

PROFESSIONAL READING LIST

The Defense Acquisition Professional Reading List is intended to enrich the knowledge and understanding of the civilian, military, contractor, and industrial workforce who participate in the entire defense acquisition enterprise. These book recommendations are designed to complement the education and training vital to developing essential competencies and skills of the acquisition workforce. Each issue of the *Defense Acquisition Research Journal* will include one or more reviews of suggested books, with more available on our Website <http://dau.dodlive.mil/defense-acquisition-professional-reading-program>.

We encourage our readers to submit book reviews they believe should be required reading for the defense acquisition professional. The books themselves should be in print or generally available to a wide audience; address subjects and themes that have broad applicability to defense acquisition professionals; and provide context for the reader, not prescriptive practices. Book reviews should be 450 words or fewer, describe the book and its major ideas, and explain its relevancy to defense acquisition. Please send your reviews to the managing editor, *Defense Acquisition Research Journal* at DefenseARJ@dau.mil.

Featured Book

Rational Action: The Sciences of Policy in Britain and America, 1940–1960

Series: Transformations: Studies in the History of Science and Technology

Author: William Thomas

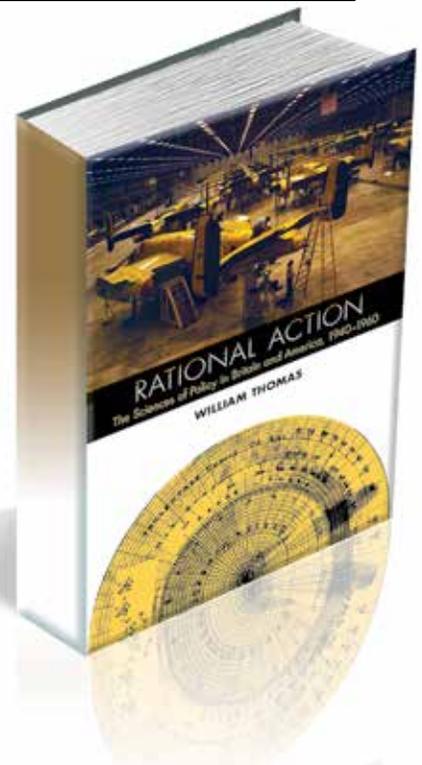
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Review:

It was Plato who said, “Necessity is the mother of invention,” and there cannot be a more invention-driven context than the one imposed by a war. The foundations of Operational Research (OR) were laid during the world wars, and today OR is both a science and a practice that has been incorporated in defense and business activities since then. William Thomas takes readers on a journey through the stages of its development, offering insight to the problems that necessitated its birth. These problems are not very different from what today’s defense decision makers manage, ranging from the type of systems with which a unit should be armed and the required support, to how to deploy and operate these units.

However, decisions today that are related to units’ acquisition and support are more frequent, and in that sense also more intense, than decisions on their operational use. *Rational Action* does not offer the textbook list of best practices to such problems and, indeed, decision makers need more than a guide denoting what procedures to follow. They also need the insights obtained by the “what happened” question in order to relate to similar cases and understand how they evolved. Social and political factors cannot be joined with the practical reality of calling for action to arrive at solutions that are both feasible and desirable, except by being viewed through the lens offered by credible historical research. William Thomas offers just that.

“What [Leslie Bennett Craigie] Cunningham’s theory did [in 1937 for the configuration of aircraft design] was probabilistically interrelate armament specifications with mathematical representations of air combat scenarios” (p. 34), which closely resembles how specifications are still developed today. Further, on p. 35 we follow within the historical narrative the existence of the unavoidable political drivers: “[Cunningham’s] paper was so fortunate to survive the [Royal Aircraft Establishment’s] serious fundamental criticisms again ...,” and on p. 103: “[In 1940, Warren Weaver] showed and praised [Cunningham’s papers] to various military officers until they asked him to try to digest and simplify them, and to explain their content in terms not so formidably mathematical.”

In an even larger acquisition challenge—that of 1944’s B-29 “Superfortress” bomber—William Thomas offers similar significant insights. Warren Weaver’s Applied Mathematical Panel took over the AC-92 contract to improve B-29 bombing accuracy (p. 121) while “Unfortunately, there was very little theory, test data, manuals, or training standards” The continuation is equally enlightening: “Throughout the course of the AC-92 contract,

Weaver steadily and stubbornly insisted that all aspects of the problem needed to be worked ... A sense of the theoretical and empirical disarray in which work on AC-92 took place can be gained from an internal working paper on the question of whether the B-29 should be modified ..." (p. 122).

Similar work has been done to the support dimension of acquired systems. Thomas, in his chapter on the development of "Theories of Decision, Allocation and Design" (chapter 20), discusses the Travelling Salesman Problem, and he devotes chapter 21 to Inventory Theory.

Even though *Rational Action* addresses matters of the past, it is of interest to historians or operational researchers whose science foundations are the subject of the narratives. Through the historical analysis of obsolete systems and already-solved problems, it becomes essential reading for managers and decision makers who want a better understanding of the critical factors that drove the evolution of acquisition-related problems.