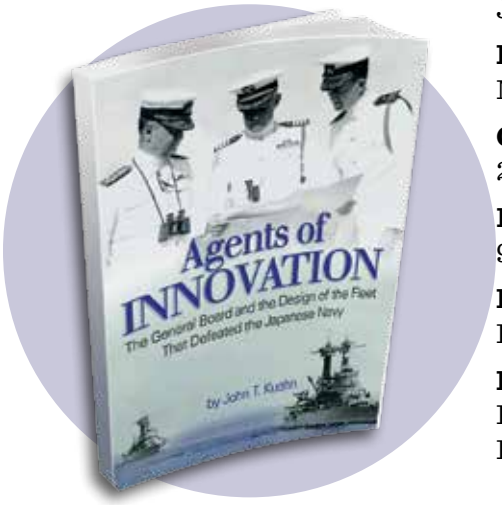
PROFESSIONAL READING LIST

GOVERNMENT PRODUCTIVITY AND INNOVATION

Agents of Innovation: The General Board and the Design of the Fleet That Defeated the Japanese Navy



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Publisher Summary

Agents of Innovation examines the influence of the General Board of the Navy as agents of innovation during the period between World Wars I and II. The General Board, a formal body established by the Secretary of the Navy to advise him on both strategic matters with respect to the fleet, served as the organizational nexus for the interaction between fleet design and the naval limitations imposed on the Navy by treaty during the period. Particularly important was the General Board's role in implementing the Washington Naval Treaty that limited naval armaments after 1922. The General Board orchestrated the efforts by the principal Naval Bureaus, the Naval War College, and the Office of the Chief of Naval Operations in ensuring that the designs adopted for the warships built and modified during the period of the Washington and London Naval Treaties both met treaty requirements while attempting to meet strategic needs. The leadership of the Navy at large, and the General Board in particular, felt themselves especially constrained by Article XIX (the fortification clause) of the Washington Naval Treaty that implemented a status quo on naval fortifications in the Western Pacific. The treaty system led the Navy to design a measurably different fleet than it might otherwise have in the absence of naval limitations. Despite these

limitations, the fleet that fought the Japanese to a standstill in 1942 was predominately composed of ships and concepts developed and fostered by the General Board prior to the outbreak of war.

Review

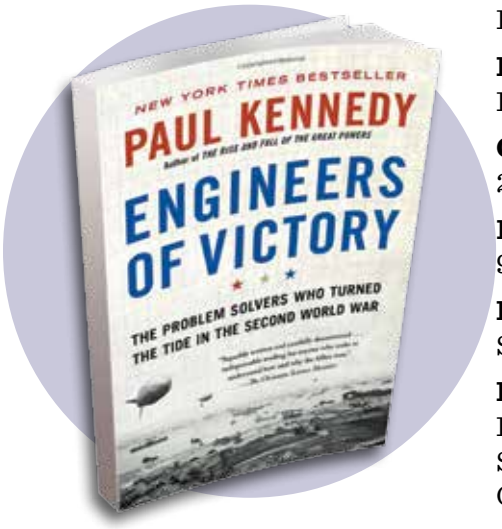
Innovation during the period between World Wars I and II? How could that be? The nation could little afford to build new warships. Treaties limited the number, type, and size of capital warships as well as fortifications in the Western Pacific. Yet, the Navy knew it had to implement new, emerging technologies such as naval aviation and undersea warfare. Navy leaders recognized they had to look for innovative ways to overcome the decreasing strength of their fleet relative to Japan's. As Professor John Kuehn emphasizes, this multidimensional threat drastically altered the way the Navy viewed the application of sea power. The simple premise of this brilliant book is "the U.S. Navy's contributions to victory in the Pacific... can be understood only by studying how the General Board...constructed the 'treaty navy' during the period between the wars."

The General Board was established as an advisory body by the Secretary of the Navy in 1901. Its members were senior- and mid-level officers with proven experience and promise. The Board hastened collaboration between the Naval War College, the Bureaus (now the Systems Commands), and the Chief of Naval Operations. It held iterative deliberations concerning naval warfare strategies, new technologies and systems, and the structure and size of the U. S. Navy Fleet. The Board collaborated closely with the Bureau of Construction and Repair (BuC&R)—now the Naval Sea Systems Command (NAVSEA)—tasking BuC&R to conduct extensive ship design studies to determine the size and structure of an affordable fleet. Although the Board's official role was advisory, its actual influence was much greater. It had the final word on ship design decisions, including critical operational requirements and costs. Kuehn provides a captivating description of how the Navy was transformed from a battleship-centric Fleet to an efficient treaty Fleet, designed to operate at extreme distances without available bases, that by 1937 also included aircraft carriers, cruisers, destroyers, submarines, and new types of logistics support ships.

