Besides the cost of the war itself which amounted to L8,000,000,000; loss of overseas investments, strong United States and Japanese competition, increased demand for consumer items, and slow economic recovery of European trading partners, especially Germany made drastic reductions in government spending mandatory. The Army budget was an immediate target for cuts, consequently the government reduced it each year from 1919 to 1932.[13]

Increased commitments from territorial gains of the war, British involvement to shape the post-war world and increased instability throughout the world used most of the Army's budget and magnified the effects of continual budget reductions. There were new commitments in Iraq requiring 32 battalions in 1921 and these units were not completely withdrawn until 1929. The cost of

this garrison was L20 million in 1921-22 alone. Britain eventually committed 20,000 soldiers to North Russia to aid anti-Bolshevik forces as well as other contingents to other fronts in Russia. As a result of the Treaty of Versailles, Britain maintained two Armies of occupation in Constantinople and the Rhineland. The former was withdrawn following the Treaty of Lausanne in 1923, but the Rhineland occupation continued until 1930. In 1921 the force in Ireland reached a total of 80,000 soldiers.[14]

All of these commitments stretched Britain beyond her capabilities and had serious effects on attempts to allocate money for tanks or mechanization. Between the years 1923 and 1933, the Army averaged only L2 million per year for the purchase and maintenance of army weapons and war stores.[15] Money was not available for research and development. As an example, from 1926 until 1937 the annual amount budgeted for tank design varied from L22,500 to L93,750. Since one experimental model might cost L30,000, design experimentation was inadequate before the war.[16]

The effects of this austerity were twofold. First, tank design and production capability were never adequately developed before World War II. Without hope of

profitable long term contracts, few firms capable of manufacturing tanks and other armored fighting vehicles existed. Those that did exist had limited capacity. In 1937, with the threat of approaching war, the Government allocated significant increases for mechanization; however, British industrial capacity could not handle all of the orders. A second effect was the lack of mechanically reliable tank designs when war began. A quick solution to this problem was not possible. Without a thriving industry, trained engineers skilled in tank design were not available. Unreliable tanks plagued the British Army until late in the war. Lack of available money was not the only reason for this problem, but it was certainly a major factor.[17]

After Hitler's accession to power, arguments for limiting defense spending began to weaken. More individuals in government came to recognize the need for increased defense spending. The Cabinet issued a White Paper on defense in March 1935 which stressed the need for sufficient forces for security, noted Germany's rearmament, and concluded that Britain was approaching a time when defense capabilities would be inadequate. With the start of this recognition of defense needs, each new

year found more support for increased defense spending.[18]

While there was acceptance of increased probability of war by 1935, and that there was a need to raise defense spending; there was not a mandate for modernization and expansion of the Army. On the contrary, the three major external factors continued to haunt the Army. The controversy within the cabinet before the issuance of another Defense White Paper in February 1937 demonstrated this. It called for a defense loan to allow increased expenditures over the next five years, but there was cabinet resistance to the idea of building the Field Force and Territorial Army reserve. The cabinet feared public opposition to the preparation of another Army for war on the continent. A compromise was reached by approving only the regular divisions of the Field Force. In December 1936, Neville Chamberlain, as Chancellor of the Exchequer and member of cabinet, wrote a memorandum outlining the Treasury's position. He believed that national resources were not adequate to meet all defense needs. In the memorandum, he listed defense needs as the Royal Navy, Air Force, air defense of Great Britain, imperial commitments, and a continental scale Army. This list priorized the way he saw defense requirements. The

memorandum pointed out that public opinion would not support large-scale military preparations for intervention on the continent. When Chamberlain became Prime Minister in 1937, his influence caused the Cabinet to decide against equipping not only the Territorial units, but the regular units of the Field Force as well. In this course of events, fear of a continental commitment, economic constraints, and lack of public will towards war preparation all worked against Army attempts to prepare for a European war.[19]

The debate over these issues during the critical years prior to the outbreak of war kept the Army from focusing its efforts on a continental commitment. Without this commitment, the argument for armored forces was weakened considerably. Ultimately this had a major impact on the type of army that was produced at the beginning of the war.

Within the external environment, there was one factor which aided mechanization and armored force development in an indirect way. Throughout this period, the motor vehicle was being substituted for the horse in civil life. Civilian use of motor vehicles gave momentum to technological development of such items as engines, transmissions and production processes. Also, individuals

were entering the service with technical skills. Both of these occurrences were a benefit to the Army.[20]

While this provided impetus to mechanization in general, it had a more limited impact on armored vehicles. Since there was no use for tanks in the civilian sector, Britain did not develop a technological base or production facilities for tanks. Although it was true that many items for motor vehicles and tanks were similar in design and development, in the case of large tank engines civil law actually hindered its development. A law taxing large horsepower engines in automobiles provided a negative incentive for production of larger engines. Lack of a large horsepower engine was the major problem experienced in the production of reliable tanks throughout the interwar and most of the war years. Rolls Royce did not manufacture a 600 horsepower engine until 1944.[21]

Although far from a complete discussion of the external environment, these were the primary external factors that affected the creation of armored forces. While these factors caused difficulties for the tank pioneers, this was only a partial picture of the environment.

The internal environment was the other portion of this picture. Significant in this environment was three

institutions which hindered change, a fourth which aided change and some armored and mechanized experiments. The institutions which hindered change were the regimental system, the branches of the Army, and the war office bureaucracy. The institution which aided change was the staff college. Armored and mechanized experiments tested ideas and were an important part of armored force development.

Extreme parochialism existed throughout the officer corps because most officers spent a large part of their career in an environment which fostered a narrow outlook. The regimental organization was one of the institutions responsible for this parochialism. Each regiment was a major source of the young officer's military education. The scope of this education was limited, and it did not encourage a professional outlook in its officers. Once an officer had been in a regiment for several years, it was difficult for him to accept new ideas. The regiment so dominated its members lives that it represented the antithesis of change.[23] This system hindered the acceptance of ideas about mobile armored warfare during the interwar years.

Another problem that occurred with a return to the regiment as the basic unit after World War I was the

disbanding of all higher level organizations of Armies and Corps. The Army's command and staff skills atrophied, but more importantly the Army lost the extended loyalties which these organizations created. Loyalty focused on the regiment or in many cases the battalion because the entire regiment was rarely stationed in one location. While only the cavalry and infantry adhered to the regimental system, this was the bulk of the Army.[22]

A final problem with the regimental system was that regiments were not organized for modern war. They were not a modern tactical entity, and the organization was based on a single arm. This hindered the development of combined arms doctrine. Tactical techniques and procedures that the infantry and cavalry regiments developed and practiced were for a single arm. Since the regiment was a closed society and resistant to change, cooperation between infantry, armor, artillery and the other support arms did not automatically occur when they were placed together in the same division. The limitations this imposed upon the development of the armored division are obvious.[24]

The second institution which added to the parochial outlook of the officer corps was the branch system. Of course, the branch system was not unique to

the British Army. Branches were a part of all modern armies, and they all contended with branch parochialism to varying degrees. In the British Army, however, this problem, added to those of the regimental system, meant the consideration of many more interest groups when making changes. Without an individual or group in the Army to set organizational goals or priorities; all of these separate groups operated in their own best interests.

During the interwar years, the Army's branches all developed and fought for their own initiatives. Several doctrines for the tank forces resulted from this parochialism. The infantry, Royal Tank Corps (RTC), and cavalry all had different ideas on the role of armored forces in battle.

To the infantry, the tank's primary purpose was as an infantry support weapon while for the RTC it was to conduct independent armored missions. Since the infantry branch was more well established in the Army hierarchy, the Army gave priority in tank design before the war to the development of a slower, more heavily armored tank. This design supported the infantry doctrine for the use of armor.[25]

The cavalry fought for its existence as it did in many armies. In the British Army, they survived and

became armoured cavalry regiments. Not only did they maintain their regimental names, but the doctrine they adopted for the light tank regiments was the old cavalry doctrine.[26] A statement by the regimental commander of the 3d Hussars, a converted cavalry regiment provides an example of the cavalry's refusal to adopt a new doctrine.

> Every effort has been made to keep the tactics of the Mech. Cav. to the principles laid down in Cav. Training Vol. II with the motor vehicle substituted for the horse. The idea has been to evolve Mech. Cav. out of horsed Cavalry as opposed to producing something new.[27]

A later chapter will demonstrate how this failure to adopt new doctrine led to many reckless "cavalry" charges against anti-tank guns during the early years of World War II.

Only the zeal with which the tank corps advocates advanced their ideas allowed the formation of a separate armored force. The Army organized one armored division before the war; however, its organization was almost entirely pure tank units. There were six tank battalions and only one infantry battalion in the division. The narrow outlook of the branches prevented the formation of

a true combined arms organization (see appendix one for the organization of this division).

Also a decision to modernize the more traditional branches at the expense of the fledgling Royal Tank Corps (RTC) delayed the establishment of even this one armored division . Priority was given to the motorization of infantry, artillery and support arms instead of expanansion of the RTC. This hurt the development of tank production and had serious repercussions when the Army tried to increase tank production after the war started. A more serious problem for industry was the requirement to design and produce three different types of tanks at the start of the war. This requirement existed because of the failure of the infantry, cavalry and tank corps to agree upon a common doctrine.[28] Later chapters will discuss the growth of these divergent doctrines and their subsequent impact upon armored force development in World War II.

The third institution which hindered change in the British Army was the War Office bureaucracy. This large organization directed and controlled all Army activities and expenditures. The Army Council, a group of eight men, directed War Office activities.[29] Because the Army Council was organized along functional lines, each

military member of council had autonomous control of his department and often initiated programs without regard for its effect on the Army as a whole. This rather narrow outlook at the highest level meant that the War Office was unable to give the Army a common direction or set of priorities. No one individual directed changes in the Army through the War Office, and the Army Council met too infrequently as a group to consider Army-wide goals.[30]

The nominal head of the Army was the Chief of the Imperial General Staff (C.I.G.S.); however, he had little direct power over the other members of council. He had direct supervision over certain departments in the War Office, but in Army Council matters, he was an equal among peers with the other military members. His only method to shape the ideas of the Council was through his authority to recommend individuals for the other military positions on the Council when a serving member's term expired. Eventually, he could hope to have men sympathetic to his own ideas on the council; however, most men generally pursued an independent course after appointment.

General Sir John Burnett-Stuart's thoughts, found in his unpublished memoirs, on the War Office and the position of C.I.G.S. provide a good description and summary of the problems with this organization.

Burnett-Stuart believed that the War Office Staff was top-heavy, dealt with details that the commanders could have handled, and was out of touch with the Army..This was particularly true of civilian staff members who never came into contact with the soldiers or commanders outside the War Office. Additionally, the C.I.G.S. was only a member co-equal with the other military members of the Army Council not a real military head of the Arm. Consequently, the C.I.G.S. had no real power to direct the Army as a commander in chief. His authority was in title only and his single means of gaining acceptance for his ideas and policies was through personal influence. Possibly a more serious problem was that the general officers who commanded the various Army commands were not consulted on Army defense policy matters.[31]

As a concluding comment about the War Office and Army Council Organization, writers and officers at the time were critical of the War Office and the Army Council. They criticized the interwar C.I.G.S.'s conservative nature and lack of forward thinking.[32] When recommending changes to the system or criticizing a particular individual, most failed to consider that many officers arrived at the War Office with a parochial outlook. With this fact remaining constant, no change in

the organizational structure could have made a significant difference. Conversely, if there had been a concensus of ideas and Army-wide values, then the people could have made the organization work. It is true that lack of central direction for the staff was an organizational problem, but individual parochialism at the Army Council and War Office level was the critical problem. The only conclusion that can be drawn from this is that the absence of coherent and unified guidance from the War Office hindered the development of armored warfare concepts.

When WW II began, the Army did not have a concensus on the role of armored forces, and these institutions were the main reasons for this. On the other hand, there were few institutions which aided the development of doctrinal concensus. The Staff College education system was one institution which helped to promote change and develop cohesion across group boundaries, but its impact was limited. Less than ten percent of the eligible officers were afforded the opportunity to attend the staff colleges.[33]

A final internal factor which provided the greatest impetus for armored force development was the training exercises with armored and mechanized units. The British Army conducted these exercises almost annually

starting in 1927. These exercises tested concepts and provided a forum for the propagation of ideas about mechanized and armored forces.

The British Army was the first country to conduct exercises with an experimental mechanized force in 1927-28.[34] After these first two years, there was an annual change of purpose for these training exercises. This lack of continuity was the reason why these exercises never led to a coherent doctrine. Each yearly exercise was not an attempt to build upon previous experiments or to implement the lessons learned from the previous year. Instead, the year's exercise often scrapped the previous year's ideas completely and used the new exercise to develop a competing armored force doctrine. When the Royal Tank Corps was in control, it tested independent armored concepts. During other years, the concept of using the tank as an infantry support weapon was developed. One year was devoted to the testing of concepts for recently converted armored cavalry units. Throughout this period there was little attempt to develop a combined arms doctrine because of the on going struggle for primacy between the infantry, cavalry and tank corps. The Army devoted only one year to the creation of a combined arms, armored and mechanized division.[35] The

next chapter will discuss more completely the importance of these exercises in the development of British armored doctrine.

This concludes the discussion of the environment in which the British armored forces developed throughout the interwar period. The external factors generally caused confusion. They prevented the development of a national strategy which would support the creation of large armored forces. Also, the economic constraints of the period further limited the emphasis armored forces could receive. Most importantly the combined effect of these factors added to the problems the British Army had in developing a coherent doctrine for armored forces. Even without the external conditions which faced the British Army, a consensus for armored force employment was not likely, given the internal environment. The Regimental system superimposed over the Branch system caused most officers to develop a narrow focus and prevented the growth of cohesion across these primary group boundaries. This parochialism limited the Army's ability to set organization-wide goals and adapt new ideas. Because of the War Office structure, there was no organization which provided a common direction or a rational process of change for the Army. Structural or

organizational changes would have produced limited results, however, without a corresponding growth of a concensus toward the use of armored forces among the Army leadership.

Under this framework, leaders labored to produce armored force doctrine. As previously noted, several doctrines emerged and created even greater confusion. From this doctrinal confusion, organizations and weapons were developed which highlighted this lack of concensus and coherency. Doctrine development and the key role that individuals played in the process is the subject of the next chapter.

ENDNOTES

1. Brian Bond, British Military Policy Between the Two Wars (Oxford: Clarendon, 1980), pp. 2-12.

2. Shelford Bidwell and Dominick Graham, Fire-Power: British Army Weapons and Theories of War, 1904-1945 (London: George Allen and Unwin, 1982), p. 150. Harold R. Winton, "General Sir John Burnett- Stuart and British Military Reform, 1927-1938" (unpublished Ph.D. thesis, Stanford University, 1977), pp. 472-474.

3. Continental commitment refers to the commitment of forces to the main continent of Europe. Many people thought this strategy was incorrect. The desire to avoid a continental commitment arose because of the tremendous cost of WW I in terms of human life and financial resources. Many people in Great Britain wanted to ensure that such a disaster did not occur again. Their argument was based upon their interpretation of traditional British strategy. This strategy called for the application of naval power to blockade the enemy and support allies without the commitment of large numbers of Army forces. They believed that naval supremacy allowed the British to interject the British Army at the critical point and time in war. In this way a small force could be used with decisive influence on the outcome. The continental commitment of WW I had tied the British Army to a continental land power's strategy. This was to be avoided at all costs.

Others refute this argument and maintain that the traditional British strategy is to keep the balance of power and to deny the occupation of the channel ports and low countries by a hostile power. This requires preparedness to intervene on the continent with British forces. This commitment is complementary to and not an alternative to the maritime strategy. See Bond, pp. 1; 7-8.

4. Minutes of Cabinet meeting 23/15, 15 August 1919 as quoted by Bond, pp. 24-25.

5. Bond, pp. 81-82.

6. Bidwell and Graham, p. 150.

7. Bond, p. 253.

8. Bond, pp. 257-258. Michael Howard, The Continental Commitment: The Dilemma of British Defense Policy in the Era of the Two World Wars (London: Temple Smith, 1972), pp. 96-116. Michael Howard's book provides an excellent discussion of the effects that the low priority for the continental commitment had on Army budgets from 1932-1938.

9. The Cardwell system was established in the 1870's through a series of reforms due to problems experienced during the Crimean War, and this system was continued after WW I. Originally, the reforms were aimed at satisfying the need to have a large portion of the British Army overseas as well as the need to establish an Expeditionary Force and Reserve. An appropriate balance between home and overseas forces was established at that time. Home forces provided replacements for overseas units and there was a periodic rotation between overseas and home through a regimental system. At all times a portion of the regiment was stationed overseas and the remainder was stationed at home. The problem with this system was that it was impossible to maintain the balance of units during times of crisis such as the Boer War or the expanded commitments after WW I. During these periods, units at home found it difficult to maintain replacements or to conduct proper unit training. They were often no more than understrength training battalions for the units overseas. See Bond, pp. 99-100.

10. John Frederick Charles Fuller was the leading proponent for armored forces immediately after World War I. Most of his service during the war was with the Royal Tank Corps in France, and he later became well known for his views on armored warfare throughout the Army. While he was dedicated to the formation of a permanent Royal Tank Corps, he was also concerned with reform of the British Army in general. He believed that many of the Army's problems during World War I were a result of poor leadership and that only major changes to British Army institutions could correct these leadership deficiencies. For an excellent biography of J. F. C. Fuller with a detailed analysis of his contributions see Brigadier John Anthony Trythall, "Boney" Fuller: Soldier, Strategist and

Writer 1878-1966 (New Brunswick, New Jersey: Rutgers Univ. 1977).

11. Bond, pp. 98-103.

12. Winton, pp. 476-477.

13. Ian Hay, Arms and the Men. The Second World War, 1939-1945 (London: His Majesty's Stationery Office, 1950), p. 58. Bond, pp. 32-33.

14. Bond, pp. 14-20.

15. Norman Gibbs, "British Strategic Doctrine 1918-1939," in The Theory and Practice of War, ed. Michael Howard, (Bloomington, IN: Indiana University, 1975), p. 195.

16. M. M. Postan, D. Hay and J.D. Scott, Design and Development of Weapons, Studies in Government and Industrial Organisation (London: Her Majesty's Stationery Office, 1964), pp. 304-305.

17. Postan, Hay and Scott, p. 239. Winton, pp. 500-501 (Appendix 4).

18. B. H. Liddell Hart, The Memoirs of Captain Liddell Hart (London: Cassell, 1965), I, 260.

19. Michael Howard, pp. 114-115.

20. Winton, pp. 465-466.

21. G. MacLeod Ross, The Business of Tanks, 1933-1945 (Infracombe, UK: Arthur H. Stockwell, 1976), pp. 69-71.

22. Bond, pp. 37-38.

23. Bond, pp. 56-62. Correlli Barnett, The Desert Generals (Bloomington, IN: Indiana Univ, 1982), pp. 103-106.

24. Bidwell and Graham, pp. 193-196.

25. Postan, Hay and Scott, p. 310.

26. Giffard LeQ. Martel, Our Armoured Forces (London: Faber and Faber, 1945), pp. 50-51. Barnett, p. 106.

27. This is from a report by LTC Grubb from War Office Papers 32/2847 as quoted by Winton, p. 379.

28. Barnett, pp. 106-107. Bidwell and Graham, pp. 214-215. Bond, pp. 171-178.

29. The Army Council was composed of four civilian and four military members; The Secretary of State for War, Parliamentary Under-Secretary of State, Financial Secretary, Permanent Under-Secretary, The Chief of the Imperial General Staff, Adjutant-General to the Forces, Master-General of the Ordnance, and Quartermaster-General. Each member was responsible for specific activities or functions similar to a department head. While they were to coordinate their activities, this was usually done informally between the members concerned. Since the Council met so infrequently, the Permanent Under-Secretary had an important role. He was secretary to the Council and was the coordinating link between the Secretary of State and all departments in the War Office. During General Milne's seven year reign as C.I.G.S, the full Army Council met formally only 31 times; however, during times of crisis, they met informally at least once a day. See Bond, pp. 42-43.

30. Giffard LeQ. Martel, <u>An Outspoken Soldier: His Views and Memoirs</u> (London: Sifton, Praed, 1949), pp. 330-331. Bond, p. 43.

31. General John Burnett-Stuart's unpublished memoirs as quoted by Bond, p. 39. General John Burnett-Stuart was a progressive general officer who had considerable influence over modernization in the Army during the interwar period. For an account of Burnett-Stuart's contributions see Harold R. Winton's unpublished Ph.D. thesis.

32. See Martel, <u>An Outspoken Soldier</u> pp. 330-333, 370-374 (Appendix IV), Liddell Hart, I, 122-123, 193; II, 51-61, and J.F.C. Fuller, <u>Memoirs of an Unconventional Soldier</u> (London: J. Nicholson and Watson, 1936), pp. 360-386 for critical comments about the War Office. Also see Winton, pp. 467-469 for a balanced account of the interwar C.I.G.S.'s accomplishments. Bond, pp. 41-44.

33. Bond, p. 62.

34. The reasons for the British lead in this area are the legacy of World War I and the circumstances surrounding the development of the Royal Tank Corps after the war. Because of British experimentation and employment of tanks in WW I, they had a corps of officers advocating armored forces, an armament industry capable of producing and designing tanks, and a concept on the use of armor in battle. Their experience with tanks in WW I was greater than any other nation. It is quite possible, however, that the British would have lost these advantages if not for the work of J. F. C. Fuller and a few other advocates immediately after the war. A case can be made that Fuller was largely responsible for the establishment of the independent Royal Tank Corps in 1923 thanks to his zeal, energy, pen and well placed position in the War Office. These circumstances are the background which generated enough interest, as well as controversy, in the British Army to lead to these experiments in 1927-28. See Trythall, pp. 75-96 and Lieutenant-Colonel Giffard LeQ. Martel, In the Wake of the Tank: The First Eighteen Years of Mechanization in the British Army (London: Sifton, Praed, 1935), pp. 80-99. Bond, pp. 127-137.

35. In 1929 and 1930, all armored units were attached to the infantry to practice the use of armor in close support of infantry. In 1931, the armored units were grouped together to form a tank brigade in order to develop independent armored operations. In 1935, the exercise employed converted cavalry units in light tanks to allow these units to develop armored concepts. Only in 1934 was an exercise designed to develop a combined arms division using motorized, mechanized and armored units. These exercises are discussed in greater detail in the next chapter. See Bond, pp. 150-151 for an understanding of the 1929 exercise; see Martel, An Outspoken Soldier pp. 66-67 for a description of the 1931 exercise; and see Winton, pp. 347-366 for the 1934 and 1935 exercises.

CHAPTER 3

"THE VISION"

DOCTRINE DEVELOPMENT 1926-37

Doctrine is the collection of ideas which men use to determine how to organize units and weapons systems for battle. During peacetime it is the vision of how to fight the next war. Doctrine is the intellectual framework around which an army develops its military forces. This notion is the ideal case, however, for only in an abstract, theoretical model will the complete doctrine precede the weapons or the organization. Still, the British Army designed its armored weapons and tactical organizations around a tactical doctrine. The problem for the British was that several competing doctrines developed because there was no agreement over the vision for the next war.

Doctrine exists in two forms; written and practiced. The practiced doctrine is the most important because this is what the army will execute. All doctrine flows from men's ideas, and experiences shape their ideas. World War I, peacetime training, and their military education were the experiences which shaped the ideas of

the British officer corps. Military education for the officers came from their branch, their regiment, staff colleges for a few, and the influence of fellow officers.

There were few experiences or institutions in the peacetime environment which promoted concensus building among the officer corps on the use of armored forces. The last chapter described an environment that was not conducive to the creation of armored forces because of the pervasive Empire defense commitments and the austere military budgets. Regardless of these barriers, the British Army not only created armored forces but was the leading practitioner of armored warfare for the first 15 years after World War I.

There were several reasons for this. Although not all British officers saw the tank employed in World War I, the British experience was extensive enough to have developed a fledgling tank industry,[1] a concept for the employment of tanks, and a group of armor advocates.[2] Most importantly, the advocates kept the Army interested in the tank immediately after the war. The advances in armored warfare made during the war would have been lost without the work of these few men. The most influential advocates were J. F. C. Fuller and B. H. Liddell Hart.[3] Liddell Hart had no wartime experience with the tank and

did not begin to advocate armored and mechanized concepts until 1921. Fuller, therefore, deserves the major credit for the formation of The Royal Tank Corps as an independent branch of service in 1923. During the period immediately following the war until 1926, Fuller had a significant influence upon what other officers thought about armored warfare. His ideas, however, out paced both the development of the tank and the doctrine which more conservative members of the Army were willing to accept. Fuller could not countenance the resistence he encountered within the War Office, so he became more radical in his demands for change. At some point during this period, Fuller became less effective because his abrasiveness alienated too many important officers.[4]

By 1923, the British Army had an independent armored organization and a new tank, with the most advanced design in the world.[5] The Army also had a number of tank advocates providing leadership and direction for the fledgeling corps. While these were certainly positive accomplishments, a divergence over the doctrine for the employment of tanks soon became apparent.

Brian Bond, in his book British Military Policy between the Two World Wars, places the officers of the British Army into five categories during the interwar

years. This categorization is useful to demonstrate the divergence of opinion that existed in the Army over the tank's role and mechanization, in general. These groups were far from homogeneous on other issues which faced the Army and even officers in the same group might have differences over a particular aspect of armored force development. Ideas of individual officers continued to change throughout the period and this allowed for some mobility between the groups. Only members at the opposite ends of the spectrum tended to remain constant in their views.

At one end of the spectrum were the revolutionaries. J.F.C. Fuller was the group's original leader. Their central premise was that the tank would dominate future wars while the other branches would provide support on the battlefield in an auxiliary role. While a relatively small group, their influence over the Royal Tank Corps (RTC) was great. Other members of this group included Colonel C. N. F. Broad, Major Frederick A. Pile and Major Percy Hobart. All three were general officers during WW II and the role they played in the development of armored forces will be described later.

Next was the category of reformers. They believed in a complete change in tactical doctrine from WW I, but

were willing to work within the system to achieve it. Recognizing what was possible based on circumstances, they were willing to accept more gradual change than the revolutionaries. While believing strongly in mechanization and tank forces, they favored a combined arms organization and doctrine. Unfortunately, in the course of armored force development, the revolutionaries and reformers often worked at cross-purposes. Two important members of this group were Major Giffard Martel and Colonel George M. Lindsay. Both became general officers, but only Martel contributed anything during WW II. Lindsay's career effectively came to an end as a result of the 1934 Army exercise.[6] Their specific contributions will be discussed later.

