History from the Middle: The Case of the Second World War*

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Abstract

Writing on modern warfare lately has tended to focus upon two vital but divergent trends, which might be termed the War from Above and War from Below schools of analysis. This essay concentrates instead upon the middle levels of warfare, drawing examples from mid-World War Two, where the chief operational objectives of the Allies were clearly established (at Casablanca, January 1943), but had yet to be realized. The realization of such military goals as defeat of the U-boat threat, or gaining domination of the air over Europe, in turn required breakthroughs that could only come from what one might term "the mid-level managers of war"—inventors, scientists, civil servants, captains of naval squadrons, and commanders of air groups. Scholars of these campaigns have long recognized the importance of the changes that occurred at the operational level of war between 1943 and 1944; this essay offers a larger synthetic analysis of their argument.

This paper, in the memory of George C. Marshall's extraordinary role as the greatest of the Grand Alliance's generals-cum-politicians, concentrates upon, and develops a theory about, the operational and tactical history of the middle

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years of the Second World War—between Casablanca in January 1943, and the D-Day and Marianas invasions of June 1944. As the title implies, the focus here is on the so-called "middle managers" in the story, not upon those at the top or those at the bottom.

This intellectual exercise has also taken me back a very long time to when, as the newest and probably the youngest member of St. Antony's College, and on the prompting of its Warden, Sir William Deakin, I took the bus from Oxford to Henley one morning in October 1966, and then walked up the driveway to States House, Medmenham, the home of the renowned strategist and military historian Sir Basil Liddell Hart, and presented myself as his next, actually his last, research assistant.

The work with Basil occupied two days a week over much of the next four years. He was busy drafting what was to be his final book; it appeared, shortly after his death, as Liddell Hart's *History of the Second World War*. It was about three-quarters completed when I met him, and he was much satisfied at what he had written, but there were parts of the Second World War that he didn't really like, or understand, because they were not about Blitzkrieg warfare or the Kasserine Pass or Patton's breakout from Normandy. I suspect he didn't much like the war in the Pacific and Far East, although he had allocated six chapters to that critical aspect. He understood very well that the Battle of the Atlantic was all-important, but I doubt if he could personally tell a frigate from a corvette. He much disliked the strategic bombing campaign because it offended all his principles of indirect approach and limited warfare, but there had to be a chapter on that theme. In consequence, I was given the task of researching and then drafting the Pacific, South-East Asia, Atlantic, and bombing campaign chapters. When I returned from a year of research for my D.Phil. in the German naval and colonial archives, he asked me to do the last two chapters on the Italian campaign.[1]

Why this lengthy reminiscence of military history writing for a grand old man some forty years ago? It is a way of allowing this article to advance certain thoughts upon the state of our field—and thus fulfilling the designations of the Marshall Lecture. Basil was consummate in his study and description of the higher levels of military politics and strategy, the constructor of the thesis about a "British Way in Warfare," and also the author of that 1954 classic volume on *Strategy* that has never gone out of print.[2] He was also fascinated, at an entirely different level, by the intimate details of battlefield operations, whether of Scipio Africanus, or Sherman in the South, or Monty at El Alamein. I can still recall watching him, late at night, puffing on his pipe and peering at detailed maps

1. B. H. Liddell Hart, *History of the Second World War* (London: Cassell, 1970), chaps. 17, 23, 24, 29, 30, 33, 34, 37.

2. B. H. Liddell Hart, *The British Way in Warfare* (London: Faber and Faber, 1932), actually a collection of scattered essays; B. H. Liddell Hart, *Strategy* (London: Faber and Faber, 1954, 1957).

of the American break-out from Utah Beach. It occurred to me many years later that if you, too, had been gassed on the Somme in July 1916, you would always be interested in tactical and battlefield details.[3] This may also explain his fascination—and, later, deep friendship—with Lawrence of Arabia: the attack out of the desert, the element of surprise, the indirect approach, were all central to Liddell Hart's views on operations and strategy.[4]

What Liddell Hart really wasn't interested in was what I am calling here "the Middle Level of War," which brings us to this article's core theme. The larger argument here is that, although military and strategic history has made a significant recovery over the past decade or more—and the writings and reputations of the previous Marshall Lecturers are perhaps the best testimony to that—we probably still have an intellectual "black hole," a grand deficit, a "building block" that needs to be closed between military history at the top, that is, the "Masters and Commanders" such as Churchill, Roosevelt, Marshall, and Alanbrooke[5], and the history of bloody-awful military experiences at the bottom, as represented by such various works as *The Face of Battle*, *Saving Private Ryan*, *Letters from Iwo Jima*, and so on.[6] Thus, the rest of this Marshall Lecture offers some ideas regarding the closing of that gap, at least in the specific regard of how the Allies moved from stalemate and setback in early 1943 to undoubted operational success by mid-1944. It refers to a future book entitled *The Turn of the Tide: How the War Was Won, from Casablanca to D-Day*.[7]

The work itself consists of five very large "how to" chapters: chapter one, "How to Get Convoys Safely across the Atlantic"; chapter two, "How to Win Command of the Air over Europe"; chapter three, "How to Defeat the Blitzkrieg"; chapter four, "How to Land on a Hostile Shore"; and chapter five, "How to Defeat the Japanese Empire." These were, in essence, the operational tasks given to George Marshall, Alanbrooke, and the other Chiefs at Casablanca.[8] None of them were fulfilled easily and, in most instances, things got worse before they got better. But by mid-June 1944—that is, seventeen months later—all five operational directives had been accomplished.

