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Enigma: The Battle for the Code

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consciously pursued contacts with leading scientists, industrialists, and engineers, planting in them ideas and urging them to move more quickly and boldly. He supported research into cruise and ballistic missiles, precision weapons, jet engines, and rockets. Daso highlights the special relationship between Arnold and the brilliant aeronautical scientist Theodore von Kármán, who in 1945 wrote the seminal *Toward New Horizons*, a detailed look at the future of air and space technology that would serve as the blueprint for Air Force research over the next two decades.

Daso points to Arnold's holistic approach to airpower as one of his great insights. Arnold understood that it took more than a collection of military airplanes to generate airpower. Needed also were a strong industrial base, robust research and development, a broad aviation infrastructure, a large pool of qualified personnel, and, perhaps most importantly, a clearly devised, coherent, and codified doctrine for the employment of those assets. Arnold, believing unshakably in the importance of strategic airpower, labored to ensure that America possessed all of these necessary factors.

One of the most interesting and insightful portions of this account is the epilogue, where Daso expands upon a letter that Arnold wrote shortly before his death regarding his views on leadership. The general noted several vital qualities: technical competence, hard work, vision, judgment, communication skills, a facility for human relations, and integrity. One could also add mental and physical courage. As he went higher in command and responsibility, Arnold was continuously faced with tough decisions. Having the courage to do the right thing regardless of the consequences and regardless of

the effect on friends and family is enormously difficult. This list of attributes, which Arnold displayed in abundance throughout his career, serves as the perfect summation for both the book and the man.

One might quibble with Daso over what he left out of this book. He spends almost no time discussing broad issues of strategy in World War II, targeting debates, interservice rivalries, or Arnold's relationships with his commanders. It is useful to recall here that Arnold's title was "commanding general" of the Army Air Forces; he was indeed that. He had far more control over his air forces and personnel than does a present-day chief of staff. An exploration of this aspect of Arnold's life would have been interesting.

Nonetheless, Daso's research is prodigious, the numerous illustrations are excellent, and his writing style is eminently pleasing. This is an excellent biography of a great commander; it should be read by airmen of all ranks, scholars, and other services' officers who wish to understand better the key influence in the development of the U.S. Air Force.

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Sebag-Montefiore, Hugh. *Enigma: The Battle for the Code*. New York: John Wiley & Sons, 2001. 403pp. \$30

Hugh Sebag-Montefiore has given us a scholarly and thoroughly researched account of the code breaking that staved off unsustainable losses of merchant shipping and thereby led to victory in the Battle of the Atlantic. This book is particularly recommended to communications and communications security personnel.

Enigma may be scholarly, but it certainly is not dull. It is difficult to put aside and is, in the modern vernacular, “a good read.” The author traces the history of the Enigma machine from its beginnings in Belgium and Germany in 1931 to what the author titles the “Last Hiccough,” in June 1944. Most war college graduates consider themselves informed on the events of World War II, but few fully realize how crucial breaking the codes was to winning the war or appreciate the blood, sweat, guts, and luck that made it possible.

In 1931 Hans Schmidt, who has been called the “Enigma spy,” gave some Enigma manuals to the French. Two years prior, the German embassy in Warsaw asked Polish customs to return a box to Germany that had evidently been sent to Poland by mistake. A suspicious customs officer alerted the appropriate officials, and when the box was opened, an Enigma machine was found inside. Polish cipher authorities spent the weekend examining it before sending it back to Berlin, with no one German wiser. The Poles took advantage of their find and managed to break the code. With the beginning of the war and the subsequent fall of France, the Polish code breakers, who had fled to France, were in a precarious position. Their efforts to escape to England were frustrated by seemingly endless French bureaucratic roadblocks. Finally, some succeeded in crossing the English Channel and joined the British code breakers at Bletchley Park.

There are really two facets to this story: acquiring the material, and then developing the capability to use it. The credit for the first requirement belongs to the Royal Navy, and later to the U.S. Navy. Credit for the second goes to the code breakers themselves.

The film *U-571* is fictitious but draws upon the capture of *U-110* by HMS *Bulldog*. At its conclusion, full credit is given to *Bulldog* and other people and ships that captured Enigma machines, including Admiral Dan Gallery and the men of USS *Guadalcanal*'s hunter-killer group who captured *U-505* in June 1944. The author comments on Admiral Ernest King's severe displeasure at the salvage of the submarine; had word filtered back to Germany, the high command would have been certain that the Enigma secret was no longer safe. If there was a leak, however, evidently it was not acted upon. In addition to U-boats, German trawlers, weather ships, and supply ships were boarded and their code material taken to the Allied code breakers. Although the popular recent movie might be thought to be overdrawn, in fact the boarding officer and one enlisted man from HMS *Petard* went down with *U-559* after retrieving its code books.

The author points out that the German high command discounted any indication that its code might have been compromised. It did not indoctrinate submarine personnel sufficiently to ensure that Enigma material was safe from enemy hands. Weighting cipher books seems elementary. Still, none of us is blameless. Code books from American destroyers sunk in the Solomons washed ashore, much to everyone's embarrassment, but fortunately they were recovered by “the good guys.”

This book contains a considerable amount of technical information about the Enigma machine, how it was put together, and about the code books that made it work. Fortunately, most of this is contained in appendices, so the flow of the narrative is not disrupted. For the untutored, the technical data make clear

the enormous effort and highly talented people required to succeed in such difficult and frustrating work. Communications have come a long way since 1945, but a detailed description of Enigma of World War II may be useful to young security communications personnel of today. After all, if you want to know where you are going, you should know where you have been.

Hugh Sebag-Montefiore has done a real service to all navies by digging out this story and unfolding it so well. Had the code breakers not been successful, the world might look much different. At the least, some of us would not have survived, and our children and grandchildren would not have been born.

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