A third category of officers was the progressives. This was a rather large group of thinking officers who believed in change, but worked primarily within their own branches or area of expertise. Their WW I experiences caused them to seek changes in the Army. Some of these officers were converted to mechanization during the late 1920's, but they were never as enthusiastic as the revolutionaries. A number of relatively junior officers during WW I who rose to high command in WW II were in this

category. Field-Marshal Bernard L. Montgomery was the most famous member of this group.

After the progressives was the category known as conservatives. Although not entirely opposed to mechanization, they disagreed with the creation of independent armored formations. For this group, the most important use for the tank was as an infantry support weapon. The limitations and vulnerabilities of the WW I tanks constrained their ideas about the tank's future role. Their vision of the next war was a continuation of WW I. They failed to see that a different form of warfare was possible with armored forces.

The final group was the reactionaries. Totally averse toward the idea of mechanization, they remained convinced that cavalry would play an important role on future battlefields. How influential this group was in the interwar army is open to question, but they were probably not a very large group.[7]

This description provides a complete spectrum of ideas about mechanization and armored forces found in the prewar Army. This mix of ideas led to confusion in doctrine and no group achieved a clear concensus for their ideas.

These five categories were certainly not unique to the British Army. An analysis of almost any army at the time would probably reveal these same categories or something similar. The British Army never resolved group differences because a high-level unifying organization was absent most institutions in the Army promoted parochialism.

As early as 1924 the effect of several of these groups in doctrine development became evident. Written doctrine for the British Army was found in the Field Service Regulations (FSR), Volume II, Operations. The official doctrine in 1924 clearly recognized the requirement for combined arms. The following statement is from that manual:

> The full power of an army can be exerted only when all its parts act in close combination, and this is not possible unless each arm understands the characteristics of the other arms. Each has its special characteristics and functions, and is dependent on the co-operation of the others[8]

There are numerous other passages in this regulation which support this idea. Not everyone accepted this doctrine. Liddell Hart's ideas were close to this particular aspect of the doctrine; however, his ideas were

more advanced than the intent of the regulation. He envisioned a force in which all arms had the same mobility as the tank. He saw a complementary role between the infantry and armor. Captain Giffard Martel, an officer who served in the Tank Corps during WW I and contributed to the development of armored forces throughout his career, agreed with Liddell Hart's concepts. Martel's and Liddell Hart's ideas were representative of the reformers. J. F. C. Fuller on the other hand, was not in agreement with the regulation or Liddell Hart and Martel. As the leader of the revolutionaries, he advocated the primacy of the tank on the modern battlefield. Infantry forces were necessary only to occupy terrain seized by tank forces and to guard the logistics and line of communications of the tank forces. The struggle between these two groups for control of the Royal Tank Corps will emerge later in the chapter and the results had a significant impact on the development of armored forces.[9]

There was also another aspect of the 1924 doctrine which represented the views of the conservatives. The regulation portrayed the primacy of infantry in its vision of future war. As an example;

> Artillery, engineer and tank units are only effective in conjunction with the other arms, and all their efforts must be directed towards assisting the infantry to secure decisive success.[10]

Later in the manual it stated that the primary role of the tank was "to facilitate the forward movement of the infantry."[11] While not denying the need for tanks on the battlefield, this idea clearly saw tanks in the role of infantry support.

In actual practice the tank battalions did not train with other units until 1925, when the first large exercise since WW I was conducted. The results of this exercise revealed that tanks and infantry were unable to work as a combined team. Clearly the units could not execute what the doctrine stated was a necessity in modern war.[12] Part of the reason for this is found in the 1923 FSR, Volume I, Organization and Administration. It explained that tanks would not be included in the division establishment until they completed the experimental stage. In the meantime, tanks were to be kept at higher levels; Corps and Armies. Since these formations no longer existed after the war, there was no provision for tanks to train with the other arms.[13] The other part of the reason was probably due to the dominance of J. F. C.

Fuller over the RTC, and he had little in common with most infantry officers on the subject of combined armored and infantry operations.

The climate changed between 1925 and 1927 to allow the creation of an experimental force for the purpose of testing armored and mechanized concepts. Fuller and Liddell Hart advocated the creation of such a force and gained support for their ideas through their writing and lectures. Winston Churchill, Chancellor of the Exchequer, was willing to support the development of a new type force even though he was charged with curtailing government spending. He had supported the development of tank forces during WW I and was aware of Fuller's ideas. There was a new Secretary of State for War, Sir Laming Worthington-Evans, who attended the 1925 exercises with Fuller and subsequently recommended the establishment of a small experimental mechanized force in his 1926 Army Estimates speech to Parliament. Finally, General Milne was the new Chief of the Imperial General Staff (C.I.G.S.) beginning in February, 1926, and he expressed support for the force to Liddell Hart. To signal his resolve for modernization, he selected Fuller as his Military Assistant apparently after a suggestion from Liddell Hart.

The support of these personalities led to the creation of the Experimental Mechanized Force in 1927.[14]

The year 1927 marked the British Army's first serious attempt to create an armored force after World War I. J.F.C. Fuller was initially appointed to command the Experimental Mechanized Force; but due to a disagreement over the scope of his duties as commander, he tendered his resignation. Although he later withdrew his resignation and remained in the service until 1933; he did not command the experimental force. After this affair his contribution to the development of armored forces was insignificant during the remainder of his career.[15]

Even after Fuller received a different assignment, the storm over the mechanized force did not end. The appointment of Colonel R.J. Collins, a rather conservative but experienced infantry officer with no previous association with mechanized forces, to command the infantry brigade at Tidworth Garrison caused further furor. When Liddell Hart heard of this appointment, he became suspicious that the War Office was backing away from its decision on the mechanized force since no mention of it appeared in Collins' assignment order. He wrote an article which caused the Secretary of State to conduct an investigation. Shortly afterwards, in May 1927, Colonel

Collins appointment as commander of the Experimental Force and the 7th Infantry Brigade was published. The force finally formed after a lengthy period of bureaucratic delay. The War Office's inability to provide direction to the Army was a major cause of delay.[16]

Although the experimental force did not have Fuller as its commander, there were a number of officers present who would continue to influence the development of armored forces. The commander of the engineer company was Major Giffard LeQuesne Martel. He had been a member of the Tank Corps during WW I; and although after the war he returned to the Royal Engineers, he continued to take an active interest in mechanization.[17]

Another individual who soon achieved considerable notoriety in the Royal Tank Corps was Major P.C.S. Hobart. He had joined the Royal Tank Corps branch when it was first founded in 1923. Major Hobart commanded the light tank element of the force.[18]

A third member was Lieutenant-Colonel Frederick A. Pile who commanded the reconnaissance group of which Major Hobart's light tanks were a part. He was a member of the RTC and demonstrated his talents through the excellent manner in which he led his reconnaissance group during the exercises.[19]

There were two other men present as observers who would have a substanial impact on mechanization and armored force development. Their names were Colonel George M. Lindsay, serving as Inspector of the RTC, and Colonel Charles N.F. Broad who became a member of the RTC in 1923. Colonel Broad was Deputy Director of Staff Duties in the War Office. Broad and Lindsay took extensive notes throughout the exercises of 1927 and 1928.[20]

Officially, the purpose of the force was two-fold. They were to discover through practical application the effect of mechanization on the organization, and how to tactically employ mobile forces.[21] To achieve these objectives the force had three roles to play during the exercises. They were to perform strategical reconnaissance, to conduct operations in cooperation with regular forces, and to conduct independent operations for a period of up to 48 hours.[22]

The exercises were not a great success. First, Col. Collins was probably too conservative in his employment of the mechanized force. His plans failed to take advantage of mobility, and he appeared too concerned with security. A second problem was the disparity in mobility between the different types of vehicles in the

force. Collins attempted to place the vehicles into three groups based on road speed; fast, medium and slow. Unfortunately, this grouping did not correspond to cross-country mobility.[23]

Another problem was the high visibility of these exercises, and this kept the participants from having a free hand over the training scenarios. This was particularly true of the second year when part of the time was spent preparing and conducting demonstrations for Staff College students and Members of Parliament. However important and necessary this was to gain support for armored forces, it still took valuable time away from the development of mobile warfare concepts.[24]

A third problem was the lack of experience on which to build such a combined arms force. To further aggravate this problem, the force was assembled just prior to the start of the first year's exercises, and insufficient time was provided to develop unit operating procedures. Consequently, when the exercises began, considerable time was devoted to learning how to control the movement and plan the logistics for such a heterogeneous force rather than its tactical employment. Lack of imagination on the part of the commander may have

contributed to this, but even a more resourceful commander would have faced severe difficulties.[25]

Finally, these exercises pointed out a need for better equipment. The requirements included; a faster, more heavily armored light tank, better infantry transport with cross-country mobility, a better infantry anti-tank gun, and self-propelled artillery. Officers, like Major Hobart, saw the need for every armored vehicle to have a radio. Also, the Vickers medium tank was becoming obsolete.[26]

The final reports of Col. Collins and General Burnett-Stuart both recommended further trials for the next year. General Burnett-Stuart, who was the conventional force commander, had become a supporter of mechanized and armored forces.[27] He hoped that more maneuver space could be found for next year's exercise in order to fully test the capabilities of the armored forces. Not everything he hoped for was accomplished during the year, and he believed that confusion remained in the tank battalion over the correct procedure to advance when given an independent mission. He recommended some changes in organization for 1929 which would allow the force to achieve it full potential. Notably these changes included the separation into a long range

reconnaissance group amd a main body, the addition of a Royal Air Force-Army Co-operation squadron, self-propelled artillery and an infantry battalion in armored vehicles.[28]

Regardless of these recommendations, General Milne disbanded the force at the end of 1928. Branch parochialism eroded the support for the exercises and was a major reason for their discontinuance. Because the exercises were a test or experiment rather than a training exercise, won or lost became important. The Commander in Chief, Southern Command, Montgomery-Massingberd, feared that the exercises had demoralized the infantry and cavalry. As the commander of all forces in the 1928 exercise, he gave part of the tank and mobile forces to the conventional force, and he required the reconnaissance tanks to work with a cavalry brigade. This negated some of the tank's mobility, and the umpires judged the 1928 exercise a draw to the chagrin of armored force enthusiasts. Montgomery-Massingberd's influence over the C.I.G.S. was considerable and in his opinion;

> What was wanted was to use the newest weapons to improve the mobility and firepower of the old formations...What I wanted, in brief, was evolution not revolution...I discussed this question very fully with Lord Milne who was then C.I.G.S. and as a result

> the "Armoured Force" as such was abolished and a beginning was made with the mechanization of the Cavalry and Infantry Divisions.[29]

Montgomery-Massingberd's views coincided with the conservatives. His vision of the next war was one in which tanks would support infantry and cavalry divisions. Since he later became C.I.G.S. after Milne, his vision had a profound affect on future doctrine and the condition of armored forces at the start of WW II.

Even supporters of armored forces agreed with the decision to abandon the experiment which again showed the effects of branch parochialism. Colonels Lindsay and Broad believed that the force required a more imaginative commander. They of course wanted a tank corps officer to command the force.[30]

With the loss of support from officers on both sides of the issue, Milne lost his zeal to reform the Army. Although Milne's initial impression suggested that he would push for modernization, he did not have the strong will required for his position. He lacked experience in the War Office and was unable to gain the support of the other military chiefs on the Army Council.[31]

General Milne's plan was to disperse the Experimental Armoured Force for one year, but it was three years before a brigade sized armored force conducted an exercise. The loss of momentum was critical, and because Burnett-Stuart's recommendations were ignored, the possibility of producing a combined arms force was lost. The next experiment in 1931 was an all tank force.

With the dispersal of the Experimental Armoured Force, the development of armored forces slowed, but doctrine and ideas continued to evolve. A new Field Service Regulation was published in 1929, and the influence of the 1927-28 exercises on the manual is apparent. The manual contains a description of a combined arms attack with armored forces. This description notes that reconnaissance units must select the best routes to take advantage of the force's mobility and firepower. The manual states the need to use tanks in mass, to support their attack with aircraft in order to suppress anti-tank weapons, and to provide artillery covering fire and smoke. Most importantly, the manual declares that close liaison between tanks and infantry is critical. It states that infantry must provide information, suppress anti-tank weapons and take over ground quickly for tank forces.[32] This doctrine was close to the methods that successful

armies used in WW II; however without a force to develop these ideas, British Army units were never able to execute this doctrine. This is a clear example of the difference between written and practiced doctrine.

The FSR was not the only written doctrine published in 1929, the War Office also published the first official manual on mechanized warfare. While the FSR was not an attempt to look into the future and still had many sections which sounded like WW I, the manual entitled Mechanized and Armoured Formations was a futuristic document. The document's author was Col. Charles N. Broad, a member of the RTC. He had been an official observer of the 1927-28 mechanized experiments for the War Office while serving in the capacity of Deputy Director of Staff Duties. The Director of Staff Duties and Director of Military Training worked under the C.I.G.S. in the War Office and were jointly responsible for doctrine. Although officially published, this was not considered doctrine at the time of its publication. However, it later took on the force of doctrine because it had considerable influence on armored doctrine in the 1930's particularly for Royal Tank Corps members.[33]

Although the manual envisioned four types of formations; cavalry brigades or divisions, light armored

attack defensive strongpoints, like most members of the RTC, Broad believed that the anti-tank gun would be relatively ineffective against the tank's mobility. The manual states;

> 3. Furthermore, surprise should result from freedom of manouevre, since the time as well as the place of attack should be at the choice of the attacker. Tactical surprise must, to a certain extent, be vitiated by the noise of the approach, but speed of manouevre on the battlefield, combined with the use of smoke, may prevent anti-tank weapons being moved to the correct locality until it is too late.[36]

At the time Broad wrote this, tanks were relatively invulnerable and anti-tank gun capability was lagging in both gunpower and mobility. Also, as a former artilleryman, Broad probably expected self-propelled artillery to suppress anti-tank defenses in the future, but the British Army did not produce self-propelled artillery until WW II began even though there was a prototype as early as 1925.[37]

A second factor which biased his thinking toward independent tank operations was that the infantry lacked armored carriers and the inability to keep pace with the tanks in maneuvers. did not have armored carriers and could not keep pace with tanks in maneuvers.

brigades or divisions, medium tank brigades, and infantry divisions supported by tanks and other non-divisional troops, he saw the armored brigade as the most powerful formation. The medium tank brigade organization that he described consisted of a headquarters and signal section, a medium tank battalion, two light tank battalions, two close support tank batteries and one anti-aircraft armoured battery. This force was primarily a tank force.[34]

The concept of independent tank operations which became the dominant philosophy of the Royal Tank Corps was apparent in this manual. In his chapter on operations, Broad acknowledged that tank brigades needed to cooperate with infantry under certain conditions and that infantry was actually the stronger force in certain terrain, but he devoted the majority of the space to the discussion of independent tank operations.[35] It is clear that he saw the role of the other arms as auxiliaries to the tank brigade's main offensive power.

Available technology and the 1927-28 exercises shaped Broad's thinking in this manual. First, he failed to recognize the future importance of the anti-tank gun. While he acknowledged that artillery was necessary to suppress anti-tank defenses and that tanks should not

Additionally, most officers in the Royal Tank Corps believed that the differences in the mobility of the many types of vehicles in the Experimental Armoured Force handicapped its performance. The conclusion therefore, was that the tank formation must remain pure to maximize the tank's capabilities.[38] At the time of its writing, many of his ideas were correct, but conditions changed which made independent tank operations untenable.

While most RTC officers adhered to the concepts espoused in this document, most infantry officers did not give the same priority to independent tank operations. They saw the tank primarily as an infantry support weapon, and this debate over the tank's primary role continued to rage for the next ten years. Branch parochialism created this different vision of future war. Since there was not enough money to properly resource both roles, the debate became impassioned. Increases in the Royal Tank Corps, posed a threat to the size of other branches as well as their relative importance on the next battlefield.

Not all supporters of mechanization were in total agreement with Broad's document. Liddell Hart noted that the manual did not stress the potential of strategic thrusts in the enemy's rear to cut communications and supply lines. He also cited its failure to stress the

need for close attack aircraft in conjunction with armored operations. Another criticism was its failure to discuss the possibility of specially trained infantry in armored vehicles as an organic part of the armored force. A final shortcoming that he saw was its failure to stress the shock value of tanks in night attacks.[39] This last criticism was valid because Broad specifically stated in the manual, "the dangers and uncertainties of night attacks are, however, such as not to encourage the use of armoured brigades in them except in special circumstances."[40]

Martel's concern was that Broad's all tank brigade could not cooperate with the infantry in wartime if they did not train together in peacetime, he recommended a different type of mobile formation. He suggested a formation with medium tanks, motorized artillery, and infantry in lorries which would be organic to the same formation. While this was not the ideal formation; it may have allowed the branches to work together to develop a true combined arms doctrine. He later recommended the production of affordable light tanks for training with a medium tank prepared for production when war threatened. In this way enough equipment would be available for training.[41] This was generally the policy that the

Germans followed when they first began to develop armored forces.[42]

In fairness to Broad, however, this was a far-sighted document which saw the importance of armored formations and their capability to restore maneuver to the art of war again. It was certainly the first document of its kind and preceded the actual formation of the tank brigade. Broad discussed in his preface how the lack of money precluded the immediate formation of such forces, but that this did not preclude officers from thinking about their employment. He also made allowances for the future when he admonished officers to keep "an open and flexible mind."[43]

From his position in the War Office, Broad attempted to develop forces to fit his doctrine. He planned the formation of four armored brigades as set forth in his manual. General Milne thought the forces might become available because the War Office might disband the infantry division recently redeployed from the Rhineland allowing a reduction of 12 infantry battalions. Broad recommended the implementation of his plan over a five year period and reduced the tank strength in the brigade from its wartime strength of 150 tanks to a peacetime establishment of 89 tanks. This eliminated the

need to buy any medium tanks since the proper number of these tanks already existed in the Army's four tank batallions. The purchase of 200 light tanks at L2000 each was considerably less than the purchase of new medium tanks at L16000 each. This program was to begin in 1930, but due to lack of support and money it was not included in the budget estimate. By 1931, the effects of the depression in America hit Great Britain and forced the War Office to cancel the idea completely.[44]

Broad's tour in the War Office ended in 1931, and he took command of the tank brigade which was formed for the exercise in 1931. Three of the Army's four tank battalions formed this tank brigade, and for the first time all forces participating in the exercise had tracked vehicles. Broad's objective was to produce units which could move rapidly and independently. This apparently took considerable training because prior to this exercise, the battalions' only had experience in movement with infantry as single battalions. The final exercise which was an unrehearsed demonstration for the War Council was impressive. The exercise was a success, and the all armored doctrine was firmly established even though the tank brigade did not become a permanent formation until 1933.[45]

British armored forces made no real advances between the end of the 1931 exercise and the start of the 1934 exercise. During the period 1931-34, the armored forces languished due to a lack of new initiatives and more importantly, a lack of money. The Army Estimate for 1933 increased by L1.5 million to L38, but there was no appreciable increased expenditure for mechanization. The estimate for vehicles was L885,000 as opposed to L820,000 from the previous year. Of this amount, only L348,000 was spent on tracked vehicles. In 1934 the estimate for vehicles climbed to over L1 million, but this estimate still was not as large as the estimates in either 1928 or 1929. At the end of this period the British Army was no longer the world leader in armored forces.[46]

General Sir Archibald Armar Montgomery-Massingberd became C.I.G.S. in 1933, and he agreed to an exercise in 1934 which would combine the mechanized 7th Infantry Brigade and the Tank Brigade to test a "Mobile Division" concept. Thus the 1934 exercise became an opportunity to work out the doctrine and organization for a new type division. Final results of this exercise were a disappointment and possibly delayed the actual establishment of the division.

While personalities entered into the outcome, the exercise brought into focus the lack of concensus on the use of armor within the RTC. Major-General George Lindsay, who commanded the mechanized 7th Infantry Brigade and the overall "Mobile Force" for the exercise, was previously identified with the group labeled, reformers. He was a moderate and his idea was for a combined arms mechanized force. The commander of the Tank Brigade was Brigadier P.C.S. Hobart who was a disciple of the pure armored concept. He was a direct descendent of Fuller's and Broad's ideas within the RTC. Like a true "revolutionary," he was uncompromising. The basic disagreement between Lindsay and Hobart was that the former saw a distinct function which directly contributed to the tactical mission for all troops in the division, while the latter saw all other formations in the division as auxiliaries to the tank brigade.[47]

The differences in personality intensified the disagreement between the two individuals. Lindsay spent too much effort trying to accommodate both Hobart and Burnett-Stuart when developing his plan. Hobart, on the other hand, was strong-willed. How much Hobart's dominant personality affected the outcome of the exercise is not clear. There is some question whether Hobart's actions

during the exercise were a result of his disgust with unrealistic umpire decisions, or his unwillingness to cooperate with Lindsay in a plan with which he did not totally concur.[48]

This exercise destroyed Major-General Lindsay's career, although he served several years in India before retiring in 1939. He lost all influence in the RTC and the Army lost an officer who believed in combined arms. Whether or not he had the will or strength of character to affect true reform is debatable, but with his sound tactical ideas, his influence on others would have benefited the Army.[49]

The individual in charge of the 1934 exercise was General John Burnett-Stuart, recently returned from Egypt where he had been commander of troops. He was now the commander of Southern Command, and he took an active part in the 1934 exercise. In Egypt, he had designed and controlled his own exercises, often handicapping the mobile forces to force the commander to develop innovative solutions. He was not concerned with results as much as with lessons learned. He planned to do the same with the 1934 exercise and designed it to show the weaknesses of the tank brigade, but he overestimated his control over the situation. In Egypt he could always temper the

results with his comments, but in Britain the exercises drew too much outside attention from the press, military observers and other senior officers for him to limit the impact of the results.[50]

The significance of this exercise was the damage that it caused to armored force development. Publicity for this event was considerable, and the conclusion of the press was that a conventional infantry division and cavalry brigade defeated the new mobile division which the Army was considering. Many senior officers in the War Office and elsewhere believed that the mobile division could not become a major combat force. Some advocated that the mobile division assume the role of the old cavalry division and called for the mechanization of cavalry to form the mobile division rather than an expansion of the Tank Corps. Another concept which assumed priority was the use of close support tanks for the infantry. This meant forming tank battalions and assigning them to infantry divisions rather than forming additional tank brigades.[51]

Different roles for the tank developed because each group in the Army developed a different vision of future war. The vision of Royal Tank Corps members centered around the use of armor as the decisive force in

the next war. As previously noted, this vision was not uniform among all members of the RTC. Those who advocated the all armored concept believed that the tank must be used for thrusts into the enemy rear to destroy headquarters and lines of communication. They saw speed as the essential factor. The more moderate group in the RTC believed that the tank would be dominant, but only in conjunction with a combined arms mechanized force. The 1934 exercise destroyed the support for this group and the advocates of independent tank operations became dominant in the RTC. More conservative officers in the British Army held a vision of future war in which infantry remained the dominant arm on the battlefield. The role of the tank was to support the infantry and heavy armor was the key requirement for the tank. Not surprisingly a large number of infantry officers held this view.

Branch parochialism was a factor in maintaining these differences and not allowing a concensus to develop. As a case in point, Hobart, as the main advocate of this concept, weilded considerable power in the RTC during the mid-1930's because he was both the commander of the Tank Brigade and the Inspector of the Royal Tank Corps. From his position he was able to spread his vision to other members of the RTC.[52]

Failure to achieve a concensus on the vision of the next battlefield resulted in an attempt to accomodate several of the groups in the doctrine. The result of this accomodation was to produce different tanks for a single or specialized role rather than a single tank which maximized gun power, armor protection and mobility and fulfilled a more general mission. Producing several types of tanks required more resources which neither the military budget nor Great Britain's industrial base could support. Limited resources caused further frustration in the competing groups. As an example, the expansion of the RTC meant a reduction in the infantry and threatened the basic belief of the group advocating the primacy of the infantry. All groups became fixed and unwilling to compromise in their ideas.

In 1935, an update of Volume II: Operations was published and it reflected divergence of opinion over the primary role of the tank on the batttlefield. It stated that tanks were designed either for mobile operations in which speed was most important or for close support in which armor was most important. Tanks designed for mobile operations, light and medium, are grouped together to form tank brigades. Light tanks conducted reconnaissance or suppressed anti-tank guns to protect the medium tanks.

Medium tanks provided the offensive power of the brigade. Tank brigades organized with other mobile units would form a mobile division. The tank brigade was to make the main attack for the division while the other formations performed auxiliary roles. These roles included reconnaissance, protection for the tank brigade when at rest, clearance of obstacles, and indirect fire support for the tank brigade. Separate from the tank brigades were Army tank battalions. These battalions, equipped with heavily armored tanks, were responsible for close cooperation with the infantry.[53] The doctrine in this manual expressed what the various groups advocated.

Another doctrinal manual was published in 1935 entitled Field Service Regulations Volume III: Operations-Higher Formations. In both Volumes II and III, the idea of combined arms operations was much less clear than in previous manuals. They placed more emphasis on the use of tank brigades in independent operations, and stated that the combination of different types of tanks could replace the need for combined arms. Light tanks would perform the roles of reconnaissance and suppression of anti-tank weapons in support of medium tanks making a main attack. The use of separate tank battalions equipped

with heavy, slow close support tanks was the only means of cooperation between infantry and armor.[54]

In the 1935 FSR Volume III, the following passage described the main attack in offensive operations.

> In selecting the front for the main attack, he has to consider which portion offers the maximum results,...also which section of the ground best suits the characteristics of his force in combination or of that arm in particular on which he is principally relying, the power of his armoured troops, the skill of his infantry, the weight of his artillery or the mobility of his mounted troops.[55]

While this passage did not rule out the possibility of combined arms, the idea that individual arms could conduct attacks alone was also present. This passage demonstrates the lack of understanding that combined arms action was a requirement for a successful attack on the modern battlefield. Another excerpt from this same manual verifies this lack of understanding.

