

Transformation and Innovation: The Lessons of the 1920s and 1930s

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My main theme is the transformation of the U.S. military during the period between the two great world wars. What I hope to do is examine the experiences of the past in light of what might be useful today.¹ Because this is an American audience, I will focus on the performance of the military institutions of the United States during this period – with some references to the experiences of others – despite the fact that my main academic interest has been with European military organizations.

Given the penurious approach of the American government's executive and legislative branches to the problems of national defense throughout this period, the record of the U.S. military is far and away the most impressive of any nation in the 1920s and 1930s. Moreover, full-scale rearmament began very late for all the American services: for the U.S. Navy only in 1938, for the U.S. Army Air Forces in September 1939, and for the U.S. Army only in summer 1940. Whereas the German Army had over six years to prepare for war, units of the U.S. Army found themselves engaged in major combat operations in North Africa within two years and four months of the beginning of that service's rearmament efforts.² The course of American efforts at transformation underline that it was the intangibles of education, experimentation, and leadership that mattered most and that technology and resources were only enablers.

The Problems of Transformation

The context of transformation suggests that there are always a number of systemic problems that confront military institutions in addressing the processes of transformation and innovation. The foremost is the reality of an uncertain and ambiguous future: ‘Against whom will they fight? Under what political and strategic conditions? Where will that struggle take place? What technological, doctrinal, and tactical changes will have the greatest impact on the battlefield?’ To add to these difficulties, military institutions must innovate and transform by developing concepts and doctrine that they can rarely replicate in peacetime.³ Moreover, the bureaucratic, day-to-day processes involved in running peacetime military organizations serve to distract military leaders from the problems of preparing for war at some uncertain date. No matter how farsighted military leaders may be, they will always get a portion of the equation wrong. The issue, then, is to get it less wrong than future opponents, and then to adapt more quickly than the enemy does.

Military leaders and their organizations also confront the problem of making difficult judgments on the basis of incomplete information, – incomplete information often reinforced by faulty assumptions. Historians have argued that militaries study the last war and that is why they do badly in the next. The historical record indicates that such a picture is largely wrong. For the most part, military institutions rarely study the last war, and even when they do, they have a tendency to examine only what agrees with their inclinations, preconceived notions, and prejudices.⁴

Ironically, there were only two major efforts to examine the lessons of

the First World War – the first by the Germans and the second by General Pershing’s AEF headquarters. In the former case the chief of the German general staff, General Hans von Seeckt, established no less than fifty-seven different committees to study the lessons of World War I.⁵ His instructions were explicit. He wanted:

short, concise studies on the newly gained experiences of the war and [to] consider the following points: a) What new situations arose in the war that had not been considered before the war? b) How effective were our prewar views in dealing with the above situations? c) What new guidelines have been developed from the use of new weaponry in the war? d) Which new problems put forward by the war have not yet found a solution?⁶

The result of these studies was an intellectual framework that eventually resulted in a revolutionary combined-arms doctrine that came close to destroying Western Civilization in the early years of World War II. It is only through a sense of what has happened in the past that military organizations can gain a glimmering of reasonable paths to the future. After all, as the old saw goes: “if you don’t know where you’ve been, any road will do.”

There is, admittedly, a considerable difficulty in using the past as a guide. There is the tendency of historians to simplify the complex course of events. Working their way back from some extraordinary event, such as the German breakthrough on the Meuse in May 1940 or the Battle of Midway, historians find it easy to underline the decisions and causes that contributed to success or failure.⁷ What historians often leave out are the uncertainties and

ambiguities, the arguments and accidents that make decision making such an extraordinarily difficult affair. We in the twenty-first century know the results of policy and doctrinal debates in the 1920s and 1930s. Those at the time did not; there were always other roads to the future which were not taken, sometimes for the most obscure of reasons. The past is always an uncertain guide to the future, but it is the only one that we have.

The Strategic and Contextual Framework for Change

Perhaps the greatest difference between the interwar period and the present is the fact that the First World War suggested most of the directions towards which military capabilities and technology were pointing in the 1920s and 1930s.⁸ Virtually all of the major changes in military capabilities that reached full flower in World War II had begun to emerge at the end of the Great War: Combined-arms- tactics, submarine war, strategic bombing, and even carrier warfare had all appeared in nascent form by November 1918.⁹ While the possibilities and enablers remained unclear to victors and vanquished alike, the battles of 1918 had, at least, suggested the possible vectors to military leaders in the postwar period.

Unlike our present era, the military institutions of the interwar period confronted distinct military challenges. For the Germans, the challenge was a deep desire to overthrow the Treaty of Versailles and achieve the hegemony in Europe they had come so close to attaining in World War I. In the 1920s, given the limitations on armaments imposed by the Treaty of Versailles, they had to think in terms of defending their borders against the superior forces of the French and their Eastern European allies. That fact led to a considerable

interest in mobility as a means to augment the *Reichswehr's* (German military's) fighting power.¹⁰ In the long run the Germans were aiming at achieving the ability to wage a war of aggression.

