



ESCORT CARRIERS file in formation during World War II. Viewed from the Manila Bay (CVE-61) are sister Casablanca class carriers Coral Sea (CVE-57), later renamed USS Anzio, Corregidor (CVE-58), and Natoma Bay (CVE-62), followed by Bogue class carrier Nassau (CVE-16)

Evolution of Aircraft Carriers

EMERGENCE OF THE ESCORT CARRIERS

'The story of the escort aircraft carriers is like a story with a surprise ending. When the United States began to build them, there was a definite purpose in view—fighting off submarines and escorting convoys. But as the war progressed, the small carrier demonstrated surprising versatility. It became a great deal more than its name implies. From a purely defensive measure, the escort carrier emerged as an offensive weapon.'—FAdm. Chester W. Nimitz, USN, CinCPacFlt/CinCPOA, 1945

TOWARD THE END of World War I, Great Britain experimented in converting light cruisers to airplane carriers—notably in HMS *Cavendish* of 32 knots and about 10,000 tons displacement. But with the signing of the Armistice, the project was abandoned. Despite this, it was a subject of interest in the following years.

In 1925, the General Board seriously considered the conversion of cruiser hulls to aircraft carriers. Although treaty limitations restricted the building up of carrier strength, there was sufficient uncommitted construction tonnage to permit the building of more carriers than the U.S. Fleet had. Could this uncommitted tonnage be best employed in building small carriers? The Board's answer can best be summed up in this excerpt from its report:

"Incomplete studies of the subject by the Bureau of Construction and Repair and the meagre information available concerning the performance of airplanes from carriers of approximately 10,000 tons displacement does not justify building them at this time."

But the subject of "light" carriers

By Scot MacDonald

was of recurrent interest to the U.S. Fleet. In May 1927, LCdr. Bruce G. Leighton prepared a paper in which he analyzed the problem. He titled it, "Light Aircraft Carriers, A Study of their Possible Uses in So-Called 'Cruiser Operations,' Comparison with Light Cruisers as Fleet Units." Though the title may have been cumbersome, the document was impressive. He forecast every fundamental combat requirement of the later-day CVL's and CVE's, including the bombing of capital ships, support of fleet operations, anti-submarine work, scouting and reconnaissance, and the reduction of enemy shore bases. He concluded that "all things considered, it might well be considered as a worthy substitute for the light cruiser, or even distinctly preferable to the cruiser."

For the next dozen years, the subject interjected itself spasmodically and unsuccessfully into Navy thinking. But in March 1939, Capt. John S. McCain, Sr., then commanding the *Ranger*, wrote to the Secretary of the Navy

advocating the building of at least eight "pocket-size" carriers of cruiser speed. These were not meant to replace the CV's, but to supplement them, giving force commanders much more flexibility in the use of ship-based aircraft at sea, without jeopardizing the much more costly heavy carriers. RAdm. Ernest J. King, in his endorsement to the letter, was not at all enthusiastic about this scheme. He suggested that existing aircraft carriers carry the maximum number of planes permissible as a better solution than the construction of smaller carriers.

The matter was not entirely dropped, however, for the Bureau of Construction and Repair was considering, and even drawing plans for the conversion of 20- or 21-knot passenger ships, creating experimental carriers with short flight decks. By November 1940, the Chief of Naval Operations brought these considerations to an abrupt halt, basing his decision on a letter from SecNav to the Chairman of the U.S. Maritime Commission. SecNav wrote:

"The characteristics of aircraft have changed, placing more exacting de-

mands upon the carrier. These demands are such that a converted merchant vessel will no longer make as satisfactory an aircraft carrier as was the case when the plans for those vessels were being drawn."

In commenting on the beginning of escort carriers, historian Lt. William G. Land, USNR (*Functional Development of the Small Carrier* [CVE]) says, "The escort carrier was forced upon the Navy by the President."

Indeed, President Franklin D. Roosevelt did actively enter the "light" carrier controversy. Great Britain had been at war with Germany since September 1939. Since that time and before the U.S. entered the war, large numbers of U.S.-built military aircraft were sold to the British. The U.S. had need for an aircraft-carrying ship to speed delivery. By mid-February 1941, RAdm. W. F. Halsey (later Fleet Admiral) had written to Commander-in-Chief, U.S. Fleet:

"A previously stated expectation, that the Navy would be called upon to provide transport for Army aircraft, has now materialized in the current diversion of *Enterprise* and *Lexington* to transport 80 pursuit planes from the West Coast to Hawaii. To continue with primary reliance on aircraft carriers for such work, as is our present necessity, seriously endangers the availability of air-offensive power in the Fleet."

Adm. Husband E. Kimmel, in endorsing this letter from his Commander Aircraft Battle Force to the Chief of Naval Operations, fully concurred and pointed out that on five separate occasions in the past he had himself urged such action.

Earlier, on October 21, 1940, CNO had received a memorandum from the President's Naval Aide advising him that President Roosevelt proposed the Navy acquire a merchant ship and convert it to an aircraft carrier, accommodating 8 to 12 helicopters (not yet operated by the Navy) or airplanes capable of landing or taking off in a small space. The purpose of this type carrier was to "provide quick conversions for carrying small planes which could hover ahead of convoys, detect submarines and drop smoke bombs to indicate their locations to an attacking surface escort craft."