> The speed at which the operations of a mobile and armoured force will develop will usually preclude any co-ordinated plan for support by other troops. The co-operation of aircraft will be of great value.[56]

This was the doctrine that the Royal Tank Corps practiced. By 1935 the past failures of attempts to combine tanks and other arms during Army exercises reinforced the all armored concepts of the RTC and also influenced the written doctrine. The attempts to develop combined arms were sporadic efforts. Support for a long term dedicated effort to develop these capabilities was never present. The attempts during 1927,28 and 34 were tests of this idea, but failure became inevitable because the units placed together for the exercise had no previous training in combined arms maneuvers prior to the exercises. Those advocates of mechanized combined arms forces failed to vehemently press for acceptance of their concepts.

Finally, the resistance to the use of armor as a major combat force was significant. Other branches refused to cooperate and men like Hobart sought a solution to the problem without their support. Colonel Eric Offord, a loyal supporter of Hobart during this period, corroborates this idea. He states;

> We didn't want an all-tank army, but...what could we do? The infantry were in buses, they couldn't come with us. The artillery were...obstructive. They never put the rounds where you needed them, and when you called, it always came too late.[57]

Written doctrine was now closer to the reality of practiced doctrine. This did not necessarily make it a better doctrine. In fact, it now lacked coherency because it included the ideas of several competing groups. With no single overarching vision behind it, there were actually several incomplete doctrines and these did not change significantly in the remaining years before WW II. A discussion of key policy decisions provides a more thorough understanding of the relative priority of the existing doctrines. These decisions dramatically shaped armored organizations and determined the effectiveness of armored forces at the start of the war.

The first policy appeared in an Army Training Memorandum in December 1934. This memorandum, signed by the C.I.G.S., specified the missions of the Mobile Division and committed the Army to its establishment. The failure of the 1934 exercise to demonstrate that a mobile force was capable of a major combat role influenced the misions outlined in this memorandum. These missions were;

> (1) to perform reconnaissance and protection of the main body during movement.
> (2) to conduct delays, guard flanks, cover withdrawals and be a mobile reserve.
> (3) to conduct an exploitation and pursuit.
> (4) to support the main attack on or close to the battlefield.

(5) to conduct raids.

All of these missions, except number four, were traditional cavalry missions. The division organization included two mechanized cavalry brigades, one tank brigade and divisional troops. (The organization chart for the division is found in Appendix 1). The cavalry doctrine now supplanted the RTC doctrine, and this division was to become a replacement for the old cavalry division. In the minds of many officers, the RTC's armored doctrine was not feasible. The RTC and its supporters had to fight hard to keep the tank brigade in the division organization. For this reason the mission to support the main attack remained as a division mission.[58]

The attempt to include both doctrines in the division missions handicapped the division. While the mission of supporting the main battle was clearly a role for the tank brigade, it was difficult if not impossible for the two mechanized cavalry brigades in the division which were equipped with light tanks and armored cars. On the other hand, using the tank brigade in the other roles was a waste of combat power. Given this dichotomy in the division's organization and missions, it is doubtful

whether it would have fought as a unit. It was more likely to be parceled out to perform different roles.

This division did not become an active formation until late 1937. Considerable controversy raged over its formation. The difficulties of its formation were a direct result of the different doctrines and branch parochialism.. The division never fought as originally organized and it went to France in 1940 redesignated as an armored division. All of this controversy destroyed the combat effectiveness of the British Army's only armored division by the time war began.

The second policy decision occurred in 1935. The C.I.G.S., supported by the Army Council, made it official policy that the Royal Tank Corps would not be expanded prior to the modernization of the traditional arms. The infantry and divisional artillery transport became motorized while the horsed cavalry converted to armored cavalry. The C.I.G.S. made this decision because most officers recognized the growing threat of war and the need to modernize. For most officers their concern was to modernize their own arm; while any interest they had in armored forces declined. There was apparent retrenchment against the expansion of the RTC. Lacking a

spokesman in a position of power on the Army Council, no one properly represented the interests of the RTC.[59]

Within the decision to modernize was a curious mixture of conservatism and progressivism. Unwillingnes to expand the RTC reflects the conservative nature of the War Office and particularly the officers on the Army Council. However, the recognition that the Army needed greater mobility and the decision to convert the horse cavalry reflects a more progressive nature in this same body of men.

More than anything else this reflected confusion over the vision of the next war and thus a confusion in the doctrine. Those members who were in the center of the spectrum of ideas, the conservatives and progressives, were not as settled in their vision of future war as those on the ends.

While most members of the RTC did not begrudge the modernization of infantry and artillery, the decision to provide the cavalry with light tanks rankled them. The main argument of the RTC was that since their branch already had technical and tactical proficiency in the use of armor, the logical decision was to expand the RTC. Some members such as Broad believed the cavalry was too conservative to adapt to a new style of warfare. The main

argument for the cavalry was that since they thought in terms of rapid actions, their branch was ideal for tanks.[60]

The decision to convert the cavalry regiments was probably the only possible solution given the strength of the cavalry's supporters. In the long run it was probably the right decision. Cavalry regiments were already cohesive units, and they could be trained more quickly than newly formed units. More importantly, maintaining these regiments prevented additional strain on the Army's social structure at a time when it was already undergoing significant changes. While the decision was correct, the delay in implementation compromised its effect. The C.I.G.S. wanted a gradual conversion process, and the tanks and other equipment took time to procure because of financial and industrial shortfalls.[61] The result of these constraints was that the conversion of most cavalry units took place just prior to the war and they could not adapt to new concepts in such a short period of time. This decision was important to future armored divisions because the armored cavalry regiments were later merged with the RTC to form one branch. The next chapter will cover this development.

The final effect of these competing doctrines was the requirement for three types of tanks; light, medium and heavy. The type with the highest priority reflected the priority to modernize the infantry. Since each infantry division organization included an Army tank battalion, priority went to the heavily armored, close support tank. In the end this priority was irrelevant because of limitations in Britain's tank production capability. Production of three types of tanks was impossible. This diffusion of effort meant that no tank of any type was produced in sufficient quantities before the war began. Tank design became a greater problem than production, and at the outbreak of war, the only proven design was for the light tank.[62]

In conclusion, doctrine by the mid-1930's was a confused mixture of ideas. The effects of this confusion on the condition of the armored forces at the start of the war were significant. Lack of a common vision of the future battlefield was at the heart of this doctrinal confusion. The Army never developed a concensus about futrue war because of the nature of the Army's external and internal environment. The armored force missions which resulted from the several competing doctrines were incompatible and required the development of different

types of armored forces as well as tanks. The infantry division viewed the tank as a way to enhance its combat power. The cavalry division saw the tank as a replacement for the horse. In both cases, the concept did not envision the tank as a new means of fighting. Only in the case of the RTC doctrine was there a provision for using the tank in a new mode of fighting, and this doctrine was flawed. The reason for the errors in this doctrine was the lack of cooperation between the various branches in its development. Most infantry, cavalry and tank corps officers wanted their individual branch to play a decisive role on the battlefield and this jaded their vision. Few officers saw the complementarity of all arms on the battlefield. Finally, each doctrine demanded a radically different tank design. The light and heavy tanks could only perform in the specific mission for whch they were designed. Only the medium tank had possibilities as a general purpose tank, but a low priority for this design resulted in a mechanically unreliable tank at the start of the war. As succeeding chapters will show the armored forces never recovered from some of the effects of this doctrinal confusion.

ENDNOTES

1. Vickers-Armstrongs was the only private armaments firm which survived the post WW I demobilization that remained capable of designing and producing tanks. This did not change until 1936. M. M. Postan, D. Hay, and J. D. Scott, Design and Development of Weapons, Studies in Government and Industrial Organisation (London: Her Majesty's Stationery Office, 1964), p. 255.

2. For a description of the British WW I armored experience see Lieutenant-Colonel Giffard LeQ. Martel, In the Wake of the Tank: The First Eighteen Years of Mechanization in the British Army (London: Sifton Praed, 1935), pp. 1-53; 69-79. Brigadier John Anthony Trythall, "Boney" Fuller: Soldier, Strategist and Writer 1878-1966 (New Brunswick, New Jersey: Rutgers Univ., 1977), pp. 50-74. There are also several books which describe the Tank Corps in WW I. See J. F. C. Fuller, Tanks in the Great War, 1914-1918 (London: John Murray, 1920). B. H. Liddell Hart, The Tanks (London: Cassell, 1959), I.

3. See Endnotes No. 10 and 34, Chapter 2 for J. F. C. Fuller's contributions to the formation of the Armoured Corps. Captain Sir Basil H. Liddell Hart was instrumental is shaping armored concepts and exercised considerable influence on the Army during the interwar period. He served as an officer during WW I and was wounded during that war. Although he was subsequently forced to retire from the Army because of the wound in 1923, he continued his involvement with the Army as a military correspondent and through his many contacts with military officers. He actively corresponded with many members of the RTC who rose to key positions in that Corps. He and J. F. C. Fuller developed a lasting relationship soon after WW I and were the early leaders in advocating armored and mechanized forces. Liddell Hart also advanced many ideas for the reform of the Army and later, as an advisor to the Secretary of State for War, wielded great influence for a short period of time. See Brian Bond, Liddell Hart: A Study of His Military Thought (London: Cassell, 1977).

4. Brian Bond, British Military Policy Between the Two World Wars (Oxford: Clarendon, 1980), pp. 132-137.

Hereafter cited as Bond. B. H. Liddell Hart, The Memoirs of Captain Liddell Hart (London: Cassell, 1965), I, 91-94. Kenneth J. Macksey, The Tank Pioneers (London: Jane's, 1981), p. 50.

5. The Mark II tank manufactured by Vickers was a remarkable tank for its speed of 20 mph, mechanical reliability, and revolving turret with a machinegun coaxially mounted with the main gun. It served as the main British tank for the next thirteen years and was a model for most tanks of the future. It had a 3 pounder gun, weighed 12 tons and 130 mile radius of action. Its main drawback was its thin armor, .3-.6 inches. See Bond, p. 133. Liddell Hart, I, 95. Martel, Wake of the Tank, pp. 91-92. Macksey, Tank Pioneers, p. 50.

6. The 1934 Army exercise was an attempt to test the feasibility of a mobile division. This was to be a combined arms division comprised of mechanized and motorized units. A type mobile division was eventually formed and was the forerunner of the British armored division. The 1934 Mobile Force exercise and its results are discussed later in the chapter.

7. Bond, pp. 130-132.

8. Great Britain, War Office, Field Service Regulations, Vol. II: Operations (1924) (London: His Majesty's Stationery Office, 1924), p. 12.

9. Giffard LeQ. Martel, An Outspoken Soldier: His Views and Memoirs (London: Sifton Praed, 1949), pp. 50-52. Liddell Hart, I, 90-91.

10. Field Service Regulations, Vol. II: Operations (1924), p. 12.

11. Field Service Regulations, Vol. II: Operations (1924), p. 22.

12. Bond, pp. 138-139.

13. Great Britain, War Office, Field Service Regulations, Vol. I: Organization and Administration (London: His Majesty's Stationery Office, 1923), p. 93.

14. Liddell Hart, I, 99-100. Harold R. Winton, "General Sir John Burnett-Stuart and British Military

Reform, 1927-1938" (unpublished Ph. D. thesis, Stanford University, 1977), p. 103. Bond, pp. 138-139.

15. Fuller was offered command of the mechanized force, but he found this command unacceptable because it included the 7th Infantry Brigade and Tidworth Garrison. Fuller submitted a memorandum to the C.I.G.S. requesting relief from command of the infantry brigade and garrison. He wanted to devote his full energy to the Experimental Mechaniized Force. He further wrote a letter to General John Burnett-Stuart, commander of 3rd Division of which 7th Infantry Brigade was a part, requesting assistance in the matter. Burnett-Stuart wrote a sarcastic letter in reply chastising Fuller for his impertinence. General Milne did not answer Fuller's memorandum, so Fuller submitted his resignation. His resignation caused the C.I.G.S considerable public embarrassment. Fuller committed a grave miscalculation, and the British Army lost its most ardent armored advocate. His imaginative spirit was lost to the Experimental Force. For a full explanation of this affair, see Trythall, pp. 120-144. General John Burnett-Stuart's letter to Fuller as well as an analysis of his actions in this affair is found in Winton, pp. 110-118.

16. The force consisted of the following units: a tank battalion, 2 armored car companies, one light tank company, field brigade; Royal Artillery, pack battery; Royal Artillery, field company; Royal Engineers, signal unit, and infantry battalion. The tank battalion was equipped with medium Vickers tanks of the type first built in 1922. See Liddell Hart, I, 116-117.

17. Liddell Hart, I, 17. Martel Wake of the Tank, p. 149.

18. Kenneth J. Macksey, Armoured Crusader: A Biography of Major-General Sir Percy Hobart (London: Hutchison, 1967), pp. 79, 100-102.

19. Liddell Hart, I, 96-97. Bond, p. 142.

20. Liddell Hart, I, 96. Macksey, Tank Pioneers, p. 75.

21. Liddell Hart, I, 116-117.

22. Martel, Wake Of the Tank, pp. 150-151.

23. Liddell Hart, I, 125-127. Macksey, Armoured Crusader, p. 93.

24. Bond, p. 146.

25. For a balanced and thorough discussion of these exercises, the best source is Winton, pp. 120-153. Martel, Wake of the Tank, pp. 154-169.

26. Macksey, Armoured Crusader, p. 93. Bond, pp. 143-144. In 1928, Vickers had developed a new medium tank, weighing 16 tons, but due to lack of money, it was never produced. This is significant because Vickers never produced another medium tank before WW II, and consequently the British Army entered the war without a mechanically reliable medium tank.

27. Apparently, Lieutenant-Colonel Pile's dynamic employment of the reconnaissance elements throughout the 1927 exercises converted General Burnett-Stuart to this view. His support was important because of the positions he held over the next several years. Burnett-Stuart commanded all British troops in Egypt from 1931-34 and the Southern Command in Great Britain from 1934-38. Egypt had mechanized forces and all the mechanized training exercises came under the Southern Command. See Winton, pp. 132-136.

28. Winton, pp. 156-161. General Milne may not have read or understood Burnett-Stuart's comments. He believed that the armored brigade should be almost entirely a tank force.

29. From Montgomery-Massingberd's unpublished Memoirs as quoted in Bond, p. 147.

30. Liddell Hart, I, 135-136. Winton, p. 167.

31. Liddell Hart, I, 108. Winton, pp. 104-107.

32. Great Britain, War Office, Field Service Regulations, Vol. II: Operations (1929) (London: His Majesty's Stationery Office, 1929), pp. 110-126.

33. Shelford Bidwell and Dominick Graham, Fire-Power: British Army Weapons and Theories of War, 1904-1945 (London: Allen and Unwin, 1982), pp. 174-180. Bond, pp. 152-155.

34. Great Britain, War Office, Mechanized and Armoured Formations (Instructions for guidance when considering their action), 1929 (Provisional) (London: The War Office, 1929), p. 16.

35. Mechanized and Armoured Formations, pp. 16-32.

36. Mechanized and Armoured Formations, p. 27.

37. Liddell Hart, I, 101.

38. Liddell Hart, I, 161.

39. Liddell Hart, I, 161.

40. Mechanized and Armoured Formations, p. 36. To evaluate how much influence this manual had on future armored divisions is difficult, but an example from the initial campaign against the Italians in Africa may shed light on this issue. The commanding general of British forces became upset when the 7th Armoured Division, one of the original armored formations, missed several opportunities during the campaign. The division was unaccustomed to night operations and failed to conduct several night attacks, allowing Italian forces to slip away. Whether or not this can be tied directly to this manual is open to debate. See Barrie Pitt, The Crucible of War: Western Desert 1941 (London: Jonathan Cape, 1980), I, 162, 169.

41. While Martel records this after the fact in his memoirs, these ideas are consistent throughout his written work. He was always for a combined arms formation and was less outspoken as a tank advocate than the other reformers. See Martel, An Outspoken Soldier, pp. 65-66.

42. The Germans built a large number of light tanks, Mark I and Mark II models, and developed reliable, heavier models, Mark III and Mark IV models, which they planned to produce when war began. When war started, they began converting the units to the heavier models and had not completed this conversion when they attacked into France. See Martel, An Outspoken Soldier, pp. 66; 163. For a discussion of the types of tanks the Germans had for the battle of France see Colonel H. C. B. Rogers, Tanks in Battle (London: Seeley, 1965), pp. 107-108.

43. Mechanized and Armoured Formations, pp. 7-8.

44. Liddell Hart, I, 176-177.

45. Liddell Hart, I, 179-181.

46. Bond, pp. 161-162. Winton, p. 500 (Appendix 4). Postan, Hay and Scott, pp. 304-305.

47. Winton, pp. 277-278. Bond, p. 167.

48. Winton, pp. 357-360. Martel, An Outspoken Soldier, pp. 124-125. Bond, p. 169.

49. Winton, p. 362.

50. Winton, pp. 358-359.

51. Winton, pp. 361-362. Bond, pp. 170-171.

52. Bond, pp. 162-163.

53. Great Britain, War Office, Field Service Regulations, Vol. II: Operations-General (1935) (London: His Majesty's Stationery Office, 1935), pp. 3-4.

54. Field Service Regulations, Vol. II: Operations-General (1935), pp. 3-4.

55. Great Britain, War Office, Field Service Regulations, Vol. III: Operations-Higher Formations (1935) (London: His Majesty's Stationery Office, 1936), p. 39.

56. Field Service Regulations, Vol. III: Operations-Higher Formations (1935) (London: His Majesty's Staionery Office, 1936), p. 47.

57. As quoted from an interview with Colonel Offord, 8 Nov. 1972 by Harol R. Winton, pp. 348-352.

58. Robert H. Larson, The British Army and the Theory of Armoured Warfare 1918-1940 (Newark, NJ: Univ. of Delaware, 1984), p. 179. Liddell Hart deserves considerable credit that the tank brigade was a part of the division when it was formed. As advisor to the Secretary of State for War, he was able to modify the idea that the Mobile Division was only a mechanized cavalry division. After its formation, he continued working with limited success, to change its structure to a stronger fighting organization. See Liddell Hart, II, 45-59, and

Sir Frederick Pile, "Liddell Hart and the British Army, 1919-1939," in The Theory and Practice of War ed. Michael Howard. (Bloomington, IN: Indiana Univ. Pres, 1975), pp. 175-176.

59. Bond, p. 172. Liddell Hart, I, 269.

60. Larson, pp. 171-174. Winton, pp. 379-382. Bidwell amd Graham, p. 227. Bond, p. 152.

61. Winton, pp. 380-383. Larson, pp. 178-185. Bond, p. 174. Conversion from light tanks to medium tanks during the war further handicapped the Cavalry units. While the original concepts for which the light tank was developed were more compatible with the old cavalry tactis, this was not true when the units were given heavier tanks. Heavier tanks meant a different role on the battlefield. Unfortunately, failure to understand this new role found many former cavalry regiments still thinking in terms of the old cavalry charges. See Bidwell and Graham, p. 228.

62. Postan, Hay and Scott, pp. 309-314. Bond, pp. 177-178.

AD-A163 867 THE PROCESS OF CHANGE: THE BRITISH ARMORED DIVISION; ITS DEVELOPMENT AND..(U) ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS D A HAHN 1985 2/3

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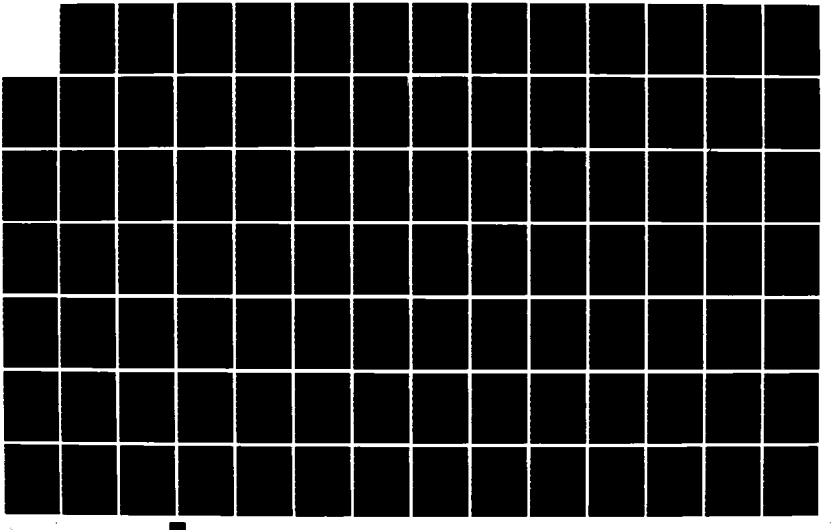

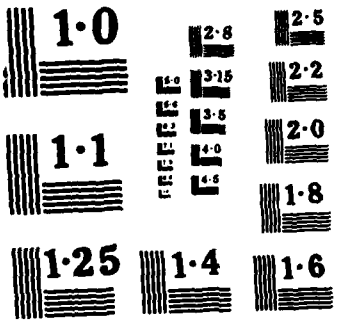

NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

CHAPTER 4

RECOGNITION OF THE NEED FOR CHANGE

The years 1933 to 1937 destroyed any chance of creating a significant armored force before WW II. With the decision to modernize the traditional branches, the Royal Tank Corps appeared to lose influence. Montgomery-Massingberd's decision had diverted the Army's attention away from the development of armored forces.[1] Many of the leaders of the RTC were passed over for important positions, and after 1934 none of the annual exercises were designed to test the armored force concepts. The morale of the RTC was probably at a low ebb.[2] Major-General Hobart's comment in late 1937 is probably a good indication of the lack of support for his ideas on the use of armor. He stated that,

> from nobody could he obtain any sort of definite picture of what the battle area might look like in the next war. Only cloudy generalities... but all agree in condemning my practice![3]

Another indication of the depth to which the fortunes of the armored forces had sunk during this period

is seen in the debate over whether or not the tank brigade was to be a part of the mobile division.[4] Since the only designated mission for the tank brigade was with the Mobile Division, it probably would have been dispersed and the battalions trained to support infantry divisions. The RTC might have faced elimination as a branch.

The debate over the division's organization delayed its formation, but was not the only debate which surrounded it. All during the month of September and October 1937, controversy over who should command the division continued. The C.I.G.S. wanted to appoint a cavalry officer, while the Secretary of State for War, favored someone with mechanized or armored force experience. The Secretary's choice was Broad, recently promoted to Major-General. This debate continued throughout October 1937; when Major-General Gort, the Secretary of State's Military Secretary, suggested a compromise with a field artillery officer named Major-General Francis Alan Brooke. Although Brooke had no mechanized experience, he was acceptable to the cavalry.[5]

The controversy for command of the Mobile Division did not end here. In July 1938, after only a brief period of command of the division, General Brooke was transferred

to an Anti-Aircraft Corps command, and the new C.I.G.S. demanded that a cavalry officer command the division. Major-General Roger Evans, a cavalry officer, took command of the division and remained in the position after the division was redesignated the 1st Armoured Division. He took the division to France in May 1940, but after Dunkirk never had another command.[6]

The result of this controversy meant that a RTC officer was not given an opportunity to influence the development of the Army's only armored division. Whether or not this would have made the division any more effective when it went to war is questionable. As will be seen later, there were more serious problems which confronted the division as it prepared for war. Perhaps a more serious loss was the rapid turnover of General Brooke in command. He appeared to understand the tactical requirements of his cmmand, but also the critical need to form a rapid union between tank and cavalry officers. Upon taking command, he wrote;

> There was on the one hand the necessity to evolve correct doctrines for the employment of armoured forces in the field of battle, and on the other hand some bridge must be found to span the gap that existed in the relations between the extremists of the tank corps and the cavalry. There was no love lost between the two...[7]

This passage also illustrates the deep-seated parochialism that existed and the barrier this was to the creation of armored forces. The differences between the two branches were never completely erased throughout the war. In April, 1939 measures were taken to form one armored branch when the RTC and Cavalry were combined to form the Royal Armoured Corps. This action was only achieved through compromise in which the cavalry units were allowed to keep their old unit designations, while the units of the RTC were designated as battalions in the Royal Tank Regiment (RTR). Thus, the retention of the distinction between the two types of units impeded the formation of one branch with a single doctrine. Eventually soldiers and officers became interchangeable between the RTR and the cavalry regiments, but it took time for this to happen.[8]

In late 1939, the Mobile Division became the 1st Armoured Division. Along with this redesignation, came a restructuring of its organization. This change was made because the previous structure was too unwieldy and consequently lacked mobility. It had called for 620 tanks and large numbers of unarmored vehicles in three brigades plus division troops. The new organization contained only two armored brigades, and the division troops were

organized into a support group with a separate commander. On the negative side, it reduced the organization to one infantry battalion and one artillery regiment. (See Appendix 1).[9]

Further changes were made at the beginning of 1940 which demonstrates the unsettled nature of British armored doctrine when war arrived. This change gave the division more fighting capability and it no longer resembled the cavalry division. The armored brigades were homogeneous organizations rather than the previous separate light and heavy brigades. Also, a second infantry battalion was added to the divisional support group (Appendix 1). Nominally a second armored division was formed in January 1940, but only a few light tanks were available for its initial training.[10] Apparently the German campaign in Poland had caused a reappraisal of the role of the armored division.