The 1920s resulted in creation of a tactical and operational framework, based on a thorough and accurate reading of the last war's lessons. That tactical framework, given the context of German strategic aims, emphasized the conduct of offensive, aggressive operations. The massive rearmament programs of the Nazi regime then fleshed out the doctrinal and conceptual framework and created the terrifying military instrument that destroyed the European balance of power in 1940.¹¹ The great weakness in the German effort in the Second World War, however, rested on the fact that the Germans prepared their military forces to fight and win a war in Central Europe and not on a worldwide scale. Thus, when they found themselves waging war from the plains of Russia to the North Atlantic and from the Arctic wastes of the North Cape to the deserts of North Africa, they possessed neither the logistic nor intelligence support required to fight war on a global scale.¹²

The American military prepared for war within a framework determined by the strategic and political realities of America's peculiar situation as a great power, separated from potential battlefields by two great oceans. For the Navy and the Marine Corps the obvious opponent was Imperial Japan. From the early 1920s they began gaming and thinking about the strategic, operational, and logistic problems that might arise in a conflict in the Pacific.

The Army also focused on the problem of projecting American military power across oceanic distances. Unlike their brethren in the Navy and Marine Corps, who largely focused on the Pacific, many in the Army felt the Germans would make another run at dominating Europe. They felt that

the United States would inevitably become involved again in Europe. With such beliefs, officers stood in stark contrast with the majority of their countrymen, who believed that the United States would never again be involved in a foreign war.

The story with the Army Air Corps, ancestor of the current USAF, was rather different. For a variety of reasons, it developed its concepts with no specific opponent, or set of opponents in mind. In effect, Air Corps officers developed heavily theoretical, generic conceptions of future war. There were a number of reasons for this. First, most airmen rejected the lessons of past war as being irrelevant to future warfare.¹³ Second, the rapid development of technology led many to believe that there was no tactical or operational problem that technology could not solve in the near future. Moreover, the sheer distances to Europe and Japan and the capabilities available, even in the late 1930s made it difficult to envision a specific enemy. The result was the creation of generic opponents in the articulation of air doctrine – generic opponents against whom the capabilities hopefully under development would work. This led to the development of the concept of precision, high altitude bombing, which would, it was argued, would confront no serious air defense and against which the enemy could not adapt.

The focus on generic opponents also allowed the U.S. Army Air Corps to ignore to a considerable extent, the contributions air power could make to the joint battle. On the other hand, since the Luftwaffe's approach rested on a close analysis of the last war, it is not surprising the Germans developed close air support, reconnaissance, airborne, and interdiction capabilities in addition to strategic bombing capabilities.¹⁴ The focus on generic opponents led to considerable mirror imaging on the part of the Americans. Thus, in developing theories of attacking the enemy's industrial web through high

altitude, precision bombing, American airmen used their nation's economy as their model for examining the possibilities open to what today would be called effects-based operations.¹⁵ Unfortunately, the American economy had entirely different weaknesses and strengths than did the German economy and that reality had a profoundly negative impact on the conduct of the strategic bombing offensive in 1943.

Innovation and Professional Military Education: The United States

The U.S. Maritime Services

Almost from the end of the Second World War, historians have understood the importance of professional military education in the development of the Wehrmacht's battlefield capabilities.¹⁶ What has only become clear in the 1990s was the extraordinary role that professional military education played in innovation and transformation in the American armed forces during this period. The most interesting and important case was clearly that of the Naval War College – an institution that provided the intellectual engine for the Navy's transformation and innovation efforts from the early 1920s through to the start of World War II. In the interwar Navy, not only attendance, but also teaching on the faculty of the Naval War College, was considered career enhancing for officers on the fast track. Virtually every single admiral of note in the Second World War was a graduate of the Navy War College. Moreover, the future admiral Raymond Spruance served not one, but two tours on the faculty.¹⁷ Other admirals, such as Richmond Kelley Turner, also served on the faculty of the Naval War College.

The impact of serious professional military education showed directly in the Navy's efforts to transform its combat capabilities. If it had had little chance to test its battle fleet in World War I – only one squadron of U.S. battleships made it to Scapa Flow – it had the opportunity at least to take a close look at what the British were doing. The admiral in charge of the U.S. efforts in European waters, Admiral William S. Sims, was one of the most intelligent and sophisticated naval officers in U.S. history. Like the World War II fleet commander, Admiral Raymond Spruance, Sims returned from wartime service to become president of the Naval War College. There he set about adapting war games at the college to educate officers by providing surrogate decision-making experience in naval warfare. These games probed the framework of emerging concepts and technological change. In particular, the fleet games tested the possibilities that aircraft carriers might contribute to revolutionizing the conduct of maritime operations.¹⁸ Serious, honest red teaming lay at the heart of the war-gaming at Newport.¹⁹ The resulting intellectually honest culture carried over into the Navy's fleet exercises throughout the interwar period. There was little effort to validate preconceived assumptions. Rather the focus was on testing ideas and concepts until they failed.