It is a book, then, of five parallel narratives, of which the present article is one example, on the winning of the air war over Germany and all of Western Europe in early 1944. But the larger lesson of my thesis rests within this single

3. The best account is in A. Danchev, *Alchemist of War: the Life of Sir Basil Liddell Hart* (London: Weidenfeld and Nicolson, 1998), especially chap. 2.

4. B. H. Liddell Hart, *Colonel Lawrence (Of Arabia)* (New York: Halcyon, 1937)—and note, via the Index, Basil's frequent cross-references to Scipio, Caesar, Sherman, Marlborough, and Wellington: astonishing.

5. A. Roberts, *Masters and Commanders: How Roosevelt, Churchill, Marshall and Alanbrooke Won the War in the West* (London: Allen Lane, 2008).

6. The classic here is John Keegan's *The Face of Battle* (London: J. Cape, 1976).

7. Forthcoming (New York: Random House, 2010; London: Penguin, 2010).

8. Most easily summarized in H. Feis, *Churchill, Roosevelt, Stalin: The War They Waged and the Peace They Sought*, 2nd ed. (Princeton, N.J.: Princeton University Press, 1967), 105–7.

case-study: between the decisions of "the big boys" at the top, and the "poor bloody infantry" who have to win on the ground, or the exhausted crews of those little corvettes fighting to control the Cruel Sea, there is a vital, mid-level transmission mechanism—of innovators, organizations, officers, bureaucrats, eccentrics—who turn the bigger aim into something that those fighting at the front can understand and deploy.[9] And thus win the war.

There is another methodological claim here, which is about the relative neglect of "History from the Middle." At Yale, we have a small "History from Below" study group, and, in our Grand Strategy program, we unabashedly do "History from Above."[10] But, *mid-level* History, the analysis of how things got done and who did it, is where, I suspect, we can see relative neglect. Our colleagues in early-modern history, perhaps inspired by Braudel's wonderful enquiring mind concerning the different "levels" of History, do it better. How, actually, *did* you get those battalions from Castile to Antwerp, along the "Spanish Road," for eighty unbroken years; how *did* the Amsterdam international money market work in the seventeenth and eighteenth centuries, or, for that matter, the muslin and spice markets along the Malabar Coast; how *did* Sweden, in its relative poverty and isolation, and with its small population, create one of the world's most formidable armies under Gustavus Adolpus by the 1630s—and who was it who actually worked *under* the king, and what exactly did they do?[11] The managers, the middle men, the inventors, the risk-takers, the improved systems, the new weapons . . . how did all of them fit into the larger story? Who put Alexander's army across the Oxus, and who supplied Caesar's invading armies? Who put the pieces of the jigsaw-puzzle together, and how?

This set of questions is not novel; they are questions that have been asked by many enquirers, and in many fields. Still, one of the virtues of this line of approach is its transferability, from discipline to discipline. The real focus, after all, is about problem-

9. There is a larger methodological literature here, including useful examples in Harvard Business School's case-studies project, and it seems fair to say that students of "managing the firm" etc. have pushed further ahead than historians. One of the few exceptions: Timothy Lupfer's classic Leavenworth Paper No. 4, *The Dynamics of Doctrine: The Changes in German Tactical Doctrine During the First World War* (Leavenworth, Kans.: Combat Studies Institute, U.S. Army Command and General Staff College, 1981), which argues that it was the Prussian Army's provision of "feed-back loops" from mid-level officers' experiences at the front that allowed military staffs to work out an escape from the deadlock of trench warfare after 1916–17.

10. See, for example, the syllabus of the Spring-term portion of the Grand Strategy course, at http://yale.edu/iss/gs/GS-syllabus-spring-2009.pdf, with its focus upon Machiavelli's Prince, Philip of Spain and Elizabeth I, the Founding Fathers, Bismarck, and so on.

11. Key works here would be: G. Parker, *The Army of Flanders and the Spanish Road 1567–1659: The Logistics of Spanish Victory and Defeat in the Low Countries War* (Cambridge: Cambridge University Press, 1972); J. C. Riley, *International Capital Finance and the Amsterdam Capital Market, 1740–1814* (Cambridge: Cambridge University Press, 1980); M. Roberts, *Gustavus Adolphus*, 2 vols. (London: Longmans, Green, 1958), in much detail, and, more briefly, *Gustavus Adolphus and the Rise of Sweden* (London: English Universities Press, 1973).

solving, about how to get things done, so this is a topic towards which scientists, engineers, and businessmen evince the greatest enthusiasm. After all, how *do* companies like Pepsico and BP manage an organization that operates in 120 countries; how does Boeing get its "Dreamliner" aircraft from the original blueprint to the final product for Singapore Airlines; how do you encourage a culture of innovation in a period of acute crisis, when struggling for survival seems the only goal? Why does one ingenious idea in wartime get the green light swiftly, and another get halted at red, and for an awfully long time—or not even get accepted at all?

