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Thomas G. Mahnken. *Technology and the American Way of War since 1945.* New York: Columbia University Press, 2010. 256 pp. $26.50 (paper), ISBN 978-0-231-12337-2.

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From the dawn of history, armies have sought ways to overcome their enemies. They have, for example, used various forms of technology for military systems and warfare. Sometimes they included civilian technology that had been adapted for military use, and at other times, they focused solely on the product of military research and development. But the ultimate aim was the same: to obtain an advantage and victory over the enemy.

Technology in the service of war raises two fundamental questions: how does certain technology affect warfare and wars? And does that technology bring about revolutionary change on the battlefield? These two questions merge into a fascinating discussion on the phenomenon of the military revolution. Military revolutions begin with technological changes and end with far-reaching alterations in social structure. The most important and critical revolution was the discovery of gunpowder which had worldwide influence. Historical military revolutions occurred over very long periods of time, even centuries. This fact has led certain researchers to argue that what we have here is not revolution but a gradual development, and evolution. This debate is still ongoing.

In his new book, *Technology and the American Way of War since 1945*, Thomas G. Mahnken raises a further question. How does technology change warfare methods and the warfare of a specific country, in his case, the United States? This is a comprehensive study that includes a discussion of the military technological developments that have become integrated into the various branches of the American military system, from the end of the Second World War until the first decade of the twenty-first century, the era of war against global terror. The six chapters of the book examine chronologically these developments within their historical contexts.

The central topic in Mahnken's book is the interaction of technology with the military and operational culture of the U.S. Armed Forces within the strategic framework in which the American forces were active. The book also examines the interaction between technology and service culture. Mahnken's main claim is that although service culture was influenced by technology, it was the armed services that adapted the technology for their operational needs.

The discussion on the connection between technology and service culture turns the book into a kind of introduction to understanding the joint operations process that has engaged the American military system for the past three decades. It is not possible to comprehend the extreme complexities in activating joint operations without understanding the special military and operational culture of each service. By examining this connection, Mahnken has made an important contribution to those researching the historical and theoretical sources of the joints operations process and the many problematic issues involved in the shaping of an integrated system.

As Mahnken shows, the cultural differences between each service culture makes each service unique. A service culture includes accumulated reservoirs of information, operational experience, warfare doctrine, educational models, and even ceremonial niceties that distinguish one service from another. Service culture is what stands counter to joint operations.[1] The military high commands as well as the civilian ranks in the Pentagon are aware that bringing all the armed services to fight in cooperation with each other requires more of a cultural change than a change in doctrine. This is no easy matter. In the Pentagon and in military academies, there are voices claiming that joint operations can be achieved by education (at all command levels) and not by the shaping of a doctrine. Only after making cultural changes, some argue, it is possible to develop a doctrine and to instill it among the armed services.[2]

The book examines the United States Army in the years following the Second World War, a period that is divided into two subperiods that begin with military revo-

lutions. The Cold War began with the nuclear revolution while the period that followed began in tandem with the information revolution, which is still continuing today. The chapters focus attention on two parallel processes. The first is how the changing strategic environment has influenced military service. The second is the interaction with technology in which the aim of each service was to remain relevant within the changing strategic environment. These processes stress the considerable differences among service cultures, and have led to competition between them over budgets, research and development, and equipment. This competition has also created separate warfare doctrines; different means of warfare with minimal cooperation; and as Mahnken shows, the integration of new technologies that emphasized differences between the services and were intended to maintain the relevance of the service during the Cold War and afterward. Mahnken's thesis can be exemplified by the army's and navy's attempts to remain relevant within the strategic framework of nuclear warfare in view of the rising strategic strength of the United States Air Force.