The most important insight to emerge from the Red-on-Blue war games at the Naval War College was that the tactical dynamics of offensive carrier operations differed fundamentally from battleship engagements. When battle lines of dreadnoughts engaged, the fires from the two sides concentrated more or less in steady streams. Each side could redirect its "stream" of fire on the enemy's surviving ships as the engagement progressed. However, the tactical war gaming indicated that carrier strikes should come in discrete pulses of combat power rather than in continuous streams. Thus, the

effectiveness of such pulses on the enemy would be a linear function of the number of aircraft that an attacking carrier could launch in a given pulse or strike.²⁰

Hence, the fundamental measure of carrier aviation in the future would be the number of aircraft that carriers could launch for a given mission. Crucial to the gaining of this insight was the fact that those running the war games at Newport were open to new ideas and approaches:

As [Captain Harris] Lanning [the Director of the Tactics Department at Newport] noted in his memoirs, ‘a group of the cleverest tacticians among the students came to me and said that... they all believed there were better methods and intended to find them.’ Instead of being offended Lanning backed them. As he recalled, ‘In investigating aircraft [in the war games] we gave the officers commanding miniature fleets a rather free hand in the use of aircraft... the only restriction being that planes had to operate in accordance with the capabilities and limitations as established by aviators familiar with planes.’²¹

A game at the end of 1923 suggests the willingness of those designing fleet games at Newport to experiment with potential changes in fleet composition. In this exercise the Blue (American) fleet possessed five carriers, the Red fleet four. While much of the game emphasized the maneuvers of the battle fleets, the Blue fleet launched 200 aircraft at the Red fleet and damaged Red’s carriers and one of its battleships. Besides pointing to the need for concentrated strikes against the enemy fleet, the game suggested the need for a coherent air defense plan and the importance of gaining control of the air –

thus the conclusion that the enemy's carriers must be the first targets of carrier air strikes.²²

The insight that the number of aircraft launched by a carrier would be the critical factor had far-reaching implications for the development of naval aviation. It suggested that in fleet engagements, striking first with aircraft would confer considerable advantages. It also indicated that range, payload, and sustainability would be essential elements in future naval equations. Newport's Red teaming in relatively simple war games also suggested not only that the more aircraft a carrier could take to sea, the better, but also that reducing aircraft launch, recovery, and on-board handling times would be essential to effective carrier operations. All of this was accomplished *before the United States Navy had a single operational aircraft carrier.*

But the war games at Newport provided more than just an insight into the possibilities that carriers offered. They created a mind set in the Navy prepared to deal with the larger problems of a future war in the Pacific. Chester Nimitz's thesis at the Naval War College in 1923 noted the following about the operational and strategic framework of a possible future Pacific War:

The operations imposed [in a future Pacific war] on Blue will require the Blue Fleet to advance westward with an enormous train, in order to be able to seize and establish bases on route.... The possession by Orange [Japan] of numerous bases in the Western Pacific will give her fleet a maximum of mobility while the lack of such bases imposes on Blue the necessity of refueling at sea en route or of seizing a base from Orange for this purpose, in order to maintain even a limited degree of

mobility.²³

Thus, the games and strategic analysis at the Naval War College led to the conclusion that the fleet would have to capture a number of the islands in the Central Pacific to support the drive to the Japanese Home Islands. And that task would require amphibious capabilities. Almost immediately after demobilization from World War I, the Marines had begun focusing on the possibilities offered by amphibious warfare for their survival as a military organization. The way ahead was chartered by Commandant John Lejeune, who proudly wore the combat patch of the Army's 2nd Infantry Division on his right shoulder. As the premier historian of the Corps has noted about Lejeune:

The Commandant intended that Marine officers study their profession, and he also intended that school completion be regarded as part of an officer's fitness for special assignments. It might also serve as a moral equivalent of promotion and the key to rapid advancement if the corps went to war again.²⁴

Thus, the Marine Corps Schools at Quantico became the one place in the world where the implications of the British assault on the Gallipoli were studied, not only for its failures, but also for what might have been done differently.²⁵ Between the mid-1920s and 1930s the curriculum at Quantico saw a steady increase in the proportion devoted to the study of amphibious operations from 25 percent to 60 percent.²⁶ Gallipoli became one of the main foci, with an increasing emphasis on the tactical and operational movements once the amphibious force had achieved a beachhead. But beyond an increasing emphasis on amphibious warfare, the Marines also placed a

number of their finest officers and future leaders on the faculty at Quantico. Among other future luminaries on the faculty in 1938 were Lemuel C. Sheherd, Jr., O.P. Smith, Merrill B. Twining, David M. Shoup, and Gerald Thomas.²⁷

There is another point that emerges from the contribution that institutions of professional military education made to the processes of transformation. Since they were relatively small – certainly in comparison to today’s schools – it was relatively easy to form small groups of innovative officers who could interact and push concept development in imaginative new ways. Thus, the bureaucratic stranglehold of the bureaus could be loosened.

