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Dark Sky, Black Sea

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obtained from these members and official sources. His anecdotes bring a sense of the familiar to a laboratory working intensely to provide the military with a successful solution to air-to-air combat. Many military personnel then believed an IR seeker could not work. An IR detector was developed and mounted on an old, surplus radar pedestal. It used feedback to follow the target. Westrum notes, "It tracked lighted candles, birds, and even hugs. Crowds came to committee meetings just to watch the tracking films." McLean's philosophy was always to keep it simple, maintain an open mind about various approaches to the problem, involve the end user at every step of the development process, and test to improve the product early on. Often, in the evenings, a cluster of automobiles could be seen in the parking lot outside Michelson Laboratory, as the Sidewinder team returned after dinner to resume their work. Weekend work was common, and always actively involved was Bill McLean, as head of the aviation ordnance department and later as technical director of NOTS. One can envision the man "out on the Baker 4 test track at two in the morning, in shirtsleeves, waving a cigarette to see how the tracker was working." Westrum has documented a triumph of technological weapons innovation by a small, devoted team of Navy engineers and scientists who provided a "successful solution" in spite of bureaucratic roadblocks and lack of funding. He has captured the essence of the man who led the team, and of the environment in which their efforts flourished. The book is highly recommended as a record of what can be accomplished with creative technical expertise and great perseverance.

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Brown, Charles H. *Dark Sky, Black Sea*. Annapolis, Md.: Naval Institute Press, 1999. 252pp. \$34.95

This work is a detailed history of the evolution of naval aviation's quest to conduct night and all-weather flight operations. With this book Charles Brown, a former carrier pilot and squadron commander, makes a significant contribution to understanding naval aviation on carriers. He details the many trials and advances of aircraft and their equipment between 1925 and 1999 in the attempt to conquer the difficulties of flying at night. The author's use of primary sources as well as of his own experiences only adds to his outstanding research. He conveys a full understanding of the technological and tactical advances through successive phases of carrier aviation.

While the first attempts at night carrier landings on USS *Langley* (CV 1) occurred in April 1925, interest in the concept of night combat operations had its real beginning in 1929, when the Navy first experimented with a predawn launch for a mass bombing exercise.

Innovation during World War II was driven by the increasing ability of the enemy in Europe to fight at night and by Japan's interest in night naval operations. In April 1942, the U.S. Navy established the first development, test, and training unit for night-fighter equipment and operators, at Quonset Point, Rhode Island. In 1944 the first detachments of trained night fighters deployed with Admiral Marc Mitscher in Task Force 58. Mitscher's carrier-based fighters flew the first night combat air patrols against harassing Japanese Betty bombers and conducted the first night carrier offensive operations of the war.

Postwar transition reduced the naval fighter-bomber inventories to minimum levels. However, the Navy retained its interest in night combat capability and formed two fleet all-weather training units to conduct the specialized training required for carrier night combat operations. By the late 1940s, the Soviet bomber and submarine threats had become evident. Brown describes in detail the evolution of aircraft, missions, systems, and training in response to the increasing threat.

At the beginning of the Korean War, the Navy was again ready to conduct night operations. The Navy night flyers helped the Marines retire from the Chosin reservoir, and they performed interdiction missions at night north of the thirty-eighth parallel. Brown discusses the innovative tactics developed by the aviators, as well as the introduction of jet-powered aircraft into the Navy's order of battle.

Mature operations and a new era began in 1953, when the Navy introduced the angled-deck carrier to the fleet. New electronic systems rounded out significant improvements in the effectiveness of carrier aircraft. That same year, the first radar-guided air-to-air missile, the Sparrow, was tested; it would prove to be the turning point in U.S. night fighter capabilities.

After the Korean War, the Navy's primary mission was focused on its nuclear strike capability. The introduction of aerial refueling with the newest fighters further improved their potential. By 1954 each of the fifteen carriers had a night-fighter squadron. An optical landing aid, the mirror, was introduced in 1955 aboard USS *Forrestal* (CV 59) and greatly reduced the number of carrier landing accidents. By 1960 a new era was evident in carrier aviation. Every carrier had completed the major modifications, installing angled decks and steam catapults,

and the frequency of night sorties had increased sixfold. The new era of the 1960s saw the introduction of the F-8, F-4, A-5, A-6, and A-7.

Brown skillfully describes carrier operations during the Vietnam War, including the tempo, Alpha strikes, barrier combat and patrol (BARCAP), and the strike missions performed by the Navy. He then proceeds with the resumption of the Cold War missions and the introduction of the F-14 in 1973 and the F/A-18 in 1980.

The final chapter highlights the Navy's performance in the Persian Gulf War, with its sustained twenty-four-hour operations; over half the missions were flown at night. As a final note, the author declares, "Clearly, carrier night air combat operations had proven their value to the U.S. Navy."

Dark Sky, Black Sea should appeal to many interests. Aviation buffs will enjoy it for its vignettes: those in weapon system procurement will not be surprised to see rapid periods of development with emerging threats, and vice versa; and old, bold carrier pilots will particularly enjoy the personal accounts, which may revive memories of similar experiences. All naval aviators should have this book in their professional collections. It will be the best read on "Steel Beach," and it will surely impress the air group commander.

ED CAHILLY
Captain, U.S. Navy



Merrill, John, and Lionel D. Wyld. *Meeting the Submarine Challenge: A Short History of the Naval Underwater Systems Center*. U.S. Gov't. Print. Office, 1997. 329pp. (no price given)

The Naval Underwater Systems Center (NUSC) was formed in 1970 by merging the Navy Underwater Sound Laboratory