So much for the larger methodological issue. One would have thought that historians, with 10,000 or 20,000 case-studies to refer to, would have been at the forefront of this immensely fascinating sub-discipline of the history of problem-solving, and, yes, there are some excellent if exceptional examples: think of David Landes's *Revolution in Time*, Dava Sobel's compelling study *Longitude*, and Daniel Headrick's many works on technology and Western imperialism.[12] But those books are exceptional, rather than the norm.

Moreover, in any analysis of military and operational problem-solving during the Second World War, one bumps into another methodological difficulty, namely, the great gap that exists between historians of science and technology on the one hand, and historians of combat on the other. Perhaps this is true of the historiography of other wars and conflicts as well. All this author can report is the "disconnect" that was noticed in my specific case-studies, as between books on newer or evolving war technologies, and books on the impact of those newer weapons in the field. Generally speaking, the historians of science and technology have the habit of ending their story when the "product"—the new weapon, the new detection system, the breakthrough decryption machine—is handed over to the pertinent military customer. The narrative is complete. Think, for example, of the histories of "M.I.T. at War."[13] Consider, as another example, the Paul Newman movie on the making of the A-bomb, *Fat Man, Little Boy*, which concludes, essentially, with the first successful controlled explosion at Alamogordo. The War in the Pacific is nowhere in sight.

Historians of combat, on the other hand, tend to *begin* their story with the arrival of the new weapon or detection system at the front line. Most general histories of the Second World War, of which Liddell Hart's *History* is only one example, are particularly prone to using this early short-cut, which you can easily identify by sentences that begin with the phrase "With introduction of . . . such and such. . . "[14]

12. See D. S. Landes, *Revolution in Time* (Cambridge, Mass.: Belknap Press of Harvard University Press, 1983); D. Sobel, *Longitude* (New York: Penguin, 1996); and D. R. Headrick's first great foray, *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century* (Oxford: Oxford University Press, 1981).

13. J. Burchard, *QED: M.I.T. in World War II* (New York: Technology Press, 1948), for the earliest example.

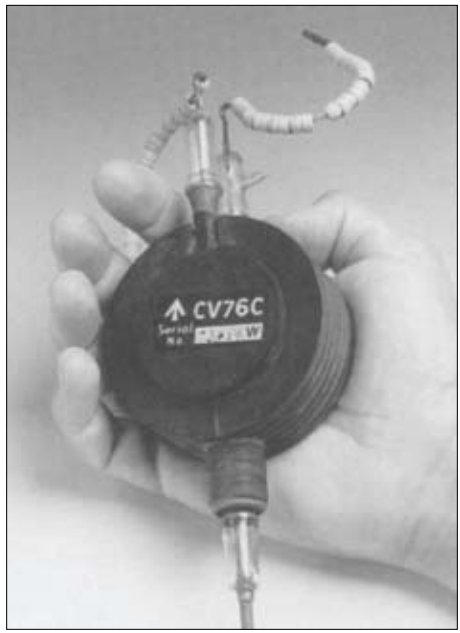
14. Liddell Hart, *History*, 389 (on the coming of the long-range Liberators, 10-cm radar, the "Hedgehog," and heavier depth-charges), and 604 (the Mustang).

After a while, this semantic device is easy to detect: with the introduction of centimetric radar, Allied escorts could at last pick out German U-boats, even in the mist or dark; with Bletchley Hall codebreakers at last cracking B-Dienst ciphers, the Battle of the Atlantic turned against Karl Doenitz; with the coming of the forward-firing Hedgehog projectile, submarines could be attacked before they dived below the waves; with the introduction of the very-long-range Liberators, the mid-Atlantic air gap was at last closed; with the development of more sophisticated amphibious forces, assaults from the sea became steadily less hazardous. In fact, it is a fair hypothesis that if one comes across a sentence beginning "With the advent . . . with the coming . . . with the introduction . . .," there is probably a very interesting story of problem-solving and development which *precedes* what is, after all, just the second part of a longer story. The various sections of what otherwise might have been a seamless narrative have come adrift.

If one was to offer a model of this middle-level theory of historical causality and change, each narrative might normally have *three* sections: (a) the first is the problem itself, the challenge or setback that has arisen, the task that is to be accomplished in order to achieve one's defined aim; (b) the second, critical part is the discovery of a solution and creation of an instrument—here is the realm of the historian of science and technology; yet, (c) the third and equally critical section is the application of that instrument, that invention, in the most effective way, on the battlefield itself—the realm, in other words, of the historian of combat. A specialist in creating management flow-charts and feedback-loops would understand this model in a split second, as would a distribution manager at Federal Express, because it is what they do in real life.

There are some instances where, as the Allies grappled with turning an operational-strategic stalemate into victory, the "problem-solution-application" story was a relatively straightforward one, that is, although it took immense brainpower and effort, no major obstacles were thrown up to hurt or even halt the process. However, there were other cases where the development in question ground to a halt, until the road-block was surmounted. And each story brings some lessons to the table.

