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Book Review by Raymond E. Franck, Jr. of
The Pursuit of Power: Technology, Armed
Force and Society Since A.D. 1000 by Mark
William H. Neil; The Future of War: Power,
Technology and American World Dominance
in the 21st Century by George and Meredith
Friedman; War, Economy and Society,
1939-1945 by Alan S. Milward; War and
Economy in the Third Reich by R.J. Overy

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William H. McNeill, *The Pursuit of Power: Technology, Armed Force and Society Since A.D. 1000*. Chicago: University of Chicago Press, 1982. Pp. 405. \$16.00, paperback reprint.

George and Meredith Friedman, *The Future of War: Power, Technology and American World Dominance in the 21st Century*. New York: Crown Publishers, 1996. Pp. 464. \$16.95, paperback (St. Martin's Press, March 1998).

Alan S. Milward, *War, Economy and Society, 1939-1945*. Berkeley: University of California Press, 1977. Pp. 365. \$17.95, paperback (October 1979).

R. J. Overy, *War and Economy in the Third Reich*. Oxford: Clarendon Press, 1994. Pp. 375. \$26.00, hardcover (Oxford University Press reprint edition, August 1995).

This essay reviews literature relating to war, economy, and technology (i.e., the material means of warfare), all of which are of great importance to the development of society. The relative importance of material vs. other factors is itself an interesting question. For example, Arther Ferrill regards human nature as combat-ready, and dates the emergence of warfare to a prehistoric Revolution in Military Affairs (RMA).¹ However, H. H. Turney-High, seconded by John Keegan, traces warfare as an institution brought into being as a consequence of social organization, and possible only after crossing a "military horizon."² Even though they seem mutually exclusive, both views have considerable merit. The point this reviewer offers is that those who study warfare and society using a material focus miss much that's relevant, and those who omit the material likewise overlook many important factors.

Studies of the material means of warfare and society vary widely in breadth. Some, like McNeill's *The Pursuit of Power*, depict a wide variety of experience over an extended period. Others, such as Robert Hardy's history of the longbow, concentrate on a relatively narrow subject.³ Some offer a broad survey of one period, such as Milward's *War, Economy and Society, 1939-1945*, or the Friedmans' *The Future of War*. Still others have

more modest ends, such as Overy's *War and Economy in the Third Reich*, or Milward's earlier work, *The German Economy at War*.⁴

Given the richness of the literature, which sample to consider must in the end depend on individual preference. However, it is fair to say interest in the study of technology, economy, and war increased dramatically in the twentieth century—which featured large-scale military-technical applications as well as fully mobilized economies committed to the conduct of total war. Within those studies, Nazi Germany has attracted considerable attention for a number of reasons: (1) its articulated view of total war prior to 1939, (2) its clear defeat in the material dimensions of warfare despite successes in early campaigns, and (3) scholars' extensive access to Third Reich archives after 1945.

The Pursuit of Power

McNeill's book is a magisterial treatment of a large, complex subject: methods for mobilizing resources for military purposes and the consequences of using those methods. There are three main parts: the Chinese dead end, the successful European formula, and the breakdown of that formula in the twentieth century.

According to the author, large-scale commercial markets became important around 1000 AD. First to enter the new age was China, which enjoyed huge technical and economic advantages. However, McNeill is primarily interested in China's failure to maintain its lead. The overarching explanation is the bureaucracy's ability to preserve its power at the expense of entrepreneurs and soldiers: "...systematic restraints upon industrial expansion, commercial expansion, and military expansion were built into the Chinese system of political administration" (pp. 40-41). One might say success for Chinese bureaucracy meant eventual failure for China.