At this point, a change in armored doctrine was not going to affect the coming campaign. Still, it was important that the need for change was gaining recognition. The British Expeditionary Force began deploying to France in September 1939; however, only two infantry support tank battalions were ready for deployment. Seven divisional cavalry regiments (light

tank battalions) which were converted cavalry regiments were deployed with the divisions. Eventually, the 1st Armoured Division was deployed but not until the middle of May 1940 after the initial German attack had begun.[11]

One reason for the late deployment of the armored division was that Allied leadership expected a campaign similar to the fighting of World War I. Although most British leaders saw the need for armored forces; they believed that armored divisions were not needed until after the German attack was stopped, and the allies were able to penetrate the German defenses. The "sitzkrieg" during the winter and spring of 1940 during which time defenses were improved reinforced their beliefs. Design emphasis was shifted even further toward the development of infantry support tanks. One initiative led to the development of a 68 ton prototype. The story of this prototype helps to corroborate the view that many officers in the War Office and on the General Staff had a vision of WW I all over again. This design called for the development of a "shelled area tank" which could penetrate well prepared defenses. The group of men who worked on this project were some of the men who had helped to produce the first tanks in 1915.[12]

The low priority that was given to the formation of armored divisions was only part of the reason why they were not combat ready. The British war plan called for the establishment of 11 divisional cavalry regiments, 3 armored divisions, 5 Army tank brigades and 1 armored car regiment of which all but 1 armored division and the armored car regiment were earmarked for France. When war began the Army had only one-tenth of the equipment it needed for these forces. Even the tank brigades, which had a higher priority because of their infantry support mission, had not received their tanks. Only one brigade was ready for deployment.[13]

Given the condition of British tank production capability, the war plan was extremely ambitious. As noted in the last chapter, the extreme economy required in government spending after the last war had not allowed tank design and production capability to develop. Lack of government contracts to produce weapons had caused the capacity of armament firms to decline. The requirement to design and produce three types of tanks exacerbated this problem. Only two facilities, the government-owned Royal Carriage Factory at Woolwich Arsenal and Carden-Loyd owned by Vickers could manufacture tanks until 1937. In 1936, when Colonel Martel became Deputy Director of

Mechanization, he set out to have other firms involved in tank manufacture. He was successful in getting two other firms started in designing and manufacturing tanks. While these firms started too late to increase tank production significantly before the campaign in France, they were of critical importance for the remainder of the British war effort.[14] The biggest problem, however, was design. It was relatively easy to get heavy industries to produce tanks, but it took considerable time to develop the engineering skills to design these heavy vehicles. Lack of design expertise was partially resposible for the unreliability of many of the British tanks.[15]

The whole tank design problem was related to the British Army's inability to arrive at a common armored doctrine. With a single conceptual basis for the tank's employment, a general purpose design would have been possible. One design would have required fewer design resources and design resources could have been pooled. Also, if multiple facilities produced the same tank; then retooling for required modifications could have been accomplished without losing all production capability in the process.

Of course one of the barriers to the common design was the failure to settle on the commitment of an

expeditionary force to France until February 1939.[16] One should not underestimate the difficulties this caused. In January 1939, the Director General of Munitions Production noted,

> The difficulty about the tank has really been...to make up our minds exactly what we want...The type of tank you want depends very largely on the theatre of war in which it is expected to be used...Directly you begin to consider a war on a Western basis your tanks become a different business altogether from a war on Egypt.[17]

Still, a single concept of the tank's function on the battlefield would have eliminated many of the difficulties experienced later in the war. A single design which balanced the characterisics of firepower, mobility and armor protection could have been modified more easily than several designs.

As a result of the difficulties faced in tank production it is not surprising that the 1st Armoured Division was woefully short of tanks when war was declared in 1939. The German attack began on 10 May 1940, and the division was deployed to France on 21 May. The deployment of this division was a mistake. The division arrived without artillery because it had been sent to France previously to make up shortages, and the armored brigades

had only two-thirds of their required tanks. Many of the tank crew had not seen their tanks before their arrival in France. Its infantry battalions had been with the division just four weeks because the original battalions had been sent to Norway. Additionally, the division debarked at two different ports in France and was never able to assemble as one unit.[18]

The British 1st Armoured Division was evacuated from Cherbourg on 17 June 1940. The loss of almost all tanks which were sent to France was critical. British industry had managed to produce approximately 1000 tanks in 1939 and 700 had been sent ot France.[19] Losses in both tanks and anti-tank guns shaped all production decisions for the next two years of war. This was the period of time it required to recover from these losses.

Most of the lessons learned from this campaign were with regard to equipment and organization. Brigadier Vyvyan Pope, in his capacity as senior tank advisor with the BEF, enumerated these lessons for the British Army. Pope wrote that the light tank was worthless, the heavy tank was too slow, the 2-pounder tank and anti-tank gun (37mm) was just adequate, armor of less than 40 to 80 mm was inadequate, and the cruiser tank was mechanically

unreliable. He recommended that the 6-pounder gun replace the 2-pounder gun.[20]

All of these observations were significant for the future battles in North Africa. Perhaps the most critical decison was the one involving tank and anti-tank gun size. The eventual need to up-gun to the 6-pounder was recognized prior to the start of the war in France. Consequently, a 6-pounder gun was already designed. With the loss of so much equipment in France, and since it would require time to retool for 6-pounder production it was necessary to continue producing the 2-pounder gun. To begin producing 6-pounder guns would have have left units without any weapons during the changeover period.[21]

While it was not recognized at the time, Pope's recommendations were exactly what the Army needed for its main battle tank. A tank with a 6-pounder gun, adequate armor and sufficient mobility. Even a tank with the 2-oounder gun would have been adequate. This did not occur because Brtish doctrine still called for two types of tanks. Cruiser or medium tanks were given the highest priority because armored divisions were now seen as decisive on the battlefield, but tanks for infantry support were still necessary. The cavalry role for the light tank had gone by the wayside as a result of the

campaign in France, and armored cars were seen as more capable in this role.[22]

Although the new priority was for medium tanks, checking the production figures do not verify this. The British problem was that their most capable design and production firm, Vickers, was only able to produce infantry tanks, while one of the new firms was designing and producing the medium tanks. This not only slowed production but was the major reason for this tank's mechanical problems.[23] The British never really recovered from the prewar decision to prioitize infantry support tanks.

The other significant lesson from the campaign in France was the importance of armored divisions for offensive operations. After Dunkirk, the British increased the planned number of armored divisions from three to nine. Brigadier Pope also recommended that a Royal Armoured Corps (RAC) should be formed with a commander in the field to control all the RAC units. He said this was necessary because the General Staff and formation commanders had no concept of how to use mechanized forces. While not providing the sweeping authority that Pope recommended, the RAC was formed with Martel as its commander. The RAC was not given any

authority over armored commanders in the field but became a training command under the General Officer Commanding-in-Chief, Home Forces. All armored divisions formed in Great Britain came under this command until it was abolished in 1942.[24]

One significant and severe handicap for all British tank units during the first two years of war was the acute shortage of equipment. This was particularly true when the expansion of armored forces was first initiated. Large groups of men in the units had no prior experience with tanks and this included most of the leadership. Cavalry units converted to armored cavalry, new tank brigades, and all armored divisions were in this same predicament. Except for one tank brigade and a few cavalry regiments, all other units were constituted sometime after the start of 1939. It was extremely difficult to train these units without tanks. The dilemma for the War Office was that tanks used for new unit training were obviously not available for the units already in North Africa.

These were the major lessons of the campaign in France. While there was a recognition that changes were needed, the analysis of armored warfare concepts was incomplete. There was little basis for analysis of

British armored doctrine because the armored force participation had been too limited. Britain's only armored division was not deployed until the situation was beyond control. Brigadier Pope's solution to the inability of commanders to employ mechanized forces was to set up an organization under the RAC that would properly train the leaders. While this was a necessary part of change, a corresponding reevaluation of the doctrine was not seen as necessary. Expansion in the number of armored divisions was a direct result of the German success with their armored forces. This was an attempt to imitate the German Army without understanding the combined arms nature of German panzer divisions. Finally the other lessons keyed on the need for more and better tanks. Limitations in British tank production capability made a quick fix of this problem area impossible. Here again, a flawed concept as a basis for tank design prevented a more rapid solution to this problem. A better concept for the tank's battlefield role would have simplified the design process.

All of these changes, while necessary, were physical and only superficially effective. There were no simultaneous intellectual changes made because the leadership did not recognize the flawed doctrine. The limited use of armor in the campaign provided only an

ill-defined picture. The early commanders in the desert had a difficult time identifying all the problems. It was too easy to pin the blame on shortages of equipment as well as inferior equipment. Combined arms was not yet a way of thinking in the British Army. Organizational changes alone would not make this happen. A concensus about how to fight was necessary, before training and other changes were fully effecctive. As the next chapter will show, it took time for these ideas to develop.

ENDNOTES

1. It is interesting to note that during this same period, Germany took almost the opposite course on these decisions. First, with regard to the Panzer Division, it became a main fighting force and not a cavalry force like the Mobile Division. The Germans developed a common tank design for all models and placed all armored and mechanized units in Panzer Divisions. Finally, the Germans decided to develop Panzer Divisions at the expense of motorizing the rest of the the army. See B. H. Liddell Hart, The Memoirs of Captain Liddell Hart (London: Cassell, 1965), II, 244, and Lieut.-General Sir Giffard Martel, An Outspoken Soldier His Views and Memoirs (London: Sifton, Praed, 1949), p. 163.

2. Brian Bond, British Military Policy Between the Two Wars (Oxford: Clarendon Press, 1980), pp. 173-182.

3. Kenneth J. Macksey, The Tank Pioneers (London: Jane's, 1981), p. 140. Written by Major-General P.C.S. Hobart after being criticized by the Chief of the Imperial General Staff for a memorandum he wrote explaining his views on the European role of the Army and the use of armored forces.

4. See endnote 58 in Chapter 3.

5. The Secretary of State was Leslie Hore-Belisha who had taken office in May 1937. The Prime Minister had charged him with the mission to make drastic changes in the Army. Almost immediately upon taking office, he asked Liddell Hart for advice on Army reorganization. This began a nine month period in which Liddell Hart acted as the Secretary of State's advisor. Liddell Hart had recommended both Pile and Broad to the Secretary as possible choices for this command. General Gort was the next C.I.G.S., and General Brooke was the war time C.I.G.S. from 1941-45. See Liddell Hart, II, 1-50.

6. Bond, p. 180. The new C.I.G.S., General Gort, demanded that a cavalry officer command the Mobile Division. This was a rather surprising decision because 6 months previously, he was in apparent agreement with

Liddell Hart and Hore Belisha that the command should go to an RTC officer. See Liddell Hart, II, 20-50.

7. From "Notes on My Life" written by General Brooke as quoted in David Fraser, Alanbrooke (New York: Atheneum, 1982), p. 120.

8. Liddell Hart, II, 1-21. Shelford Bidwell and Dominick Graham, Fire-Power: British Army Weapons and Theories of War, 1904-1945 (London: Allen and Unwin, 1982), p. 228.

9. Liddell Hart, II, 112. Giffard LeQ. Martel, Our Armoured Forces (London: Faber, 1945), pp. 49-50.

10. Great Britain, War Office, The Second World War 1939-1945 Army, The Development of Artillery Tactics and Equipment (London: War Office, 1950), pp. 32-33.

11. Martel, Our Armoured Forces, p. 59. David Fraser, And We Shall Shock Them The British Army in the Second World War (London: Hodder and Stoughton, 1983), p. 28.

12. M.M Postan, D. Hay and J.D. Scott, Design and DEvelopment of Weapons, Studies in Government and Industrial Organisation (London: Her Majesty's Stationery Office, 1964), pp. 310-314. This secret project was named "TOG" and was the subsequent name given to the prototype. Some of the men who worked on the tank included Sir Albert Stern, Gordon Wilson and Sir Ernest Swinton, considered by many the inventor of the modern tank. G. MacLeod Ross, The Business of Tanks, 1933-1945 (Infracombe, UK: Arthur H. Stockwell, 1976), p. 153.

13. On 22 February 1939, the British Cabinent finally decided to equip the regular army for a European war. Fraser, And We Shall Shock Them, p. 20.

14. During the war British industry produced approximately 25,000 tanks. The two firms in question, L.M.S. Railway and Nuffield Manufacturing produced over 8000 tanks during the war. See Ross, pp. 152-153.

15. Martel, An Outspoken Soldier, pp. 127-135. Ross, pp. 70-71. Bond, p. 177. For an understanding of the multiplicity of problems associated with trying to

increase tank production capacity see Postan, Hay and Scott, pp.304-321.

16. Fraser, And We Shall Shock Them, p. 20.

17. As quoted in Postan, Hay and Scott, p. 311.

18. Fraser, And We Shall Shock Them, pp. 67-75. The Development of Artillery Tactics and Equipment, p. 33. U.S. War Department. Military Intelligence Division. British Tank Operations in the Vicinity of Arras, May 1940. (22 August 1940), pp.12-14. Bond, p. 187. Martel Our Armoured Forces, p. 70.

19. Fraser, And We Shall Shock Them P. 88. Ross, p. 40.

20. Macksey, Tank Pioneers , pp. 170-171.

21. Bidwell and Graham, p. 230.

22. Postan, Hay and Scott, p. 323.

23. During the war Vickers produced approximately 10500 infantry tanks while other firms produced approximately 8400 medium tanks. Until American tanks were available, the British Army was always short of medium tanks. See Ross, pp. 150-154.

24. Macksey, Tank Pioneers, pp170-171. See Martel, An Outspoken Soldier, pp. 162-184. for a complete account of his activities and accomplishments while commanding the RAC.

CHAPTER 5

CHANGE ON THE BATTLEFIELD

When war began again in Europe, the British Army had a second armored division, the 7th, stationed in Egypt. The Italian threat to Egypt provided the motivation for the British Army to establish this unit in the late 1930's. The slow process to equip this division illustrates the difficulties which confronted the officers who tried to organize and prepare the armored forces for war.

The unit's origins were the mobile forces which made their appearance in Egypt during the early 1930's. Many early tank pioneers served tours of duty in Egypt and contributed to the division's eventual formation. Brigadier Lindsay, as the primary staff officer on the General Staff in Egypt from 1929 to 1932, introduced the initial experiments with armored vehicles during training exercises. The force started with two armored car companies and 16 medium tanks. General Burnett-Stuart became the commander of troops in Egypt during 1931, and in 1932 the future General Pile took command of the mobile forces. He was the same member of the RTC who

demonstrated his brilliance as an armored commander in the 1927-28 exercises. General Burnett-Stuart designed demanding training exercises, and emphasized experiments which tested and expanded the capabilities of the commander as well as the armored forces.

Prior to his departure from Egypt in 1934, Burnett-Stuart convinced the War Office to establish a mobile force in the Middle East permanently. Increased tensions with the Italians in the region made the need for such a force apparent. The mechanized units in this force were the 11th Hussars (Armored Cars) and the 6th Battalion Royal Tank Corps. In 1935 when the Italians were at war with Ethiopia, a medium tank company and light tank battalion arrived from the tank brigade in England.[1]

From this nucleus, a mobile division was formed in 1938 after the pattern of the one formed in Great Britain the previous year. The Munich crisis precipitated this action. Major-General Hobart became the commander at the insistence of the Secretary of State for War, Hore-Belisha, who wanted an individual with armored experience to command this division.[2] Hobart arrived in September 1938, and the force had only one and a half tank battalions and a light armored brigade consisting of a light tank battalion and the 11th Hussars. Since priority

for the next year went to equipping the BEF, the situation did not improve significantly. Problems for the new division included; outdated equipment, personnel shortages, no ammunition for light tanks, as well as equipment shortages. The tank tracks needed replacement, but few spare tracks were available. The division support group did not have its infantry battalion, and Hobart formed his division headquarters from garrison troops.[3]

While these problems may have discouraged a less energetic man, there is every indication that Hobart applied himself to his new command with his usual energy and zeal. Hobart was always a demanding trainer, and in this case he tackled his new duties with the assumption that war was imminent. He concentrated his training efforts on dispersion, flexibility and mobility. To accomplish these objectives, he taught his units how to navigate in the desert and stressed the importance of crew maintenance. He had problems with maintenance because it was not yet second nature for the men to check the tanks at every halt. This was especially true of the newly mechanized cavalry units.[4]

Apparently his officers and men, who were accustomed to a more leisurely pace, initially resisted his training program. In a letter to his wife he wrote;

> ...I had the Cavalry CO's in and laid my cards on the table. They are such nice chaps, socially. That's what makes it so difficult. But they're so conservative of their spurs and swords and regimental tradition etc., and so certain that the good old Umpteenth will be all right on the night, so easily satisfied with an excuse if things aren't right, so prone to blame the machine or machinery.
>
> And unless one upsets all their polo etc.-for which they have paid heavily-it's so hard to get anything more into them or any more work out of them. 3 days a week they come in 6 miles to Gezirah Club for polo. At 5 pm it's getting dark: they are sweaty and tired. Not fit for much and most of them full up of socials in Cairo. Take their clothes and change at Club. Don't return to Abbassia till 2 am or 3 am. Non-polo days it's tennis or something.
>
> Well, well. But I am trying not to be impatient and to lead gradually, not drive. The result is I get depressed by how little is happening: and impatient with myself.[5]

Hobart took his profession seriously. His energy was tireless and he inspired his men with his enthusiasm. He demanded that his officers meet his standards and in the end his will was stronger than theirs. One year later his men had great respect for him as a commander and gave him a warm send off when he left Egypt. Major-General Richard O'Connor, who commanded the 8th Division in Egypt at the time, told Hobart that his division was the best trained division that he ever saw.[6]

Hobart departed Egypt in November 1939 because General Maitland-Wilson, the new commander of troops in Egypt, with the apparent approval of his superior, General

Archibald Wavell, General Officer Commanding-in-Chief, Middle East, relieved him. Why Maitland-Wilson relieved him is unclear. The immediate reason given by Maitland-Wilson was a loss of confidence in his ability to command, but the respect of his soldiers and General O'Connor's comment hardly confirm this.[7]

This narrative of the 7th Armoured Division's formation omits many of the details, but it provides an example of the many problems which limited armored force expansion during the interwar period. First, there was the slow and austere nature of its formation because of the economic constraints described in an earlier chapter. Lack of funds imposed severe limitations on the number of new units, the number and type of tanks, the amount of training ammunition, and repair parts which the Army could build or buy. As noted in an earlier chapter, as funds became available British tank industry did not provie tanks in the necessary quantity or quality. Regimental parochialism was another problem which beset Hobart because of the recently converted armored cavalry regiments in his division. While apparently successful, he only commanded for a year and how much he accomplished is open to question. Hobart's uncompromising and strong-willed personality helped him train this new unit,

but these same qualities contributed to his relief. Hobart was a zealous reformer, and this did not endear him to his superiors or their staffs. This last pitfall is endemic to all true reformers.

Hobart's influence on the 7th Armoured Division was significant because he set the tactical concepts and doctrine of armored warfare with which the division first entered battle. His concepts on dispersion and mobility were particularly important because these were the concepts which the officers in the division tried to use early in the war. Dispersion meant that individual units traveled in separate columns and remained dispersed until the attack. Dispersion was an important means of protection from air attack, particularly with no cover available in the desert. His idea of mobility stressed rapidity of commanders to act, as well as physical speed. Speed was an important part of Hobart's doctrine.[8]

Although Hobart's concepts are valid tactical doctrine if properly executed, the problem for most British armored units was that they were not well trained. Over reliance on speed for protection proved foolhardy in future battles and caused many units to outpace the supporting arms. They often charged directly into anti-tank guns without support. Dispersion caused command

and control problems, and they could not achieve the necessary mass at the point of attack.

After Hobart's departure from Egypt, Major-General Michael O'Moore Creagh, a former cavalry officer became the division commander, and the division became the 7th Armored Division on February 16, 1940.[9] The organization chart for the division is found in Appendix 1. This division was not at full strength in either units or equipment until some time in October.[10]

Thanks to Hobart's training and the influx of new units into the division, it went into battle better prepared than most armored divisions in future battles. This contributed to the initial British success in the Western Desert against the Italian Army.[11] It destroyed the Italian Tenth Army, and if British forces had continued their offensive, it may have ended the war in this theater and caused an early capitulation of Italy in the war. This was remarkable because the Italian forces grossly outnumbered the British at the start of the campaign.[12]

Lieutenant-General Richard O'Connor commanded the Western Desert Force which became the XIII Corps after the campaign began.[13] General O'Connor took command during June 1940 and was subordinate to Lieutenant-General Henry

Maitland-Wilson, Headquarters British Troops in Egypt. The theater commander was General Sir Archibald Wavell. Under General O'Connor's direct command were approximately 36,000 troops.[14]

Opposing General O'Connor's force was the Italian Tenth Army which consisted of 10 to 13 divisions and numbered around 150,000. An additional 90,000 were probably located in western Libya.[15] Fortunately for the British, the Italians never concentrated this force.

The Italians began a limited offensive on 13 September and they advanced a total of 60 miles into Egypt by the end of the month. At this point they stopped and gave the British time to build up and prepare their plans for a counterattack.[16]

The British began Operation Compass on December 9, 1940 and planned it only as a limited attack against the leading elements of the Italian Army. The success of the operation exceeded their greatest expectations. O'Connor took advantage of the opportunity which the Italians presented to him. He continued the attack, and at the end of ten weeks, General O'Connor's forces had advanced five hundred miles, fought four major engagements and captured 130,000 prisoners, approximately 400 tank and 850 artillery pieces. The cost to British and Commonwealth

forces was approximately 500 killed, 1350 wounded and 50 missing.[17]

This operation was the first opportunity for a British armored division to fight as a unit, and the 7th Armoured Division played a major part in each battle. The division's success gave no indication of a need for doctrinal change. British armored forces appeared capable of conducting mobile warfare when properly trained.

A closer look at the campaign finds that the XIII Corps and specifically the 7th Armoured Division did not fight a highly mobile battle. They fought a series of limited tactical engagements in which the Italians were in defensive positions and surrendered the initiative to the British. In the first three battles the Italians were in static defenses and allowed the British to make extensive reconnaissance of these positions. There was at least a week between each battle, and in one instance almost a month. The British used this time to deliberately plan their next move, and formed supply dumps in front of the attacking columns several days prior to each attack. The first three attacks were made from assembly areas rather than from the march, and prior to the first battle, there was a complete rehearsal against a full-scale mockup of the Italian position. The last

engagement was a mobile one, but only a force of several understrength battalions which was the remainder of 7th Armoured Division after 8 weeks of fighting participated in the operation.[18]

The 7th Armoured Division generally attacked as brigades with little or no cooperation between the armored brigades and the support group. As in France, the armored brigades often lacked artillery support and the employment of air forces was not in a close air support role.[19]

From this description of the campaign, the conclusion is that the individual attacks resembled WW I battles in their planning and conduct. This campaign gave no indication of what the British capabilities were against a more active enemy with a doctrine for mobile warfare. The capability of one's enemy is of course an important factor in the analysis of any campaign. The condition of the Italian Army was a key to British success. The Italian Army was unprepared for World War II in many ways. Most units were poorly equipped and trained, and were poorly led by officers who did not understand the nature of modern warfare. The morale of most units was low, and there were indications that many soldiers and officers did not want to fight a war against the British. This partially accounted for the mass

surrender of many units and there willingness to offer tactical intelligence to their captors.[20]

Still the British deserve credit for making the right decisions, being thoroughly prepared to fight each battle, and capably executing their battle plans. Lt.-General O'Connor's leadership was a key factor in victory. He was flexible in his employment of forces and maintained the initiative throughout the campaign. He drove his soldiers to victory in the last battle when equipment was breaking down, supplies limited and the soldiers nearing exhaustion.

The combat capabilities of the 7th Armored Division was also a factor. The nucleus of this division trained together for several years prior to the war and this was an advantage over the armored division that went to France. A second advantage was in the division's leadership. Many of the leaders had trained with the unit for more than a year, and they knew their soldiers and had a familiarity with the conditions of the desert. There was cohesion in the division and it had skills in desert fighting. Even the two new tank regiments sent to join the division in August 1940 had a couple of months training in the desert before going into battle. Subsequent armored divisions deployed into the theater did

not have this. A final factor which added to the combat capability of the unit was morale. The division's morale was high, and they were confident of victory. The division's ability to keep fighting over a ten week period of time attests to their high morale.[21]

Although the armored division was successful, this campaign was not a complete test of the armored division's doctrine and organization. Part of the doctrine for a British armored division was to destroy enemy armored formations. Since the Italian Army did not have any armored divisions in this campaign and deployed its armor in small tank units supporting its infantry formations, the division did not fight a large armored force during the campaign.

Finally, a comparison of tanks in the two armies clearly favored the British. The Italian tanks were no match for the British cruiser or infantry tanks. One vulnerability which surfaced was the mechanical unreliability of many British tanks in the desert. In the campaign, the British lost more tanks to breakdown than to enemy fire.[22] This vulnerability had serious implications for the future.

During this campaign, the armored division enjoyed advantages over the Italians in leadership, weapons, unit

training, cohesion and morale. The division's doctrine and organization were not factors in the battle. In future campaigns many of these advantages turned into disadvantages when compared to the Germans. From this base of combat experience, the 7th Armoured Division could have developed into a unit capable of matching a German panzer division. This did not happen. Because the 7th Armoured Division needed a complete refit, it returned to Egypt. The refit process took considerable time because of critical shortages in British tanks. In the meantime the need for manpower and units in other parts of the Middle East resulted in the dispersal of the division before it saw action again.[23]

At the conclusion of the campaign against the Italians, two events occurred which had disastrous effects on the British in the Western Desert. The first was the requirement to send British forces to the aid of Greece. The second was the arrival of General Irwin Rommel and subsequent German forces into the theater.

The forces which went to Greece came from General Wavell's Middle East Command. General Maitland-Wilson took command of the forces that went to Greece while Lieutenant-General O'Connor relinquished command of XIII Corps and took over as Commander of British Troops, Egypt.

The Cyrenaica Command replaced the XIII Corps headquarters, and the new commander was Lieutenant-General P. Neame. There was no trained staff corps headquarters and a shortage of communications equipment made it impossible to control mobile forces over the extended distances of the desert.[24]

Lt.-General Neame's forces did not include any major units used in the last campaign against the Italians. The 2nd Armoured Division relieved the 7th Armoured Division. Originally formed in late 1939, it arrived in the Middle East while the campaign against the Italians was in progress. However, only part of the division was available to Neame, because one of its armored brigades and part of its support group went to Greece[25]

General Wavell was aware of the weakness of his forces defending in Cyrenaica. According to his intelligence reports the Axis powers could only mount a limited attack through mid-April. The most likely assessment stated that Rommel would wait until he received his panzer division in May. Personally, Wavell thought that Rommel might need until June in order to acclimate and prepare his forces for battle in the desert. By May

Wavell expected several more infantry divisions to arrive and Neame's defenses prepared.[26]

Surprisingly, this assessment was close to the German high command's appraisal of the situation. They did not want Rommel to get into difficulties in a theater that was clearly secondary to the upcoming Barbarossa operation. Rommel's mission was to raise the morale of the Italians and keep them in the war.[27]

Neither Wavell nor the German high command knew Rommel. He started his offensive at the end of March and continued as each opportunity presented itself. By the end of April 1941, he pushed the British back to the Egyptian border, and except for the units holding Tobruk, the British lost all their previous gains made against the Italians.[28]

A general with less drive and willingness to take risks than Rommel could not have achieved this success. It was also important that he disobeyed his orders and overcame the objections of his Italian superiors. General Wavell took a calculated risk in this portion of his theater because he had major operations to conduct in Greece and East Africa and had to plan against threats in Iraq and Syria.[29]

The 2nd Armoured Division typified the problems facing the British Army in developing the fighting capabilities of its armored forces during the first two years of the war. In 1939, the 2nd Armoured Division existed in name only. The 1st Armoured Division received priority for its deployment to France. As discussed in the last chapter, tanks were not available to equip any armored division up to full strength. Loss of tanks in France increased this shortage.

