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FORECASTS OF FUTURE WAR:
EARLY POST-WAR MILITARY REFORMERS

A CASE STUDY

BY

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FORECASTS OF FUTURE WAR:

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Judging from Biblical accounts, the indispensability of long-range politico-military forecasting as a basis of military policy-making has been recognized for at least thirty centuries. The Old Testament, which contains numerous references to the importance the Israelites attached to prophecies in determining strategy, tactics, weaponry and military organization, is but the first in a long list of documents which attest to man's concern with the future in making military decisions. 1/

Contemporary observers of military affairs continue to stress the importance of prediction as a requisite to successful military decisions and point out the lengths to which military planners have gone in an attempt to cope with the future. Bernard Brodie, for example, states that "today the American armed forces are eagerly exploiting science and scientific techniques not only to avail themselves of new military tools of increasingly bizarre characteristics, ... but also to predict and analyze the tactics and strategy of future wars." 2/ Forecasting, then, has lost none of its importance during thirty centuries of military decision making. Whether the contemporary military planner uses "scientific" techniques, logic or his imaginative powers to delve into the future, he shares with his Biblical counterpart the recognition that prediction is necessary to the accomplishment of his duties.

Yet the history of man's predictive experience reveals a remarkable dilemma: man's dependence on accurate forecasts has in no way resulted in an increase in his capacity to predict politico-military affairs accurately. This has been noted by countless observers of politics. Hans Morgenthau, for example, states that "the fallibility of prophecies in international affairs is strikingly demonstrated by the fantastic errors committed by the experts who have tried to forecast the nature of the next war. The history of these forecasts, from Machiavelli to General J.F.C. Fuller, is the story of logical deductions, plausible in themselves, which had no connection with the contingencies of the actual historic development." 3/ Bernard Brodie also supports Morgenthau's contention, arguing that "in wars throughout history, events have generally proved the pre-hostilities calculations of both sides, victor as well as loser, to have been seriously wrong." 4/

It should be noted that both Morgenthau and Brodie correctly restrict their generalizations to predictive attempts related to politico-military affairs, for it is obvious that man can predict some things with a high expectation of success. But this ability to predict some things accurately merely increases man's frustration, for what can be predicted is relatively unimportant in terms of the great social and political issues of this or any other day. Thus it is almost paradoxical that despite the enormous accumulation of knowledge and the increasing rate of spending for research in the atomic age, the contemporary policy maker is still confronted by an age-old dilemma: the realization that the complex decision making process is erected on the sands of man's predictive ability.

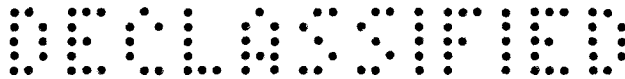
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Yet forecasts continue to be made despite the history of predictive failure; despite the continued existence of the traditional barriers to successful forecasts; despite the absence of empirical data relative to modern war; and despite the unparalleled increase in the tempo of change which, according to Brodie, "has carried us far beyond any historical experience with war, and has moved much too fast to be fully comprehended even by the most agile and fully-informed minds among us." 5/ Forecasts continue to be made because they are necessary to such decisions as the design of a state's military establishment, the direction of scientific and technological research related to the means of war, the ordering and acquisition of the implements of war, and the formulation of the military budget. And the essentiality of forecasts to military decisions, decisions whose implications far exceed the boundaries of purely military activities, requires some attempt to develop a precise appreciation of how accurate military forecasting may be.

Such an attempt is also necessary because man's predictive capability has become an increasingly important object of legitimate research in the West. Future-oriented scholarship such as that represented by the Futuribles project 6/ has received the support of both public and private resources--a reasonably good indicator that there is substantial support within both the intellectual community and government for serious investigatory efforts into the subject. The current scholarly interest in an area that was heretofore reserved to a large extent for ideologues, prophets and charlatans is a manifestation of the contemporary state of man's environment and his intellectual development. While the future has always been an object of intense attraction, man's limited knowledge has prevented him from carrying out any professed intention to shape his destiny. Thus, conjecture implied wishful thinking, and scholarship remained safely oriented toward the past, or at best the present. Since the Second World War, however, the tremendous scientific and technological advances that include the development of nuclear weapons have almost forced the orientation of intellectual resources away from the past. The post-war zeal for theory building and methodological augmentation in the social sciences represents more than intellectual empire building or a reaction to the disappointing results of prior scholarship. It also manifests a somewhat desperate recognition of the need to expand, order and relate man's previously fragmented and chaotic knowledge of change so as to make possible the systematic and deliberate evaluation of present alternatives in terms of their impact on the future. Thus, while the present interest among social scientists in theory building and methodology is focused on the identification and interrelating of significant variables relevant to change--the first step toward explanation--the long-range goals include, perhaps somewhat over-optimistically, the development of a higher level of predictive ability. That the road yet to be travelled toward this goal remains long and torturous seems evident from the recent record of progress in the social sciences. While in agreement with Hans Morgenthau that "history ... is the domain of the contingent, the accidental, the unpredictable, and insofar as it is that, it cannot be comprehended by theoretical means," 7/ the author nevertheless is confident that the degree to which this has been true in the past need not be carried over into our own future.