Perhaps the best example of a "smooth-way-forward" story is that concerning the development of the vital miniaturized, or centimetric, radar systems between 1940 and 1942–43. The problem was easily understood. Those extra-tall, triffid-like radar pylons along the south and east coasts of England had played a vital role during the Battle of Britain; but how on earth did you miniaturize that technology to create an instrument that could operate inside a Mosquito night-fighter or a Catalina flying-boat without the sheer energy of the pulse destroying the metal surround of the instrument? This essay cannot detail the full story of the two young post-docs at the University of Birmingham who figured that out, but once they had built the first and famous "cavity magnetron" (essentially, our modern-day microwave); and once their professor, who had trained with the great physicist Rutherford, recognized it for what it was worth; and once he got the instrument to London; and once Sir Henry Tizard brought it as the most vital of the gadgets



1. *A Cavity Magnetron (the original "microwave"). A copy of the instrument handed over to the Americans in September 1940 and taken to the new "Rad Lab" is displayed in a glass box in the M.I.T. Museum.*

that the September 1940 Tizard Mission took with them to Washington; and once Vannevar Bush and Bell Labs saw what a precious jewel they were looking at across the table (see illustration 1, above); and once M.I.T.'s extraordinary Rad Lab was set up the next month, then . . . with Bell moving to massive production, Allied aircraft and small escort warships could look forward to receiving this critical detection equipment, a couple of years later, just as the Battle of the Atlantic reached its climax.[15]

Just examine a photo of a Royal Navy corvette or a Wellington bomber in 1940, and again by 1943; by the later year those ships and planes were sprouting antennae like a Christmas tree. And the U-boats felt the pain, blinded in the mid-Atlantic darkness or heavy daytime mists just when the Allies could see. By June 1943, Doenitz was losing more U-boats in the North Atlantic than the Allies were losing merchant ships. Even creeping across the Bay of Biscay at night to more distant stations was perilous. The tides of battle had turned.[16]

15. E. G. Bowen, *Radar Days* (Bristol, U.K.: A. Hilger, 1987), chaps. 9–12; Burchard, *QED*, 219; and, more generally, D. Howse, *Radar at Sea: The Royal Navy in World War 2* (London: Macmillan, 1993), for the more technical side of the story.

16. The official British and American naval histories of World War Two have terrific data on the U-boat losses and the victory of the convoys; note, in particular, S. E. Morison, *History of United States Naval Operations in World War II*, 15 vols. (Boston: Little, Brown, 1947–62), 10:97, with a great spreadsheet map of U-boat losses in the Bay of Biscay in late 1943, when all the Allied technologies had come into play.

But there is another, more dramatic tale, where the "problem-response-application" journey was much more difficult and obstacle-strewn. It concerns one of the greatest operational-strategic challenges of the Second World War, namely, how to gain control of the air over Western Europe and the Third Reich itself. The problem is easily understood; in fact, it was glaringly obvious by the late-autumn of 1943. Neither Bomber Harris's night-time attacks on Berlin nor, perhaps especially, Carl Spaatz's daytime aerial offensive against Germany's industrial capacity was getting anywhere. The loss of sixty Flying Fortresses in one day in the disastrous raid upon Schweinfurt-Regensburg led, in effect, to the end of strategic daylight bombing of Germany over the months ahead; instead, the B-17s bombed the French ports. Things were going backwards, not forwards.[17] At the end of 1943 the head of the American Army Air Forces, Hap Arnold, issued his famous "Christmas message." Unless they figured out a way to destroy the German Air Force, there would be no D-Day, no landing in the South of France. They had to eliminate the Luftwaffe, in the air, on the ground, wherever. But *how*?

The blunt fact was that Stanley Baldwin's famous aphorism that the "bomber would always get through . . ." was proving to be false. In fact, the Allied bombers were being shot to pieces, day and night. They had lost the air war over Europe, a full year after Casablanca. Unless someone, some inventor, some body, some service, some *middle people*, could come up with an escort fighter that could fly all the way from East Anglia to Prague and back, then the bombers, however many and increasing in number, were dead meat. The Spitfire could escort only for a certain distance; the Lightnings and Thunderbolts, even with drop-tanks, could go only a bit further; and, as they turned back to base, the Luftwaffe came for the bombers. Yet it was simply aerodynamically impossible to conceive of a single-engined fighter that could carry so much fuel *and* be nimble enough to out-fight a Focke-Wulf 190 at all altitudes, from 5,000 to 40,000 feet, over the outskirts of Berlin. Physics didn't seem to allow it.

But the solution was there, and the general histories of the Second World War recognize it, in its final form: the North American P-51 pursuit plane, the Mustang, the greatest and most famous long-range fighter of all time. And how does it fit into the general textbook narratives of the war? Well, by predictable sentences such as "With the introduction in early 1944 of the new long-range fighter, the American Mustang, the Eighth Air Force at last had the escort it needed . . ." (sic). For example, John Keegan, in his own excellent *The Second World War*, enthuses as follows: "The P-51 Mustang was a new phenomenon: a heavy long-range fighter with the performance of an interceptor."[18] Well, yes; true enough.

But this new phenomenon was scarcely an American product, except for its lumpy ugly-duckling chassis, and had the U.S. Army Air Forces had its way, the plane would never have got off the ground. Its existence was questioned, its

17. W. F. Craven and J. L. Cate (authors and editors), *The Army Air Forces in World War II*, 7 vols. (Chicago: University of Chicago Press, 1948–58), vol. 2, especially chap. 20.