McNeill focuses mainly on the European formula for military power, commercial success, and world domination. Knowledge of Chinese technology and methods inevitably spread, Europeans being particularly successful in exploiting and improving them. Rivalries among European powers led to a number of experiments in military operations, organization, and equipment—with "best practices" generally spreading. For example, various types of contractual arrangements for raising military forces proved less satisfactory than national administration; hence the bureaucratic rationalization of warfare. Commercial markets proved more effective for arranging logistics; hence the commercialization of warfare. The economic, political, technical, and military dimensions of European statecraft were interlinked in one highly successful formula: "a self-reinforcing cycle in which military

organization sustained, and was sustained by, economic and political expansion..." (p. 143).

One logical culmination was industrialization of warfare, which began with military applications of steam engines and mass production. The Industrial Revolution greatly extended the horizons of military policy—providing the economic wherewithal to raise and train large military forces; large quantities of goods to equip them well; and transport to get them quickly to distant theaters of operation. Like most successful practices, industrialized warfare spread to all major powers, leading among other things to the stalemate of 1914. Subsequent need for war materiel, in quantities too great and time periods too short for commercial markets to effectively respond, led to mobilization managed by national edict. Broadly speaking, war was “decommercialized.” Command methods came to the fore during total war, and significant parts of the command apparatus remained in place in peacetime.

At the same time, complexity of military-technical affairs meant erosion of rationality in military decisions. In support of that proposition, McNeill considers a gun-laying system for Royal Navy capital ships prior to World War I, in which an inferior model was chosen because the technical issues were beyond the ken of the main decisionmakers (pp. 295 ff.). A more fundamental challenge to rational management was the appearance of nuclear weapons, whose use would render moot any rational war aims. The author sees these developments as constituting a dead end for the European formula. The way around it is “political change.... The alternative appears to be sudden and total annihilation of the human species” (pp. 383, 384).

McNeill presents an interesting narrative—well told and leading to a logical conclusion; however, even the most sweeping narratives have significant gaps. He frequently cites demographic pressures that drove major national policies. Similarly, he cites a demographic revolution in which the French “learned how to control births” some time after the Revolution of 1789 (p. 214). The reader is left to wonder how population pressures arose, and how societies then become self-sustaining. This seems to have been an excellent opportunity for McNeill to connect *The Pursuit of Power* with his earlier work, *Plagues and Peoples*.⁵ But he does not do that. This is less a criticism of him than an indication that even works of this scale are inherently incomplete.

More importantly, he appears to have been more wrong than incomplete. As *The Pursuit of Power* was published (1982), a new method of warfare was in development, centered on precision weapons and information (highly effective military force without mass destruction). With the new era has come a new literature, as is represented by *The Future of War*.

The Future of War

This volume offers itself as a preview of technology and warfare in the twenty-first century—an “American epoch.” There is a strong thread of technical determinism in the Friedmans’ approach, revealed in statements such as “Great technologies permeate great civilizations” (p. 10). The distinctive American technology is the computer, whose military embodiment is precision weaponry. Their narrative consists of three parts. First, the authors present their view of technology, warfare, and America’s place in the world. Second, they make the case for obsolescence (“senility”) of ballistic weapons from the previous, “European,” epoch. Third, they offer us their vision of future warfare.

However, there is more to their account than narrative and prediction. Theirs is a decidedly “realistic” view of the American world order and American interests. The United States is seen as a maritime state with interests in both the Atlantic and Pacific regions. Preservation of U.S. primacy implies control of the seas—which means, in turn, a strong interest in preventing any potential peer competitor in Eurasia the freedom to contest maritime supremacy.

The authors also present a theory of the life cycle of military technologies, from inception to strategic significance to “senility.” Senility gets most of the attention, as a condition in which so many resources are devoted to self-protection that offensive capabilities wither to insignificance. The story of David and Goliath is the illustrative parable. Goliath was heavily armed and heavily defended. If David had gotten close, Goliath would have won. David, of course, didn’t do that, relying instead on simple technology, tactical agility, and (most important) outranging his opponent. This theory is applied to current military affairs to prove that tanks, manned aircraft, and aircraft carriers are senile weapons.