The Army

Like its sister services, the Army placed a considerable emphasis on professional education, although there was a less coherent focus on transformation, innovation, and the development of new capabilities. That Leavenworth at times had a two-year curriculum probably had more to do with the fact that movement through the Army’s ranks remained at a glacial pace throughout the interwar period than any desire to extend the intellectual horizons of the officer corps. For much of the period, the Army War College displayed little more intellectual vigor. Nevertheless, academic performance was a serious enough factor in officer evaluation that Dwight Eisenhower expended great effort to graduate first in his class from Leavenworth.

The real intellectual engine of the Army’s efforts at transformation came at the Infantry School at Fort Benning during the five years that George Marshall served as assistant commandant. One hundred and fifty future generals in World War II attended the school during this period, while an

astonishing fifty future generals worked for Marshall on the faculty.²⁸ An observer of the school during Marshall's tenure remarked at an atmosphere that encouraged officers:

To disagree at times on questions of military education, regardless of rank, and an attitude of tolerance of ideas, which encourages free and open discussion. [The faculty was] thinking seriously about matters, old and new, that may find application in our Army of the future. They are not afraid to look outside the field of what is generally considered military education for ideas to help in solving the problems of national defense.²⁹

How Marshall felt about professional education is suggested by his support for institutions like the Army War College in his first years as the Army's chief of staff, at a time, when the United States confronted the massive problems occasioned by rearmament in the face of the Nazi and Japanese threats. Out of seven faculty members teaching at that institution over the 1939-1940 academic year, Colonel W. H. Simpson would go on to command the Ninth Army in the ETO, and Major J. Lawton Collins would become one of the army's most distinguished corps commanders in World War II and eventually the Army's chief of staff. The following academic year would see Alexander Patch, eventually an army commander in World War II, on the faculty.

The Army Air Corps also placed considerable emphasis on its school, which was first based at Langley Field and then moved to Montgomery, Alabama. The Air Corps Tactical School was the essential driver in the

creation of the doctrinal concept of high-altitude precision bombardment that aimed at attacking select targets in what its theorists termed the enemy's industrial web.³⁰ Whatever the difficulties that such doctrine presented to the actual carrying out of air operations in World War II, the Army Air Corps' leadership felt that education was important enough to assign significant numbers of its future leaders in World War II to the faculty. George Kenney, Haywood S. Hansell, Jr., Claire Chennault, Harold George, Kenneth Walker, and Hoyt Vandenberg all served tours on the faculty. The doctrine and theory they developed did play a significant role in the destruction of the German war economy, once Army Air Force leaders recognized the necessity to adapt doctrine to the actual conditions of the war.³¹

Experimentation and Transformation

The Maritime Services

Perhaps the most impressive aspect of American transformation and innovation in the interwar period lay in the ability of the services to translate intellectual insights and thinking into experiments and exercises that had a direct impact on the development of combat capabilities. In turn, those improving capabilities were often fed back directly to the schools, where real world experience could refine doctrine and concepts. The development of the carrier underlines these processes most clearly.

As suggested above, the key insight in the Naval War College war games in the early 1920s was that pulses, rather than streams, of air power represented the best way to 'fight' the carrier. One result of this insight was

that when future admiral Joseph M. Reeves went to sea with the Navy's first carrier, the *USS Langley*, in 1925, he immediately set about experimenting with the ship and its aircraft to maximize the potential for launching and recovering large numbers of aircraft.³² Significantly, Reeves had attended the senior officers course at Newport in 1923, and after graduation had become the head of the tactics department, where he supervised the 1924-1925 games.³³

By the time that he left command of the *Langley*, Reeves' intense pressure on crew and pilots alike had significantly shortened take off and landing times for larger numbers of aircraft. In one year Reeves increased the number of aircraft the *Langley* could generate in simulated combat conditions from fourteen to forty-eight.³⁴ In that period, Reeves and his officers figured out how to use arresting cables to maximum effect, invented crash barriers, developed the concept of the deck park, and began the processes of refueling and rearming aircraft at faster speeds. It is doubtful whether there has ever been a more impressive use of low-cost resources than the relatively inexpensive games that Sims designed and led at Newport in the early 1920s and their impact in creating new capabilities.

In the longer range perhaps the most impressive attribute of the Navy's efforts at innovating with carrier aviation was the fact that by the mid-1920s there was a direct interaction between the games at Newport and the fleet exercises. The concepts and insights gained at Newport were fed directly into the design for those exercises, which involved Red-on-Blue engagements. At the conclusion of the fleet exercises – the umpires often coming from the cadre of instructors at Newport and returning to the faculty – the results directly affected the tactical and operational games that took place at the war college.

