

important contribution to the history of warship design and is most highly recommended.

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Jean-Denis G.G. Lepage. *Torpedo Bombers 1900-1950: An Illustrated History*. Barnsley, S. Yorks: Pen & Sword Books, www.pen-and-sword.co.uk (distributed by Naval Institute Press), 2020. ix+394 pp., illustrations, bibliography, index. UK £30, US \$44.95, cloth; ISBN 978-1-52676-347-1. (E-book available.)

After the first controlled heavier-than-air flight by the Wright brothers in 1903, navies slowly appreciated and embraced the possibilities for aircraft as a new technology in conducting naval warfare. Aircraft quickly evolved from flimsy prototypes with flyers perched precariously in the open air to more substantial, enclosed models used for reconnaissance, surveillance, gunnery spotting, and communication purposes. On 28 March 1910, the French inventor and manufacturer Jean-Henri Fabre flew the world's first floatplane, taking off from the water under its own power. The idea of matching up aircraft with torpedoes, another technology changing the nature of naval combat, was broached and taken more seriously after the start of the First World War. Britain proved the concept with successful air-launched torpedo attacks against Turkish ships in August 1915 by aircraft operating from a seaplane tender. Subsequent years and decades saw the development of new types of land-based and shipborne torpedo bombers dedicated to the specialized role of sinking ships in the maritime environment. The experimentation of the interwar period gave way to large-scale employment in combat during the Second World War and predominance of carrier aviation in the vast Pacific Ocean. The torpedo bomber's days, however, were numbered with improved anti-aircraft defences, the advent of missiles, and eventual introduction of the helicopter, another vertical air platform capable of carrying torpedoes and operating off ships. Jean-Denis Lepage, a Dutch-based author and illustrator, takes on the weighty task of documenting the evolution of the torpedo bomber up to the mid-twentieth century in its many varieties.

The book is divided into six chronologically structured parts, comprising forty distinct chapters focused on general developments and specific countries. Further headings within chapters places the focus squarely on the individual aircraft, with paragraphs of various lengths giving background and technical details and accompanied by illustrations. Though references are not provided, the entries are very detailed and comprehensive, drawing upon available secondary literature and trade sources. Lepage covers both torpedo bombers

that entered into manufacture and operational service in various countries, as well as those that either never went beyond the design stage, or were turned down by navies for various reasons, most commonly cost, poor design, or inferior performance against stated requirements. It is interesting that the most used and beloved torpedo bombers, such as the venerable Fairey Swordfish or Heinkel 111, were not necessarily the most advanced designs and obsolete by the time war came.

The torpedo, a favourite of the *Jeune École*, was already an established naval weapon by the time it was married up with aircraft, gaining in design and performance. The Sopwith Short 184 was probably the most active and successful float biplane put into the torpedo bomber role during the First World War, capable of carrying one 14-inch torpedo underneath its fuselage. German and by extension, Austro-Hungarian (the country had no aviation industry to speak of), types tended to be larger and employed for multi-purpose functions. Trials showed that aircraft could be hoisted or flown off ships and landed on flight decks, that gave rise to converted seaplane and aircraft carriers. Interwar naval treaties put limits on new construction and allowed certain battleship and battlecruiser hulls otherwise slated for scrapping to be completed as aircraft carriers in the American, Japanese, British, and French navies. The 1920s- and 1930s-era torpedo bombers were intended to fill out squadrons manning those carriers in wheeled varieties, be carried aboard warships and tenders as seaplanes for catapult and recovery, and larger high-performance land-based aircraft with sufficient range to operate over adjoining seas. The Farman F.160 was a converted heavy bomber and civilian airliner that was made into a successful torpedo-carrying seaplane for France's *Aéronavale* until superseded by rival company offerings in the Levasseur PL.15 and Latécoère 290. The British and American navies, taking the lead in nascent carrier aviation, could choose from a number of types put forward by established companies such as Blackburn, Fairey, Douglas, and Glenn Martin eager to get contracts and start production. The Mitsubishi B1M and B2M were standard interwar carrier-based torpedo bombers deployed by the Imperial Japanese Navy. Monoplane designs with more powerful engines and stressed metal skins gradually superseded the biplane. Lepage includes interesting chapters on torpedo bombers in the Netherlands, Soviet Union, and Poland in that section.

During the Second World War, fast, land-based, two-engine bombers represented by the outstanding Bristol Beaufighter and Junkers 88 proved to be deadly torpedo bombers in European waters sinking a fair share of shipping, as well as the very capable Tupolev Tu-2 whose creator was released from a Stalin prison and rehabilitated for the war effort. The Heinkel 115, like most bulky twin-engine seaplanes, was soon outmatched by high-performance fighters within range of land, and the Junkers 87T Stuka was modified for naval

service carrying torpedoes on the never-finished carrier *Graf Zeppelin*. The Italians favoured three-engine torpedo bombers which incorporated several advanced features, though lack of industrial capacity meant a chronic shortage of torpedoes. The obsolete Fairey Swordfish outlived its intended replacement by the same company's Albacore and Barracuda torpedo bombers. The Royal Navy in due course adopted American-type fighter and torpedo bomber aircraft from North American production.