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It is my objective to attempt to contribute to the understanding of man's relationship to the future by investigating the accuracy with which important political and military developments can be forecast by examining a case-history, that of the forecasts made in the inter-war period of the general character of a second world war. While it is obvious that an analysis of forecasts made during a single period concerning a unique historical event will not, per se, provide conclusively valid generalizations relative to man's capability to forecast the politico-military future, such a study combined with a series of similar studies and with current approaches to the future employing other than descriptive methods may eventually permit such generalizations.

I have chosen 1919-1939 as the temporal parameters of my study because the period is particularly fruitful in terms of the quantity of forecasts made and the relative explicitness of the assumptions basic thereto. For several reasons, "the next war" held the interest of most observers and practitioners of politics and military art during this period. First, and most important was the traumatic effect of the First World War upon its survivors. Not only had the war destroyed an enormous quantity of human and material resources, but, as was clearly recognized at the time, it had eradicated a way of life. It had put in question the optimistic assumptions of a pre-war generation that, in large part, had come to view the future as one of inevitable progress marked by the universal acceptance of democracy, rationalism, internationalism, humanitarianism, liberalism and "scientism." After the war, the foundations of stability and certainty upon which Western man had formulated his expectations of the future had been swept away. Thus the conflict created a profound sense of disillusionment and insecurity throughout the world and brought forth a revulsion that expressed itself in terms of opposition to future war on the grounds that the sole alternative to total peace was the destruction of civilization. The proponents of this view were a major source of forecasts of "the next war."

A second effect of the chaos of 1914-1918 that inspired numerous forecasts of a future war was the recognition of the decisive impact of science and technology on modern warfare. The apparent battlefield superiority of material over man reinforced the predictions of the "war-as-a-civilization-destroyer" groups by giving them a specific basis for their forecasts. The continued development of weapons and their future employment would, it was alleged, lead to even greater destruction in the future, particularly since future belligerents would have the capacity to mobilize a coordinated national effort in the pursuit of total victory. Thus the insecurity produced by the war was compounded by the fear of an uncontrolled and rampant science. Given these assumptions, any image of the future would necessarily be bleak.

On the other hand, some political and military "experts" saw the impact of science and technology as leading to the opposite result. The development of revolutionary weapons would make war less destructive and more humane. Closely related to this view was the realization by some military specialists that many of the strategic and tactical errors of the World War could, to a large extent, be traced to the failure of pre-war military leaders to comprehend the impact of modern weaponry on warfare. Similar errors could be avoided in the future only if the misapplications of the principles of war, so obvious and inexcusable in the past, were eliminated by the enunciation of the "scientific" principles of modern conflict. Presumably a future war fought according to these principles would be free from subjective error and from the extreme and unnecessary destruction of the past war.



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The final source of numerous interwar forecasts of the characteristics of a future war can be traced to the existence of several radically new weapons which had been extensively employed in combat for the first time during the war but whose strategic and tactical potential had never been fully achieved. The post-war debate over the impact of poison gas, the tank, aircraft and the submarine on future conflict was international in scope, unrivaled in bitterness, and crucial to the shape of the Second World War. This great controversy--or continuous series of controversies--inspired an almost unlimited number of forecasts of what the next war would be like.

This paper examines the important role played by early post-war military reformers in the evolution of inter-war forecasts of the character of the next war. Like the advocates of total peace, this group sought the avoidance of another disastrous war like the last. Unlike those who saw future peace as the only alternative to the inevitable destruction of civilization, the military reformers looked for an entirely different kind of war.

The reformers viewed the military stalemate of 1914-18 as the direct result of an attempt to wage a modern industrial-technological war with antiquated concepts. They were particularly concerned with the abysmal lack of appreciation of the relationship between science and the battlefield that was manifested by political and military leaders on both sides. Accordingly, they saw the key to the future resolution of the strategic and tactical problems of the World War as lying in the correct application of modern scientific developments to the art and science of war.

Advocates of reform were confronted with two formidable barriers to change. Not only were the top echelons of military leadership generally unyielding in their conservatism, but budgetary limitations and public war-weariness precluded the funding necessary for the rapid development and testing of new military concepts and hardware. The frustration engendered by these obstacles added a dimension of desperation to the efforts of many reformers. Most reacted by entering the post-war debates over strategy, tactics, weaponry, organization and training with a zeal that occasionally escalated into personal crusades in which reputation and careers seemed to be more important than the character of national military postures. Forecasts of future war figured prominently in all of these debates.