That interaction was crucial to underlining the potential of carrier aviation as well as pushing the Navy to develop the aircraft capabilities that would revolutionize naval warfare. In fleet problem IX in early 1929, the new carrier *Saratoga* detached from the 'Red' battle fleet, struck the Panama Canal, and caught the defending forces by surprise. In the 'hot wash' after the exercise, all the senior officers were present, and the commander of the force that included the *Saratoga* noted that "when we learn more of the possibilities of the carriers, we will come to an acceptance of Admiral Reeves' plan which provides for a very powerful and mobile force... the nucleus of which is the carrier."³⁵

Not all of the lessons were learned or remembered. In one of the fleet exercises in the early 1930s the 'Red' fleet achieved a notable success in striking the defending fleet in its base at Pearl Harbor. But connecting theoretical work at institutions of professional military education to the real world of exercises laid the groundwork for the Navy's successes during the Second World War. Even though not all insights could be acted upon, ideas and concepts remained available for the time when sufficient resources became available. For example, as early as 1921, war games suggested that underway replenishment would be an essential element in a campaign across the Pacific. However, throughout most of the interwar period, there was simply not the funding to work out the possibilities. Of the greatest importance was the fact that the habits of mind created at Newport carried on into the conduct of war. From the Marianas, Nimitz would spend several days' war-gaming and red teaming the possibilities inherent in upcoming operations with his staff and principle commanders.³⁶

The development of amphibious capabilities by the Marine Corps and the Navy came more slowly than did carrier aviation. Part of the explanation

lay in the fact that much of the Marine Corps focus in the 1920s was on policing actions in the Caribbean. But with the withdrawal of Marine units from that role in the early 1930s and their re-designation as the “Fleet Marine Force,” the maritime services began an active program of designing fleet exercises – FLEXs in the acronym of the time – to test the possibilities of amphibious landings. By 1934 the Marines had developed a manual for such operations, titled the *Tentative Manual for Landing Operations*, while increasing tensions in the Pacific made it increasingly likely that a great conflict between the United States and the Empire of Japan would occur.

The result of these efforts was that the Navy and Marine Corps carried out a significant number of FLEXs, based on the doctrine emerging from the Marine Corps Schools.

In the course of the FLEXs the Navy and Marine Corps experimented with about every imaginable amphibious technique and tactical approach allowed for by their equipment. They tried day and night landings, smoke screens, varieties of air and naval gunfire support, concentrated assaults and dispersed infiltration, the firing of all sorts of weapons from landing craft, and an array of demonstrations, feints, subsidiary landings, and broad-front attacks.³⁷

All the while, debates went on throughout the Navy and Marine Corps, fueled by experiences gained in the FLEXs. By 1940 the parallel development of doctrine and experimentation had created amphibious capabilities that needed only the addition of significant resources. The resulting capabilities eventually played a crucial role in the Allied victory in the Second World War

in both Europe and the Pacific.³⁸

The Army and the Army Air Corps

The connection between experimentation and the work in the army's schoolhouses was more ambiguous and less successful than the case with the Navy and Marine Corps. There were a number of reasons for this state of affairs. Perhaps the most difficult to assess is the inherently greater complexity of ground combat to war in the other dimensions. The Army did have an exceedingly good base to start from, namely the Field Service Regulations of the early 1920s that rested on the solid lessons-learned analyses that Pershing had commissioned in 1919.

With an Army that was approximately the same size as the German *Reichswehr*, it would seem that the stage had been set for the development of combined-arms warfare along the lines of what was occurring in Germany. But substantial difficulties prevented experiments and exercises that might have provided American officers with the insights the Germans achieved. The first had to do with the Army's promotion system, which systematically ensured that talented officers received absolutely no preference over their more senile and incompetent colleagues. Thus, the cultivation of talented and bright officers, who could drive transformation, as occurred with the Germans, did not occur in the U.S. Army.

Equally serious to experimentation and kinds of exercises that could have developed and nurtured an understanding of the operational level of war, was America's enormous expanse. Scattered across thousands of miles in tiny garrisons, the Army was not able to gather its troop units together for major exercises until war had already broken out in Europe. The Louisiana

Maneuvers of 1940, which enabled George Marshall to identify so many first-class officers as well as the dead wood, provide a hint at the contribution such exercises and experiments might have made to sharpening the officer corps as well as in developing concepts and doctrine. Finally, the parsimony of the executive and the legislative branches was such that the Army could barely maintain itself in its enclaves – most far removed from American society.³⁹ The result of these factors was that the Army had to learn combined-arms tactics on the battlefield at great cost to its soldiers. At least in the European Theater of Operations, it only managed to master the operational level of war in 1945.⁴⁰

The great problem the Army Air Corps' leaders confronted in the late 1930s was the fact that their theories of future war in the air were largely improvable – at least until its forces were engaged in combat. Here American airmen should have enjoyed a considerable advantage over the European air forces – the Army air Forces were not committed to combat in Europe until 1942, nearly three years after the war had begun. Over the course of that period, there was considerable evidence, especially in the Battle of Britain, that confirmed the harsh lessons of the last conflict – that air superiority was the *sine qua non* of all other air operations and that target identification, bombing accuracy, and damage assessments were all fraught with uncertainties and ambiguities. Unfortunately, by 1940 American air doctrine had become dogma, and the lessons learned at considerable cost by others were judged to be irrelevant in the case of American air power. Thus it would take not one, but two Schweinfurts, to persuade Army Air Force leaders of the kind of war they were actually fighting.