Likewise, the Friedmans assert an ongoing “epochal change” in military affairs, as demonstrated in the Gulf War of 1991. Smart, precision munitions have replaced ballistic munitions. Furthermore, long-range precision strikes are now possible due to rapid integration of large amounts of combat information. They seem to view the change as something more than just another Revolution in Military Affairs (as discussed by Krepinevich), but less significant than the manifestation of a major change in the human material condition (the Tofflers).⁶ Consequently, successfully discarding old ideas and equipment when appropriate and without large social cost is necessary for military success.

Finally, the authors predict weapons and technologies that will dominate future warfare and shape statecraft: (1) long-range, high-speed, brilliant

cruise missiles, (2) space-based reconnaissance and strike systems, and (3) a resurgent infantry. These changes are expected to have consequences well beyond the art of war. For example, the United States faces a sea-control dilemma related to the senility of the aircraft carrier. Space-centered means are offered as the solution, but the implications of space are not limited to military strategy: “Whoever controls space will control the...oceans. Whoever controls the oceans will control...global commerce. Whoever controls...commerce will be the wealthiest power...Whoever is the wealthiest...will control space” (p. 411). Also, the authors expect fundamental changes in the relations of military and society. Military forces will become small, professional and elite—more like knights than mass armies. Also, the advent of deep precision strike capabilities promises warfare conducted with minimal effect on populations—wars will be more like those fought in the eighteenth than in the twentieth century.

The basic strength of the book is a coherent theory of military technology, which leads to hypotheses about future warfare. However, reasonable people can draw different conclusions from the lessons of history, and hold different expectations about the future of war. The authors, perhaps of necessity, focus mainly on technology. In so doing, they implicitly assume an international order that may or may not persist until such time as their vision of future warfare can be realized.⁷

Their technical focus also leads to conclusions they think are self-evident, but that aren't, really. New technologies are presumed to allow small, high-tech militaries such as those of Israel and Singapore to readily compete with larger powers like the United States. This ignores one essential point: significant economies of scale. One example is the complex featuring hypersonic cruise missiles and space-based sensors that the authors posit. The missiles would be launched from an advanced artillery piece, which costs about \$7 billion. The marginal cost of the associated “Hypersonic Aerospace Weapons” would then be relatively small. As with all such classic economies of scale, getting half the capability entails considerably more than half the cost—a major deterrent to entry for small states.

Some other propositions are also open to question. The David and Goliath story illustrates both the book's virtues and weaknesses. One virtue is a definite thesis articulated clearly and imaginatively. A weakness is that the example cited is not fully consistent with military history. Heavy infantry units, Goliath's heirs, were a mainstay of most ancient armies, while the light missile troops, David's heirs, were almost always relegated to a secondary role.

Similarly, David and Goliath could describe English longbowmen against French knights during the Hundred Years' War. Yet, while knights

in plate armor were well into senility, their obsolescence is not the whole story. English battlefield prowess was built on combined arms: infantry, cavalry, and bowmen.⁸ A more useful lesson is that new weapons are used most effectively in proper combination with older weapons. That said, however, the Friedmans have written a thoughtful and interesting book.

World War II: War, Economy and Society, 1939-1945; War and Economy in the Third Reich

Alan S. Milward has written what is arguably the seminal work for modern studies of society and the material means of war. This is a broad study of the economic policies of the major powers during World War II, and in it, Milward pays more attention to the Axis powers, especially Germany.⁹ He takes the interesting, perhaps controversial, view that warfare can be part of a rational pursuit of prospective economic benefits. He argues persuasively that such calculations were significant factors in the German and Japanese decisions to go to war. Both countries were intent on forming large, closed, autarkic trading blocs with themselves as the manufacturing centers.