18. John Keegan, *The Second World War* (New York: Viking, 1990), 430.

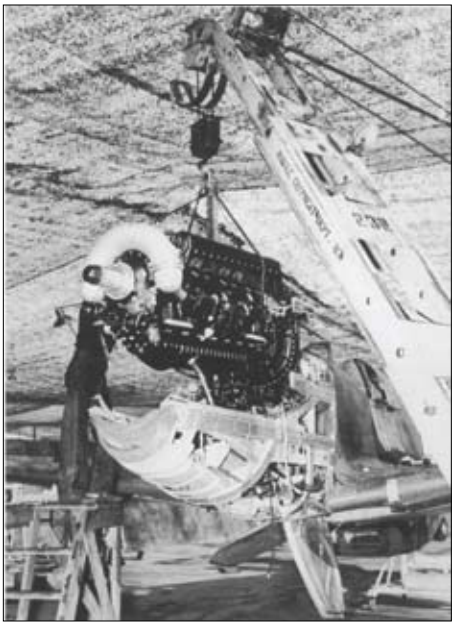
development delayed, its production prevented, for close to fifteen months. The problem was that it was one of those newer aircraft types ordered in panic by the French and British air forces in 1939–40, when the Luftwaffe's superiority was becoming obvious. The U.S. Army Air Forces was at the same time ordering a plethora of other aircraft types, some successful like the P-38s and P-47s, but many of them duds, like the Airacobras. Since the P-51 was not an Air Force product, it did not go through the Wright Field testing process; it was not "made here." If the North American Aviation Company wanted to build it, with foreign funds, and put an Allison engine into it, fine. Just don't bother us.

By the time the first prototypes of the P-51 arrived in England, early in 1942, its fate was very much in doubt. The British aircraft industry was in full production of the improved, superb Spitfires and Mosquitos, so any new plane had to be produced in the United States or Canada. Besides, the Mustang's performance was disappointing; it was OK as a low-level fighter—which was, in fairness, its original specification—but it was hopeless at over 18,000 feet and couldn't get to 25,000 feet, which was roughly where the air war over Europe was being determined. The first Mustangs were lumpy, unattractive, under-performing, and without a powerful backer. On the brink of scrapping their order for more copies, however, Fighter Command Development section at RAF Duxford asked the remarkable Ronnie Harker to fly the plane and offer his judgement. Harker was an ultra-competent test pilot for Rolls-Royce Engines of Derby; among his many tasks was to test-fly the latest versions of captured Messerschmidts and Focke-Wulfs and see how they performed against the latest Spitfires. On 23 April 1942—this is a historic date—Harker drove from Derby to Duxford, and tested the Allison-engined P-51, flying it once, twice, then a third time.

Harker's report, in the Rolls-Royce archives, made two simple points: this aircraft, despite its rather ugly look, was aerodynamically superb—it had far less "drag" than any comparable fighter, it never stalled, and it was astonishingly fuel-efficient; but, secondly, it was hopelessly under-powered. By great coincidence, however, Harker was at that time involved with the designers and engineers of what was to be the single best piston engine of the Second World War, the Rolls-Royce Merlin 61, which powered the Lancasters, Mosquitos, Typhoons, Spitfires, and many more. By even better coincidence, the length and other dimensions of the Mustang's "nose" were almost exactly the same as those of the newer Spitfires. At Harker's suggestion, the Allison engine was removed and a Merlin engine put in its place; to the delight of all air-power fans, there exists a photograph of the Merlin engine being lowered, by marriage, into the original P-51 chassis (see illustration 2 on next page).[19]

The results were astounding; the Merlin-powered Mustang could do things which were not thought aerodynamically possible—top speed of 420 mph,

19. D. Birch, *Rolls-Royce and the Mustang*, Rolls-Royce Historical Series 9 (Derby, U.K.: Rolls-Royce Heritage Trust, 1987), passim. Photo is from p. 89 of P. A. Ludwig, *P-51 Mustang: Development of the Long-range Fighter* (Surrey, U.K.: Classic, 2003).



2. *The Merlin Engine marries the Mustang P-51 Chassis. There are many photos of this "marriage," including those in Rolls-Royce's own historical series. This is a later one, showing a Packard-Merlin being lowered in, under a camouflage net, from Paul A. Ludwig's authoritative* P-51: Development of the Long-Range Escort Fighter.

altitude of 44,000 feet, never stall, turn on a penny, and manoeuvrable at any height, *plus*, the greatest boon of all, a low drag and fuel economy that could take it further into Europe than any other Allied fighter. With the newly introduced drop fuel-tanks, a parallel improvement, it could accompany the B-17s to Prague and back; actually, by late 1944 Mustangs could accompany Allied bombers from East Anglia to airfields in western Russia.

But that is running ahead of the story. The technical solution may have been found, but the bureaucratic and political obstacles to the Merlin-Mustang's mass production remained. And the obstacles, alas, were all in Washington. In the United Kingdom, Harker's report crossed the desk of that extraordinary individual, Air Marshal Sir Wilfrid Freeman, who had in previous years authorized development and production of no less than the Hurricane, the Wellington, the Halifax, the Spitfire, the Lancaster, the Mosquito, and the Beaufighter—it was Freeman who had rescued the Mosquito from those who wanted to scrap it, turning aside the jibes that it was simply "Freeman's Folly."[20] Freeman at once ordered the conversion of another five Mustangs with Merlin engines, and directed also that two of those copies be given immediately to General Spaatz and the U.S. Army Air Forces in Europe. At the same time, the Packard Company, already contracted by the Royal Air Force to build Merlin engines in the United States, was asked to step up production. It was vital to get the Americans on board.