Military traditionalists generally made one of two conclusions regarding the lessons of the recent war. Either they saw the war as a confirmation of time-tested principles and practices of the military art and hence a manifestation of the need to effect no changes in the methods of waging a modern conflict; or they considered the war as the model for all future wars and based their evaluations of future military requirements solely on its experience. The result was the same in either case: a refusal to look beyond the past in considering the future. This past-oriented approach to military issues in the post-armistice period took the form of a predisposition to evaluate new developments in terms of their demonstrated accomplishments during the war rather than on the basis of their potential, and resulted in vigorous opposition to proposals for significant changes in organization and doctrine to accommodate the qualitative effects of science and technology on future strategies and postures. The potential of rapidly advancing weapons was, in fact, rarely grasped, nor was there any apparent recognition that the rate of technological progress might create new or revised conditions of war which would alter or invalidate the experiences of the past war upon which army doctrine was firmly rooted. There was comfort in the belief that the recent war had revealed nothing basically new and that the future would be shaped essentially in the same mold as the past.

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While the leaders of most military establishments were content with their assumptions, visionaries saw the World War as having exhibited those means by which the next war could be made to conform to the model of a quick and decisive victory that the wartime military leaders had failed so miserably to achieve. The prescriptions of the reformers were therefore focused on breaking the costly and futile deadlock of the recent war either by the employment of new weapons to bypass the static trench warfare of future mass armies or by devising new methods of restoring decision through maneuver.

The earliest and most spectacular of the several reformist groups advocating a single weapon as the panacea to the problems of the past war was the airpower enthusiasts. According to Douhat, Trenchard, Mitchell and others, the next war would be decided in the air because only the airplane would possess the capability of directing flexible and decisive offensive blows at the heart of the enemy's war effort - his will to continue to fight. No other weapon gave promise of an ability to strike at the enemy's centers of physical and moral resistance, to cut off his army and navy from their bases of operations, or to subject his population to the constant fear of imminent death. No other weapon would be so unhampered by geographical factors or possess the combination of capabilities that would enable the airplane to surmount enemy defenses and successfully strike a mortal blow with concentrated force. The airplane, in sum, was envisaged as offering a practical and relatively economical solution to the costly and indecisive stalemate of the past war. 8/

Despite Douhat's claim that his forecasts were not prophecies but predictions based on reasoning from verifiable data, the war had provided little evidence to support the contentions of the airpower enthusiasts. Massed bombing raids against civil targets had been proposed but never implemented. 9/ Despite Douhet's conviction that "with mathematical certainty...the facts will prove me right." 10/ the theory of strategic bombing rested upon its advocates' utmost confidence in the potential of the aircraft and several untested assumptions.

The first of these was the certainty that the next war would be total. This was supported by the observation that all nations had accepted the theory and practice of the nation in arms and were organized in such a way that the trend of past wars toward a commitment to total victory would be continued in the future. As Douhet put it, "the prevailing forms of social organization have given war a character of national totality,...and it is (therefore) within the power of human foresight to see now that future wars will be total in character and scope." 11/

In such a total war, the airpower enthusiasts further assumed that the belligerents would seek to eliminate the opponent's will to fight by any and all means. In the past, the defeat of the enemy's field army was a requisite to achieving this goal since there was no other means by which his will to fight could be directly affected. In the future, however, the employment of massive aerial attacks against the ultimate source of the enemy's morale - his population centers, factories and transportation and communication nets - offered a means by which future conflicts could be resolved at far less cost to the belligerents than in the past. The fact that warfare waged by these assaults would directly subject previously non-combatant populations to the horrors modern conflict was not a moral or political liability as far as the aviation enthusiasts were concerned since, in their view, the relentless logic of total war dictated the inevitable inclusion of the entirety of the enemy's human and material resources in future hostilities.

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The third assumption inherent in the airpower forecasts concerned the capability of improved aircraft to accomplish the future objectives its supporters claimed for it. This was a crucial element in the post-war debates over the future role of airpower. Douhet was convinced that aircraft of existing types were already capable of devastating large population centers such as London, Rome, and Paris. ^{12/} However, most military authorities saw both the experiences of the recent war, which demonstrated clearly the limitations of airplanes as strategic bombers, and the lack of tangible progress during the early post-war period in solving the problems of range, speed and load-carrying capacity as proof that aircraft were neither capable of delivering decisive blows against anything or likely to be for a long time. The airpower enthusiasts replied that the technical problems related to aircraft performance would be solved so rapidly and completely that all current operational limitations would be removed in the very near future.

Douhet was vague as to how long this would take. He asserted that aeronautical development would progress at such a rate that "there is nothing to prevent us from thinking that in the not too distant future Japan may be able to attack the United States and vice versa." ^{13/} Obviously, the temporal ambiguity of such a forecast was not helpful to a military decision-maker in whose hands the effectiveness of both current and future national security lay. Mitchell, however, was more explicit. He forecast in 1919 that within ten years technical advances in the field of aviation would permit a nation winning control of the air to dictate peace to the United States. ^{14/} Although other aviation enthusiasts were not as confident of the immediacy of such developments, all agreed with Under Secretary of War Benedict Crowell that the aerial destruction of major combatant and industrial areas was inevitable "in the next war." ^{15/}

The airpower enthusiasts forecast two major effects of future aerial bombardments: material destruction in the form of the complete annihilation of large areas, and the psychological devastation of entire populations. The latter was the more important since they were certain that the moral disintegration created by constant punishment from the air would eventually force the capitulation of an attacked nation through its population's unwillingness to continue to absorb more of the same. Although there was disagreement on how long this would take, all agreed that the key to victory in the next war would be the application of air power against what had, in the past, been considered non-combatants.