The book's main concern is national strategies, their execution, and the effects of their execution. Each major power arrived at a "strategic synthesis" with military, economic, and political dimensions. For Germany, the strategic synthesis was *Blitzkrieg*. The military dimension called for a series of short, mobile, decisive campaigns. The political dimension was built on expansion through the opportunistic choice of such campaigns. The appropriate economic component of that synthesis was an emphasis on existing inventories ("armament in width") and flexibility in armaments production—which meant considerable sacrifice in efficiency. Reflecting similar circumstances, Japan reached a similar strategic synthesis.

Britain started with a defensive emphasis on air and naval forces for the first phase of a grim, prolonged struggle. The intention was to win eventually by outproducing Germany, with help from the Empire and the United States. In the late 1930s, the Soviet Union embarked on a policy of rebuilding its military infrastructure after Stalin's purges. The United States began with the aim of preserving its neutrality—which proved increasingly untenable after September 1939. The basic choices then ranged from arming itself or arming those fighting the Axis. The eventual choice was to do considerable amounts of both.

The execution of German strategy receives much attention. With the failure of *Blitzkrieg*, Germany switched to modes of production consistent with a long war. However, Germany's "armament in depth" emphasized high-quality weapons, rather than competing directly with the Allies'

quantity. Nonetheless, war production increased steadily and rather dramatically until the collapse that began in 1944.

During World War II, all nations faced a common problem in executing their strategies: non-market allocation of resources in highly complex, sophisticated economies. Results were decidedly mixed. In many cases, execution of policy differed significantly from national intentions. A problem unique to Germany and Japan was exploitation of their occupied areas, which each did with varying success.

Execution of a strategic synthesis included disruption of the enemy's economy—described broadly as economic warfare. Measures included surface blockade, submarine warfare, preemptive purchases, coercion of neutral suppliers, and strategic bombing. Despite conspicuous successes such as bombing German synthetic oil production and interdicting Japanese sea lanes, the overall record was mixed. The basic reason was the same as for the mixed results in economic control. Both approaches required detailed knowledge of complex industrial economies.

War and Economy in the Third Reich

R. J. Overy takes on the same general subject as Milward. His book is really a collection of essays, with the whole both interesting and coherent.¹⁰ Its chapters develop four interrelated themes: the course of economic recovery in the 1930s, the relationship between the regime and business, the nature of prewar rearmament, and the operation of the war economy.

Recovery emphasized employment, with civilian programs receiving high priority until 1936, followed by a strong shift to rearmament. The Nazi regime had a complex record of cooperation and friction with German business, with the details varying according to the industry, the individual firms and over time. Like Milward, Overy provides a thoughtful analysis, but arrives at conclusions that are sometimes strikingly different.¹¹

His most important, and most interesting, theme involves the nature and operation of the war economy. General war came too soon because much investment involved infrastructure to support military production, which was still in progress in September 1939. Although there were production bottlenecks by 1936, the economy was extensively mobilized by 1939 thanks to Hitler's reliance on command methods. With consumption well on its way to a minimum level at the outbreak of war, it was increasingly difficult to further decrease it later.

The war economy evolved in three phases. In the first (1939 to 1941), additional resources committed to military industries did not result in much additional production. For example, 50% more labor in the aircraft industry

resulted in only a 15% increase in production. This occurred for a number of reasons: military infrastructure investments were incomplete; assimilating occupied territories was costly; there were uncertainties regarding the future direction of the war; defense suppliers faced perverse incentives and acted accordingly; and military and political authorities could not effectively coordinate their efforts.

The second phase (1941 to 1944) featured increasingly effective coordination by technical experts. With direct backing from Hitler and a central planning apparatus, the technocrats rationalized production (for cost minimization) and concentrated facilities (for economies of scale). The result was a dramatic increase in war production.

The third phase (1944 to 1945) marks the economic collapse that accompanied rapid declines in German military fortunes on all five fronts. Overy attributes much more importance to strategic bombing than is currently fashionable, asserting that it caused disruptions of supply chains, with attendant losses in efficiency. Bombing also necessitated the dispersion of facilities, negating economies of scale. Overy regards strategic bombing as having directly undermined the basis of Germany's production successes and thus was well designed to disrupt its war economy.