20. A. Furse, *Wilfrid Freeman: The Genius Behind Allied Survival and Air Supremacy 1939 to 1945* (Staplehurst, U.K.: Spellmount, 1999).

But the all-powerful War Material Board in Washington, under the dogmatic Major-General Oliver P. Echols, was adamant; this was not an all-American plane, it wasn't put together here, it didn't go through the Wright Field process, and, besides, there were a further 7,500 Allison engines on order and that company and its congressman would get very mad at any cancellation. There was also a strong nativist prejudice. Harry Hopkins, asked by Freeman to help out, investigated the matter and reported only half-jokingly that the belief was that the British could not build better aircraft than Americans, and that putting the Merlin engine in place of the Allison was an insult. Anti-British prejudice in parts of the American military still ran deep.[21] The contrast with the story of the swift acceptance of the cavity magnetron is staggering. Is it simply because scientists, engineers, businessmen, have only one test: *does it work*??? If it does, go for it. Forget about culture, ideology, nationality: get the thing. By this stage, at Freeman's request, Packard were building some Merlin-Packard engines, putting them into P-51s in the United States, and having American officers fly them. But it was slow going.

Freeman, a great admirer of Americans, had many routes of approach. He turned to Hopkins again and again; he persuaded Churchill to write to FDR; he recruited American fliers already in the U.K., like the dynamic Colonel Donald Blakeslee, who flew and adored Spitfires for years but chafed for a longer-range fighter; he talked it over with the influential Robert Lovett, General Arnold's chief deputy, when Lovett made his vital investigation of the strategic bombing crisis in late 1943, and recommended a long-range fighter with drop tanks as the only solution; and, finally, Freeman recruited that handsome, charismatic, socially well-connected U.S. Assistant Air Attaché at the London Embassy, the legendary Tommy Hitchcock, the greatest polo player the world had known, the captain of three successive American Olympics teams, himself a First World War pilot (as was Lovett) on the Western Front, a friend and neighbor of the Roosevelts, and utterly un-intimidated by anyone at the Material Board.

Then came the Schweinfurt-Regensburg disasters, Lovett's visit to the U.K., Hitchcock's return to the United States for a while to press the case, some more tugs from Freeman to Hopkins, and then the real breakthrough: Hap Arnold's famous Christmas message of 27 December 1943 to his senior commanders in Europe. Some Christmas message indeed—it was bleak and insistent: the Luftwaffe had to be destroyed, or there would be no D-Day. Early in the New Year, the Material Board faded off the stage, Mustang production went into full strength, and Blakeslee and Jimmy Doolittle at last had U.S. Army Air Forces squadrons of Mustangs, to reinforce the RAF Mustang squadrons that Arthur Tedder had already directed to join the Eighth Air Force as escorts. Unsurprisingly, and no doubt as a reward, the delighted Blakeslee got command of the first American Mustang squadrons.

Is that the end of the story? Not quite. In fact, this is where the methodology argued for here comes to the point. From February 1944 the daylight raids upon Germany resumed. By May 1944 the Luftwaffe had been shot out of the skies all over Western Europe. Early in the next month the Normandy landings took place,

21. Ludwig, *P-51 Mustang*, especially chap. 3, on the resistance of Echols.

3. *Allied Escort Fighter Range, from Eastern England. There are many versions of this "concentric range" problem, including in the Official Histories, and some seem to borrow from others. This one is from W. Murray,* [see footnote 23].

completely unaffected by the German Air Force. Within another few months, the American and British strategic bomber forces could resume, much more safely, their assaults upon German cities and industries. The change of fortune was astonishingly quick.[22]

Did the coming of the Mustang do all this? Not by itself. But what it did was to close the "air gap" over Germany in rather the same way that the long-range Liberators closed the "air gap" over the mid-Atlantic. What happened was that it forced the Luftwaffe to make choices: Adolf Galland could no longer order his Focke-Wulf squadrons to wait until the shorter-range Allied escorts went home, and then attack the American bombers. The Luftwaffe could either take on the Spitfires over the Channel and the Netherlands, or take on the Thunderbolts over western Germany, or take on the Mustangs over Berlin (see illustration 3, above)[23];

22. German fighter losses are compellingly described in W. Murray's *Luftwaffe* (Baltimore, Md.: Nautical and Aviation Pub. Co. of America, 1985), chaps. 6 and 7, with a host of statistical tables.

23. W. Murray, *Strategy for Defeat: the Luftwaffe 1933–1945* (Maxwell Air Force Base, Ala.: Air University Press, 1983), the illustration itself being on p. 172.