Transformation, Innovation, and Tactical Preparations

The great weakness in transformation efforts in the U.S. military during the interwar period lay in the inadequacies involved in translating operational and tactical concepts into actual combat capabilities. The most obvious impediment to improving tactical performance in period immediately before the war was the result of the fact that commanders lacked the technological devices that have added so much to the realism of combat training in the last two decades of the twentieth century.⁴¹ There was simply no means to calculate how well or realistically a unit was preparing for combat. Such difficulties were exacerbated by the fact that few of the army's officers had combat experience in the First World War, while virtually none of the Navy's officers had any combat experience at all.

But there were other difficulties as well. The most important of these was a general over confidence – arrogance in many cases – and a tendency among American officers to underestimate potential opponents. This was particularly true of American judgments of Japanese tactical competence, where racial stereotypes clearly figured in the overall American view of their future Pacific opponents. The results were disastrous in the defense of the Philippines and the initial fighting in the Solomon's.⁴² The Navy's underestimation of the Imperial Japanese Navy resulted in humiliating defeat at Savo Island and the embarrassments that occurred over succeeding months in the Slot. The difficulties in the first clash against the Wehrmacht were less overtly the result of an underestimation of the German opponent. Nevertheless, the Battle of Kasserine Pass indicates how under-prepared U.S. ground forces were to handle the German Army, while the Army Air Forces would suffer their own disastrous experiences in the skies over Schweinfurt –

not once, but twice. Two final contributing factors were largely beyond the control of American military leaders. First, the general unwillingness of Congress and American presidents to support serious military preparations until the last moment, when it was almost too late, made it extraordinarily difficult to build tactical skills at the most basic levels. Then when the purse strings were finally loosened, American military leaders confronted the difficulties involved in massive mobilization from a tiny base to the enormous forces that the United States would eventually deploy around the world. As a result, U.S. trainers and planners to a great extent had to be satisfied with “good enough” rather than the best. The tactical “best” would be learned at the sharp end – at the cost of large numbers of young Americans and national treasure.

Conclusion

The transformation of the American military between 1920 and 1930 is indeed an extraordinary story, especially when the handicaps are taken into account. Small groups and a number of key individuals, like Admiral Sims, the future General Marshall, made an enormous difference, particularly from within the system of professional military education. Much more than on technology or resources, the American successes rested on serious intellectual effort that came to grips with intractable problems.

And yet when all is said and done, there were too many officers in all the services who were satisfied with simply going through the motions in peacetime. The tyranny of peacetime military organizations and their peacetime pursuits resulted all too often in the confusing of polishing brass,

painting rocks, and spotless uniforms with the actual preparation for the nightmare and uncertainties of combat. Michael Howard's comments about the British Army during the interwar period could equally be applied to too many American officers during this period:

The evidence is strong that the army was still as firmly geared to the pace and perspective of regimental soldiering as it had been before 1914; that too many of its members looked on soldiering as an agreeable and honorable occupation rather than as a serious profession demanding no less intellectual dedication than that of the doctor, the lawyer or the engineer.⁴³

As we look into the decades of the twentieth century, the difficulties of transformation and innovation in the 1920s and 1930s suggest the difficulties of the paths ahead. There are no silver bullets, no simple solutions. Only hard, unrelenting, rigorous testing of concepts and doctrine and honest, serious intellectual effort can prepare America's military forces to meet the challenges of an uncertain and ambiguous future.

¹ The intellectual basis of this lecture is largely the result of the work that my colleague, Professor Allan Millett of the Ohio State University and I undertook at the behest of Andrew Marshall, the Director of Net Assessment in the Office of Net Assessment in the early 1990s to examine how military organization innovated, or did not innovate, during this interwar period. For the results of that work see Williamson Murray and Allan R. Millett, *Military Innovation in the Interwar Period* (Cambridge, 1996).

² The combat record of the U.S. Army is often criticized in comparison to that of German troops during the Second World War. What such criticism largely fails to recognize are a number of factors: the late date at which American rearmament efforts began; the extraordinary American record in logistics and intelligence in comparison to the Axis powers; and the steady improvement of the U.S. Army's performance during the course of the Second World War. For the foremost of these critiques see Martin van Creveld, *Fighting Power: German and U.S. Army Performance, 1939-1945* (Westport, CT: Greenwood Publishers, 1982).

³ Michael Howard has suggested that these difficulties might best be compared to those a

surgeon might confront were he to be asked to cease carrying out operations of real human beings, but rather prepare himself over a twenty or thirty year period by reading books and practicing on rubber dummies. In such a case we would not be surprised at the results. See Michael Howard, "The Uses and Abuses of Military History," *Journal of the Royal United Services Institute*, 1973.

⁴This author participated in the major effort to examine the lessons of the Gulf War that the Secretary of the Air Force, Donald Rice, initiated in the summer of 1991. However, the institutional Air Force had no interest in such a project; attempted to sabotage the effort while it was ongoing; and then upon its completion deep-sixed the report, since Rice had by that time left office.