Although the forecasts of the airpower advocates were built on a keen sensitivity to change, they suffered from several serious weaknesses which not only distorted their proponent's view of the future but also hampered their acceptance by the entrenched and highly conservative political-military hierarchies of the early 1920's. The most important weakness was the failure of the airpower advocates to examine the possible effects of a range of political, economic, technological and sociological factors on their assumptions. They claimed that the operational limitations of aircraft would be eliminated in the immediate future, but made no attempt to substantiate this claim by estimating realistically the temporal span separating their future from the present. Had they done so, they might have identified several existing barriers to rapid improvements in the performance of military aircraft, including strong political pressures in most nations to effect economy in government and to reduce or eliminate all preparations for war, the unyielding opposition of most military establishments to new ideas, and the difficult aeronautical problems involved. Any one of these threatened to retard the unprecedented rate of progress expected by the airpower enthusiasts. They ignored all three, however, and insisted that

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their unsubstantiated confidence in the unparalleled improvement of military aviation be accepted without qualification. In an era when "normalcy" meant a return to the past and most politicians and military leaders found change an almost unfathomable concept, both the ends and means of the crusaders for airpower seemed credible only to the Sunday supplement writers and the "peace-or-parish" advocates. Most political and military hierarchies remained unimpressed by "mere theories" which challenged the lessons of their experience so completely and which they felt could easily be neutralized by counter-arguments supported by the concrete events of the past. 16/

A second error that weakened the airpower thesis was its spokesmen's restricted vision of the qualitative aspect of technological change, specifically their pronounced tendency to view technological improvements as favoring only the airplane's offensive capability. Douhet pursued the theme of the inevitable superiority of the aerial offensive over the defensive to its extreme by taking almost for granted the rapid solution of those problems associated with the successful accomplishment of massed attacks while simultaneously considering the difficulties of a defense against them as being permanently insurmountable. His attempt to justify the concept of the supremacy of the offensive in terms of the reversal of the traditional relationship between the attacker and defender only begged the question, for he never explained why technological progress would permanently bypass the defense to the extent of leaving it without a significant role in the future. It was true, of course, that the problems of air defense appeared incredibly difficult to solve in the early 1920's. Nevertheless, anyone with the aviation enthusiasts' confidence in technology's ability to remove the considerable barriers confronting large-scale, decisive bombing offensives should have taken a more sanguine approach to the successful application of science to aerial defense as well.

An example of this propensity to take an unbalanced view of the effects of technological progress on future aerial capabilities can be seen in Douhet's calculation of the destructive effects of bombs, a calculation which grossly overestimated the power of TNT and which implied almost perfect delivery precision. 17/ No air force in the world was then capable of achieving the accuracy Douhet expected, and for any to approach it in the future would have required an enormous and rapid improvement in the performance level of bomb sights, projectile trajectories and air crew skills. Douhet's expectations of such startling advances would not have so seriously weakened his vision of the effectiveness of air power if he had extended them to include defensive measures as well. By failing to consider the possible effects of improved defenses on the accuracy of bombing and its destructiveness, he portrayed the aerial offensive in its most utopian form. More important, his assumption that mass hopelessness, fear and despair would result from prolonged devastation from an unopposed source was obviously questionable if visible and effective defenses against air raids did exist.

Mitchell envisioned a much more balanced relationship between future aerial offensive and defensive forces but, like Douhet, assumed that technological change would never improve the defensive capabilities of ground or naval units sufficiently to redress what he considered to be their existing and rapidly growing vulnerability to aerial attack. This presumption of the permanent inferiority of surface defenses to an aerial offensive grossly distorted Mitchell's calculations of the cost advantage of maintaining a national defense posture based almost solely on airpower, and alienated many political and military leaders who might have been more receptive to less extreme views. 18/

A final limitation in the forecasts of the airpower enthusiasts was their deterministic premise that the character of war is shaped by available

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weaponry rather than by human will. This view of warfare, projected into the future, justified their conclusion that the next war would be fought without limitation using the most destructive weapons on hand. It implied that once a war began, there would be no scope for human choice as to future strategy, tactics and the employment or non-employment of weapons. Human will would then play a role only insofar as it was affected by the application of military force; in this case, massive aerial bombardment.

A specific result of this logic was the failure of most the airpower enthusiasts to consider the concept of deterrence. General Ashmore was reported to have forecast that the danger of future air armaments to populations might make national leaders extremely cautious about commencing a war, and Groves argued that the only deterrence to future aggression was the threat of retaliation in kind. ^{19/} But because of the airpower enthusiasts' mechanistic view of the dynamics of war, their conviction that no defense against aerial attack was possible, and the enormous damage they expected from a surprise attack, few foresaw the possibility that fear of retaliation might influence future belligerents to withhold one or more weapons during hostilities. The single exception was Aston, who considered the possibility that a retaliatory blow might "discourage" attacks subsequent to the first strike. ^{20/} But even Aston was unable to extend this reasoning to cover the situation prior to the initiation of bombing raids because he, like most of the airpower enthusiasts, assumed that national leaders would only react to, not control, the initial use of force.

