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U-Boats in the Bay of Biscay: An Essay in Operations Analysis

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BOOKS REVIEWS

A book reviewer occupies a position of special responsibility and trust. He is to summarize, set in context, describe strengths, and point out weaknesses. As a surrogate for us all, he assumes a heavy obligation which it is his duty to discharge with reason and consistency.

Admiral H.G. Rickover

"A Rare and Especially Insightful Document"

Captain Wayne P. Hughes, U.S. Navy (Retired)

McCue, Brian. *U-Boats in the Bay of Biscay: An Essay in Operations Analysis.* Washington, D.C.: National Defense Univ. Press, 1990. 206pp.

IN THIS BOOK-LENGTH ESSAY, *U-Boats in the Bay of Biscay*, Brian McCue offers a fresh look at the Battle of the Atlantic. He has reexamined the many interrelated conclusions reached in the major studies of that long and arduous campaign, and has updated them with the new information available—notably the influence of Enigma and the Allied codebreaking effort. McCue's conclusions are not sharply revisionist, but there are enough fresh insights to attract any student of naval history. Do not be put off by the title. McCue believes that the Bay of Biscay was in its own special way *the* critical theater, but he has reexamined the Battle of the Atlantic in its entirety.

McCue introduces *models* of the campaign drawn from three essential books of antisubmarine warfare (ASW) analysis first issued by the navy's Operations Evaluation Group after the war: Morse and Kimball's *Methods of Operations Research*, D.O. Koopman's *Search and Screening*, and Sternhell and Thorndike's *ASW Operations in World War II*. New data comes from a vast number of sources, the best available now that most of the returns are in. McCue has adapted some straightforward modeling (both at the tactical and campaign level) that was developed by the World War II analysts and has explored the war against the U-boat in a surprisingly fresh fashion. In effect McCue *completes* the analysis that the World War II OEG analysts never had a chance to finish.

Thus McCue's purpose is one almost unique in our navy today: to bridge the gap between history and operations analysis and produce a legitimately scientific study in which historical insights are substantiated with analysis, and analytical models are corroborated with historical data. Unlike the U.S. Army, which has never ceased to blend history and analysis, the navy has failed to nurture these uniquely valuable historical-analytical studies in recent years. McCue's short but searching book is a notable exception.

McCue has summarized the ASW war in the bay, with all of its tactical-technological lessons about electronic measures and countermeasures; a straightforward historical-empirical quantitative account has resulted. Thus far it is, in McCue's words, a "bookkeeper's analysis," working from back to front, from effects to causes. Representing the dynamics of the campaign with appropriate models, the author performs as an analyst might have done in the midst of the war—analyzing the causes to effects.

McCue expands his thesis from the Biscay operations to the entire Atlantic campaign. Relying on Morse and Kimball's pioneering work, McCue has constructed a model of the Atlantic theater that is so transparent that every reader will see what is happening. His model—"if-only-they-had"—suggests a less dramatic effect on the total campaign than many historians in the past believed. I think readers will find this portion of the book most fascinating.

For example, McCue argues that, except for either more U-boats or an early increase in U-boat quality (more Type XXI boats), the most effective single German action toward winning the war could have been adding "*milch cows*" to the small number of U-boat tankers. These would have given the attacking U-boats longer and more useful lives in the shipping lanes. On the Allied side, codebreaking is shown to have been of even greater importance than previously thought, because of its ability to pinpoint the U-boat tanker locations and allow hunter-killer groups to sweep them up.

Another interesting concept is McCue's observation that, in view of the large repair queue that built up in the Biscay U-boat pens, one of the most effective actions Dönitz might have taken would have been to increase (or better sustain) the maintenance capacity there. We know that bombing the submarine pens did little damage to U-boats; but would a redirected bombing effort have achieved more? Not likely. Elsewhere McCue observes that the payoff of bombing attacks on the pens was much less than that of the same number of flying hours in close escort of threatened convoys. Based on U-boats damaged or destroyed, the relative effectiveness was in the ration of 1:15 (Morse and Kimball had calculated 1:30). We must remember that one of the most important contributions of air escort was to suppress the wolf packs, thereby keeping the U-boats submerged and immobile in the vicinity of the convoys. Moreover, bombing attacks on the pens were more hazardous than blue-water operations. If anything, the 1:15

effectiveness ratio probably *understates* the differential worth of the two alternatives, even after factoring in the indirect effects of air attacks on the Biscay ports.