On June 11, 1940, Winston Churchill told parliament that there were only 100 tanks in Great Britain.[30] The only other tanks in the British Army were in the Middle East where the 7th Armoured Division had only four of its required six tank regiments.

The first priority for Britain from June 1940 until late that year was defense against invasion. Sometime during this period the 2nd Armoured Division started receiving its tanks. The division arrived in Egypt during early January, but the normal deployment from England to the Middle East took nearly three months. The division received only a short training period prior to deployment, and some of those skills atrophied during the long deployment period.[31] It is a reasonable assumption that critical tactical skills such as coordinating attacks

in support of or in conjunction with infantry, combining the effects of all the weapons and systems of the division in an attack, and the use of aircraft in a close support role were not mastered prior to leaving Great Britain. This was particularly true because branch parochialism during the interwar years prevented most officers from thinking through the requirements for employment of a combined arms division.[32]

Certainly a unit organized in such haste could not master these higher order skills of coordination even if a training system existed which it definitely did not at this stage of the war. The Army was too busy forming and deploying units to give training a high priority.

When the 2nd Armoured Division arrived in Egypt it was still incomplete. One of its tank brigades did not have tanks for one of its tank regiments. This brigade replaced the 7th Armoured Division in western Cyrenaica and equipped its third tank regiment with captured Italain tanks. The only training this brigade received in desert operations was the experience it gained on its move across the desert to the battle area. When Rommel attacked, he defeated each regiment individually because they were dispered conducting individual unit training. Finally the

division commander stated that he lost one tank for every ten miles because of mechanical failure.[33]

This unit was not combat ready. It was inexperienced in division operations and its short history limited unit cohesion. Shortages handicapped the unit, and most of the tanks on hand were mechanically unsound. Finally, upon arrival in January, the division commander died suddenly, and a commander inexpeienced in both armored and desert warfare replaced him. On the 7th of April during the middle of this campaign, the Germans captured the divsion commander and most of his staff. Several days before this event occurred, the division was combat ineffective because its tank strength was around 20.[34]

Again the British Army did not receive a clear vision of its doctrinal deficiencies. The deployment of this division as a separate armored brigade with roughly half of its support group showed a true belief in the ability of armored forces, specifically tanks, to operate independently. Actual dispositions of the division's support group and the armored brigade in Cyrenaica further demonstrated the lack of a combined arms concept. The two formations were unable to support each other throughout the campaign.[35]

The all armored concept which Hobart and others in the Royal Tank Corps preached and practiced prior to the start of the war was the doctrine which armored commanders were attempting to execute. Even this faulty doctrine was impossible for the 2d Armoured Division to execute because of its inexperience. The cruiser tanks which the division possessed at this time further hampered the execution of this doctrine. Their limited mobility due to mechanical unreliability made rapid and deep thrusts impossible. As indicated in the last chapter, the competing doctrine which prioritized infantry tank production prior to the war had a serious impact on the fighting in North Africa. When this campaign ended, the command in Egypt disbanded the 2nd Armoured Division. After nearly a year of fighting, the British Army was no closer to developing a viable armored fighting force than it was at the beginning of the war. The Army lost the experience of the 7th Armoured Division because they were basically a new unit when they fought in the next campaign.

In the four months that the 7th Armoured Division waited for reconstitution, the units did not have any tanks. The theater commander used the soldiers of the division as replacements, and many key officers and non-commissioned officers left for other assignments.

Division leadership was significantly different. The division commander, however, remained the same. The tank crews did not train with any tanks for four months and now one regiment received a new model cruiser tank. All units finally received their tanks by June 9, 1941 and had only five days to train as a division before entering the battle. This lack of training time was even more critical because the division contained several new units. In the initial campaign the division had six tank regiments in two brigades. Now the division had four tank regiments in two brigades and two regiments were new to the division. The two armored brigades had two different missions because the 4th Armoured Brigade was equipped with infantry support (Matilda) tanks while the 7th Armoured Brigade was equipped with cruiser tanks. These changes in the division meant a loss of cohesion an important part of combat effectiveness was lost.[36]

During the next campaign, Operation Battleaxe (15-17 June 1941), the differences between the two brigades' missions were significant. In the concept of the operation the brigade with infantry tanks initially was to support the infantry division, and once it accomplished its objectives, the brigade was to work with the rest of the 7th Armoured Division. Destruction of the

enemy armor was the armored division's mission. The coordination of infantry and cruiser tanks in the same attack was new for the armored division. The differential in mobility made this mission difficult. The speed of the Matilda tank was about the same speed as marching infantry while the speed of the cruiser tanks available for this battle ranged between 15 and 30 mph.[37]

Another problem with the 4th Armoured Brigade's mission was the lack of training with the infantry division they were to support.[38] General Wavell recognized that this Army required more training to reach combat effectiveness, but his hands were tied because of pressures from the Prime Minister to begin the offensive as soon as possible. He delayed the attack as long as he could under the circumstances.[39]

New Corps leadership was another factor in preparing this force for the campaign which caused Wavell concern. The third campaign began with Lieutenant-General Beresford-Peirse in command of XIII Corps. Rommel captured both Lt.-General Neame and Lt.-General O'Connor in the last campaign. The loss of O'Connor was a serious blow for the British.[40]

With the problems which again plagued the XIII Corps, it is hardly surprising that the British lost the

campaign. While the campaign lasted only three days and British forces consisted of only two divisions, one infantry and one armored, the conclusions drawn from this campaign were extremely important for future British operations.

Before it is possible to understand these conclusions, one must understand some of the differences between British and German doctrine. Comparison of the two armies' tank and anti-tank strengths at the start of the campaign brings these differences into focus. In terms of tank numbers both armies possessed approximately 200, but only half of the German tanks had guns and the rest were light tanks armed with machineguns. All British tanks had guns. The penetrating power of the British and German tank guns was roughly equal.[41] The number of anti-tank guns strongly favored of the Germans. They had 150-175 anti-tank guns and the Italians had 80 anti-tank guns. The Italian guns were generally inadequate. The German guns were 50mm and 88mm dual purpose anti-aircraft/anti-tank guns. The number of 88's was approximately 13. The British had about 90 of the 2 pounder anti-tank guns.[42]

The German Army doctrine planned to concentrate their armored forces at the critical time and place.

Because they recognized the vulnerabilities of a pure tank force, they organized a combined arms formation which included artillery, anti-tank and ant-aircraft guns, infantry and reconnaissance elements. They developed techniques and drills to coordinate the movement and functions of these various arms within the formation. The German Army recognized the importance of infantry on the battlefield and the use of defensive positions as linchpins for their offensive operations. In order to do this, the infantry units needed the means to defeat tanks. Anti-tank guns provided this capability for their infantry. The importance of the anti-tank gun coincided with their concept that the purpose of tanks on the battlefield was to destroy soft-skinned targets such as headquarters and supply columns, not to destroy other tanks. This led them to the conclusion that anti-tank guns also protected their tanks from other tanks. This was the reason for the large number of anti-tank guns in the German organization.[43]

The British Army doctrine believed the purpose of the tank was to destroy enemy armor. Armored divisions attempted to mass their tank strength to destroy enemy armor. The other arms in the armored division performed subsidiary roles in this mission. British armored

brigades usually moved as pure tank formations. The support group which contained the other arms of the division screened a flank or protected the lines of communication. The leaders of the armored divisions lacked techniques to provide adequate fire support for the armored brigades. The British saw the antitank gun as a defensive weapon and had not integrated it into the armored brigade.[44]

British infantry divisions also required tanks to protect them from enemy tanks. This was the reason for the Army Tank brigade equipped with infantry support tanks. Although the main purpose of the infantry tank was to help the infantry to break through the enemy defenses, it was also available to ward off enemy tanks. Up until the Battleaxe operation, the "Matilda" tank was relatively invulnerable on the battlefield so it performed both roles.

The Germans recognized the need to develop a weapon and tactics to defeat the British heavy infantry tanks particularly after they examined the captured infantry tanks in France. It was for this reason that they adapted the 88mm to perform its dual role as an anti-aircraft and anti-tank gun. This weapon had a

significant impact on all campaigns in the desert starting with Battleaxe.[45]

Without any training between the 4th Armoured Brigade and the infantry division, the attack on the Axis defenses failed because of a lack of coordination. The attack of the infantry and armor were not mutually supporting. With little artillery support to suppress the anti-tank defenses, the infantry tanks were defeated. There was possibly another reason besides lack of training to explain why the tank units entered the battle without adequate support. Both tank regiments in the 4th Armoured Brigade fought in France and one fought against the Italians. In these campaigns they had been relatively safe from all tank and anti-tank guns. The new role for the 88mm gun brought a change to the battlefield.[46]

Meanwhile the 7th Armoured Brigade, equipped with cruiser tanks, met a similar fate when it ran into a group of 88mm anti-tank guns which Rommel had dug-in on key terrain. Like the 4th Armoured Brigade, the 7th drove into the anti-tank defense without any support.

After the repulse of the armored brigade, Rommel massed his armored strength and attempted a flanking movement to cut the British lines of communication. This forced the British forces to withdraw to the Egyptian

border. The British lost 91 tanks while the Germans lost 12.[47]

The first conclusion the leaders of the armored division made was that the majority of the British tanks were destroyed by enemy tanks. Later analysis has shown that anti-tank guns destroyed most British tanks. There are several reasons why the British did not understand this at the time. The first is that the 88mm had a range of 3000 yards at which, it could destroy a British tank. At this range if a crew were hit, it was difficult to determine what hit the tank. Further, the German tanks used a tactic which they used successfully many times in future battles. The German tanks lured the units of the 7th Armoured Brigade into their anti-tank defenses. Since the British saw enemy tanks in the area, the assumption was that they did the damage.[48] Since the British believed that the primary purpose for the tank was to kill other tanks and they did not perceive a role for the anti-tank gun similar to the Germans, their assumption was understandable.

The result of this conclusion was the creation of the myth of the overwhelming superiority of German tanks. This forced British commanders to concentrate even more on the relative tank strength of the two armies, and the need

for available reserves with which to reconstitute the tank forces during the middle of the battle. This belief in German tank superiority led to a morale problem among the British armored soldiers. They began to believe that they were incapable of defeating German armor even when they had overwhelming superiority.

The second conclusion was that the Germans could now defeat the "Matilda" which meant that the infantry division now required additional protection from tanks. Three methods of how this could be accomplished were conceived. First the armored formation could support the infantry directly. Second the armored formation could be employed to defeat the enemy armor before the infantry launched its attack. Third the armored division could conform its movement to the infantry attack in order to guard the infantry from tank attack. The first idea was eliminated because there was no procedures or training worked out which would allow an armored division to support infantry units. Also armored division leaders did not believe that this was a proper mission for an armored division. Few saw the need to increase the fire support or anti-tank gun capability to solve this problem.[49]

These lessons learned affected the next British offensive which was called the Crusader operation. Within

the concept of the operation the decision was made that the enemy armor must be destroyed in the first phase of the operation and then the garrison of Tobruk was to break out to link up with infantry forces fighting toward the garrison. After the link up and relief of the garrison, phase two consisted of the reconquest of Cyrenaica. The most important part of this concept was clearly the destruction of the enemy armor. Originally the plan called for the concentration of three armored brigades under Lt.-General Norrie, commander of XXX Corps, to destroy enemy armor, but the plan was later modified to detach the 4th Armoured Brigade to protect the left flank of XIII Corps. XXX Corps would attack on the left and XIII Corps would attack on the coast. This generally conformed to the lessons of Battleaxe. General Norrie's mission was to destroy enemy armor, but also to conform his movements of thrust to protect the infantry corps flank.[50]

Prior to the operation, the continuity of leadership was again broken. General Claude Auchinleck replaced General Wavell who was relieved after Battleaxe. It is interesting to note that General Auchinleck spent most of his time in the service in the British Indian Army.[51] Since armored forces were such an important

part of warfare in the Western Desert, it would seem logical that the British Army would select an officer with some experience with armored forces. The reason that one was not goes back to the interwar years in which most of the leaders of the Royal Armoured Corps had been shunted into other duties or retired. General Pile was the only possible Tank Corps officer with enough seniority for the position, but he was serving as the Commander of Anti-Aircraft Command which was still a position of high priority.

With the appointment of General Auchinleck to command, he selected his own commander for the newly formed 8th Army. In August 1941, he selected Lieutenant-General Alan Cunningham who had no previous armored experience. Other changes saw the relief of Lieutenant-General Beresford-Peirse from XIII Corps and Major-General Creagh from 7th Armoured Division.[52]

Another loss which may have hurt the development of armored forces in the Middle East, was the death of Lt-General Vyvyan Pope and two of his principle staff officers, Brigadiers Caunter and Unwin, in a plane crash on their way to the Middle East. General Pope who had been the Royal Armoured Corps observer on the BEF staff in France was on his way to Egypt to command XXX Corps which

contained the armored and mobile forces. Whether he could have solved the leadership problems is not known, but at least it would have been better than what occurred after his death. The commander of the 1st Armoured Division who was on his way to the Middle East with his division was elevated to command XXX Corps for the Crusader operation.[53] Not only did this deprive the 1st Armoured Division of its commander, but it required a man, unproven as a division commander in combat, to serve at the next higher level.

As in the other desert campaigns the armored forces were undergoing changes until the last minute and the training was again cut short. General Auchinleck began receiving pressure to begin an offensive as soon as possible almost from the day he took command. This put him in a dilemma. He knew that the lack of trained units was a cause of defeat in Battleaxe, and he wished to avoid this same problem. This did not, however, endear him with the Prime Minister who did not appreciate being put off by his generals. In the end Auchinleck succumbed to the pressure and set a date of attack for November 18, 1941 which was earlier than he wished.[54]

The 7th Armoured Division for this battle consisted of the 7th Armoured Brigade, the 4th Armoured

Brigade and the 22nd Armoured Brigade which was really part of the 1st Armoured Division, but the remainder of the divison did not arrive until after the battle started. The 7th Armoured Brigade was an experienced unit by now, but even this unit still had a shortage of tanks at the end of October. Meanwhile the 22nd Armoured Brigade equipped with the newest cruiser tank, Crusader, did not start to disembark in Alexandria until October 4. All of its tanks required a modification which took three weeks. This brigade was not able to begin its desert training until October 25. Some of the crew training included driving, navigation, gunnery, intercommunication, recognition of many types of vehicle and crew maintenance. This of course did not make a unit combat ready for they still required to learn movement techniques in formation as well as the necessary skills to cooperate with other arms. By the time the 22nd Armoured Brigade went into battle it was far from combat ready.[55]

The 4th Armoured Brigade was equipped with the first contingent of American tanks. This was the Stuart tank. It proved to be a reliable tank mounted with a 37mm gun, but it only had a range of 70 miles. This brigade was potentially the strongest armored formation because it had experienced tank units, a commanding officer who had

been in the Middle East since the beginning of the war and new tanks which were mechanically reliable. This unit was initially held out of the armored battle because it was required to screen the left flank of XIII Corps, an infantry corps.[56]

The major doctrinal issue was the concept that the British tanks went into battle to destroy enemy tanks. It is interesting to note the number of tanks on both sides during the battle. Again the quality of armor on both sides was roughly equal if crew training is not considered. In total tanks the British were vastly superior to the Germans. They had over over 700 tanks while the Germans and Italians had approximately 390. Of the German total 70 of the tanks were light tanks armed only with machine guns and 146 of the tanks belonged to the Italians. The British tended to ignore the Italian armor, probably because of the poor showing the Italians made in the initial campaign. If these are discounted this brings the total count of German tanks available for the battle down to 175. On the British side not all 700 tanks would participate in the great tank battle. Approximately 100 tanks were in Tobruk garrison and 130 were in the 1st Army Tank Brigade (infantry support -Matilda and Valentine). This still left the British with

470 tanks in the 7th Armoured Division. If the 170 tanks of the 4th Armoured Brigade screened the XIII Corps, the British could still mass 300 tanks against German tank formation. This is the type of calculation that the British tank commanders went through in determining whether or not they were ready for battle against the Germans.[57]

The problem with this calculation was that it was irrelevant in a couple of ways. First the German commanders did not plan to tackle the British armor with their tanks. If the commanders wanted to compare weapons they should have counted the total number of anti-tank guns that the Germans had with their armored formations as well. This is what destroyed most British tanks during Battleaxe. A German panzer division had almost as many anti-tank guns as it did tanks, and if one takes into account the quality of these guns the picture begins to look somewhat equal. As an example, in one position an 88mm gun knocked out 11 British tanks.[58] Both the 50mm long barrel and 88mm anti-tank gun could destroy British tanks outside the efective range of British tank guns.

Even this is not totally relevant because it ignores the moral domain of combat. This pertains to those human factors which influence the combat potential

of a unit. The factor of training has been discussed, but to further elaborate, the 22nd Armored Brigade was given one week to train in the desert prior to going into battle. Besides all the individual crew skills it had to master, the brigade needed unit training to employ all its combat power effectively. As previously described, British armored divisions were weak in combined arms because of a tradition of training as single arms with separate doctrines. This greatly handicapped the British armored division because the Germans fought as combined arms units, and the German units in the desert were well drilled. In addition, they had considerable combat experience. With this understanding of the type of unit that British armor was trying to defeat, it was absolutely imperative that the armored brigades mass their units to bring the most combat power to bear. Their capability to do this in this battle was extremely limited. It is highly unlikely that the 22nd Armoured Brigade could be properly integrated into the 7th Armoured Division in one week's time, given all the other skills the brigade needed to learn first. This is why in all the campaigns in the desert up until this time the armoured divisions fought as separate brigades.

The Crusader battle was more violent and confusing than any other previous desert battle. This pattern of confusion and hard fighting on both sides became the norm for this and all future desert battles. When the British launched their attack they achieved total surprise over Rommel, although some of his staff and subordinate commanders tried to alert him to the attack almost immediately. The first day the armored brigades moved about 40 miles and stopped. The British commanders commanders were in a quandry about what to do because they predicated their next move on Rommel's reaction.[59]

The next day, the armored brigades decided to move deeper into the German positions and seize a vital location which would force the German panzer divisions to attack. This is what General Norrie wanted to do from the beginning. They did this and all three brigades got into battle the next day. The unfortunate problem was that the brigades were in three separate locations and could not support each other. The deeper they drove into German territory the more dispersed the three brigades became. The relative combat experience of the three brigades was apparent in the three battles.[60]

The 22nd Armoured Brigade which was the new brigade in the theater, foolishly drove directly into an

Italian defensive position held by an Italian armor division. One of the reconnaissance regiments warned the brigade not to attack this position, but they failed to heed the warning. This brigade received a severe repulse and suffered considerable tank losses. Even prior to this engagement, the 22nd Armoured Brigade had lost many tanks because of mechanical failure, and its support echelon which kept getting lost delayed the brigade. The breakdowns indicate both the unreliability of the new Crusader tank as well as the inability of the tank crews to perform maintenance on their tanks.[61]

The 4th Armoured Brigade suffered the most losse when a panzer division attacked it. This was due to the anti-tank guns which were with the panzer unit. The Germans broke off the attack toward dusk and the 4th Armoured Brigade decided to pursue the attack the next day. This attack continued the next day and 22nd Armoured Brigade was ordered to support the 4th Armoured Brigade. The 22nd did not arrive until late and was unable to get into the attack that day. The two commanders made their plan to attack and fight the decisive armor battle the next day. The Germans withdrew that night and concentrated against the 7th Armoured Brigade the next day. The 4th Armoured Brigade attempted to pursue in the

morning but could not catch up because of the 70 mile range of the Stuart tank.[62]

The 7th Armoured Brigade, probably the most experienced unit of the division, siezed an objective which threatened Rommel's line of communications on the 19th. They captured an airfield with the aircraft still on the ground. With this success at the end of the day, they set up a combined arms defense with the support group of the division. The division needed more infantry, artillery and anti-tank guns because there were too few support arms in the British armored division organization. Consequently the defensive position was not very strong. The division called for more infantry support, but it never arrived.[63]

From this point the battle lost its coherency. Both commanders were confused about where the enemy was and what he was doing. Subordinate commanders disobeyed or disregarded orders which added to both commanders' confusion. Cunningham received optomistic reports about the defeat and withdrawal of German armor. He subsequently ordered the breakout of the Tobruk garrison. On the 21st, he received a report that the German armor was withdrawing and he launched the infantry attack with his XIII Corps.[64]

This was not the case and for the next three days the armored battle that the British had been seeking occurred. Although the British finally managed to mass their armor, they were unable to coordinate their attacks. The British fought hard, but for the most part the tank brigades fought alone, and the combined arms attacks of the Germans destroyed the armored brigades. At this point, the British might have retreated if Rommel had continued his destruction of the armored units. His offensive spirit caused him to take a risk and try for total victory. He had lost heavily up to this point and his troops were tiring.[65]

For the next three days, Rommel made a daring dash to the Egyptian border while the XIII Corps continued the attack. The 8th Army did not panic and the only one who apparently lost his nerve was Cunningham. On the 26th of November, General Auchinleck replaced Cunningham with Acting Lieutenant-General Ritchie, his deputy chief of staff. This was to be a temporary appointment until the end of the campaign. His instructions to Ritchie were to continue the offensive. By now Rommel was unsuccessful and retreated because of the threat to his lines of communication. During the period while Rommel made his drive for the Egyptian border, the British armor

reconstituted and the anti-tank defenses of the British infantry destroyed the German armor.[66]

The British Army continued the offensive and on December 7th Rommel withdrew. Tobruk was relieved. The British armored brigades tried to pursue and Rommel, but they were unable to do this effectively. Both armies were exhausted, but the "Afrika Korps" continued to mount counterattacks to cover its withdrawal through Cyrenaica.

"Crusader" was a British victory, but the cost in armor was excessive. 8th Army began the campaign with 950 tanks counting reserves. With a battle loss of over 800 tanks, replacements were no longer available. Mechanical breakdown produced many tank casualties, and added to repair shop burdens. Recovery operations swamped the repair shops which could only repair 300 tanks by year's end.[67]

During the last week of the campaign, the "Afrika Korps" received a resupply of tanks and other equipment. This improvement in Rommel's supply situation was a direct result of the winter in Russia which allowed the release of aircraft to support the North African campaign. The use of these aircraft in December and January neutralized the island of Malta and allowed several convoys to get through to Tripolitania. At the same time, the Japanese

attack in the Pacific hurt the British supply situation because it took away British shipping and air power. The situation rapidly stabilized and the initiative again passed from the British 8th Army to Rommel's "Afrika Korps."[68]

Rommel wasted little time in counterattacking the widely dispersed British forces. The situation for the 8th Army paralleled the situation of the previous year. General Auchinleck underestimated the time Rommel needed to begin his offensive. 7th Armoured Division needed refitting, so Auchinleck accepted the risk. He replaced the 7th Armoured Division with a poorly trained division. This division was the 1st Armoured Division and its condition was similar to the condition of the 2nd Armoured Division when it replaced 7th Armoured Division in 1941. The 1st Armoured Division was the original "Mobile Division" and subsequently the first armored division. After the division's piecemeal commitment and loss of equipment in France, it was not totally reorganized with the units that accompanied it to the Middle East until February 1941. In April, the new cruiser tanks were taken from its tank battalions and sent to the Middle East. By July, when the division was again re-equipped, the tanks were withdrawn one more time to undergo modification.

Because of the preparations for "Crusader", the War Office decided in late August to send one of the division's armored brigades to the 8th Army. This brigade, the 22nd, as previously described, fought poorly in the "Crusader" campaign. After losing its tanks early in the campaign, the brigade was refitted and participated in the pursuit of Rommel across Cyrenaica. It was this brigade which bore the brunt of the counterattacks covering Rommel's withdrawal in late December. The results of these actions were the almost total destruction of the 22nd Armoured Brigade for the second time and it was withdrawn to refit.

Meanwhile, the remainder of the 1st Armoured Division left Great Britain in late September, arrived in Egypt in late November and came under 13th Corps' command at the beginning of January 1942. Training throughout this period was disrupted and cohesion was never developed within the division. As with most previous armored units, upon arrival in Egypt there was little time to learn operations in a desert environment. A further complication developed when the division commander was wounded in an air attack and had to be replaced. When the division arrived at the front, it had no engineers, infantry, or reconnaissance units. Also, the field artillery units supporting the division were South African

units which had conducted only one training exercise with the division prior to moving to their position.[69]

Rommel's intelligence officer provided him with information that an opportunity existed because inexperienced units occupied the British front. The British received no Ultra information about Rommel's intentions because he told no one about his plans to attack. Rommel's surprise attack resulted in the withdrawal of Britisih forces to the Gazala line, the loss of 70 tanks of 1st Armoured Division, and the abandonment of early plans for another British offensive. Luckily for the 8th Army, the Axis strength was not sufficient to push them back further. The British now needed until June to resume the offensive.[70]

Rommel's last counterattack during the "Crusader" campaign which mauled the 22nd Armoured Brigade and his limited counteroffensive in January which destroyed the remainder of the 1st Armoured Division had some strategic significance for the North African theater. More importantly for this study, it had operational significance for the next campaign. By pushing the British Army back to what was known as the Gazala line, the British access to airfields which were necessary to support Malta were denied. Coupled with the return of

German airpower from the Russian campaign during the winter months, this had the effect of isolating the British bastion in the Mediterranean. At the same time, this helped Rommel's supply situation and allowed more Axis shipping to get through. Conversely, this threatened Britain's shipping and control of the Mediterranean. This was significant to Churchill and his military planners in London and caused the Prime Minister to place immediate pressure on Auchinleck to begin an offensive to take back Cyrenaica to help relieve Malta. At the operational level, the ultimate effect of this was a source of friction between Auchinleck and his political and military superiors. Of greater operational significance was the moral effect these two tactical defeats had on the British 8th Army. After these two defeats, there was a general feeling among the British armored units that the German panzer units were overwhelmingly superior in equipment and fighting capability. Rommel had moral ascendancy over the British.

