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Destined for Glory: Dive Bombing, Midway, and the Evolution of Carrier Airpower

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principal authors are all respected scholars, and the editing has been accomplished with such skill that the text has a single "voice." Finally, when compared to similar books of this quality, the retail price is a bargain.

Though *America and the Sea* is a cohesive narrative, not a collection of essays, one of its most attractive and valuable features is the sprinkling of short pieces on specific aspects of America's maritime heritage throughout the text. These run the gamut from "The Slave Trade" to "John Paul Jones," from "Seaman's Morals" to "The Great White Fleet," and from "Navigational Instruments" to "The Boat People of Cuba and Haiti." There are even sections on "Recreational Boating and Racing in the Interwar Years," on "Hollywood and the Sea," and a discussion of how America's maritime heritage has been portrayed on the silver screen, from *Moby Dick* (1955) to *The Hunt for Red October* (1990). Each of these essays is between two and five pages long (triple column), and though each essay supports and complements the main narrative, they may also be read independently.

Not a few of the inserts offer contemporary views of America's maritime heritage. Many are literary; there are excerpts from the likes of Richard Henry Dana (*Two Years before the Mast*), Mark Twain (*Life on the Mississippi*), and Herman Melville (*Redburn*). Others are firsthand accounts culled from the letters and diaries of historical figures. Margaret Perkins Forbes, wife of the captain of the fishing schooner *Midas*, recalls a harrowing ocean crossing in 1811; Charles A. Post, a seaman on the blockading vessel

USS *Florida*, recounts the tedium of blockade service in the Civil War; and Newell B. Jordan, captain of down-easter *R. D. Rice*, writes to the ship's owner in 1889 that his return trip will be delayed because he simply cannot get enough sailors to man the ship.

Easily the most arresting aspect of the book is the presence of several hundred full-color illustrations, the captions of which are little essays in themselves. Some are a full page in length. It is possible (and rewarding) to page through the book reading from caption to caption. It is, in short, the kind of book that can be (and most likely will be) sampled in small pieces over a long period.

There are a few disappointments, such as the absence of any reference notes (mostly overcome by a useful suggested reading list). In addition, there are no graphs or diagrams to illustrate, for example, the rising and falling fortunes of America's maritime industry or naval expenditures. Then, too, the maps are too few, and generally too small and nonspecific, to be of much help. But these few shortfalls should not detract from a splendid accomplishment.

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Wildenberg, Thomas. *Destined for Glory: Dive Bombing, Midway, and the Evolution of Carrier Airpower*. Annapolis, Md.: Naval Institute Press, 1998. 258pp. \$34.95

As discussions of a potential revolution in military affairs (RMA) percolated in recent years, the Department of Defense sponsored a number

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of case studies of military innovation leading to revolutionary changes during the period between the world wars. One of the most interesting and widely discussed concerned the development of the aircraft carrier. But given the focus on the carrier itself, there was less emphasis on the slower evolution of its principal weapon—aircraft. Indeed, while U.S. carrier development was completed in most of its essentials with the commissioning of *Lexington* and *Saratoga* in the late 1920s, as late as 1930 senior naval aviators were still forced to admit that “aircraft are not shipkillers.” Consequently, the carrier was not then widely perceived to have radically changed naval warfare. Yet Midway was only a dozen years away.

Destined for Glory is a thoroughly researched discussion of the evolution of U.S. carrier aircraft from the flimsy biplanes of the late 1920s into the robust aircraft whose devastating attacks at Coral Sea and Midway dramatically demonstrated the radical transformation of naval warfare. This evolution entailed far more than mere technological improvements to aircraft; rather, it resulted from a highly complex interplay of technological possibilities, competing operational and tactical concepts and tradeoffs, and political and budgetary struggles both within and outside the Navy. Wildenberg does a nice job of coherently sorting out the various factors and their interactions and of placing them in their chronological context.