The variations McCue explores appear to have had the potential to reverse the outcome of the Atlantic campaign at the beginning of 1943. There was nothing Dönitz could have done to stem the tide of American Liberty ships, escorts, and ASW aircraft that was inundating the U-boats. The accuracy of Dönitz's own conclusion that Hitler started the war too soon, before his U-boat navy was strong enough, appears absolute. Dönitz's own prewar estimate was that Germany needed to sink 800,000 tons per month to starve England. This is an uncannily shrewd macro-analytical judgment. He almost, but not quite, built up to that level—but he could never have sustained it.

Throughout the book McCue's recognition that the essence of an ASW campaign was, and still is, a campaign of *search*, is manifest. A submarine war is a guerrilla war at sea: where U-boats stalk merchant ships while ASW forces search for U-boats, the nexus of the two efforts being the convoys themselves. What you can find you can kill—perhaps not every time but often enough that when the search effort succeeds the battle will be won. In chapter four, McCue accordingly includes a primer on search theory: sweep rate, sweep width, the random search and inverse-cube-law search algorithms, the "balanced search" concept, and more. These were analytical tools invented by World War II analysts, and remain as sound and essential today as then.

In fact, McCue is, justifiably, more than a little impatient with modern analysts. He writes, "a final reason for the high quality of wartime operations research must be noted: the employment of geniuses. [The British Operational Research section included two Nobel Prize winners and five Fellows of the Royal Society.] The war effort plucked these individuals from their natural habitats and set them to work seven days a week, 52 weeks a year. Today's peacetime efforts—many of which are in fact window dressing or rococo computer make-work—cannot hope to engage such talent with such intensity."

I was so enchanted with *The Bay of Biscay* because of the memories it brought back. In 1961, when I was a lieutenant and Ops officer of a destroyer in an ASW hunter-killer group, I found a copy of OEG Report 51, the aforementioned *ASW Operations in World War II*. The first half of the report was a narrative of the Battle of the Atlantic. I was spellbound. The last half contained some of the basic models and analyses that were developed and used by the Operations Evaluation Group. I was in awe; but it was about tactics, so I read it. The stuff was magic. It was mathematical legerdemain that, after three years chasing submarines, I could see was really practical but which took a special insight to create—something I did not possess. It explained, for example, from where our search and screen plans originated. I understood how they were sometimes misused, out of ignorance, by the OTC's staff, in their lack of appreciation for the progress of technology between 1942 and 1962. I was hooked by this tactical

magic, and in due course was awarded a master of operations analysis degree from the Naval Postgraduate School.

I can not summarize the significance of this straightforward, tightly written, two-hundred page book more adroitly than has Vice Admiral Jack Baldwin in his foreword. He writes that McCue "validates the usefulness of their [the wartime analysts'] techniques even as he clarifies and identifies the limits of their analysis [in the midst of war]. In a key finding, he stresses the overwhelming importance of selecting appropriate measures of effectiveness when attempting to quantify military operations. Beyond its obvious appeal to the military operations research community, McCue's essay generates broad principles—supported by both empirical evidence and analytical modeling—of interest to national security strategists and policymakers. For example, his critical analysis of the troubles with the 'top-down' approach used by current defense analysts has great currency for modern policymakers. McCue's conclusions might reasonably be extended to the measurement of other military endeavors, such as bomber operations or antimissile defense studies."

Fiske, Bradley A. *The Navy as a Fighting Machine*. Annapolis, Md.: The Naval Institute Press, 1988. 387pp. $32.95

Bradley Allen Fiske (1854-1942) was the Thomas Jefferson of the American Navy. He was a Renaissance man who set his hand and mind to many things and did them all quite well. He invented naval "appliances," commanded ships and fleets at sea, and wrote widely on the uses of naval power and the operations of navies. Fiske was an early champion of preparedness and quantitative thinking. His book is as stimulating to read today as it must have been when it was first published in 1916. While reading Fiske, this reviewer had the distinct impression of being engaged in a lively, real-time dialogue with a very modern mind.

Fiske graduated from the Naval Academy in 1874, and spent the next eighteen years in various posts while turning his mind to the invention of naval appliances (his word). These included electric logs (speed indicators) and depth sounders, and electric drives for ammunition hoists, turret training and gun elevation machinery, and range finders. He attended the Naval War College in 1896 and was exposed to and influenced by that magnificent collection of minds assembled there in the late nineteenth century. This influence became apparent when Fiske began writing for the Naval Institute *Proceedings*. His articles examined the navy as an integrated system for the application of naval power to national purposes. After four years at sea, as captain and rear admiral, he was aide for operations to Secretary of the Navy,