SEE ALSO Airplanes; Baruch Plan; Biological Weapons; Chemical Weapons; Geographic Information Systems; International Relations; Just War; Missile Defense Systems; Limited Nuclear Test Ban Treaty; Weapons of Mass Destruction.

BIBLIOGRAPHY


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MILITARY-INDUSTRIAL COMPLEX

The military-industrial complex is one of a series of ideas that aim to critique the manner in which science, technology, and society have interacted with one another since World War II. The term itself was popularized by U.S. president and World War II general Dwight D. Eisenhower (1890–1969) in a farewell address to the nation on January 17, 1961, in which he warned the American people against “the acquisition of unwarranted influence, whether sought or unsought by [such a complex] and the corresponding threat it posed to democracy. Although defined as “the conjunction of an immense military establishment and a large arms industry,” its influence extends beyond industry and the military (Eisenhower). Often called the military-industrial-congressional complex, for instance, it comprises the iron triangle of Congress, the Pentagon, and defense industries. Additionally because the military and industry both support and depend upon academic research, another iron triangle has been dubbed the military-industrial-university complex (Hughes 2004).

Context and Emergence
The precise origins of the term military-industrial complex are obscure, but the idea is not. During the war, the U.S. government became increasingly dependent on both industrial corporations and scientific research for the production and development of military weapons. Military needs far exceeded those of previous wars. A typical U.S. army division, for example, required 225 times the mechanical horsepower required in World War I (Abrahamson 1983). In response, industry and the scientific enterprise shifted focus to help with the war effort.

Ford Motor Company, for example, manufactured jeeps, general purpose vehicles, and B-24 Liberator aircraft at a rate of one airplane per hour at the peak of production (Grudens 1997). Boeing Aircraft Company designed and built both the B-17 Flying Fortress and the B-29 Superfortress bombers at a rate of up to 362 planes per month. In total, companies produced 303,717 planes
during the war—including 18,481 B24s and 12,761 B17s—at a price of $45 billion. According to Henry Stimson, secretary of war under both presidents Franklin D. Roosevelt and Harry S. Truman, “if you are going to try to go to war, or to prepare for war, in a capitalist country, you have got to let business make money out of the process or business won’t work” (Higgs 1995, p. 1).

At the same time, the National Defense Research Committee, later the Office of Scientific Research and Development (OSRD), secured vast new resources for scientific research aimed at solving wartime problems. As a result, two new efforts allowed for increased collaboration between large numbers of scientists toward set goals: the centralization and creation of national laboratories, such as Los Alamos and Oak Ridge, and the targeted funding of research projects at universities, such as the Massachusetts Institute of Technology (MIT) Radiation Laboratory and the University of Chicago reactor research.

With the war, funding for large-scale scientific research shifted from industry to government and thus enabled big science projects such as the Manhattan Project. The architect of this shift, OSRD chair Vannevar Bush, began a trend to fund and direct scientific research through the military that would last well beyond the end of World War II. New scientific and industrial relationships and institutions begun during the war soon became fixed in U.S. economic and political life with the immediate emergence of the Cold War (1945–1989). It was this entrenchment that Eisenhower sought to highlight as a danger to political life.

Post-Cold War Revival
Throughout the Cold War, increasing military budgets were justified by the Soviet threat. When the Soviet threat disappeared, so too did the justification for large military budgets. Yet neither large military budgets nor the power of the military-industrial complex diminished, they simply reorganized (Hartung). According to Columbia University professor Seymour Melman, the United States has a permanent war economy, having “been at war—somewhere—every year, in Korea, Nicaragua, Vietnam, the Balkans, Afghanistan” since the end of World War II (Melman).

As a result, both scientific and industrial enterprises remain directed toward military ends. The fiscal year 2005 research and development (R&D) budget includes $75 billion for defense R&D and $57.2 billion for nondefense R&D. Defense R&D, therefore, comprises 56.7 percent of the total R&D budget (AAAS 2004). Additionally the fiscal year 2005 defense R&D budget is nearly $20 billion above what it was at the height of the Cold War, adjusted for inflation but not for growth in the economy.

Defense contractors have gained considerable power and influence because of mergers between previously competing contractors. Because of their size and power, specific contractors—such as Lockheed Martin, Northrup Grumman, and Raytheon—can secure support through sizable congressional contributions. They do so by supporting those candidates with power over their pet programs. Of the forty top recipients of defense contractor campaign donations, thirty-six are on either the congressional Appropriations Committee (the committee with authority over government funds) or Armed Services Committee (the committee with authority over defense programs). As a result, weapons programs, such as the Lockheed Martin F-22 fighter, the most expensive bomber ever built, are not likely to be terminated.

When President George W. Bush was first elected, he and Secretary of Defense Donald Rumsfeld promised a revolution in military affairs in which they would create new, more agile forces. Bush suggested that they might “skip a generation of technology” in certain systems, which would require the elimination of at least one big-ticket system such as the F-22 fighter (Hartung 2001, p. 3). As a testament to the power of the defense industries, this has not happened and in fact “the Pentagon has not shut down a single major weapons production line since the end of the Cold War” (Hartung).

Ethics and Policy Issues
Several scholars have raised concerns about the military-industrial complex throughout the years, including that it is a threat to democracy and to the free market. Lewis Mumford argues that the military-industrial complex threatens democratic processes, because it has become a megamachine, a rigid, hierarchical social structure with absolute powers and little outside input (Mumford 1964). In effect, he argues against the authoritarian nature of the military-industrial complex. This echoes Eisenhower’s warning that the American people must remain alert and knowledgeable to ensure that the complex “does not endanger our liberties or democratic processes” (Eisenhower).

Seymour Melman argues that the military-industrial complex endangers the free market, because it actually creates a state economy. He contends that appropriations for physical infrastructure, health, and welfare are drying up, and thus “the idea that the U.S. can afford guns and butter without limit is proven false every day” (Melman).
MILL, JOHN STUART

John Stuart Mill (1806–1873) was born in London on May 20. The son of the philosopher James Mill (1773–1836) and the godson of the philosopher Jeremy Bentham (1748–1832). John Stuart Mill was the most influential British philosopher of the nineteenth century, which saw science and technology transform society as significant contributions were made in metaphysics, logic, the philosophy of science, ethics, social and political philosophy, economics, the philosophy of religion, and the philosophy of education. The System of Logic (1843) and the Principles of Political Economy (1848) became canonical textbooks in their fields. Mill died on May 8 in Avignon, France.

Logic

Mill understood his work in technical philosophy as providing a foundation for his social and political philosophy. The purpose of the discussion of the origins of knowledge in the System of Logic is to prepare the ground for the social sciences, and the discussion of the social sciences provides the grounds for Mill’s moral, political, and economic views.

The first five books of the Logic are largely polemical, attacking the philosophical position known as intuitionism, which in the nineteenth century had served as the basis for political conservatism. Intuitionism takes the view that there are innate truths, including moral truths. Innate truths can be known independent of experience, and thus custom and tradition were elevated to the status of timeless truth impervious to empirical refutation. In contrast, Mill wanted to argue that customary practice is often no more than a historical...