Naval operations in the Pacific and Indian Ocean theatres featured widespread use of torpedo bombers flying from carriers in fleets and from land. Japan's Nakajima B5N (Kate) was the favourite carrier-based torpedo bomber used in the attack on the American naval anchorage at Pearl Harbor and the 1942 Battle of Midway, when the Imperial Japanese Navy lost its fast carriers to strikes from US Navy dive and torpedo bombers. Planned upgrades with the Nakajima B6N Tenzan (Jill) and Aichi B7A (Grace) came too late. The Japanese also boasted several good extended range land-based bombers capable of carrying torpedoes, including the Mitsubishi G4M (Betty). On the American side, the aging Douglas Devastator and Dauntless were replaced by the more powerful Grumman Avenger, the versatile and arguably amongst the best-suited carrier-borne torpedo bombers produced in quantity during the war. The Douglas Helldiver and Consolidated TBY Sea Wolf played second fiddle. In a pinch, the workhorse Consolidated PBY Catalina, a long-range flying boat, could carry torpedoes on racks under the wings, as could the British Short Sunderland flying boat nicknamed the "flying porcupine."

After 1945, defence and aircraft manufacturing industries were capable of producing advanced designs, though the torpedo bomber had already reached its zenith and the capability was incorporated into long-range maritime patrol aircraft with the onset of the Cold War. The lighter weight American Mark 43 torpedo, and later Mark 46, were specifically produced for launching from aircraft. The Canadair CP-107 Argus, up to that time the largest aircraft entirely built in Canada, was a mainstay in the Royal Canadian Air Force's anti-submarine warfare and maritime patrol functions, able to carry a dizzying array of sensors and weaponry that included torpedoes, bombs, depth charges, and air-to-surface missiles as a counter to Soviet SSN and SSBN submarines. A European consortium similarly designed the Bréguet Br.1150 Atlantique that entered service in France and other countries and an updated version that carried torpedoes, Exocet AM39 and Harpoon air-to-surface missiles, mines, and depth charges. The Soviets produced the Ilyushin Il-28 jet bomber post-war in large numbers and later the Tupolev Tu-142 (Bear) four-engine maritime reconnaissance aircraft able to carry a dozen torpedoes and other munitions.

The book is marketed as an illustrated history, incorporating artwork done by Lepage instead of photographs and other graphic materials. First

impressions should not be off-putting when picking up the book. The drawings are cartoonish in appearance, more suited to a child's colouring book. Nonetheless, the drawings are seriously rendered and accurately depict the aircraft, ships, and weapons under discussion. In effect, each aircraft has its own picture, even those less known or that never made it beyond prototype. That ensures a certain uniformity throughout the book. The French aircraft carrier *Béarne*, despite its inherent limitations in design and propulsion as a naval treaty conversion, is shown from a very pleasing front angle. Lepage invested considerable time and effort in the illustrations, which are as much of the book as the text. *Torpedo Bombers 1900-1950* is recommended for readers interested in twentieth-century naval warfare, aviation, and scale modelling.

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Leo Marriott. *Images of War: Essex Class Aircraft Carriers, 1943-1991*. Barnsley, S. Yorks: Pen and Sword, www.pen-and-sword.co.uk, 2020. 176 pp., illustrations, table. UK £15.99, paper; ISBN 978-1-52677-214-5.

Number 231 in the Images of War series, this is a photographic history of the twenty-four completed Essex-class aircraft carriers of the United States Navy from their introduction in 1943 to the final decommissioning of USS *Lexington* in 1991. Arranged chronologically, the text and photographs trace the development of the Essex design, describe life aboard the vessels, and detail a near-half-century of service. A brief abbreviation guide and bibliography bookend the primary contents, with the majority of the space depicting various carriers through half-page black and white photographs.

Author Marriott begins his work with a brief introduction, accompanied by a table of the planned Essex carriers, their builders, and the key dates in their construction. This leads into a chapter on pre-Essex carrier development in the United States, including a brief background on American Naval Aviation, the effects of the international interwar naval treaties on carrier designs, and the situation America found itself in leading up to the commissioning of the Essex on 31 December 1942. The next four chapters cover the construction, deployment, and operation of the wartime Essex carriers from 1943 through 1945. Following the format of the Image of War series, independent textual information takes a backseat to selected period images and their detailed captions. Of particular interest are the images of below-deck activities and operations in chapter four, a perspective often overlooked in favour of the more iconic exterior views of the massive carriers or on-deck operations.

Chapters six through eight cover the post-war evolution of Essex carriers, showcasing periods of mothballing and decommissioning, the modification of