The similarities between the assumptions of the early post-war airpower enthusiast's and the peace advocates are striking. Both assumed that technology would progress at an unprecedented rate; both were convinced of the inevitable superiority of the offensive; and both viewed the nature of war as changing according to a trend that the human will could not significantly influence. These assumptions led both reformist groups to similar forecasts of the next war. Their value judgments and prescriptions were the major difference. Whereas the peace advocates reserved for man the choice of fighting no war or destroying himself, the airpower enthusiasts gave him the choice of fighting the correct kind of war or suffering overwhelming defeat. In both cases the requisite decision had to be made from a severely limited set of options prior to the commencement of hostilities. The wrong decision meant that the inexorable trend of war would produce disaster.

Many of the airpower enthusiasts' premises were common to all military reformers of the post-armistice period. Most saw the World War as a striking departure from the traditional forms of warfare and sought means by which decision through effective military action would replace stalemate and slaughter in the future. Most envisaged the characteristics of the next war as being shaped by science and the force of nationalism, the combination increasing the commitment of all belligerents to the war effort and changing the means by which this commitment was expressed. Some of these reformers, however, perceived the lessons of the recent war and the future application of science to weaponry in much broader terms than the airpower enthusiasts, and refused to limit the focus of either their analysis of the past or their view of the future on a single weapon. Significantly, these generalist reformers were strongly influenced by Clausewitz' broad approach to the study of war.

Post-war German military leaders were prominent among this group. For several reasons, they had both a clearer appreciation of the changing nature of war and more incentive to act in accord with their perception of change than most other military hierarchies. First, defeat had discredited the past. The World War provided little that could be projected into the future on the grounds of its demonstrated success. Change, not dogma and glory, was what the German leaders had on their mind. Second, the disarmament clauses of the peace treaty gave Germany's armed forces the opportunity

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to modernize unencumbered by stockpiles of obsolete weapons or a large General Staff. 21/ Finally, the Reichswehr was led by Seeckt, whose organizational skill and political acumen were exceeded only by the clarity of his vision. 22/

In Seeckt's view, mobility was the basic principle of war, and the major question for the future was how to restore it. His answer was the substitution of a highly trained and flexible elite force for the ponderous mass armies of the past and the development of aircraft and motorized vehicles which showed great promise of operating with speed and decisiveness against the armies that were in vogue among Germany's potential enemies. This force would fulfill the Reich's immediate defensive needs by providing the best hope of successfully repelling an attack by a numerically superior force on either of two fronts. In the long run, it would assist a revitalized Reichswehr in escaping the positional warfare of the past by smashing an enemy's forces before he could mobilize and consolidate his reserves. The army's anticipated numerical weakness relative to a future enemy necessitated a rapid decision because Seeckt realized that once massed reserves reached the front lines, another static situation would almost inevitably ensue and Germany could ill afford to fight another war of attrition. 23/

The German leader envisioned a highly mobile war of two stages. During the initial stage, the air force would strike to destroy the enemy aerial capability and then engage targets behind the enemy's lines in support of the ground forces. Meanwhile, motorized units supported by cavalry, artillery and aircraft would seek deep penetrations in the enemy's front. 24/ This vision was remarkable because Germany possessed few of the weapons that were requisites to its being put into practice. Nor had aircraft or motorized vehicles been proven in combat; certainly not in the form Seeckt intended to use them. Nevertheless, he was convinced that the potential of these instruments promised the restoration of mobility to the battlefield, and mobility was so important to Germany's future strategic requirements that he was willing to commit a large share of the army's time and resources to developing the tactics and organization that would best utilize what eventually were called Panzer units. 25/

Seeckt's vision, while certainly dynamic, contained little that was fundamentally new. The principles which he held to be basic to warfare were as old as military history, and the weapons he considered as the keys to a future conflict included the curious mixture of technologically advanced aircraft and obsolescent horse cavalry. Both of these were vehicles of mobility, of course, but so was the tank, a weapon in which Seeckt seemed to have little confidence. Seeckt's faith in the future efficacy of cavalry and his failure to foresee the importance of armor were due less to traditionalism than to his inability to complete the logic inherent in his concept of highly mobile firepower and to grasp the rapidity with which technological change would affect the battlefield. He did not recognize that aerial attacks and mobile artillery would bring enormous fire to bear on large areas in and beyond the battle zone. Under such conditions, maneuvering speed alone would not protect combat forces; armor was also necessary. Additionally, Seeckt foresaw no dramatic improvements in tanks and aircraft and therefore his vision of their future roles was limited. Guderian, Blomberg and other younger officers were able to apply their more highly developed appreciation of technology's potential contribution to armor to fill one of the gaps in Seeckt's vision. However, almost none of his successors in the entire inter-war period was able to relate improvements in aircraft performance to extending the mission of the Luftwaffe beyond direct tactical support of the army.