This certainly was the case with Auchinleck. He became overly cautious and perhaps even pessimistic. His attitude is best summed up in a letter he wrote to his Chief of Staff, Sir Arthur Smith in on January 30, 1942.

We have got to face the fact that, unless we can achieve superiority on the battlefield by better co-operation between the army and more original leadership of our armoured forces than is apparently being exercised at present, we may have to forgo any idea of mounting a strategical offensive, because our armoured forces are tactically incapable of meeting the enemy in the open, even when superior to him in numbers.

Another very serious aspect which is obtruding itself more and more is the growth of an inferiority complex amongst our armoured forces, owing to their failure to compete with enemy tanks which they consider (and rightfully so) superior to their own in certain aspects. This is very dangerous and will be most difficult to eradicate once it takes root, as I am afraid it is doing now. It becomes all the more important to weld the three arms together as closely as possible.

I have put this matter very plainly to the Prime Minister, as the military authorities at home, including Martel, must realise what they are up against, and it is no good just counting tanks or regiments and pretending that ours are individually as good as the German because they are not. Before we can really do anything against the German on land, they have got to be made as good and better both in equipment, organisation and training.

As you know I am not inclined to pessimism but I view our present situation with misgiving, so far as our power to take the offensive on a large scale is concerned.[71]

In a telegram he sent to Churchill on the same day he stated;

....other and at times irremediable causes which I have already mentioned to you in letter are short range and inferior performance of our two-pounder guns compared with the German guns and mechanical unreliability of our cruiser tanks compared with German tanks. In addition I am not sure that the

> tactical leadership of our armoured units is of sufficiently high standard to offset German material advantage. This is in hand but cannot be improved in a day unfortunately.
>
> I' am reluctantly compelled to the conclusion that to meet German armoured forces with any hope of decisive success, our armoured forces as at present equipped, organised and led, must have at least two to one superiority. Even then they must rely for success on working in the very closest co-operation with infantry and artillery, which except for their weakness in anti-tank guns are fully competent to take on their German opposite numbers.
>
> General Ritchie and I are fully alive to Rommel's probable intentions but whatever these may be he will certainly try to exploit success by use of even smaller columns until he meets resistance. Plans are in train to counter such action.[72]

Although his assessment of 8th Army was not far wrong, he made several key errors in judgement and leadership. Over the course of the next few months and next campaign which Rommel would initiate, these mistakes had disastrous effects both for himself and his Army.

Auchinleck's first critical error was the manner in which he resisted Prime Minister Churchill's pressure to begin an offensive. From February through May both sides built up for the next offensive. At the end of February, Churchill began to pressure Auchinleck to begin his attack. General Auchinleck began his "Crusader" campaign several weeks before he was ready because of Churchill's pressure, and for those units that went into battle before they were ready it had been a catastrophe.

He would not let Churchill coerce him to begin his next campaign before he was ready. Auchinleck's perspective was that of a military commander in a single theater. Churchill, on the other hand, was in desperate need of a victory. Events were going badly for Britain in the Far East, naval losses had been high, German armies were still being succesful almost everywhere, and Malta was under heavy pressure. Most of all Churchill needed a victory to bolster morale and political support on the homefront. Auchinleck failed to acknowledge the influence that politics necessarily had on his theater of operations.

This disagreement between the Prime Minister and his general reached its most critical stage in March. At the end of February, Churchill sent a telegram to Auchinleck asking what his future plans for an offensive were. Based on what the Prime Minister knew of the force ratios, he expected the 8th Army to go back on the offensive some time in March. When Auchinleck sent his estimate announcing that he could not begin earlier than June 1, Churchill was furious. In order to settle the difference between them, Churchill requested that Auchinleck return to Great Britain to discuss the situation. When Auchinleck refused, the damage to their relationship was irreparable. This disagreement by

correspondence continued through the month of May. Several times Churchill was determined to replace him, but his C.I.G.S, General Brooke convinced him not to change commanders at this critical juncture.[73]

Even without this feud the results of the next campaign would have spelled Auchinleck's demise as the Commander in Chief, Middle East. The significance of this argument was the effect it must have had on Auchinleck. A commander who senses his superior's lack of confidence in his abilities is unable to concentrate his efforts on commanding his organization. Much of Auchinleck's energies were directed toward his battle with the homefront rather than preparing his force for the coming battle.

The next error which Auchinleck committed was in the realm of leadership. The tenor of the previously cited messages demonstrates the depths to which his fighting spirit had sunk. He allowed the opposing commander to gain the moral ascendancy. This lack of fighting spirit emanating from the commander was fatal to the 8th Army. Auchinleck and many of the senior commanders of the 8th Army were now overly cautious toward "Afrika Korps." They lost faith in the ability of the 8th Army to beat the Germans.

Included in Auchinleck's misgivings about the qualities and capabilities of his forces was his lack of confidence in 8th Army's leadership, especially of his armored forces. As previously noted, one of the problems which confronted the armored forces in Africa and which was beyond anyone's control was the untimely loss of key armored leaders. Leaders were forced to serve in the next higher position in their chain of command. Men with no experience as division commanders in combat were suddenly thrust into positions as corps commanders. These new commanders often found themselves in combat with their units almost immediately after taking command. Loss of leaders and the resultant demands this places on other leaders is normal in wartime. There was, however, such limited British Army experience in armored warfare and even less in desert armored warfare, that the loss of just a few key men was a serious blow.

In hindsight, the manner in which Royal Tank Corps officers had been forced out of the Army or shunted off into meaningless positions during peacetime was a critical error. Many of the commanders during the war were former horsed cavalry officers recently converted to armored officers. Leaders who spent so little time learning and

contemplating the unique problems of mobile armored warfare could not hope to become experts overnight.

Regardless of these problems, General Auchinleck apparently overlooked the fact that it was his responsibility to develop his leaders and their staffs. He was the ultimate authority in setting and maintaining the leadership standards of the officers under his command. If these officers lacked experience then it was his responsibility to prepare them for combat. If they were incapable of doing the job then it was his responsibility to relieve them. Auchinleck was perhaps too easy on his subordinates and too quick to forgive their mistakes to develop a disciplined and professional officer corps in his Army.[74]

General Auchinleck's method of handling his subordinates was his trajic flaw. While he tended toward obstinancy with Churchill, his leniency with his chief subordinate was inexplicable. It was a grave mistake for him to keep Lieutenant-General Ritchie in command of 8th Army. Auchinleck's loyalty and friendship for Ritchie stood in the way of his judgement and resonsibility as a leader.

Auchinleck picked Ritchie, who was serving as his Chief of Staff at the time, to replace General Cunningham

during the "Crusader" campaign. Ritchie was still a Major-General at the time. He was made an acting Lieutenant-General and became the temporary 8th Army commander. Auchinleck's rationale for his selection was that it would cause too much turbulence to elevate any of the Corps commanders during the battle. Since Ritchie was familiar with both the Middle-East and the situation, he was a logical choice. The Corps commanders accepted this expediency particularly because General Auchinleck brought his headquarters to the battlefield and continued to give his old chief of staff detailed instructions. Ritchie remained more of a staff officer than a commander during the remainder of the campaign.

At the end of December, 1941, Auchinleck returned to Cairo. During the next month Ritchie demonstrated that he was incapable of commanding 8th Army. For the reasons previously stated, Auchinleck refused to relieve him. While Auchinleck recognized General Ritchie's shortcomings, he apparently hoped that Ritchie would grow into the job. In the meantime, he planned to give him enough advice so that he could not go too far wrong.

This system of command simply did not work. Ritchie was never seen as the legitimate commander of 8th Army. His corps and division commanders recognized that

Auchinleck was really in charge, and any command from Ritchie was questioned. This whole process led to a situation where all orders were discussed, debated and often ignored. By far the most serious weakness in the 8th Army during the next campaign, each commander placed his own interpretation on every order. Besides destroying all traces of cohesiveness and cooperation between units, the decision-making process slowed to a snail's pace. This made it absolutely impossible to concentrate forces at the critical time and place.[75]

This detailed discussion of the leadership situation was presented because it was the most critical factor which affected the development of armored forces during the first six months of 1942. Even with technological improvements, increasing quantities of material and time to develop unit cohesion; without dedicated and well-trained leadership with the will to win, the defeat of 8th Army forces was probably inevitable.

While the leadership problems were serious, they were not the only problems to plague 8th Army. An assumption which most leaders in the Army and particularly in the armored units made was that German tanks were technologically superior to the tanks of 8th Army.

Auchinleck alluded to this in his letters to his chief of staff and to Winston Churchill on January 30, 1942. A closer examination of the facts shows that these assumptions were incorrect.

Tanks can be compared in many different ways. A few of these ways include; armor, radius of action, speed, size of gun, armor penetrating capability of the gun at various ranges, ammunition capability and mechanical reliability. Armor protection is not uniformly the same over the complete tank so this comparison could be made in terms of frontal, side or turret. No tank was superior in all features. Each side had several types of tanks with each tank having advantages and disadvantages when compared with tanks of the other side, except possibly the Italian tanks which were uniformly disadvantaged in all categories. Additionally modifications to correct specific faults or to make improvements occurred constantly so it was impossible to know the complete status of the opposing tanks at any given time.

In the next campaign which began May, 1942, the principle British tanks were Valentines and Matildas; infantry support tanks, several models of Crusaders, Grants and Stuarts. The last two types were American design and manufacture. The Germans had Marks II, III,

and IV with two types of Mark III.The Italians had M13 and M14's.

The most important items of comparison were the armor protection and the penetrating power of the guns which the various tanks mounted. The British made tanks were still armed with 2 pounder guns, the Stuart had a 37mm gun and the Grant had a 75mm gun. On the Axis side, the German Mark II's had no gun, the Italian tanks had a 47mm gun, the Mark III(H) had a short 50mm gun, the Mark III(J) had a long 50mm gun, and the Mark IV had a 75mm gun. The Grant's 75mm gun had the greatest penetrating power, closely followed by the Mark III(J)'s gun. The penetrating power of the Stuart's 37mm was better than the British 2 pounder guns which were slightly better than the Mark III(H)'s and Mark IV's. The 75mm of the Mark IV was a low velocity weapon which fired only high explosive which accounted for its low penetrating power. The German Mark III's fired an armor-piercing type shell which gave it greater penetrating power than the British 2 pounder but only at shorter ranges. This shell's muzzle velocity tapered off rapidly so that at 1000 yards, the 2 pounder gun was still better. The Germans carried only a small number of armor piercing shells which were primarily to defeat tanks at close range as a self-defense measure.

One must remember that German doctrine at this time did not call for tanks to defeat other tanks.

In terms of armor protection, the Valentine and Matilda were the most heavily armored and were relatively invulnerable to all Axis tanks at 1000 yards. The long-barrel, 50mm gun was powerful enough to penetrate parts of the Valentine tank at this range. The Grant was the next best armored tank, closely followed by the Mark III, Mark IV and Crusader. The British Crusader, German Mark III(H), and Mark IV had rough equivalency in armor protection. The hull armor of the Mark III and IV was greater than the Crusader, but the turret armor of the Crusader was thicker. With only 35mm of armor in the turret, the Mark III(H) and Mark IV were extremely vulnerable in this area; however, because of the training level of many British tank crews this vulnerability was never exploited. The MarkIII(H)'s short 50mm gun or the Mark IV's 75mm gun could not penetrate any portion of the British Crusader tank's front at 1000 yards, but the British 2 pounder could penetrate the Mark III(H)'s and Mark IV's turret front at 1000 yards. (This was not true of the Mark III(J) which had more armor protection in its turret). The Stuart tank was lightly armored but still considerably better protected than the German Mark II or

the Italian tanks. Its 37mm gun had an armored-piercing, capped shell which gave it the capability to penetrate the Mark III(J) turret and hull at ranges of 1'000 yards. The Italian and Mark II tanks were not a threat to the British or American made tanks. At ranges of 500 yards or less all tanks, except the Valentines and Matildas, could be penetrated almost anywhere by any of the tank guns. Only the long-barrel, 50mm of the Mark III(J) could penetrate the British support tanks at this range. This was the primary reason the Germans developed armored-piercing ammunition for close ranges.

If just these two criteria were compared, the British tanks had a considerable qualitative advantage over the "Afrika Korps." The Grant tanks were new to 8th Army and combined with the Crusaders and Stuarts, the mix of tanks in the British Army was clearly better than that of the Germans and Italians. The Mark III(J) was the only tank which could offset the Grant tank in both armor and gun power. The Germans, however, had only 19 of these tanks while the British had 167 Grant tanks.[76]

There were other factors which degraded the British advantage in these two areas. The optical sights of the British tanks were inferior to those of the Germans. Also the armor of many German tanks was

strengthed with face-hardened plates. This caused the British 2 pounder shell which was not protected by a cap to shatter against the plates without penetrating. The Stuart tank's radius of operation was only 70 miles which limited its capability, although the range of the other 8th Army tanks was better than that of the German tanks. The Grant tank was not without some disadvantages. The 75mm gun was not mounted in the turret but in a sponson on the right side of the tank. This limited traverse to a few degrees left and right. A more serious disadvantage was that the gun was mounted too low in the tank and consequently could not fire from a "hull" down position.[77] Finally the most serious problem was the mechanical unreliability of the Crusader tank. This had serious repercussions during Rommel's counteroffensive of January 1942 when the British retreated to the Gazala line. In the words of Colonel Berry, the Chief Mechanical Engineer for XIII Corps and 8th Army;

> .... The lack of mechanical reliability was a very different matter and had a profound effect on the whole of the desert fighting in 1941 and 1942.
>
> Like the Matilda the engine of the Crusader tank was not designed as such. It was a 12-cylinder 400 hp aero engine left over from the 1914-1918 war....
>
> Unfortunately the cooling problems in a tank are very different from those in a aeroplane, and here the troubles began.... In the Crusader the engine was

> modified by the fitting of two fans and two water-pumps driven from the engine crankshaft by a long chain. This was a disaster. As soon as the tank was used in the desert sand got in the chain, the chain stretched and started to jump the crankshaft driving sprocket. It was a three-day job to change the sprocket.
>
> Worse still, the water-pump would not stand up to the sand and heat of the desert and soon leaked very badly. A re-design was necessary but unfortunately the manufacturing facilities did not exist in Egypt.
>
> In January 1942 we had pushed Rommel right back to El Agheila and he seemed to be nearly finished. I think he would have been finished if we had not two hundred Crusader tanks under repair.... The reply came back: "Regret not available in UK." If those water-pumps had been available Rommel's counter-attack could never have succeeded and there would not have been a battle of Alamein, first, second or third.[78]

Whether his assessment of the impact this deficiency had on the course of history was correct is not important. The shortcomings of the Crusader tank had a serious effect on the confidence the men had in their equipment. This was why the arrival of the Grant was so important. They finally had a weapon in which they had confidence. Its tremendous firepower came as a shock to the Axis forces in the next campaign. This tank certainly offset the deficiencies of the Crusader and balanced the scales in terms of armor on the battlefield.

At the start of the next campaign, the two British armored divisions had 573 tanks; 167 Grants, 149 Stuarts and 257 Crusaders. There was another armored brigade with

75 Grants and 70 Stuarts which was not available at the beginning of the battle, but the tanks were used as replacements during the battle. The British Army also had two Army tank brigades with 166 Valentines and 110 Matildas. Normally the infantry support tanks were not employed against other tanks, but in this battle they took a heavy toll on Axis tanks.

On the Axis side there were 560 tanks with 228 Italian, 50 Mark II's, 242 Mark III's of which, as previously noted, 19 were the J model, and 40 Mark IV's. The Axis forces had approximately 60 tanks in reserve for this battle.[79]

While the British had a clear superiority in numbers, they also had at least parity in quality as shown in the discussion above. Why then did the British lose the next battle? The answer does not lie in the numerical strengths of the two armored forces. British armored forces believed they were inferior to the "Afrika Korps" and this had real significance for the Gazala Battles which began May, 1942. Not only did the units believe it, but the Army leaders starting at the top with Auchinleck believed it.

The reason they believed this relates back to British armored doctrine. Their doctrine called for tanks

to kill other tanks. When so many British tanks were killed at great ranges during the Crusader campaign, soldiers and their leaders concluded that it was caused by the superior firepower and gun range of the German tanks. They failed to recognize that the German anti-tank guns, a part of the panzer division's offensive power was the reason for this. As indicated previously, the Germans offset their inferior tank numbers with superior numbers and quality in anti-tank guns. Add to this that the German panzer units were well trained and able to execute their combined arms doctrine and the Germans had the tactical advantage on the battlefield. Only by concentrating their superior numbers of tanks on the battlefield could the British defeat the Germans.

Another doctrinal issue and a disadvantage for the British was their belief in traveling with dispersed armored formations. This continued to haunt them. Time after time Rommel had caught the British formations dispersed. He was often able to destroy individual regiments by attacking with his entire armored force. The British always planned to concentrate their armor at the critical time and place to fight the big armored battle, but they were unable to execute this doctrine. Th command system of the British 8th Army operated too slowly

to do anything but react to Rommel and then they were usually too late. Under Ritchie, for all the reasons previously identified, the command system became slower. To counteract this problem Auchinleck gave Ritchie instructions to keep the British forces concentrated at the start of the next campaign and employ them as an armored corps. Ritchie ignored these instructions and the consequence was the defeat in detail of most of his armor.[80]

Finally, Auchinleck recognized the training deficiencies of his armored units. These deficiencies led to a decision to change the division organization. He recognized that because of the peacetime tradition of training each arm separately the British Army was handicapped when it tried to fight as a combined arms team. He believed that only the close association of all arms in a division would lead to the close cooperation required in battle. Auchinleck's timing for this decision was incorrect. This created too much turbulence at a time when the units needed to develop cohesion and "esprit de corps." Results from the battle demonstrate that his reorganization failed to achieve its purpose. In fairness to General Auchinleck, the reorganization was

incomplete and did not have enough time to prove its merit.

The organization he recommended called for the armored division to have only one armored brigade and two motorized brigades. Each brigade would have an artillery regiment to include an anti-tank battery. The armored brigade would have a motorized infantry battalion and each motorized brigade would have three motorized infantry battalions. Each brigade would have its own anti-tank, anti-aircraft and engineer units. He also had a similar reorganization for infantry divisions.[81]

This organization was detrimental because it disersed the combat support arms throughout the division and did not allow for a concentration of support within the division. Of greater consequence was the inability of the division to mass its available artillery support. This reorganization tended to allow divisions to fight as separate brigades but not as divisions.

This was the state of the 8th Army and more specifically its armored divisions before Rommel launched his greatest offensive in May, 1942. Despite all the forces working against the army, the battle was a surprisingly close contest for the first 10 days. Individual soldiers fought well in spite of their leaders

low morale and lack of faith. Many brave men were sacrificed because of leadership deficiencies, faulty doctrine, and poor tactics due to inadequate unit training. The courage of these men, however, were the seeds of future success.

Rommel began the Gazala campaign on May 26, 1942. He massed all of his armored forces to encircle 8th Army from its southern flank. He achieved initial surprise even though his movements were reported. This surprise was primarily because the commanders involved refused to believe the intellignece reports which ran counter to what Auchinleck had forecast and disseminated to his commanders as the direction of the enemy main effort. Rommel on the other side did not achieve his initial objectives because of faulty intelligence about 8th Army dispositions. Besides running into units which he did not know existed, the minefields were much more extensive than he anticipated. Still, he managed to defeat several dispersed brigade groups and armored brigades. He accomplished this with the loss of over 200 tanks in the first 2 days of battle. The Grant tank had taken its toll.

On the third day of battle Rommel had to pull in his forces in an attempt to consolidate and at the same

time he found his units practically immobile because of a lack of supplies. During this period, if 8th Army had mounted a coordinated attack, it might have destroyed Rommel. The slowness of the British command system saved him.

Once Rommel was resupplied, the story of the battle became the destruction of individual brigades and smaller size units. Repeated failure of infantry and armored divisions to launch coordinated combined arms attacks characterized this entire campaign. By the end of the campaign, infantry formations were convinced of the unreliability of armored units in battle. Many infantry soldiers lost their lives because armored units failed to follow up their attacks in time.

By 12 June, the British no longer had a superiority in tank numbers. During this period of intense fighting, the British armored units had undergone continual reorganization. A couple of descriptions of this effort shows the problems this created.

> ....Attempts to bring the armour up to strength had been most complicated and not very successful, the basic cause being the differences between the three sorts of cruiser tanks. To get the required tank with a suitable crew to the unit that wanted it was not easy. It led to sub-units being combined, or sometimes lent to other units. Even single tanks and

> crews had to be sent here and there. Regimental organization was disrupted, and the 1st Armoured Brigade, much to its disgust, had been used as a pool of immediate requirements....[82]

and

> This system ingeniously combined the worst aspects of any method of replacement. The survivors were often suffering from battle shock, needing rest and hoping for escape from a battle in which they had already experienced set-back and were now sensing ultimate defeat. Now they were to go back in, leaving to the comparative safety and ease of the rear areas entire tank crews who were fresh and unscathed. These in their turn were infuriated to see their own tanks upon which they had often lavished great care being driven off to battle by others, with so evident a reflection upon their own courage or their own ability.[83]

Thus during the course of this battle two more armored brigades were destroyed simply because they had been used as a replacement pool for the units already in the line. The advantage of unit cohesion gained through unit training was ignored through the use of such a system. This demonstrates insensitivity to and a lack of understanding in the moral domain of combat on the part of leaders. This is also a reflection on the professional competence of the leaders.

On the 14th of June until Ritchie was relieved on the 25th of June, there was a complete lack of understanding between Auchinleck and Ritchie. Primarily, Ritchie failed to inform Auchinleck of either his actions

or his intentions. On 25 June, the garrison of Tobruk fell with 33,000 men lost and 8th Army was in headlong retreat to the Egyptian border, trying to put distance between itself and "Afrika Korps."

From 25 June until 26 July, Auchinleck directed the battle. By 30 June, Rommel's forces were ready to attack 8th Army forces at El Alamein deep in Egyptian territory. The British had around 150 tanks remaining; consolidated in the 7th Armoured Division. The Axis had only 50 tanks remaining, but still Rommel maintained his offensive. On 4 July the initiative passed over to 8th Army. The remainder of the campaign saw 8th Army which received reinforcements, mount continued attacks to try and break Rommel's forces. Each one failed for basically the same reason. The infantry and armored forces were never able to coordinate their attacks. The armored units often got bogged down in minefields and then were subjected to German counterattacks. Finally, Auchinleck and his soldiers were worn out and could attack no more.[84]

During the campaign the British had basically lost an entire army. It is not surprising that General Auchinleck was relieved shortly thereafter. General Harold Alexander became Commander in Chief, Middle East

and Lieutenant-General Sir Bernard L. Montgomery became the Commander in Chief, Eighth Army. This change was to have occurred on August 15, 1942, but General Montgomery took over two days early on August 13 and created an everlasting controversy by the manner in which he denigrated his predecessor.[85]

The controversy that Montgomery stirred up is not important to this study, but what is important are the changes which transformed a defeated Army into a victorious one. Montgomery's critics say that overwhelming numbers were the real reason for his victory. Certainly when Montgomery went on the offensive during the battle of Alamein, he had an awesome superiority.[86] However, British Armies had enjoyed superior numbers throughout the previous campaigns in North Africa against Rommel and had not been victorious. Rommel beat superior numbers several times, and he took the offensive one more time against Montgomery believing that his old formula would achieve success. He was unsuccessful, and Montgomery wrested the initiative from him.

More than mere superiority in men and materiel was required to defeat Rommel. Montgomery was able to fill in the pieces to success that had eluded 8th Army in the past. This is not to say that everything prior to

Montgomery's arrival was inconsequential to his success. Montgomery was the catalyst which organized and energized the forces of 8th Army.

The first change which Montgomery brought to the Middle East was a different leadership philosophy. Montgomery defined leadership as "the capacity and the will to rally men and women to a common purpose, and the character which inspires confidence."[87] In his memoirs he added several leadership principles or qualities to this definition. He believed that a leader must be decisive and the commander must develop the plan of operation, not the staff. The commander, however, must not become bogged down in details. These should be left to the staff, so that the commander is free to think through the process of the enemy's defeat. The commander must carry out his duties in a direct and personal manner. In this regard, before each battle the leader must transmit his intent to his subordinates. In order to ensure that subordinate commanders will understand the intent, the Army commander must carefully select them. Finally he believed that the most important factor in war was the morale of the individual soldier. Montgomery practiced all of these ideas and they were the

intellectual force behind his sweeping changes in 8th Army.[88]

Montgomery was a man of action and he proceeded to ruthlessly put his stamp on the Army. One of his first actions was to appoint a capable chief of staff. He gave him the power to speak for the commander and complete control over the staff.[89] This of course freed him from staff details and allowed him time to deal directly with subordinate commanders or other critical matters. The man selected for this position was Brigadier Freddie De Guingand, an old acquaintance and friend, who had considerable time in the desert.

Montgomery was fortunate to have many experienced, young staff officers available when he built his Army staff.[90] De Guingand was a perfect example. Auchinleck appointed him Director of Military Intelligence, Middle East and promoted him from Lieutenant-Colonel to Brigadier in February 1942. He proved deserving of rapid promotion while in that position, and he did the same as a chief of staff. Another way he assembled his staff was through his intimate knowledge of the officers available in Great Britain. His first evening in command, he sent a wire to London, asking for six senior officers by name.[91]

Another part of Montgomery's sweeping changes was the process of evaluating his commanders. The first change was the appointment of Major-General Brian Horrocks to command XIII Corps, an infantry corps. Montgomery had him sent out from Great Britain because he knew him well and helped to train him as a divisional commander. Although he did not make any other immediate changes; after Rommel's brief offensive at the end of August, he placed many new men in command. Most were men he personally knew and trained.[92] Thus within a month Montgomery had gained considerable control over his Army.

The new 8th Army commander influenced his Army in other ways as well. His most immediate concern upon taking command was restoring the morale and confidence of the Army. He was most appalled by the atmosphere he found in his headquarters. With the probability of Rommel launching an attack with each passing day, he knew he must do something immediately to change the outlook of his Army. His first evening in command he gave a memorable speech to his staff. Montgomery immediately established himself as the man in charge and he emphasized the need for a new outlook in the Army. At one point he stated;

....one of the first duties of a commander is to

> create what I call "atmosphere," and in that atmosphere his staff, subordinate commanders, and troops will live and work and fight.
>
> I do not like the general atmosphere I find here. It is an atmosphere of doubt, of looking back to select the next place to which to withdraw, of loss of confidence in our ability to defeat Rommel, of desperate defence measures by reserves in preparing positions in Cairo and the Delta.
>
> All that must cease.
>
> Let us have a new atmosphere.[93]

In this same talk he assured them that they would immediately begin to plan for the offensive to throw Rommel out of Africa. He also made it clear that no offensive would begin before the Army was ready.[94]

The effects of this speech was summarised by De Guingand.