⁵ Interestingly, and in accord with the statement made earlier in this essay, the Germans were not at all interested in studying the strategic lessons of the last war, but instead managed to repeat virtually every mistake they had made in the First World War in the Second World War. For an examination of this phenomenon see Williamson Murray, *German Military Effectiveness* (Baltimore, MD, 1992), chpt. 1.

⁶ Quoted in James S. Corum, *The Roots of Blitzkrieg, Hans von Seeckt and German Military Reform* (Lawrence, KS, 1992), p. 37.

⁷ For a discussion of the ambiguities and uncertainties of decision making even in the most successful of military campaigns see Williamson Murray, "May 1940: Contingency and Fragility of the German RMA," in *the Dynamics of Military Revolution, 1300-2050*, edited by MacGregor Knox and Williamson Murray (Cambridge University Press, 2001).

⁸ This was not the case in the period before the First World War from 1871 to 1914 when the industrial revolution had a truly massive impact, not only on military capabilities, but the very social and economic fabric of European and American societies – a revolutionary state of affairs, the implications of which were clear to no one. For an examination of the difficulties that the German military had in coping with the impact on their concepts of war see Eric Dorn Brose, *The Kaiser's Army, The Politics of Military Technology in Germany During the Machine age, 1870-1918* (Oxford: Oxford University Press, 2001). For the connection between social and economic revolutions and revolutions in military affairs in history, including the Industrial Revolution see particularly Knox and Murray, *The Dynamics of Military Revolution*.

⁹ The only possible revolution in military affairs that did not appear was airborne warfare, although the American airman, Billy Mitchell, did suggest the use of paratroopers to attack German airdromes in 1919. The end of the war prevents such employment.

¹⁰ As early as 1922 the Germans were experimenting with using mobility to augment their combat power. General von Seeckt reported on these maneuvers in the following terms: "I fully approve of the Harz exercise's conception and leadership, but there is still much that is not clear about the specific tactical use of motor vehicles. I therefore order that the following report be made available by all staffs and independent commands as a topic for lectures and study." Reichswehrministerium, Chef der Heeresleitung, Betr: "Harzübung, 8.1.22," National Archives and Records administration, Captured German Records, T-79/65/000622.

¹¹ Through to the early 1980s many historians based their analysis of German rearmament almost entirely on the efforts of the 1930s. That view has been almost entirely overthrown and replaced with an understanding of the contribution made in the 1920s.

¹² This is a major theme in both Gerhard Weinberg, *A World at Arms: A Global History of World War II* (Cambridge: Cambridge University Press, 1995) and Williamson Murray and

Allan R. Millett, *A War to Be Won, Fighting the Second World War* (Cambridge, MA: Harvard University Press, 2001).

¹³ Clausewitz explicitly warns that theory much be closely connected to the real world of historical experience. Carl von Clausewitz, *On War*, edited by Michael Howard and Peter Paret (Princeton, NJ, 1975)

¹⁴ The myth that the Luftwaffe had no interest in strategic bombing capabilities has been disproved by German and American historians. In fact in 1940 the Germans possessed strategic bombing capabilities, including blind bombing, far in advance of any other air force in the world – capabilities that the RAF and the U.S. Army Air Forces would not be able to match until 1942. For a discussion of the Luftwaffe's prewar development see Williamson Murray, *Luftwaffe* (Baltimore, 1985), chpt. 1.

¹⁵ This approach would have a negative impact on the American conception of how to go about attacking the German economy in 1942 and 1943.

¹⁶ This was largely the result of the German military leadership's disinformation campaign after the war was over to excuse their role in the catastrophe of the Second World War. What, of course, they did not mention was the fact German professional military education completely failed to prepare the Wehrmacht's officer corps for the strategic, logistic, and intelligence challenges that the coming war would present. For a discussion of these issues see Williamson Murray, *German Military Effectiveness* (Baltimore, MD, 1992), chpt. 1.

¹⁷ This author has been told by professors at the Naval War College that only one admiral over the past forty years actually taught on the faculty of the Naval War College before his promotion. As recently as three years ago over half of the admirals on active duty had never attended a senior service college.

¹⁸ As one commentator on the development of war games has noted, Sims' war games "contributed substantially to the development of ideas about how to employ the aircraft carrier." Peter P. Perla, *The Art of Wargaming: A Guide for Professionals and Hobbyists* (Annapolis, MD, 1990), p. 71.

¹⁹ For the importance of red teaming in the past see Williamson Murray, "Red Teaming: Its Contribution to Past Military Effectiveness," Dart Paper, Hicks and Associates, November 2002.

²⁰ Norman Friedman, Thomas C. Hone, and Mark D. Mandeles, *American and British Aircraft Carrier Development, 1919-1941* (Annapolis, MD, 1999), p. 34.

²¹ Ibid.

²² See particularly Stephen Peter Rosen, *Winning the Next War, Innovation and the Modern Military* (Ithaca, NY, 1991), p. 69.

²³ Chester W. Nimitz, "1923 Naval War College Thesis," *Naval War College Review*, Nov-Dec 1983, pp. 12-13.

²⁴ Allan R. Millett, *In Many a Strife, General Gerald C. Thomas and the U.S. Marine Corps, 1917-1956* (Annapolis, MD, 1993).