The operational concept of near-vertical dive bombing of ships was first demonstrated in October 1926, when a

fighter squadron, VF 2, conducted a dramatic simulated attack on the battle fleet in the presence of the U.S. Fleet commander in chief. The technique appeared promising in solving the dual problem of hitting a moving target while not running an excessive risk of being shot down. But in the 1920s, hitting an armored ship with the light ordnance aircraft then could carry did not translate into significant combat effects. Torpedo bombers could carry ship-killing ordnance, but they were considered too vulnerable to defensive fire to be effective. However, incremental developments in technology and operational concepts throughout the 1930s cumulatively greatly increased aircraft combat effectiveness, though the full war-fighting implications of the changes were far from clear even to most enthusiasts, as evidenced by the tremendous surprise at Pearl Harbor.

The author traces aircraft technological improvements from the perspective of both “demand” and “supply.” Naval officers faced particular tactical problems—for instance, how can a moving target be hit by aircraft? Experience and experimentation suggested solutions, whether in practice or in theory. If in theory, solutions might be made practical when aircraft could attain certain performance specifications. Conversely, technological improvements in actual aircraft might suggest new operational methods or possibilities. The key in this interaction between multiple complex factors was the Navy’s felicitous reliance on evidentiary processes over a sustained period.

Rigorous questioning is crucial to such processes. One of the book’s central themes is the constant posing of

critical questions by key individuals throughout the development of both the carrier and its aircraft. Within a month of reporting aboard USS *Langley* (CV 1), then Captain J. M. Reeves, one of the fathers of naval aviation, told his officers that they had “no conception of either the capabilities or the limitations of the air force.” He subsequently generated a set of “A Thousand and One Questions” and issues that had to be answered before aircraft could be considered an effective weapon for use by the fleet.

Later, when *Lexington* and *Saratoga* entered the fleet, Reeves and others ceaselessly asked how carriers and their aircraft might be best employed in attacking different targets, how they would operate in support of the fleet, how they could be defended from enemy ships and aircraft, and so on.

The book is especially valuable for its emphasis on the intellectual processes and empirical experimentation that culminated in the “glory” of its title. It is often forgotten, after the fact, that so many of the decisions and choices that led to great successes were by no means obvious at the time and that many errors and “dry holes,” easily ignored today, littered the ultimately successful path taken. This may be a particularly useful reminder to those who now easily attach the term “revolutionary” to the favored project *du jour* without having done the hard work of proving just how and why the claim is justified.

Thomas Wildenberg is a naval historian whose special interest is the U.S. Navy during the interwar period. He is currently a Fellow for Naval Aviation at the National Air and Space museum. Wildenberg has also authored *Gray Steel*

and *Black Oil: Fast Tankers and Replenishment at Sea in the U.S. Navy, 1912–1992*. He is now working on a biography of Admiral J. M. Reeves, one that we hope will heighten the profile of this underappreciated pioneer of carrier aviation.

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Wooldridge, E. T., ed. *The Golden Age Remembered: U.S. Naval Aviation, 1919–1941*. Annapolis, Md.: Naval Institute Press, 1998. 376pp. \$34.95
Third in a series that uses the Naval Institute’s copious oral-history collection, this book features first-person accounts of one of the least-described periods of naval aviation. Little of any length or depth has been written about naval air’s interwar developments, especially from such a deeply personal aspect, and so this new effort, from an experienced author, historian, and naval aviator, is welcome. It is also arguably the best of the three published works in the series.

The Golden Age Remembered is a tale of pioneers shepherding their nascent charge through its infancy, fighting off those who wished it stillborn, and through an adolescence rife with tortuous developments. Important names and actions abound in these pages. The narrative gives ample glimpses of early giants whose deeds, if perhaps not personalities, are unknown. There are men like Mel Pride, who gives a fascinating account of developing carrier-landing systems. Figures come more to life here than in a mere historical chronology.