> ....That address by Montgomery will remain one of my most vivid recollections.... We all felt that a cool and refreshing breeze had come to relieve the oppression and stagnant atmosphere.
>
> He was going to create a new atmosphere.... The bad old days were over, and nothing but good was in store for us. A new era had dawned.[95]

Another comment from a staff officer conveys the same feeling.

> ....There was very much a feeling of "Well we'll give it a go." I think we had this rather arrogant view

> that we'd had rather a lot of generals through our hand in our day. And this was a new one-but he was talking sense,... I remember it was, it was a feeling of great exhilaration: a feeling that here was somebody who was really going to use his staff.[96]

Although these comments were made after the event, the fact that two principal staff officers remembered this particular talk demonstrates the impression it must have had on the staff.

Another decision which he made on the day he took command was to cancel any plans for withdrawal. He made it known that 8th Army would fight the defensive battle from their current position. From that day forward he began convincing corps and division commanders that he knew Rommel's plan and was going to make Rommel fight according to his plan. As he visited each commander he stressed these two points.[97]

His actions during the first weeks of command brought 8th Army back to life and sowed the seeds of victory. It was unsettling because his manner shook the Army out of a complacent attitude and forced commanders to heed his demands. His manner was also reassuring because his men recognized an uncommon leader in him. He was successful in rapidly imposing his will upon the Army.

Once in control the Army obeyed him and he made the changes to win.[98]

Not all agreed that Montgomery was responsible for the changed attitude of the Army. This was best expressed by the commander of the 4th Indian Division who stated after the war that "there was nothing wrong with 8th Army's morale which its regiments would not easily put right themselves."[99]

Many authors attempt to go even further in trying to show that General Auchinleck enjoyed the complete confidence of his Army and that the low morale of the Army was a myth created by Montgomery. There is no doubt that 8th Army had many capable leaders at this time and that many of these men would be loyal to whomever was the commander of the Army. Brigadier De Guingand was an example of such an officer. It was also no secret that the individual soldiers of 8th Army had fought well in the last campaign.

Still there were indications that a change was necessary. The Army fought well as individual tactical units but were incapable of coordinating its activities as a cohesive whole. The bickering among Army commanders during the last campaign had affected its outcome. There was confusion about how the Army should fight not only due

to recent organizational and doctrinal changes, but because Rommel's methods of fighting had them baffled. Montgomery was new to the desert and was able to bring a fresh approach to the problem.[100]

Perhaps Auchinleck himself had a sense of this when he wrote to the Prime Minister after the fall of Tobruk on 23 June;

> The unfavorable course of the recent battle.... impels me to ask you seriously to consider the advisability of retaining me in my command... All the same there is no doubt that in a situation like the present, fresh blood and new ideas at the top may make all the difference between success and stalemate.... After steeping oneself for months in the same subject all day and every day one is apt to get into a groove and to lose originality.[101]

Another change which Montgomery made immediately upon assumption of command was to eliminate brigade and other ad hoc tactical groups and to return to the division as the basic Army fighting organization. He wanted units to train and fight as divisions to develop a higher degree of cohesion among the various arms. He necessarily saw the need to fight as combined arms organizations. Auchinleck also wanted his units to fight as combined arms units; however, his division reorganization made the brigade the basic fighting organization. The new division

organization which Montgomery developed had one armored and one motorized brigade with the artillery and combat support arms consolidated under division control (see appendix one). The problem frome previous battles was that the armored brigades had always fought separately. What Montgomery was now proposing was a radical change.[102] This concept did not take root overnight and the 8th Army's armored divisions were far from perfect fighting instruments, but Montgomery understood their limitations and employed them accordingly. He had to defeat Rommel in his next offensive and allow his divisions time to train before using them in an offensive role. In the battle of Alam Halfa, Montgomery put his armored units in defensive positions to make Rommel destroy his units against his guns rather than allow his units to charge into Rommel's anti-tank guns.[103]

Montgomery saw training as the key to victory. He required all units to rehearse there actions and movements before the battle. He had an exercise designed to rehearse his battle plan within a few days of taking command. In designing the exercise his instructions to the umpires were to portray an accurate picture of Rommel's attack and to produce a realistic exercise.[104]

After the battle of Alam Halfa, it was more of the same. He refused to go into battle until the Army was ready. During the intervening period between the Alam Halfa and Alamein battles he acted as his own training officer and personally published his own training instructions.[105]

Of course a vital part of the training requirements which Montgomery demanded of his units was directed at practicing and learning a new tactical doctrine. What he demanded of armored divisions was to conduct coordinated attacks between armored and infantry units. The original British doctrine called for armored brigades and divisiions to conduct separate, independent attacks. When that doctrine was written, armored brigades were largely pure organizations and the initial armored division organization reflected this same idea. Also the doctrine called for Army tank brigades to conduct coordinated attacks with infantry.

Conditions on the battlefield had changed to invalidate this doctrine. The need for a new doctrine had been evolving on the battlefield since the Battleaxe campaign. First, in the desert once a breakthrough was achieved, mobile forces were required to exploit the situation; and the infantry support tank of the Army tank

brigades were too slow to be of use in this role. This tank had also become increasingly vulnerable as the battlefield proliferated with more and better anti-tank guns. A second factor which had changed was the improvement in infantry mobility. Since all the British and Commonwealth infantry were now motorized, they required tank support to fully exploit their mobility. The final factor which ended all possibility of independent armor operations was the anti-tank mines. Minefields now stretched for miles, particularly in the battle for which 8th Army was now preparing. Besides coordination of infantry and armored units, both now required the support of anti-tank guns, artillery, anti-aircraft guns, engineers and air support to be fully successful in any attack. Rommel's panzer divisions fought this way from the beginning.

General Auchinleck recognized the need for closer cooperation between armor and infantry as well as the other arms after the "Crusader" campaign. By developing his mobile brigade groups he hoped to gain a greater degree of coordination between the various arms. Although published in London, a report after that campaign based on lessons learned from the desert theater had stated that very idea.

> The armoured division (operates) organised in brigades of all arms including a proportion of infantry.
>
> and
>
> Mobile desert warfare appears to be largely a matter of columns of all arms which may work over long distances widely separated.[106]

This idea was impossible for the British divisions to execute. The Gazala battles were replete with attacks that failed because of inability of various armored, infantry and artillery units to cooperate.

An example of two such attacks occurred on the night of 21/22 July. The first attack was to be conducted by 22nd Armoured Brigade and a brigade from the New Zealand Division.

> The commander of the 22nd Armoured Brigade had refused to move before dawn on the grounds that tanks could not move by night, and Corps Headquarters had not overruled this extrordinary assertion. The German tanks, unfortunately did move at night, and the Africa Corps was in a position to put in a dawn assault.... The infantry units were overrun by the German panzer division.[107]

The second failure occurred at dawn. 23rd Armoured Brigade was to pass through the infantry after a gap in the minefield was cleared. The armored brigade

crossed its departure line on schedule and ran into withdrawing infantry. There was no word whether the minefield was cleared, but the commander decided to attack anyway "in the armoured equivalent of a "flat-out gallop and, running straight onto the minefield, lost twenty tanks." The armored brigade all by itself on the minefield was fired on by German anti-tank guns and tanks from three sides. The brigade had to withdraw but only with 11 of 104 tanks.[108]. Obviously Auchinleck had failed in his attempt to gain greater cooperation between the different arms.

Montgomery did not try to imitate the German doctrine as Auchinleck had tried to with his mobile brigade groups. He believed that these mobile groups were a radical departure from traditional British doctrine and that British commanders were unable to execute such a mobile doctrine. He was probably correct because British doctrine in part was still closely linked to the World War I doctrine which had stressed heavy use of firepower. It is not surprising that British doctrine was tied to its past. The same was true of the Germans. Their World War II doctrine had evolved directly from the doctrine of the latter years of World War I.

AD-A163 067 THE PROCESS OF CHANGE: THE BRITISH ARMORED DIVISION; ITS DEVELOPMENT AND..(U) ARMY COMMAND AND GENERAL STAFF COLL FORT LEAVENWORTH KS D A HAHN 1985

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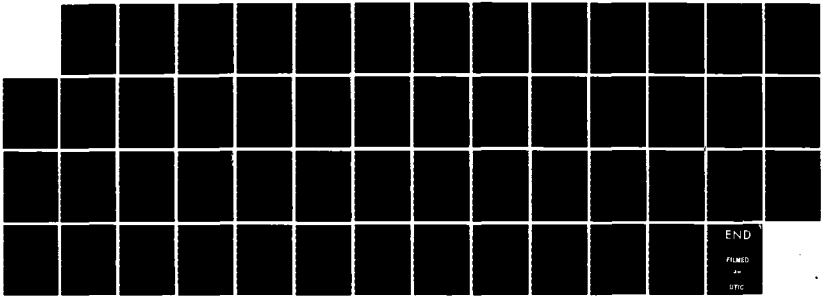

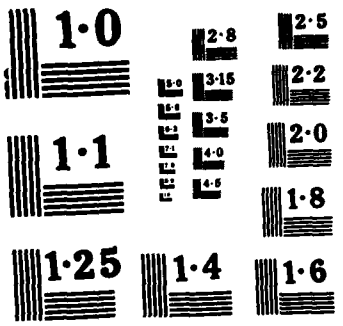

The doctrine which Montgomery was trying to develop in his armored units was not solely his own making. The Royal Armoured Corps in Great Britain had published a Royal Armoured Creed which described the new doctrine clearly. Montgomery, however, had a hand in it from his position as Chief Umpire during training exercises in Great Britain during the fall of 1941. Both he and General Brooke shaped the final wording of this creed.[109]

One only needs to compare a few of the statements on the Royal Armoured Creed with some of Montgomery's ideas written before Alamein to see the similarities. The new creed stated:

> 1. An armoured division is a formation of all arms. Each arm or branch of the Service is a member of the team, and has its vital part to play. Success is dependent on mutual understanding within the team, which must be based on experience gained during training.
> 2. ....If a commander can succeed in destroying the greater part of the enemy armoured divisions, while retaining his own fit for action, he will be able to operate freely and boldly to achieve his purpose.....This fight for armoured supremacy will normally start with a manoeuvre for position between the armoured formations of the two sides. Forward pivots may be seized by motor battalions from which armoured action can be launched.... In this manoeuvre for position, there is a great advantage to the side that can force the enemy to attack him on ground of his own choosing. This can sometimes be achieved by seizing ground which is vital to the enemy.

crossed its departure line on schedule and ran into withdrawing infantry. There was no word whether the minefield was cleared, but the commander decided to attack anyway "in the armoured equivalent of a "flat-out gallop and, running straight onto the minefield, lost twenty tanks." The armored brigade all by itself on the minefield was fired on by German anti-tank guns and tanks from three sides. The brigade had to withdraw but only with 11 of 104 tanks.[108]. Obviously Auchinleck had failed in his attempt to gain greater cooperation between the different arms.

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3. The clash between the armoured divisions of the two sides which seems a likely prelude to many operations, has often been interpreted to mean a clash between the armour of the two sides. This may happen at times, but it is generally sound to use tanks to attack the unarmoured portions of the enemy armoured divisions and ward off the enemy tanks with anti-tank guns while doing so.[110]

Montgomery wrote the folowing;

3. The armour must be kept concentrated. It must be so positioned on important ground that the enemy will be forced to attack it, i.e. he will have to attack our armour on ground of its own choosing.

5. Infantry 'pivots' (para 2) must be so strong that they will hold out against any attack. Infantry garrisons must not rely on armoured units to help them beat off attacks.

The armour will then be free to choose its own battlefield and will be able to base its manoeuvre on securely held pivots.[111]

21....b) The offensive use of anti-tank artillery in close cooperation with armoured regiments in the attack on enemy armoured formations. Particular consideration will be given to the employment of anti-tank guns on the flanks of the armour.[112]

Clearly these were ideas which Montgomery brought with him from Great Britain which had been developed during the training exercises there. The difficulty he had in gaining acceptance for these ideas became apparent to him before Rommel's attack at Alam Halfa. In explaining his concept to the armored division commander, he was asked;

> ....who would loose the armour against Rommel? He thought that he himself should give the word for that to happen. I replied that no one would loose the armour; it would not be loosed and we would let Rommel bump into it for a change. This was a new idea to him and he argued about it a good deal.[113]

His plan was obeyed during the battle. The armored brigade did not launch an assault, but before the battle began he had taken precautions and placed the armored brigade directly under the corps commander to make certain this didn't happen.[114]

After his victory at Alam Halfa, the 8th Army commander concentrated his training efforts in preparation for taking the offensive. A vital part of this plan was the use of a "Corps de Chasse." This was the 10th Corps where he had concentrated the bulk of his armor in 2 armored divisions and a motorized division. In addition to training the armored divisions in a new doctrine, he had to prepare an armored corps for offensive action.

This concept of grouping armored units together and have them fight as a corps had been tried in previous campaigns. In the "Crusader" campaign, three armored brigades and the South African mobile division were placed in one Corps, but during the battle these units became separated and basically fought separate battles. During the Gazala battles Auchinleck had told Ritchie to fight

the two armored divisions as a corps, but this broke down in execution because the units could not concentrate before Rommel defeated the armored brigades in detail.

In both cases no doctrine had been established before the campaign. There was no concept on how armored corps headquarters should control operations. At the time of these campaigns, the highest level of articulated armored doctrine was the brigade. During these campaigns each commander from corps to brigade had a different concept on how to fight the battle. For any doctrine to be validated there must be a common understanding of the concept which is only achieved through training. Training for a corps level operation must not only include developing the technical skills of the units, but more importantly developing the capabilities of the staffs to control and coordinate. No attempt had been made to do this.

Montgomery tried to rectify this past problem when he created his "Corps de Chasse" by giving the units a concept on how to fight. He made the doctrine fit his concept for the next campaign. Seven weeks were allowed for the units to train and learn the new doctrine. The doctrine was disseminated through 8th Army Training Memorandum No 1. This memorandum was to be studied and

read once a week by all commanders. A portion of the doctrine set down in the memorandum stated;

> 2. 10 Corps will be an armoured Corps. Its operations wil be mobile and essentially offensive even when 8th Army is fighting a defensive battle. Mobility means speed in action, and has little to do with m.p.h. and has less to do with haste. Speed in action is achieved by:
>
> a) Immediate decision by commanders at each level
>
> b) Rapid issue of orders and instructions
>
> c) Instant and intelligent obedience on the part of subordinates.
>
> Immediate decisions are only possible if commander's minds are continually appreciating the situation.... [115]

This illustrates Montgomery's command and control portion of his doctrine. There were other sections which discussed combined arms, flexibility and organization, commanders, formation and unit headquarters, and battle drill as well as a section for each of the combat arms.

Montgomery expected his units to learn this doctrine through a rigorous training program. Training Memorandum No. 1 established both what and how the training was to be accomplished. One section outlined a general training policy and another covered the sequence of training. A weekly training program to be prepared down to platoon or troop level was required. As the Army

Commander, he conducted staff exercises for division and brigade headquarters throughout the period.[116] In his training memorandum he stated;

> ....it is a waste of time and training mileage to train with vehicles until all ranks understand exactly what is being done. This is taught on TEWTs & demonstrated on cloth models.[117]

The level of detail to which Montgomery prescribed his concepts demonstrates the level of professionalism he had achieved in his career. That he was not completely successful in propagating this doctrine must be accepted; however, because his armored corps was never able to fully employ it in battle as he had envisioned. There were several reasons for this. First the nature of what Montgomery asked his Army to do was too complex to be mastered in such a short time. Eighth Army had never been exposed to such a system of command and discipline at any previous time. He was unable to overcome all the resistance to change found in the Army.

In previous campaigns, the use of an armored corps had failed, in part, when the corps commander had disagreed with the Army commander's plan for employment of the corps. This was a second reason for Montgomery's lack

of complete success. 10th Corps commander disagreed with the battle plan for the offensive. This was tantamount to disagreeing with Montgomery's doctrine for the use of armor. While it was never a question of the corps commander disobeying Montgomery, he clearly lacked the enthusiasm and dedication needed to execute the plan.[118]

A third reason why the armored units could not execute this doctrine was due to the many changes which had completely destroyed their cohesion prior to Montgomery's arrival. Units had been constantly changed between divisions, groupings of units were never the same from one battle to the next, and crews had to be trained on a new tank all too frequently. The picture this paints leads to the conclusion that there was too little continutiy on which to build.

Even during this period of training, from the corps commander's perspective the changes appeared insurmountable. One of the armored divisions had been disbanded and the other two armored divisions in his corps had to absorb the two brigades. One brigade, an infantry brigade, was still adapting to its recently converted role as lorried infantry, and now it was required to operate with armor attached. After Alam Halfa new U.S. Sherman tanks as well as Crusaders with 6 pounder guns arrived.

Crews had to learn the capabilities of these new tanks, and there fielding required continual transfers of tanks and crews from one squadron to another. Some of the Sherman tanks were delivered to crews on the day of the battle.[119]

Even for Montgomery's strong will, these problems were too much to overcome. To his credit he recognized the limitations in the capacity of 8th Army to change. In his Memoirs he wrote;

> ....it was becoming apparent to me that the Eighth Army was very untrained. The need for training had never been stressed. Most commanders had come to the fore by skill in fighting and because no better were available; many were above their ceiling, and few were good trainers. By the end of September there were serious doubts in my mind whether the troops would be able to do what was being demanded; the plan was simple but it was too ambitious. If I was not careful, divisions and units would be given tasks which might end in failure because of an inadequate standard of training. The Eighth Army had suffered some 80,000 casualties since it was formed, and little time had been spent in training the replacements.[120]

With these factors in mind, he decided to modify his plan and take a more conservative approach. The original plan required 10th Corps to pass through 30th Corps after the infantry of 30th Corps had breached the enemy's defenses. 10th Corps was to establish itself in defensive positions across the enemy lines of communication. This would force the enemy armor to destroy itself by attacking the British armor in their positions.[121]

The intent of the changed plan was no longer to destroy enemy armor but to hold the armor out of the battle while the forward enemy infantry defenses were destroyed piecemeal. This meant that 10th Corps did not have to thrust into the enemy's rear and closer contact could be maintained between the two corps.[122]

Montgomery was victorious, although questions and criticism of his generalship abound. His changed plan for Alamein forced his units to fight a battle of attrition. The use of armor in this battle was certainly not in the classic style that supporters of mobile warfare had demanded. Suppoerters of Montgomery point out that he recognized the limitations of his Army, particularly his armored forces and adjusted his plan accordingly. They also point out that Rommel was never able to defeat him.

Not all of these issues are important to this study. What is important is to identify why Montgomery succeeded and other commanders failed. First, the external environment provided many positive factors for Montgomery which were negative for Auchinleck and Wavell. Montgomery's relationship with his superiors provided a positive climate for change. Montgomery had the trust and confidence of both Alexander and Brooke who gave him the latitude to command his Army as he saw fit. He benefited

from his wartime experience in Great Brtiatin because he had a first hand knowledge of the leadership available in the Army. General Brooke, as C.I.G.S., allowed him to choose the leaders he needed for his Army. His brash and aggressive leadership style soon won him the respect and admiration of Winston Churchill. Although he received some pressure to begin his offensive early, he did not experience the constant badgering which both Wavell and Auchinleck received from Churchill. To his credit was his ability to communicate with the Prime Minister. Neither Wavell nor Auchinleck were able to help themselves in this regard. Montgomery was able to focus on defeating Rommel whereas Auchinleck and particularly Wavell had theaterwide responsibilities. This often diverted their attention as well as resources.

Montgomery had time to prepare his Army for battle which neither Wavell nor Auchinleck had. This allowed him time not only to make changes, but to legitimize them through training. In the final analysis, however, he still required more time to complete these changes.

A second important point is the internal environment which Montgomery found in the Army when he took command. He had the good fortune to take command of an army which had 18 months of war fighting experiences.

He had the benefit of commanding many combat skilled soldiers who had learned to endure the hardships of the desert. Besides these many experienced veterans, there were many small units which were well led and could serve as the foundation around which to develop larger cohesive units. Another advantage which Montgomery had was the many capable and experienced staff officers around which to develop an effective staff in a short period of time. Their professionalism and loyalty helped him to gain control of the Army without which he could not have carried out the sweeping changes.

Even with these advantages Montgomery still had to provide the drive, focus and direction which energized the staff and created a strong, cohesive combat force. The Army had just gone through some trying times and had suffered many casualties. He had many new soldiers and several new armored units to integrate into the Army. To develop the coordination between his infantry and armored units, he had to restore the infantry units' confidence in the fighting capabilities of the armored forces.

Another factor with which British commanders had to contend was the quality and quantity of armored forces. By the time Montgomery took command he did not have to deal with a shortage of materiel. Both American and

British war production was providing equipment and their combined capacity surpassed the Axis powers' capabilities. The British were also producing larger caliber anti-tank guns in greater quantities which helped close the qualitative gap between the Axis and British forces. The British Crusader tank was also provided with a 6-pounder gun, but its mechanical reliability had not improved. A new American tank, the Sherman, arrived in quantity in September. This was a better and more powerful tank than any which the British armored forces had seen in the Middle East. In turn a more powerful Mark IV tank had offset any technological advantages that the Sherman tank may have given the British. The German Mark IV was provided with a long-barreled 75 mm gun, and no other tank could match its range and penetrating power. The net result of these changes was that the British were closer to parity in anti-tank guns but had lost ground slightly in terms of tanks. The relative correlation between the forces had not changed dramatically.

The British forces had not been at a serious qualitative disadvantage since the Battleaxe campaign when General Wavell was in command. They had closed the gap significantly by the Crusader campaign, and by the Gazala battles they had achieved at least parity.

In terms of quantity, British forces had enjoyed an advantage in numbers over Rommel since the start of the Crusader campaign. Montgomery's ratio of force superiority in tanks and anti-tank guns before the battle of Alam Halfa was not as great as Auchinleck's before the Gazala Battles.[123] By the time of Alamein, Montgomery had a greater superiority in materiel, tanks, anti-tank guns, and artillery than any previous British commander had experienced during the North African campaigns.

While it is difficult to assess what quality and quantity of equipment meant in the desert battles, the following observations seem valid. Quality was not a significant factor in the outcome of battles at least since prior to the Crusader campaign. However, British armored forces were never able to achieve the combat power of the German panzer units, therefore the British needed numerical superiority in order to defeat the German forces. The reason for this was the superior tactical doctrine and training of the German panzer unit. Superiority in numbers did not guarantee the success of British forces. During the Gazala battles, the British had considerable armored superiority and were unable to win even while on the defensive.

Clearly then Montgomery's superior numbers were not enough, he had to make other changes to achieve victory. These other changes were in the division organization and doctrine. Montgomery's new armored division structure made the basic fighting unit the division. This was a significant change because until his arrival the armored forces had fought primarily as brigades or brigade groups. He was determined not to allow Rommel to defeat him in detail as he had the other British commanders.

Ultimately, this division organization was meant to complement his new doctrine. The British armored forces never completely assimilated the doctrine which Montgomery brought to the Middle East. Acceptance of this doctrine needed more time, but his training program to achieve it was sound.

Finally, Montgomery's generalship has been critcized for his use of armored forces, but this ignores his overall contribution as a leader. It was his leadership qualities that made the greatest contribution to the change in armored forces. The armored units had not been subjected to his style of discipline and training since the days of Hobart's prewar Egyptian command. During the intervening period, the tactical doctrine of

armored forces had been allowed to develop without a professional understanding of the type of war they were required to fight. Montgomery recognized the nature of the battle which armored forces must fight and made the appropriate adjustments to the doctrine which armored forces were then practicing. Existing doctrine was difficult to change. Other commanders, like Auchinleck had seen a need for change in doctrine but lacked the strong, forceful character to do anything about it. Montgomery deserves credit for having the will and force of personality to bring about the necessary changes to achieve final victory in the desert.

ENDNOTES

1. Brian Bond, British Military Policy Between the Two World Wars (Oxford: Clarendon, 1980), pp. 181-182.

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3. Barrie Pitt, The Crucible of War: Western Desert 1941 (London: Jonathan Cape, 1980), I, 18-21. Liddell Hart, II, 194.

4. Kenneth J. Macksey, Armoured Crusader: A Biography of Major-General Sir Percy Hobart (London: Hutchison, 1967), pp. 157-160.

5. As quoted from Macksey, Armoured Crusader, p. 159.

6. Macksey, Armoured Crusader, pp. 160-173. Pitt, I, 41.

7. Pitt, I, 40-41.

8. Macksey, Armoured Crusader, pp. 100-102, 160-161.

9. Pitt, I, 42.

10. Pitt, I, 86. A convoy set sail in August and arrived in the Suez on 24 September. On this convoy were 3 tank regiments or battalions; one battalion each of light, medium and heavy tanks. The heavy or infantry tanks did not become a part of the division, but the addition of the other two regiments gave the 7th Armoured Division its complete complement of 6 tank regiments. The total tank strength when they went into battle was about 200 light tanks and 75 cruisers. See I. S. O. Playfair et al., The Mediterranean and Middle East, Volume I: The Early Successes Against Italy (to May 1941). History of

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19. Larson, pp. 237-238.

20. Pitt, I, 21-26. Playfair, I, 363-364.

21. Pitt, I, 52-54.

22. Colonel H. C. B. Rogers, Tanks in Battle (London: Seeley, 1965), pp. 121-122. Playfair, I, 364.

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24. Barnett, p. 65. Playfair, II, 3.

25. Playfair, II, 2.

26. David Fraser, And We Shall Shock Them, The British Army in the Second World War (London: Hodder and Stoughton, 1983), p148. Playfair, II, 2, 11-17. Pitt, I, 251-252.

27. B. H. Liddell Hart (Ed), The Rommel Papers (New York: Harcourt,Brace, 1953), pp. 105-106. Pitt, I, 251. The Barbarossa operation was the plan for the German attack of the Soviet Union. Rommel was not told anything about this operation at the time.