Table 3. Attrition of German Fighter Aces in West and Reich

Ace	*Victories*	*Date Lost*
Egon Mayer	102	2 March 1944
Anton Hackl	192	March 1944
Hugo Frey	32	6 March 1944
Gerhard Loos	92	6 March 1944
Rudolf Ehrenberger	49	8 March 1944
Egmont Prinz zur Lippe-Weissenfeld	51	12 March 1944
Emil Bitsch	108	15 March 1944
Heinrich Wohlers	29	15 March 1944
Johann-Hermann Meier	77	15 March 1944
Stefan Litjens	38	23 March 1944
Wolf-Dietrich Wilcke	162	23 March 1944
Detler Rohwer	38	29 March 1944
Hans Remmer	26	2 April 1944
Karl Willius	50	8 April 1944
Josef Zwernemann	126	8 April 1944
Otto Wessling	83	19 April 1944
Franz Schwaiger	67	24 April 1944
Emil Omert	70	24 April 1944
Kurt Ubben	110	27 April 1944
Leopold Münster	95	8 May 1944
Walter Oesau	123	11 May 1944
Gerhard Sommer	20	12 May 1944
Ernst Börngen	45	19 May 1944
Hans-Heinrich König	24	24 May 1944
Reinhold Hoffmann	66	24 May 1944
Horst Carganico	60	27 May 1944
Friedrich-Karl Müller	140	29 May 1944
Karl-Wolfgang Redlich	43	29 May 1944

Source: Obermaier.

4. *Losses of Luftwaffe "Aces" in Spring 1944. This amazing table was put together for E. Obermaier's classic 2-volume* Die Ritterkreuztraeger der Luftwaffe *(Mainz: D. Hoffmann, 1966).*

there was now *no* zone free of Allied fighter escorts, and in some ways it made sense to attack the bombers earlier rather than later. At the end of the day, the Mustang's capabilities forced that tough decision. And, from Arnold and Spaatz's point of view, it didn't really matter whether German fighters were being shot down by Spitfires, Thunderbolts, or Mustangs.

And shot down they were. As the Allied bombing campaign resumed, the Luftwaffe had to pull thousands of its planes and pilots from the Eastern Front, giving the Red Air Force a great boost. But those reinforcements could not match the Allied swarms. Between February and May almost every remaining Luftwaffe fighter "ace" was shot down (see illustration 4, above).[24] Galland still had planes,

24. Taken from p. 212 of the excellent study by S. L. MacFarland and W. P. Newton, *To Command the Sky: The Battle for Air Supremacy over Germany, 1942–1944* (Washington: Smithsonian Institution Press, 1991).

excellent fighter aircraft, but he was sending up new pilots with only twelve hours of flying-time against the likes of Blakeslee in his Mustangs, or Hubert Zemke in his Thunderbolts, or the hardened RAF Spitfire pilots. Even when the Focke-Wulfs dived away, down to tree level, the aerodynamics just got better for the pursuing Mustang—as Harker had predicted, some two years earlier. His prescience was uncanny.

On the morning of D-Day, two of the dwindling band of Lufwaffe aces made a daring and futile run across the Utah and Omaha beaches. It was symbolic: a last good-bye.

To summarize. First, there was a military problem; then a technical or organizational solution; and then, with greater difficulty, the operational adaptation. To end this story when Rolls-Royce inserts a Merlin engine into the P-51 chassis and reports on the astounding test results in late-April 1942, is only half the tale. To let readers know that, fortunately for the Allied air forces, a new long-range fighter reached the front line in February 1944 and swept the skies, is like starting a detective novel halfway through. But that is what we tend to do.

What general conclusions may be drawn from the accounts above? Perhaps it is best to begin with a caveat: namely, that one should not assume that in *all* campaign narratives there was some magical device or devices, like the cavity magnetron or the P-51, to explain one side's victory. The Nazi Blitzkrieg in the East was defeated, surely, by a bigger and tougher Red Army, and a willingness by the Soviet leadership to take millions of casualties—yet fight on. Sometimes "brute force" *is* the best explanation.[25]

Yet we do have a sufficiently interesting number of examples—from intelligence discoveries, to Percy Hobart's ingenious specialist tanks for D-Day landings, to the U.S. Marine Corps' development of amphibious warfare techniques in the Pacific, as well as the slow recognition of the P-51's special qualities—to suggest that most of the breakthroughs in the air, sea, and land battles which occurred between Casablanca and D-Day can be traced to certain dynamic changes at the *middle level* of warfare. These changes made a difference, in some cases a vital difference.

This argument contributes, very directly, to the multi-level, feedback-loop understanding of "Military Effectiveness" as outlined in Alan Millett and Williamson Murray's invaluable three-volume edition of that same title, published some twenty years ago.[26] There they made the devastatingly simple point that, in the winning of any war (i.e. in being militarily effective), four interacting levels of historical processes were involved. At the top, there was the *political* dimension, the Allied decisions for the unconditional surrender of the Axis powers, with

25. See J. Ellis, *Brute Force* (New York: Viking, 1990); P. Kennedy, *The Rise and Fall of the Great Powers* (New York: Random House, 1987), chaps. 6 and 7; and much of R. Overy, *Why the Allies Won* (London: J. Cape, 1995).

26. A. R. Millett and W. Murray, eds., *Military Effectiveness*, 3 vols. (Boston: Allen and Unwin, 1988), especially chap. 1 of vol. 1.

the understanding that Germany was the most dangerous foe and that its defeat was first priority. From that grand-strategical set of decisions, the action moves downwards to the actual *military strategies* and purposes, such as "get control of the Atlantic sea-lanes," "achieve command of the air over Europe," and those other desiderata listed in the Casablanca directives. But those directives can only be achieved at the *operational* level—you had to put in place the necessary force-systems and weaponry (including newer technologies, aircraft, radar, battlefield units)—in order to destroy the U-boats, Focke-Wulfs, Tiger tanks, or whatever. The fourth stage, which seems like the lowest but is in fact the most critical of all, is the *tactical* level, the actual piece-by-piece destruction of enemy units. If there are not favorable results at the ground level, all the above stories collapse . . .