Even relatively narrow studies can reach differing conclusions. Milward's *Blitzkrieg* thesis holds that the German war economy, "arming in width," reflected a strategy of sequential short wars. While the strategy was working, the leadership felt no reason to put the economy on a total war footing—since clearly inferior opponents would be chosen.¹² Therefore, there was a certain lack of seriousness about war production, as well as uncertainty about what was needed. As a result, production fluctuated considerably in composition, but changed little in total until the Reich faced a long war. Production was then adapted to counter that of the Allies, and only then did Germany undertake an "armament in depth" approach to a long war.

Overy offers a decidedly different view. According to him, the German economy was well on its way to mobilization by 1939, with large-scale transfers of productive resources already complete but with remarkably little increase in production. With the rationalization described above, production increased dramatically between 1941 and 1944 even though committed resources changed relatively little.

Making sense of these conflicting views is difficult for those less familiar with the subject. There are points of congruence, disagreements as to facts, and differences of interpretation. One point of congruence concerns production uncertainties. Overy cites the uncertainties on national policy as one of many reasons why German military production was so slow to

respond to increased resources. In a similar vein, Milward cites the opportunistic nature of national strategy as the unavoidable cause of uncertainty about needs for military equipment and the attendant inefficiencies in military production. However, Milward believes uncertainty was central to explaining production levels, while Overy seems to regard it as secondary.

There appears to be no consensus regarding the facts. Milward asserts that German women were largely left out of the war effort, due primarily to Nazi ideology. Overy states that there was an extensive increase in female labor force participation, much of it accomplished by 1939. Milward concludes that failure of Blitzkrieg entailed significant increases in guns at the expense of butter. Overy believes there was little butter left to be had at all after 1939. Those favoring Overy will be impressed with his consideration of the German experience before 1939. Those favoring Milward will note definite evidence of reductions in consumption after 1941 (e.g., Table 9, p. 78).

Finally, there are differences in interpretation. There are, for example, differing explanations for the increase in German production after 1941. Overy's explanation centers on efficiencies (both technical and economic), while Milward emphasizes increased inputs. This leads, among other things, to differing interpretations of the effectiveness of strategic bombing. Milward views it as a blunt instrument that had its successes but could largely be countered by increased mobilization of the economy and other measures readily available until major losses in the land theaters intervened to cause collapse. Overy views bombing as a strategy that worked well to counter rationalization of war production.

A Few Closing Thoughts

What emerges from this glimpse of the literature, whether it is sweeping in scope or relatively focused, is the difficulty of encompassing the subject and reaching definite conclusions. Works like McNeill's are incomplete—not because his reach exceeds his grasp but because of the inherent difficulty in describing the relationship between the material means of warfare and society. This is both complex and difficult.

But the game is still worth the candle. Especially now. We have almost certainly entered a period of rapid changes in military affairs, driven primarily by an array of developing technologies. The Gulf War of 1991 made clear that there has been a major change in the material means of warfare, thanks to the microchip.¹³ The Friedmans project these changes into the future.

However, there are other possibilities for what will spur the next Revolution in Military Affairs, or intensify this one, ranging from

nanotechnologies, to biogenetics, and (conceivably) a high-tech, neo-Maoist art of war. Therefore, serious efforts to understand the intersections between the material means of war and society are especially critical. These four books do this, and thus present us with useful models—their “strategic syntheses”—for how this can best be done.