During the 1950s, the size of the army was reduced since the United States depended on its nuclear powers in the framework of the Eisenhower administration's Massive Retaliation policy. This policy determined that for every Communist threat, the United States would retaliate with fully military force, which meant the use of nuclear weapons. The 1950s also marked the beginning of military thinking that dealt with the doctrinal, strategic, and operative nature of Limited War, as presented by the Korean War. In this atmosphere, the army focused on justifying its existence as a conventional force in an era of nuclear warfare. One of the ways to do this was by arming its fighting forces with tactical nuclear weapons, such as short range missiles, mines, and even artillery shells. The Korean War helped the army to show that a conventional fighting force was still relevant, even if the character of warfare had changed. The dominant trends during the Eisenhower administration changed only during the Kennedy administration, which began once again to increase the conventional forces of the United States in the framework of the Flexible Response policy. The basic principle of this doctrine was that for every threat, a suitable military response should be given, and there was no doubt that nuclear force could not be used in guerrilla warfare, the type of confrontation that was so widespread during the John F. Kennedy period.

The United States Navy also found itself pushed aside during the first decade of the Cold War. In spite of its historic independence, the navy was forced to justify its relevance in the nuclear age, because the sole enemy of the United States, the Soviet Union, had a land-based strategic orientation. Therefore, the navy was left without any strategic task.[3] The navy's position was presented through the arguments regarding the shaping of the strategic national security of the United States. The essence of the argument was over the ways to activate the naval forces in any situation of conventional warfare and in a scenario of nuclear war. Naval military thinking depended on Alfred Thayer Mahan's geo-strategic philosophy, which explained why control over the sea was important for U.S. national security. The navy was perceived as the country's first line of defense, and its main task was to prevent any attack on the United States. This perception was offensive and not defensive, not to meet acts of aggression but to destroy any potential enemy near its own bases. But postwar technological developments brought the United States under the threat of long-range bombers and at the end of the 1950s also of intercontinental ballistic missiles (ICBM). In reaction to the developments relating to nuclear weapons and the development of the ICBM which was the responsibility of the air force, justification for the continued maintenance of aircraft carriers was apparently diminished. The navy's response was to develop the Polaris missile and to build submarines powered by nuclear energy.[4] Aircraft carriers lost their preeminence to the nuclear submarines of the Nautilus type which were equipped with Polaris missiles.

Here also lies a certain problematic aspect of Mahnken's thesis. There is no doubt that the strategic environment had changed, sometimes in a revolutionary manner, and that to continue being relevant it was necessary for the services to develop appropriate technologies and means of warfare. But the course of the Cold War proved just the opposite. The existence of a nuclear arsenal in the hands of two superpowers led to a nuclear arms race, but it also led to a conventional arms race because nuclear weapons created a balance of terror. Aircraft carriers are a good example of this, contrary to those who had lamented its demise after the introduction of Polaris missiles and nuclear submarines into navy's service.

Communist inspired guerrilla warfare (according to American perceptions) that threatened political stability in many places in the world strengthened the need for mobile military forces. The aircraft carrier was the ideal operational solution and the main tool that served to carry out an obstruction policy. Therefore the operational importance of the aircraft carrier was restored. American air power could be placed near the centers of potential threat without violating a state's sovereignty. Aircraft carriers did not need permanent land bases

and could make a sudden strike on enemy airfields and other strategic targets or alternatively to bring down any bomber that was making its way to the United States.[5] By shaping this strategy, the navy acquired the justification for continued maintenance of a fleet of aircraft carriers. Moreover, the navy aircraft service did not suffer from the problems encountered by the strategic air force, which had to have permanent land bases, and thus required complex diplomatic maneuvers vis-à-vis North Atlantic Treaty Organization (NATO) members and other allies.[6]