If, however, a sufficient number of enemy units are destroyed in the field, at sea, and in the air, then those cumulative tactical successes feed back favorably, and upwards, to the campaign and operational level; for example, when the post–May 1943 statistics showed German U-boats being destroyed in large numbers whilst Allied merchant-ship losses were diminishing, the Admiralty knew it was beginning to win the Battle of the Atlantic. And, if that continued to be the case, then at least one of the strategic requirements issued at Casablanca was being fulfilled. If that happened in the aerial and land campaigns as well, then the grand political purpose—utter defeat of the Axis—would be realized.

Still, there is something missing from this rather mechanistic schema of different levels of military effectiveness and the feedback loops between them. The historian's explanation cannot just be about wiring-systems, pulleys and levers, and logical flow-charts. It has to be very much about *people*—certain people who counted at a particular level, their networks, their initiatives, their personal contributions, and their good (or not-so-good) fortune; it is about chance, a bit.

In regard to the air war against Germany, for example, the list of *dramatis personae* probably ought to start with the two Air Chiefs, Arnold and Charles Portal, who had insisted that the Casablanca strategic directives include, prominently, the clause that "the combined strategic bombing campaign against Germany was to be increased."[27] Yet precisely because that proclaimed, high-level strategic purpose was failing to be realized throughout the rest of 1943, and was only rescued in the nick of time in early 1944, the spotlight of the historical enquiry has to drop down to the next level, the operational level, the problem-solving level, *the middle level.*

That in turn must cause all those now familiar with the tale of the P-51 Merlin-engined Mustang to goggle at the role of the "what ifs?" and to be stunned by the part played by chance, or good fortune, or destiny. What if Ronnie Harker had not been invited to test the Allison P-51 at Duxford, or if it had been flown by someone with less perspicacity? What if it was someone who didn't come from Rolls-Royce, and therefore didn't know about the Merlin 61? What if Sir Wilfrid Freeman had been on one of his U.S. trips when the report from Rolls reached his office; what if it hadn't been Freeman, with his American connections? What if

27. Feis, *Churchill, Roosevelt, Stalin*, 106.

he had no personal links to Harry Hopkins? What if Robert Lovett and Tommy Hitchcock, each with their special histories, hadn't been in the positions they were in between 1942 and 1944? What if Donald Blakeslee and his fellow fliers hadn't been in East Anglia, agitating for Merlin-Mustangs for the U.S. Army Air Forces, and hadn't been backed up by superiors like Jimmy Doolittle to increase the pressure upon Hap Arnold, which in turn led him—after Schweinfurt/Regensburg—to give his Christmas ultimatum? What if . . .? What if . . .?

History is not simply about chance, unpredictability, fortune, and folly, and the historian should not suggest that it is. But any responsible historian who advances an elaborate, logical-chain thesis, as has been attempted in this Marshall Lecture, cannot in turn assume that there is a mechanistic and therefore almost inevitabilist process under way; personalities and luck do count.

Still, admitting to the place of chance and fortune should also *not* blind us to the critical role of sensitive, superior organization, and of a culture of encouragement rather than of uniformity, in order to get great tasks accomplished. Those two Birmingham post-docs had been given a "free hand"; they were encouraged to experiment and speculate on how to find a miniaturized radar. Tizard had the freedom of opinion to argue before Churchill that Britain should show the neutral Americans *all* their bag of tricks in 1940, and not bargain over it. Ronnie Harker only drove down to Duxford on that April morn because the RAF had a culture of reaching out to gain the expertise of others. Wilfrid Freeman was in his critical place—he had lost it in 1940, when the turbulent Lord Beaverbrook was made Minister of Aircraft Production—because Churchill wanted him back, just as that dynamic Prime Minister reinstated Percy Hobart from oblivion into becoming the head of all experimental tanks development. Robert Lovett, Harry Hopkins, and Tommy Hitchcock played the roles they did because their American social and political system created "space" for valuable if irregular players. There is many a lesson to be learned here.

In sum, pure chance or accident in History is not everything; it is probably the exception, which is why we notice it so much. In the study of grand historical designs, and in our search to understand change and causality over time, a place definitely should be carved out for the significance of momentous decisions made at the very "Top"; and in our historiography nowadays we are also much more aware of the importance of History from below. By contrast, we may be lacking a fuller appreciation of that trickier level of "History in the Middle." This essay makes no greater claims than that it has offered an example, from the Second World War, of where that mid-level causal History can be done. It surely can be done for other historical times and in other historical genres. It makes a lot of sense.

POSTSCRIPT

The young Alexander conquered India.
On his own?

Caesar defeated the Gauls.
Did he not even have a cook with him?

Philip of Spain wept when his Armada
Went down. Did no-one else weep?

Frederick the Great won the Seven Years' War.
Who else won it?

(Excerpt from Bertolt Brecht, "Fragen eines lesenden Arbeiters")