All defense acquisition professionals should study this exceptional book, which describes the elements and processes for successful acquisition outcomes. Kuehn stresses the General Board's collaborative process demonstrates that innovation can occur in the face of constraints. MIT's Eric von Hippel, who has done pioneering research in new product innovation, emphasizes that one of the most important steps to innovative concept

development and cutting concept development time and cost is for lead users—users like senior Fleet operators at the leading edge of products—to assess their own needs and create the design concept that satisfies their own needs. His research validates what Kuehn discovered: that there are very few—maybe even no—conditions under which properly equipped users engaged in open innovation cannot outdo closed, manufacturer-based innovators. This same "open innovation" process was also followed by successor boards such as the Ship Characteristics Improvement Board (SCIB) during the build-up to a 600-ship Fleet in the 1980s and 1990s. Unfortunately, the SCIB was abolished around 2000 and has not been reconstituted. The Performance Assessment and Root Cause Analysis (PARCA) Office within the Department of Defense Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, recently highlighted the root causes for major defense acquisition programs with critical cost growth as part of the Nunn-McCurdy breach certification process. PARCA emphasized that unrealistic estimates are generally caused by the invalidity of major assumptions *not* methodological errors. This has led to what PARCA referred to as "framing assumptions" early in an acquisition program, which put the program on an initial path for success or failure. The common incorrect framing assumption made by acquisition programs with critical cost growth was the "Design is mature." In his book, Kuehn has captured how the General Board managed technical risks to ensure a mature design before entering into a shipbuilding contract. Again, this is a must read for you "back-to-the-future" types.

Engineers of Victory: The Problem Solvers Who Turned the Tide in the Second World War



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Publisher Summary

Paul Kennedy, award-winning author of *The Rise and Fall of the Great Powers* and one of today's most renowned historians, now provides a new and unique look at how World War II was won. *Engineers of Victory* is a fascinating nuts-and-bolts account of the strategic factors that led to Allied victory. Kennedy reveals how the leaders' grand strategy was carried out by the ordinary soldiers, scientists, engineers, and businessmen responsible for realizing their commanders' visions of success.

In January 1943, FDR and Churchill convened in Casablanca and established the Allied objectives for the war: to defeat the Nazi blitzkrieg; to control the Atlantic sea lanes and the air over western and central Europe; to take the fight to the European mainland; and to end Japan's imperialism. Astonishingly, a little over a year later, these ambitious goals had nearly all been accomplished. With riveting, tactical detail, *Engineers of Victory* reveals how.

Kennedy recounts the inside stories of the invention of the cavity magnetron, a miniature radar "as small as a soup plate," and the Hedgehog, a multi-headed grenade launcher that allowed the Allies to overcome the threat to their convoys crossing the Atlantic; the critical decision by engineers to

install a super-charged Rolls-Royce engine in the P-51 Mustang, creating a fighter plane more powerful than the Luftwaffe's; and the innovative use of pontoon bridges (made from rafts strung together) to help Russian troops cross rivers and elude the Nazi blitzkrieg. He takes readers behind the scenes, unveiling exactly how thousands of individual Allied planes and fighting ships were choreographed to collectively pull off the invasion of Normandy, and illuminating how crew chiefs perfected the high-flying and inaccessible B-29 Superfortress that would drop the atomic bombs on Japan.

The story of World War II is often told as a grand narrative, as if it were fought by supermen or decided by fate. Here Kennedy uncovers the real heroes of the war, highlighting for the first time the creative strategies, tactics, and organizational decisions that made the lofty Allied objectives into a successful reality. In an even more significant way, *Engineers of Victory* has another claim to our attention, for it restores "the middle level of war" to its rightful place in history.

Review

Paul Kennedy's *Engineers of Victory* offers a nuanced, multicausal explanation for the outcome of World War II. Across five lengthy chapters, the author identifies what he considers the key decisions, battles, technological advances, and operational achievements that account for ultimate victory against Germany and Japan. Each chapter focuses on a different major operational challenge the Allies had to overcome to turn the tide of World War II in their favor: halting the U-boat menace to ensure safe passage for supplies and troops across the Atlantic; knocking out the Luftwaffe to gain control over the skies of Germany; countering the Wehrmacht's Blitzkrieg ("lightening war") strategy to reverse German advances on the Eastern Front; seizing an enemy-held shore in the Normandy invasion to open up the Western Front; and fighting across a great expanse—the Central Pacific—to reach Japan and destroy its war-making capabilities.

While Kennedy acknowledges that the Allies' tremendous advantages in output of war material beginning in 1943 partly explain the outcome of the war, he contends that Allied victory also rested on differences in how each side approached geographic challenges and differences in the culture and organization of their "war-making systems." The Axis powers badly overreached, most egregiously on the Eastern Front and in the Pacific, while the Allies were more sensitive to the role of geography and, most importantly, were better at learning from mistakes, transmitting and circulating knowledge, and encouraging innovation in all endeavors.

Readers unfamiliar with the war will appreciate the tightly packed overviews of key battles and campaigns, as well as helpful summaries of major operational challenges, such as amphibious landings or strategic bombing sorties, juxtaposed across the larger history of warfare. Knowledgeable readers will be frustrated by factual errors that plague the text and how much is left out of the story, particularly in the discussion of the Pacific campaign. Those looking for insights on engineering and acquisition during World War II will be disappointed. The author pays tribute to the role of technology and production, and to those who called forth, designed, built, and improved upon critical weapon systems, but only in a cursory fashion and without providing much insight on how technological advances occurred.

Yet, this book is a worthwhile read, primarily for the author's ambitious effort to show how all aspects of the war—from high diplomacy and the factory floor, to the training and equipping of troops and the battlefield—were intimately linked and interdependent. For politicians, war planners, soldiers, weapons developers, and acquisition professionals, Kennedy's main argument is worth remembering: the Allies won "because they possessed smarter feedback loops between top, middle, and bottom; because they stimulated initiative, innovation, and ingenuity; and because they encouraged problem solvers to tackle large, apparently intractable problems." Founded on strong educational and economic systems and a culture of innovation, these attributes are no less important today for military and political advantage than they were 70 years ago.