The Korean War also helped to prove that the navy fleet of ships in general and the aircraft carriers in particular had not become obsolete. The American aircraft carriers that navigated along the western side of the Pacific Ocean were the first to respond to North Korea's surprise attack. The American navy had complete control over the sea and air space around the Korean Peninsula until land control was achieved. The North Korean navy was neutralized during the first stages of the war while the Chinese fleet never posed any practical threat.[7] During the 1950s, the American navy's task in the western Pacific also included a show of strength in the Straits of Formosa in order to prevent China from invading Taiwan, as well as keeping track of the Russian submarine fleet in Vladivostok. The presence of the aircraft carriers of the Seventh Fleet in the region of the Straits of Formosa was vital and prevented deterioration to a general state of war between Taiwan and China.[8] This presence, still maintained today, exemplifies how the very existence of an aircraft carrier in a region of tension may have the power to prevent widespread confrontations. At the height of the second crisis between the two Chinese states (August 1958), there were six aircraft carriers in the region. The United States had sent its aircraft carriers to nearly all regions of the world where there was a prospective threat to its interests or national safety, such as the East Mediterranean, Latin American, Africa, and East Asia. Many examples can be found, and each additional one only strengthens the claim regarding the decisive role played by aircraft carriers from the American perspective.

Mahnken's book provides an important discussion and broad view of the warfare perceptions of the United States after the Second World War. The book traces the dynamic historical process in the link between technology and the conduct of war, and thus constitutes an important tier to U.S. military history research during the past six decades. Although it may seem that the book is a catalogue of all the technologies and means of warfare of the United States in air, sea, and land (and in space), a careful reading shows the importance of understanding which technologies were brought into use, what caused its need, and how it changed the battle situation and the American method of warfare.

This book may also serve those who are researching the general influence of technology on warfare, with the United States as a test case. In this field, several studies have already been written, such as Martin van Creveld's *Technology and War* (1989), Christopher Bellamy's *The Evolution of Modern Land Warfare* (1990), and Max Boot's *War Made New* (2006). Mahnken's book offers important additional knowledge about the mutual interactions between technology and the phenomenon of war. Another historiographical framework within which the book may be placed is the ongoing discussion about the process that in the 1990s was called the Revolution in Military Affairs (RMA). Although the term has apparently become defunct, the essential discussion remains with regard to the information technology with which the American armed forces are equipped and are using. We therefore have here an important work based on broad-ranged and updated secondary sources for the understanding of a variety of historical and current phenomena and processes that are still in a state of emergence and that deeply concern the shapers of U.S. policy and strategy.

Notes

[1]. Bernard E. Trainor, "Jointness, Service Culture and the Gulf War," *Joint Force Quarterly* 3 (1993-94): 71.

[2]. See, for example, Lawrence B. Wilkerson, "What Exactly Is Jointness?" *Joint Force Quarterly* 16 (1997): 66-68.

[3]. George W. Bear, *One Hundred Years of Sea Power: The U.S. Navy, 1890-1990* (Stanford: Stanford University Press, 1994), 275.

[4]. On the Polaris missile and the competition between the navy and the air force, see Michael T. Isenberg, *Shield of the Republic: The United States Navy in an Era of Cold War and Violent Peace*, vol. 1, *1945-1962* (New York: St. Martin's Press, 1993), 668-687.

[5]. Carl H. Builder, *The Masks of War: American Military Styles in Strategy and Analysis* (Baltimore: Johns Hopkins University Press, 1989), 74-75. Stationed on American aircraft carriers were eighty-five planes of different types, two-thirds of which were combat aircraft and bombers (F-14 and F/A-18).

[6]. David Miller, *The Cold War: A Military History* (New York: Thomas Dunne Books, 1999), 196. For example, when the war began in Afghanistan (2001), the United States did not have land bases from which it could

launch air attacks. Participating in the initial attacks were bombers based in the United States (B-2 and B-1B) or on the island of Diego Garcia (B-52), but to maintain continuity and sequence in those attacks, they also used planes from aircraft carriers.

[7]. Bear, *One Hundred Years of Sea Power*, 321-331.

[8]. J. P. D. Dunbabin, *The Cold War: The Great Powers and Their Allies* (New York: Longman, 1994), 139-141; Patrick Brogan, *The Fighting Never Stopped: A Comprehensive Guide to World Conflict since 1945* (New York: Vintage, 1990), 169-170; and C. J. Bartlett, *The Global Conflict* (New York: Longman, 1994), 321-323, 326-327.

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