Despite these shortcomings, Seeckt's view of the characteristics of the next war was remarkable in its clarity. Not only did he pose the right question, but he was able to establish the foundation for a solution that was consistent with the basic political, social and technological trends of his day. His contributions to the Reichswehr's approach to the future gave it an

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enormous advantage over its neighbors, particularly the French. Whereas the French obscured the main problem of modern war by assuming that all future conflicts would take the same characteristics as the World War, Seeckt's historical perspective enabled him to perceive the character of the World War as the major problem to be solved in the future. Whereas the French assumed that impersonal forces would limit or eliminate man's ability to change the shape of warfare, Seeckt saw material as the means by which man could restore the decisiveness of battle. Finally, whereas the French had not yet learned that change, particularly technological change, was the mark of their age, Seeckt's entire plan for the reformation of war was predicated on the assumption that change was inevitable, desirable and causable.

Very similar views were held by Generals von Bernhardt and von Altröck. Their works epitomized the blending of historical perspective and perspicacity to change that gave the German military leaders such an enormous advantage over the French. Their training, heavily influenced by Clausewitz, and their experience enabled them to perceive the rapid changes that had taken place in a wide range of factors which shape war. Their analysis of existing national and international forces led them to the conclusion that these changes had not yet run their course. They were convinced that success in the next war would be enjoyed by those who identified and understood the trend of change, could relate it to the ends and means of war, and would then act to exploit the opportunities it presented to achieve their goals. This concept of progress as an interaction between the human will and a complex of changing forces, some of which lay outside the control of decision makers, gave post-armistice German military thought a future orientation that was not matched in other military hierarchies. On the other hand, there was nothing radical in this idea of progress. The sense of history and broad view of the numerous political, social, economic and technological interrelationships that influence war injected a moderation and comprehensiveness into the German view of change that was conspicuously absent in the forecasts of the airpower enthusiasts. The vision of Seeckt and Bernhardt was by no means perfect, but its outline was clear and specific enough to guide the Reichswehr's evolution during the entire inter-war period. The real difference between the German and French armies in the inter-war period had little to do with size, equipment, recruitment or organization. Instead, it lay in their respective attitudes towards the future. John Galsworthy stated that "if you do not think about the future, you cannot have one." 26/ Seeckt's army was motivated by this concept; Petain's was not. The results were revealed within a generation.

Views similar to those which dominated early post-armistice German preparations for the next war were also published by military reformers in Great Britain and the United States, although they had little immediate impact on national defense postures in either of these nations and were generally denounced by military traditionalists as "inaccurate, ignorant and spiteful." 27/ Foremost among the generalist reformers were J.F.C. Fuller and Liddell Hart, both of whom sought to provide remedies for the problems of the World War that would be applicable to the future conditions of war. Their method was to assess the evolving character of the most significant developments of the recent past in terms of their effect and potential effects on the general principles of war. Both were evolutionists in their approach to change, and both saw that the major strategic problem to be faced in the future was restoring mobility and decision to the battlefield. Both also saw that the weapons with the potential to resolve this problem - the tank, airplane and submarine - had already evolved during the past war and were capable of major improvement in the future. The feature common to each was the internal combustion engine, which provided the means to move men and equipment across great distances and possessed the potential to do so in a manner that would neutralize even more intense and accurate firepower than that which had ended movement and decision in the World War. 28/

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Fuller, who had been chief general staff officer of the British tank corps in 1918, built his concept of the future mobile strike force around the tank. Tanks, he asserted, were economical in terms of production costs, manpower and casualties. Although only five years old, their potential to exploit surprise and break through fixed fortifications seemed clear. Fuller envisioned tank forces supported by aircraft and mechanized infantry inherent in armored vehicles capable of amphibious operations and forecast dramatic increases in the firepower of mobile forces due to the ability of mechanized infantry to carry automatic weapons. Finally, the internal combustion engine would also increase future mobility and striking power on the seas through further development of submarines and aircraft. 29/

Fuller's forecasts, like Liddell Hart's, were described in terms of the general potentialities of new weapons to affect the principles of warfare. Fuller specifically denied the ability to foresee exactly how individual weapons would evolve and be employed because the rapidity of change made it impossible to project the development of such new weapons in detail. 30/ Nor was he unconcerned with the existing and future limitations of the tank, submarine and aircraft. He suggested that a productive avenue of studying the future possibilities of the new weapons would be to "harmonize" the characteristics of each into a single weapon, thereby optimizing their individual virtues and minimizing their limitations. The "ideal harmonization," he stated, would be "a submersible battleship which can fly through the air and move over the land." Although Fuller recognized that such a vessel would be little more than "a worthless monstrosity...if built today," its potential capabilities provided the basis for his ideas on the value of amphibious operations in exploiting surprise and mobility on both land and the sea. 31/

Liddell Hart's vision was similar in most ways to that of Fuller. He placed more emphasis than Fuller on the future employment of gas because he felt that it was superior to any other armament in terms of the principles of mobility, surprise, economy of force, striking power and concentration of force. But, like Fuller, tanks and aircraft formed the core of his view of the future battlefield because of their capability to surmount the problems posed by gas; their enormous advantages in striking power over infantry, cavalry and artillery; and their ability to free the movement of firepower from fixed communications, transportation and logistics nets. 32/ Hart also agreed with Fuller's stress on the importance of mobile artillery and mechanized infantry in support of the tank forces. Finally, both saw the primary employment of aircraft in the future as limited to the tactical support of surface units.