²⁵ Along these lines, Winston Churchill in his great history of the war (*The World Crisis*), of course, did examine Gallipoli in minute detail, but the British system of professional military education displayed not the slightest interest in that failure except to prove that such amphibious operations were impossible in the twentieth century. For British attitudes towards amphibious operations in the late 1930s see Williamson Murray, *The Change in The European Balance of Power, 1938-1939, The Path to Ruin* (Princeton, NJ, 1984)

²⁶ Allan R. Millett, "Assault from the Sea, The Development of Amphibious Warfare between the Wars, The American, British, and Japanese Experience," in *Military Innovation in the*

Interwar Period, edited by Williamson Murray and Allan R. Millett (Cambridge, 1996), p. 74.

²⁷ Millett, *In Many a Strife*, p. 128

²⁸ Forrest C. Pogue with the editorial assistance of Gordon Harrison, *George C. Marshal*, vol. 1, *Education of a General, 1880-1939* (New York, 1963), p. 248.

²⁹ Quoted in *ibid.*, p. 256. Marshall's attitude towards the study of the profession is summed up by the forward he wrote to the classic study *Infantry in Battle*: "By the use of numerous historical examples which tell of the absence of information, the lack of time, and the confusion of battle the reader is acquainted with the realities of war and the extremely difficult conditions under which tactical problems must be settled in the face of the enemy." Major Harding, *Infantry in Battle* (Washington, DC, 1930), p. ix.

³⁰ For an examination of the development of Army Air Corps doctrine, which was to have such a key impact on the conduct of the strategic bombing offensive against Germany, see among others: Robert T. Finney, *History of the Air Corps Tactical School, 1920-1940* (Washington, DC, 1992); Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm, 1917-1941* (Montgomery, AL, 1955); Robert F. Futrell, *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force, 1907-1964* (Montgomery, AL, 1971); Lieutenant Colonel Thomas Fabyanic, "Strategic Air Attack in the United States Air Force: A Case Study," Air War College Report No. 5899, April 1976; and Murray, *Luftwaffe*, Appendix 1.

³¹ For a discussion of the difficulties that American airmen encountered to attempting to execute their theories against the Germans in the Second World War see Murray and Millett, *A War to Be Won*, chpt. 12.

³² Rosen, *Winning the Next War*, p. 42. Reeves' innovations were critical in showing that carriers could handle large numbers of aircraft in combat situations. With that insight the navy was positioned to take full advantage of the huge carrying capacity that the *Lexington* and *Saratoga* would offer upon their completion as aircraft carriers.

³³ Rosen, *Winning the Next War*, p. 40-43.

³⁴ *Ibid.*, p. 40-43

³⁵ *Ibid.*, p. 49

³⁶ Unpublished paper, Barry D. Watts, "Diagnostic Observations on Theater-Level War Gaming," presented at National Defense University's "Thinking Red in War Gaming" Conference, 23-25 April 1985, p. 7.

³⁷ Millett, "Assault from the Sea," p. 77.

³⁸ By that time Marine and Navy planners had reached the conclusion that "an amphibious expeditionary force could not rely on guile for success, but would require local superiority in every element of air, naval, and ground combat power." Millett, "Assault from the Sea," in Murray and Millett, *Military Innovation in the Interwar Period*, p. 77. That was not the approach Army planners fully accepted in the ETO, particularly at Omaha Beach.

³⁹ The inability to carry out exercises on a regular basis probably gave to many Army leaders an unrealistic view about how easy it was going to be to train and prepare ground forces that would be able to stand up to the Wehrmacht in combat.

⁴⁰ The fact that the Germans were able to escape largely intact from Falaise, the third case by that time, suggests how unprepared senior American commanders were to wage war at the operational level, George Patton being the exception.

⁴¹ The introduction of technological training aids in the aftermath of the Vietnam War created a revolution in the ability of the services to evaluate the tactical performance of their units in training. The instrumented ranges of Red Flag and Top Gun improved the training of fighter

pilots by an order of magnitude. No longer were pilots able to claim extraordinary performance, while belling up to the various fighter bars. But equally important was the fact that the Army and Marine Corps created instrumented training ranges, especially the National Training Center and Twenty-Nine Palms, that allowed for a more realistic evaluation of the mistakes made by ground units during their training cycles. The impact of those technological training capabilities showed clearly in the impressive importance of U.S. forces in the Gulf War against the supposedly battle-hardened Iraqi military.

⁴² The Marines largely escaped the penalties of such underestimations by the fact that in their first great battle, Guadalcanal, the Japanese underestimated them to an even greater extent. Tarawa did not indicate an unprepared force or an underestimation of the Japanese. Rather it indicated how heavy the cost could be without proper preparation in digging out a well-dug-in opponent holding a strategically important island. Sadly Army commanders in Europe paid no attention to the lessons of Tarawa in planning the landings at Omaha Beach

⁴³ Michael Howard, "The Liddell Hart Memoirs," *Journal of the Royal United Services Institute*, February, 1966, p. 61.

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