Notes

1. Arther Ferrill, *The Origins of War: From the Stone Age to Alexander the Great*. New York: Thames and Hudson, 1985, especially the chapter on “Prehistoric Warfare” (pp. 9-31).
2. Harry Holbert Turney-High, *Primitive War: Its Practices and Concepts*. Columbia: University of South Carolina Press, 1949 (reprint 1991). John Keegan, *A History of Warfare*. New York: Vintage, 1993.
3. Robert Hardy, *Longbow: A Social and Military History*, 3rd ed. New York: Lyons & Burford, 1993.
4. Alan S. Milward, *The German Economy at War*. London: Athlone Press, 1965.
5. William McNeill, *Plagues and Peoples*. New York: Anchor, 1976.
6. Andrew Krepenovich, “Cavalry to Computer,” *National Interest* 37 (1993): 30-42. Alvin and Heidi Toffler, *War and AntiWar*. Boston: Little, Brown, 1993.
7. Dov Zakheim’s review in *U.S. Naval Institute Proceedings*, 123 (Apr 1997): 102 has a more complete statement of this point.
8. This is illustrated in accounts of the battles of Crecy (1346), Poitiers (1354), and Agincourt (1415) in Oman and Dupuy. Sir Charles Oman, *A History of the Art of War in the Middle Ages, 1278-1485 vol. II*. London: Methuen, 1924 (reprint Greenhill Books, 1991). R. Ernest Dupuy and Trevor N. Dupuy, *An Encyclopedia of Military History*. New York: Harper & Row, 1977.
9. In 1977 (the publication date), the Axis had no secrets, the Western allies had some, while the Soviet Union still kept a large number.
10. Much different assessments of coherence can be found in reviews by Fritz Stern (*Foreign Affairs*, 73, [1994]: 156) and John S. Hill (*History: Review of New Books*, 23, [1995], 178-179).
11. Werner Abelshausser provides an excellent summary and synthesis of controversies regarding the German war economy in “Germany: Guns, Butter and Economic Miracles,” Mark Harrison ed., *The Economics of World War II*, Cambridge University Press, 1998.
12. Taking this perspective at face value seems to mean the Germans regarded France and the Soviet Union as inferior military opponents like Poland.

13. Most label this a Revolution in Military Affairs, but there are contrary views such as O'Hanlon's and Beaumont's. Regardless of one's basic view, however, it's clear that major changes in military technology and the art of war are afoot. Michael O'Hanlon, *Technological Change and the Future of Warfare*. Washington, DC: Brookings, 2000. R. Beaumont, "OMTE: An Alternative Paradigm to the 'Revolution in Military Affairs'," *Defense Analysis*, 11, 3 (1995): 322-325.

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Michael A. Bellesiles, *Arming America: The Origins of a National Gun Culture*. New York: Knopf, 2000. Pp. 603. \$30.00, hardcover.

This is an important book, but also a disillusioning and disorienting one. Michael Bellesiles seeks to dispel the agglomeration of myth, history, pseudotraditions, and legalisms that have encrusted the Second Amendment and jelled in the form of the wacky cult of the gun with which we are presently burdened—to disarm, intellectually at least, what he views as a gunslinger nation. Predictably, his relative degree of success or failure thus far has been interpreted largely in partisan terms—praise that borders on fawning from the academic left, and a chorus of Bronx cheers from the fans of firearms. From my own perspective the book defies easy evaluation. It takes a mighty whack at America's gun culture and gives every appearance of obliterating substantial chunks, yet it not only fails in other respects but reveals a calculated tendentiousness that undermines confidence in the entire enterprise. Complicating analysis still further, Bellesiles, unlike many contemporary American historians, is a good, even gifted, writer capable of weaving a web of solid research, serious misinterpretation, stunning insights, and a pinch of pure balderdash into a case that looks as solid as a two-ton safe. It's not. But it is also quite compelling. Is this history or advocacy journalism with lots of footnotes? I'm not sure.

Bellesiles uses an impressive, though not necessarily definitive, body of evidence to make several key points: gun ownership and general familiarity with firearms during the colonial and early national periods were dramatically lower than previously assumed; until the Civil War, Americans, rather than romanticizing guns, were largely indifferent to them; and that the militia system, intended as an effective substitute for a standing army, was instead a grotesque and unmitigated failure. Cumulatively it amounts to an all-court press on the NRA credo, except that it leaks.