The primary difference in their forecasts lay in their appreciation of the potential impact of science on future combat. Liddell Hart was clearly more conservative than Fuller in this regard in that he specifically rejected the future value of any hypothetical new weapons and saw science's effects on the next war solely in terms of improvements in existing weapons. 33/ Fuller, however, was convinced that the role of science would not be so restricted. He noted a number of possibilities inherent in electrical science, and envisioned warfare waged entirely by psychological means. 34/

It is difficult to compare Liddell Hart and Fuller with regard to their evaluation of the qualitative and quantitative aspects of scientific change because neither established a specific time frame during which the developments they forecast would evolve. Nor can a time frame be inferred from their early works because neither gave evidence of a detailed understanding of the process by which scientific knowledge is accumulated and translated into additions to national arsenals. Their divergence of view illustrates again the difficult problem that confronted the post-armistice forecasters in their attempts to project the effects of scientific change on warfare, change that was not well understood and for which history provided only fragmentary and inconclusive data.

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In almost every case, the generalist reformers were more cautious in their estimation of the rate and magnitude of change than either the peace-or-perish advocates or the airpower enthusiasts. This was a result, first, of their use of traditional objectives and principles of war as their framework for analyzing and projecting the character of modern war. This approach moderated their view of the pace of change by providing a broader view of the nexus of war and demonstrating the magnitude and complexity of those interrelated variables that would necessarily be affected by change. It also enabled them to identify specific goals and prescriptions for the near term that were related to previous developments whose roots preceded the war. This provided a rough standard of estimating change that was not exclusively based on the abnormally rapid rates of change experienced during the war. The projections of the generalist reformers were therefore not as distorted as those of their more radical contemporaries whose past was too proximate to act as a kind of friction dampening the dynamism of change.

Secondly, the generalist reformers did not exclude the human factor in their projections of the evolution of warfare, but assumed that this would be an inhibiting influence, particularly with respect to such a complex, risky and uncertain subject as war. This was an assessment based on experience as well as anticipation. Fuller, for example, had prepared a detailed plan for a coordinated attack on German defenses in 1918 that was strikingly similar to his concept of mobile warfare in the future. Foch eventually approved the plan, but not before the novelty of Fuller's concept provoked a number of frustrating delays at various staff levels. The attack never was launched because the armistice intervened. 35/

The third factor that influenced the generalist reformers to anticipate a slower rate of change than the more radical forecasters of the post-armistice period was the fact that their forecasts included no determinate future in which the alternatives confronting man were essentially life or death. Therefore, they did not feel that compelling sense of urgency to act quickly to avoid an inevitable disaster that encouraged the peace-or-perish advocates and the airpower enthusiasts to drastically accelerate the pace of change.

The forecasts of the military reformers reinforced the apocalyptic visions of the peace-or-perish advocates in several ways. First, they legitimized the latter's claims of impending changes in warfare through the public expression of their professional views. Second, they provided direct evidence that ideas and hardware were in a state of flux, and the dynamism of their advocacy was interpreted by those assuming the worst as evidence that military establishments were, in fact, actively developing the reformers' prescriptions. Third, the forecasts of the most radical of the military reformers and the assumptions on which they were based were almost identical to those of the peace-or-perish advocates even though the objectives of each group were drastically different. Thus, the consensus of views on the next war and the memories of the past war were powerful factors influencing public expectations in the post-armistice period.

Despite the widespread interest in the next war, there was little serious concern with forecasting as a means of defining the future as a point in a specified process of change. Instead, the future was much like a dream - bad in many cases - tenuously connected to the past and present by vague assumptions, preferences and value judgements. Only the generalist military reformers were somewhat successful in interrelating the past, present and future by defining specific near-term goals that were rooted in the recent past and by establishing programs that appeared consistent with the possibilities inherent in a broadly defined future environment. This was by no means a guarantee of accurate forecasting since so little was known of the factors causing change and how these would affect the goals, the means designed to achieve these, or the situation which would define the

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appropriateness of both. Even the most perceptive of the post-armistice forecasters could not cope with this lack of knowledge. Hector Bywater, who wrote an unusually sensitive analysis of the political and strategic factors central to a future war in the Pacific, forecast that the Japanese "will not rank among the leading Air Powers of the world," a conclusion based on his observations that weather conditions in Japan made flying extremely difficult and the Japanese had not stressed aviation in the past. 36/ Such is the stuff of which Pearl Harbors are made.

The early post-armistice forecasts of the military reformers were significant in that they provided a sense of dramatic vitality to the process of conceptualizing the future and thereby stimulated wider interest in what lay beyond the present. Their strong normative focus, high level of generality and lack of explicit methodological base made them similar, in large degree, to the great prophecies of Jeremiah, which were instruments employed to influence peoples and governments to accept a prescriptive program or policy. Although they did little to increase the post-war era's understanding of change, they dramatized the process and thereby laid the foundation of further forecasting efforts in the decades that followed.