28. See Liddell Hart, The Rommel Papers pp. 106-134 for a complete account of this campaign from Rommel's perspective.

29. Pitt, I, 248-252.

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34. Fraser, And We Shall Shock Them pp. 148-152. Playfair, II, 23-24.

35. Playfair, II, 19-24.

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38. Playfair, II, 172-173.

39. Fraser, And We Shall Shock Them p. 155.

40. Playfair, II, 29.

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48. Playfair, II, 172-173. Carver, pp. 29-30.

49. Carver, pp. 28-29; 35-36.

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51. Fraser, And We Shall Shock Them p. 60.

52. Bidwell and Graham, p. 242.

53. Carver, pp. 35-37.

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63. Playfair, III, 40. Carver, p. 62.

64. Playfair, III, 42.

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77. Lieut.-Colonel R. M. P. Carver, "Desert Dilemmas, Part IV," pp. 95-97. Playfair, III, 27-28.

78. Colonel Norman Berry, Chief Mechanical Engineer for XIII Corps and Eighth Army in 1941 as quoted in Warner, pp. 116-117.

79. Lieut.-Colonel R. M. P. Carver, "Desert Dilemmas, Part IV," pp. 95-97. Playfair, III, 27-28.

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82. Playfair, III, 238-239.

83. Pitt, II, 72.

84. For a complete description of this campaign see Pitt, II, 42-170.

85. For accounts of this controversy from different perspectives see Warner, pp. 158-174. Field Marshal B. L. Montgomery, The Memoirs of Field Marshal Montgomery (London: Collins, 1958) pp. 91-106. Nigel Hamilton, Monty: The Making of A General, 1887-1942 (New York: McGraw-Hill, 1981), pp. 588-620. Barnett, pp. 231-248.

86. Montgomery had approximately 1000 tanks, 900 artillery pieces, 1400 anti-tank guns and 530 aircraft versu Rommel's approximate 550 tanks, 550 artillery pieces, 1050 anti-tank guns and 350 aircraft. See I. S. O. Playfair et al., The Mediterranean and Middle East, Vol. IV: The Destruction of the Axis Forces in Africa. History of the Second World War. (London: Her Majesty's Stationery Office, 1966), pp. 8-13. Orpen, p. 484.

87. Montgomery, p. 80.

88. Montgomery, pp. 81-90.

89. Pitt, II, 211.

90. Hamilton, p. 626.

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92. Hamilton, p. 717.

93. Address to Officers of HQ Eighth Army by Geneal Montgomery as quoted in Hamilton, p. 623.

94. Hamilton, pp. 623-624.

95. Remarks by Major-General Sir Francis De Guinguand's Operation Victory as quoted in Pitt, II, 209.

96. From an interview with Sir Edgar Willaims former 8th Army G-2 as quoted in Hamilton, p.626.

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99. Major-General F. J. S. Tuker as quoted in Orpen, p. 391.

100. Sixsmith, pp. 235-237. Bidwell and Graham pp. 241-245.

101. General Auchinleck as quoted in Barnett, p. 180.

102. See Bidwell and Graham, p. 224. They make the point "Eighth Army had been fighting in battle groups all the time."

103. Hamilton, pp. 643-646.

104. Hamilton, pp. 663-664.

105. Hamilton, p. 718.

106. Current Reports from Overseas Notes No. 1 as quoted in Bidwell and Graham, pp. 233-234.

107. Rogers, p. 166.

108. Rogers, p. 166.

109. Hamilton, pp. 493-495.

110. Royal Armoured Corps Creed as quoted in Martel, Our Armoured Forces pp. 156-157.

111. Montgomery diary entry, 7 September, lessons from Alam Halfa as quoted in Hamilton, p. 712.

112. 8th Army Training Memorandum No. 1 as quoted in Hamilton, p. 726.

113. Montgomery, p. 104.

114. Hamilton, p. 647.

115. 8th Army Training Memorandum No. 1 as quoted in Hamilton, p. 722.

116. Hamilton, pp. 721-727.

117. 8th Army Training Memorandum No. 1 as quoted in Hamilton, p. 725.

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119. Pitt, II, 275.

120. Montgomery, p. 119.

121. Playfair, IV, 5.

122. Montgomery, pp. 119-120. Playfair, IV, 34.

123. Fraser, And We Shall Shock Them, p. 212. Hamilton, pp. 661-663.

CHAPTER 6

CONCLUSIONS

THE PROCESS OF CHANGE

All changes in an army occur within the context of preparing for war, or if already at war, preparing for the next campaign. The purpose of these changes is to improve the army's combat effectiveness. Success or failure of the change process has serious consequences for the lives of many and is therefore vitally important. This study examined change in an army that tried to develop a new doctrine of warfare during peace and war. The army was not totally successful, but its success or failure does not prevent the derivation of some generalized lessons about the process of change. By looking at this army in both peace and war, it is possible to see the continuity between the two periods.

Conclusions from this study are seen in three areas:

1.) Development of a process of change.

2.) Understanding of the fundamenatal relationship between conceptual and physical change.

3.) Comparison of change in peace and war.

The Change Process

The steps in the process of change are derivations from this study, but they are not radically different than those derived from other analyses.[1] This process appears equally valid in peace and war, although the process is more dynamic during war. It is a requirement to bring any specific change to fruition, but the reader must not forget that this process is more dynamic than a mere explanation of the steps can portray. Once the process begins the steps occur concurrently rather than sequentially and there is continual adjustment throughout the process. In fact, the entire process is so dynamic that the initial analysis upon which any given change is based becomes invalid almost as soon as it is made.

Recognizing .the need for change begins the process. This is more difficult to discern in peace than war, particularly if the Army was successful in its recent past. For the British Army between the two World Wars, recognizing the need for change was not a problem, because there were many individuals who wanted to make changes to the Army, espsecially as World War Two drew closer. The problem was that there was no conceptual agreement on what or how to change.

During war the need to change becomes obvious if one loses a battle, but changes are generally required even in victory because the enemy also makes constant adjustments to gain ascendancy in battle. Examples from the study attest to this phenomenon. During the Battleaxe campaign in June 1941, the introduction of a new weapon, the 88mm dual purpose gun, defeated the Matilda infantry tank and surprised the British. Prior to this campaign the Matilda tank was invulnerable on the battlefield. Modifications to the Army's tactics would have been possible if there had been awareness of this new gun. Another example occurred during the Battle of Alam Halfa, when Rommel fought against Montgomery's tactical doctrine and methods for the first time. Rommel's tactics had become stereotyped and he failed to guage the new enemy

commander. Rommel was unprepared for the changed conditions of the battlefield.

Since all change is neither good nor effective, the next step is to determine which changes to make. There are several requirements within this step. First is the need for an accurate vision of future war. Ideally, an individual, or more likely a group, creates a concept which becomes the vision of how the future army will fight. This concept helps to shape the organizations and integrate new and old weapon systems into them. The second requirement is a proper assessment of potential enemies. It is important to know who the enemy will be because this helps to specify the resources that are necessary for defense as well as the type of forces to create.

The British Army failed in both requirements. The Army's priority was Imperial and Home Defense during most of the inter-war years. Defense of the Empire did not require large numbers of tanks, therefore the Army did not develop a large armored force. Once the Army began to prepare for war in Europe during the late 1930s, most senior officers had an incorrect vision of the next war. They expected a war similar to the last one and gave production priority to infantry support tanks to break

through heavily defended entrenchments. While the battle in France shattered this old vision, failure to anticipate the technological changes to tanks prior to the war resulted in British tank capability lagging behind the Germans for almost a year and a half after Dunkirk.

In determining which changes an army should make, the vision of future war and assessment of the threat will only produce a theoretical or ideal set of required changes. Concurrently, one must consider the constraints on the military organization in the present and those likely in the future. These constraints, which must also project into the future, are the external and internal environment of the army. They determine the feasible changes for a particular army.

As an example of someone who made these considerations, chapter three described Colonel Broad's document entitled, Mechanized and Armoured Formations which was his projection of a future doctrine. From his position in the War Office, he attempted to develop armored brigades which not only matched his doctrine but which were in consonance with the force structure and economic constraints of the British Army. He based his recommendation on the number of brigades upon a projection of available forces. To meet the financial capabilities

of the British Army, he reduced the proposed brigades' peacetime tank strength to a level which only required the purchase of light tanks and spaced the implementation of the plan over a five year period.

Broad's only mistake was that he misjudged the British Army's capacity to accept these changes. There was not enough support in the Army for armored forces. The point is that projected changes require continual refinement to match reality. Montgomery modified his plans before the Battle of El Alamein because he recognized that his forces could not adapt quickly enough to his new ideas in order to be ready for the offensive.

The third step in the process is building concensus for the change. This step requires the education of organization members about the change. In peacetime, proper organizational design can facilitate the development of this concensus, but a common outlook and broad organizational goals among the membership is more important to an organization's ability to accept change. During the period of this study, British officers never developed a unified outlook or organization-wide loyalty because they underwent few common educational and training experiences. In wartime, this concensus building becomes more difficult. Special measures may become necessary to

supplement peacetime institutions which may prove insufficient in the turbulent atmosphere of war. Montgomery did this before Alamein when he required his officers to read his training program once a week. He personally conducted Tactical Exercises Without Troops to teach his leaders the intent of his policies.

A fourth step is to protect the individual or group making the changes. This allows time for the changes to take effect. The best example of this is the protection Montgomery recieved from his superiors, Alexander, Brooke and Churchill. He had free rein and the time to make his changes.

The final step is to reinforce the changes through training. This requires evaluating the training and using the feedback for necessary modifications. Montgomery had his forces train as they were to fight before Alamein. His new armored doctrine and divisional organizations were incorporated into this training. As a result of his observations and evaluation of what his commanders told him, he adjusted his ideas about how to fight the battle.

Relationship Between Conceptual and Physical Change

A second result derived from this study is the relationship between conceptual and physical change. This

study looked at changes to armored divisions in doctrine, weapons and soldiers. Doctrinal changes are conceptual while changes in the other two areas are physical. The link between conceptual and physical change is of course the soldiers themselves and specifically the leaders. They convert concepts into material or tangible things.

Concepts are the inspiration behind doctrine, and are a part of the army's vision of future war or battle. In reality there are always several problems with a projection of the future. It is incomplete, not everyone in the organization agrees with it, and the factors which shaped the projection are constantly changing.

The changes which the British made after Dunkirk are an example of an incomplete projection of the future. An analysis of the campaign determined that massed armored formations were the decisive factor for the Germans. The Army made immediate physical changes to imitate the Germans by deciding to organize more armored divisions and to switch priorities from the production of infantry tanks to medium or cruiser tanks. The conceptual error was the failure to recognize the need to change their tactical doctrine. Tactical doctrine for the armored division did not require it to fight as a combined arms division, but the limited experience of the armored division in France

never led to an examination of tactical doctrine. An imperfect conceptual change limited the impact of the physical changes.

Whenever a conceptual change occurs in an army some corresponding physical change occurs. This could include a major change in the organization, a new weapon or a new training technique. Effectiveness of physical change is generally limited because the time required for assimilation of conceptual change is longer than that for physical change. The need to change men's ideas is the reason for this longer period of assimilation. In the British Army the existence of institutions which hindered the assimilation of new ideas was a major hurdle to change. When the British cavalry regiments were converted to armored units, there were no institutions to help them adapt to new tactical concepts and they had limited time to train before entering combat. This is why conceptual change requires more than a theoretical construct of the future nature of war. One of the requirements for developing conceptual change is to understand the cabapilities of the organization to adapt. The leader must develop a doctrine which the organization can execute.

A comparison of Auchinleck's and Montgomery's changes provides an example of the need to base all physical changes upon an accurate conceptual vision that is related to the particualar organization being changed. Both men recognized the need for change to a combined arms doctrine in the armored forces. Auchinleck decided to form brigade groups with units of all arms prior to the start of the Gazala Battles in May 1942. By forcing the units into the same organization, he thought that they would then fight as combined arms teams. He wanted all the armored forces in a mobile reserve, and for security he wanted the armored divisions dispersed into brigade groups in the rear. However, when the units went into battle, they would fight united.

On first analysis, Auchinleck's doctrine seems correct. He had developed a mobile doctrine to fit the terrain and knew that he must use combined arms to defeat Rommel. The critical flaw in his changes was that his armored units could not execute this doctrine and he provided no means for units to adapt to the changes. The various arms had no previous combined training and assumed that placing them together in the same unit would force them to fight effectively in combined arms teams. The techniques for combined arms were not known, and he did

not establish a training program to learn them. More critically, he failed to recognize that his armored commanders and staffs could not conduct mobile warfare and to disperse the units which made this task more difficult.

Montgomery knew Rommel's fighting methods, recognized that the terrain would support a less mobile battle, and that the strength of the British Army was not its armored units. The strength of the British Army was its field artillery and the ability of its infantry to hold ground. He built his changes around these strengths, and reduced change to a level of adaptability which his units could handle in the time available. He introduced a training program to stress the key elements of this new method of fighting. Although he overstates his case, he apparently developed these concepts with a clear vision of how the next battle would take place. He utilized all the elements necessary to develop change on a sound conceptualbasis keyed to the Army that he led.

Change in Peace and War

The final result derived from this study is an analysis of the differences in change between peace and war. First, the rate of change is more volatile in time of war, and an Army's peacetime organization and

institutions determines its ability to change in war. A key requirement in peacetime is to develop flexibility in individuals through the education process and build adaptability into organizations. Another important aspect of change in peace and war is that doctrine takes the longest to change. Therefore, it is important to properly conceive doctrine in peace. A poor conceptual base from which to develop forces will lead to difficulties in war even with good weapons and well trained soldiers. A statement by Michael Howard sums up these ideas clearly.

> I am tempted indeed to declare dogmatically that whatever doctrine the Armed Forces are working on now, they have got it wrong. I am also tempted to declare that it does not matter that they have got it wrong. What does matter is their capacity to get it right quickly when the moment arrives...Still it is the task of military science in an age of peace to prevent doctrines from being too badly wrong.[2]

The reason why it is so difficult to get doctrine right in peace is that there is no absolute method to prove or disprove the concepts, an important difference from war. For this reason, training in peace is so important. It must replicate the conditions under which soldiers will fight in war. The training must force leaders and soldiers to deal with uncertainty. It must

challenge them to innovate and find creative solutions. Such a training environment is the best method to develop flexibility.

During the prewar period, this is what General Burnett-Stuart tried to do during the 1934 exercises. He was unsuccessful because the British training exercises were tests of ideas or evaluations of experimental forces. They were failures because the concepts being tested were not developed through training beforehand, and there was no ability to make adjustments from lessons learned in the following year. Opponents of the concepts were willing to help them fail.

Finally, Montgomery's methods demonstrated that even in war, the only effective method to develop and inculcate new ideas is through training. The basic reason for this is that only in training does the leader have the luxury to fail.

The relevance of the subject of this thesis will continue. For the US Army, change is a way of life, and the turbulence which change creates will continue into the forseeable future. Hopefully, this historical analysis of an Army that changed in peace and war provides an awareness of some general requirements for change. As a minimum this study should create an awareness of the

importance of a coherent doctrine in relation to the process of change. This study provided an example of an army which failed to achieve this in peacetime primarily because of an inability to build a concensus among the leadership about the nature of future war. Lack of institutions to build concensus also led to difficulties in assimilating new doctrine quickly during World War II. There is a message in this historical example for all armies. Inability to adapt quickly during war will lead to failure. Building concensus, developing flexibility in leaders, and producing adaptable organizations requires constant attention in any army.

ENDNOTES

1. See Timothy T. Lupfer, "The Dynamics of Doctrine: The Changes in German Tactical Doctrine During the First World War," Leavenworth Paper No. 4, (July, 1981), p. viii. General Donn A. Starry, "To Change an Army," Military Review, 63, No. 3, (March 1981), pp. 20-27

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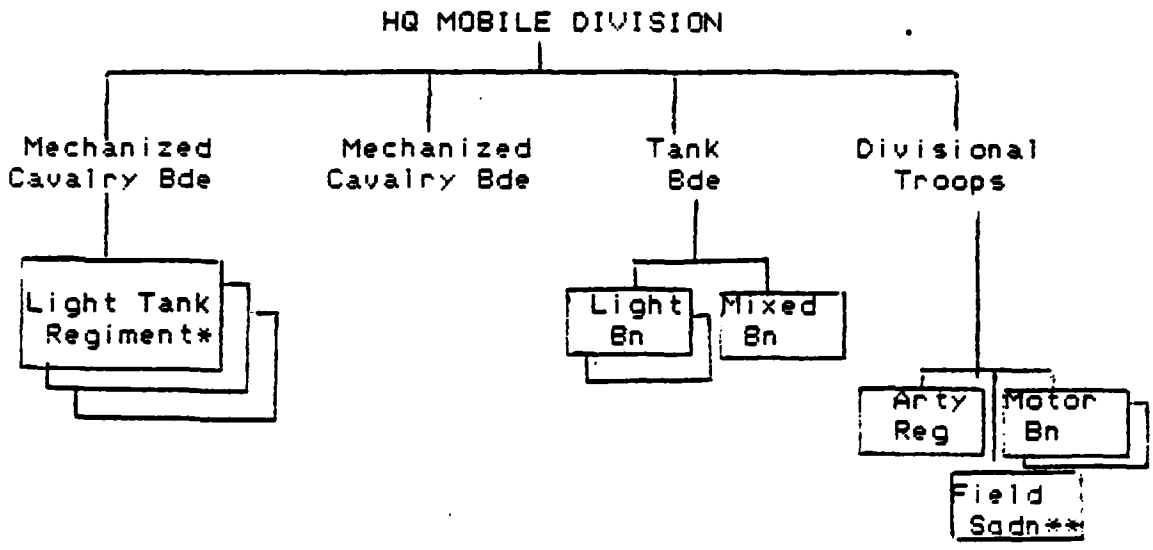
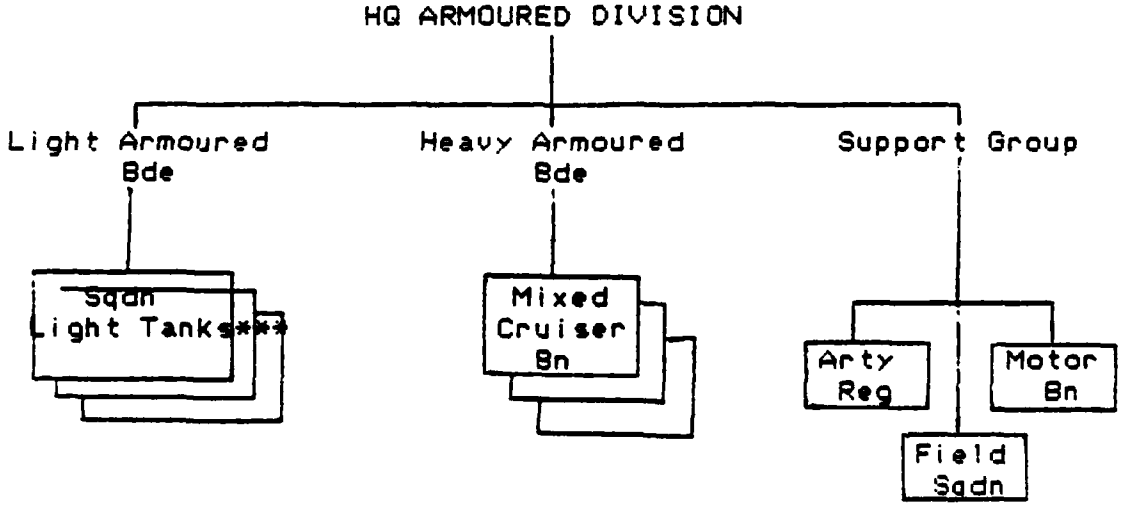
APPENDIX 1

FIRST BRITISH MOBILE DIVISION 1938

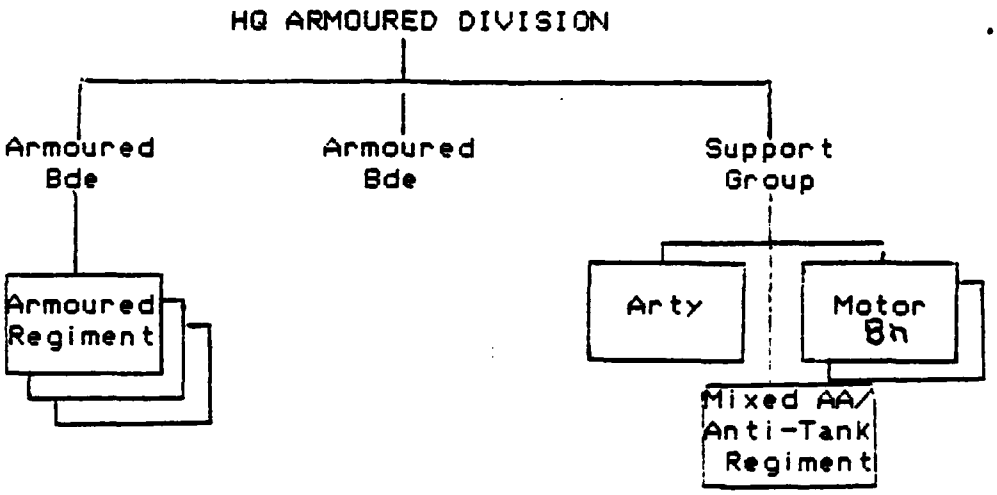


BRITISH ARMOURED DIVISION 1939

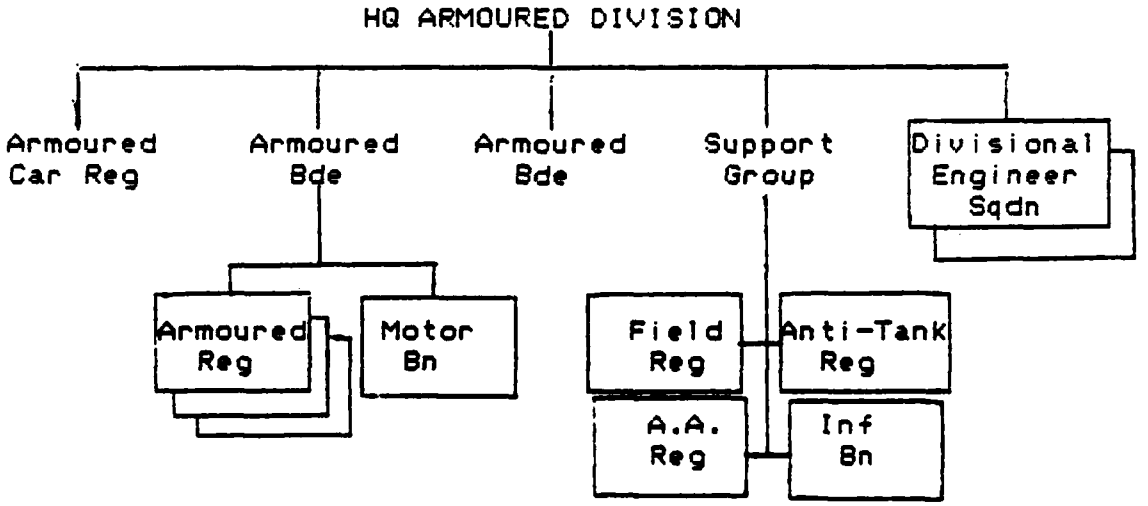


* A British Regiment was equivalent to a battalion.
** A field squadron was an engineer company.
*** A British squadron was equivalent to a company.

BRITISH ARMOURED DIVISION 1940

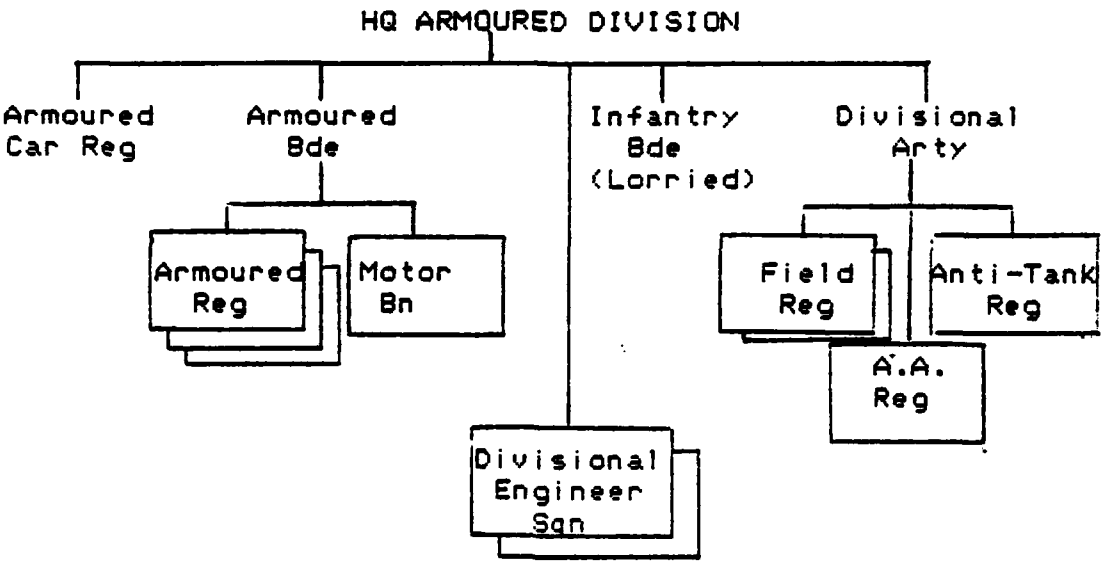


BRITISH ARMOURED DIVISION 1940 (POST DUNKIRK)*



* The armoured division already in North Africa did not add the motor battalions to the Armoured Brigades because of a shortage of infantry battalions. The units in the field did not generally change organizations when the home forces did.

BRITISH ARMOURED DIVISION (1942 AND TILL END OF WAR)*



* The division in North Africa did not make these changes until Montgomery put them into effect before the Battle of El Alamein. The divisions training in Great Britain changed to this organization in May before Montgomery arrived in the Middle East. He helped to make this change in the Home Forces.

The information on the division organization is taken from Giffard LeQ. Martel, Our Armoured Forces (London: Faber and Faber, 1945), pp. 378-380 and from Great Britain, War Office, Letter 20/GEN/6059 S.D. 1 concerning reorganization of divisions dated 1 October 1942.

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