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FOOTNOTES

- 1/ II Samuel 5:19-25, I Chronicles 14:8-17, and II Chronicles 20:13-18, for example.
- 2/ Brodie, Bernard, Strategy in the Missile Age (Princeton, N.J.: Princeton University Press, 1959), p. 406.
- 3/ Politics Among Nations, 3d ed. (New York: Alfred A. Knopf., 1961), pp. 21-2
- 4/ Brodie, op. cit.
- 5/ Brodie, op. cit.
- 6/ For a discussion, see Bertrand de Jouvenal (ed.), Futuribles, Studies in Conjecture (Geneva: Droz, 1963).
- 7/ "The Domain of the Contingent," Saturday Review of Literature, 7 January 1967, p. 30
- 8/ Giulio Douhet, The Command of the Air, trans. Dino Ferrari (1921 ed.; New York: Coward-McCann, 1942) pp. 22-4; William Mitchell, Our Air Force (New York: E. P. Ditton, 1921), pp. xix-xxii; E.S. Correll, "An American Proposal for Strategic Bombing," The Air Power Historian, V (April 1958) p. 103. See also "The Future of Aviation," Aerial Age, 14 (October 17, 1921), p. 123; and Aerial Age, 14 (November 7, 1921), p. 197.
- 9/ Correll, loc. cit.; Lynn Montross, War Through the Ages (New York: Harpers, 1946), pp. 764-6.
- 10/ Douhet, op. cit., p. 26.
- 11/ Douhet, op. cit., pp. 5-6. See also Mitchell, op. cit., p. 65; and Major General George Aston, "How the Next War Will Be Fought," The Nineteenth Century and After, 87 (March 1920), p. 426.
- 12/ Douhet, op. cit., pp. 21-2.
- 13/ Ibid., p. 68.
- 14/ Brig. General William Mitchell, "Recommendations Concerning the Establishment of a Department of Aeronautics," 17 April 1919, p. 4; USAF Historical Documents, 4726-2.
- 15/ U.S. Congress, Senate, Committee on Military Affairs, Hearings Before the Sub-committee on the Reorganization of the Army, 66th Congress, 1st Session, 1920, pp.1301-4.
- 16/ I.B. Holley, Jr., Ideas and Weapons (New Haven: Yale University Press, 1953), pp. 160-70.
- 17/ Douhet, op. cit., pp. 21-2.
- 18/ Mitchell argued that an air force could accomplish the navy's mission at far less cost, and that future intercontinental aerial invasions would require one-twentieth the manpower of an army. Mitchell, "Has the Airplane Made the Battleship Obsolete?" pp. 550-4; Our Air Force, pp. 220-1.
- 19/ Cited in K.A. Bratt, That Next War? (London: George Allen and Unwin 1930), p. 58. P.R.C. Groves, Our Future in the Air (London: Faber and Faber, 1922), p. 35.

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- 20/ Aston, op. cit., p. 428.
- 21/ B. H. Liddell Hart, The German Generals Talk (New York: W. Morrow, 1948), p. 24.
- 22/ John W. Wheeler-Bennett, The Nemesis of Power (London: Macmillan, 1964), p. 101.
- 23/ General von Seeckt, Thoughts of a Soldier (London: Ernest Benn, 1930), pp. 59, 62; Seeckt, "The Army of the Future," Living Age, 337 (November 1, 1929), p. 294. See also Walter Goerlitz, History of the German General Staff, 1657-1945 (New York: Praeger, 1953), p. 224.
- 24/ Seeckt, "The Army of the Future," pp. 290-4.
- 25/ General Heinz Guderian, Panzer Leader (New York: E.P. Dutton, 1952), pp. 20-1; Emme, op. cit., p. 147; Goerlitz, op. cit., pp. 223 and 232.
- 26/ John Galsworthy, Swan Song, Part II, Chapter 6.
- 27/ B. H. Liddell Hart, Memoirs (London: Cassell, 1965), I, p. 60.
- 28/ J.F.C. Fuller, Tanks in the Great War (New York: E.P. Dutton, 1920), p. 17; Fuller, "Tanks in Future Warfare," Nineteenth Century and After, 90 (July 1921), pp. 93-4; Liddell Hart, "The Next Great War," in The Current of War (London: Hutchinson, 1940), pp. 17-22.
- 29/ Fuller, "Tanks in Future Warfare," pp. 101-3.
- 30/ Ibid., pp. 99-101.
- 31/ Ibid., p. 103.
- 32/ Liddell Hart, "The Next Great War," pp. 22, 34-5.
- 33/ Ibid., p. 16.
- 34/ Fuller, Tanks in the Great War, p. 170.
- 35/ Lynn Montross, War Through the Ages (New York: Harper, 1946), pp. 764-6.
- 36/ Hector, Bywater, The Influence of Sea Power in the Pacific (New York: Macmillan, 1923), p. 241.

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