CNO decided on the last day of 1940 that the Chairman of the Maritime Commission would be consulted to de-

termine the availability of ships for this purpose. On January 2nd, it was found that two Danish ships might permit conversion, but later investigation proved this would not be possible. The results of this January 2 conference determined that the ships (two—one was to be sold to Great Britain) selected "should be of the same or very similar design in order that the plans made for one could be applicable to both; that the airplanes should be further investigated to determine the type and availability; that an armament of four AA pom-poms and one 5" surface gun should be such as to insure stability at all stages of loading." These converted merchant ships were to fill the need later expressed by Adm. Halsey, the transport of aircraft, as well as to provide protection to Allied convoys.

On January 6, 1941, Adm. Harold R. Stark, CNO, convened a conference in his Washington office to discuss merchant-conversion. The autogiro type aircraft was considered of dubious usefulness because of its inability to carry any load other than smoke bombs; an aircraft, to meet the purpose designed, must have some offensive characteristics. An abbreviated deck was ruled out. The converted ship should be diesel-driven in order to eliminate smokestacks. The decision was made to obtain from the Maritime Commission, if possible, C-3 cargo ships.

On the following day, CNO was informed that two diesel-driven C-3 type ships, the *Mormacmail* and the *Mormacland*, would be suitable for conversion and were available. He was told by President Roosevelt that any plan which would take more than about three months to complete conversion would be unacceptable. This, in effect, placed pressure on the project. The idea of substituting "blimps" for autogiros or heavier-than-air craft was flirted with but, by January 15, was "out of the picture."

The *Mormacmail* was acquired on March 6, 1941. On June 2—just within the three-month limitation set by the President—she emerged from conversion and was placed in commission as the aircraft escort vessel USS *Long Island* (AVG-1), commanded by Cdr. Donald B. Duncan who, on December 31, 1942, was to be the first commanding officer of USS *Essex*.

Early plans for the conversion called for the installation of a 305-foot flight

deck on the *Mormacmail*, but the Bureau of Aeronautics required at least 350 feet to safely land SOC *Sea Gulls* aboard. Upon commissioning, *Long Island* had a deck length of 362 feet. She had one elevator, handled 16 planes, had a trial run speed of 17.6 knots, and berthed 190 officers and 780 men.

The *Mormacland*, acquired at the same time, was similarly converted and was turned over to the British as HMS *Archer* (BAVG-1) when it was completed the following November. Experience with the BAVG and the two British conversions led the British to believe that the diesel-driven ships were too slow for their purpose as special escort vessels—although they were no slower than the later *Bogue* carriers.

Long Island was used primarily as a training ship during the remaining peacetime months of 1941. She was subjected to tests and experiments—much the way USS *Langley* had been in her early days—to obtain data needed for the construction of later escort carriers. As a result of the Navy's experiences with this ship, other CVE's were outfitted with two elevators instead of one, the flight decks were lengthened, and the anti-aircraft power was increased.

On December 26, 1941, SecNav approved the conversion of 24 merchant hulls for the 1942 shipbuilding program and, in March, ordered the conversion of cruiser hulls which became the CVL's. Cdr. Leighton's 1927 paper was proving its farsightedness.

Naval Aviation historian, Dr. Henry Dater, traced the next developments in a paper published in *Military Affairs*:

"There were only 20 C-3 hulls available for conversion, ten of which were earmarked for the Royal Navy and ten for the United States. The new ships were improved by the substitution of a steam turbine power plant for the diesel engines employed in the *Long Island* and *Charger* [the latter was redesignated CVE-30 and replaced CVE-1 as a training ship when the *Long Island* was pressed into service, ferrying planes and pilots at the outbreak of war], and by the addition of a slightly larger flight deck (436 by 79 feet), a small island, and a considerably larger hangar space.

"They were referred to either as the CVE-6 class, from the numerical designation of HMS *Battler*, or as the *Bogue* class, from the first ship to operate with the U.S. Navy.

"The remaining four CVE's authorized for the 1942 program were converted from *Cimarron* class fast fleet oilers and were known as the *Sangamon* (CVE-26) class. These were considerably larger, having a flight deck of 503 feet by 85 feet, and were able to accommodate two small squadrons of aircraft. Because of their size, work was rushed on them during the summer of 1942 so that they would be available for the North African invasion in the autumn."

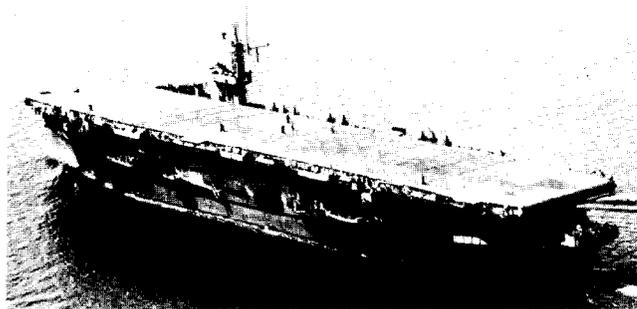
Before the U.S. entered the war, German U-boats hovered near British coastal ports and picked off merchant ships with ease. Land-based RAF planes drove the German submarines further out to sea. To make matters more difficult for the enemy, convoys sailed

They left a double space in the middle in the center of which they placed the *Bogue*. The other escorts were placed around the convoy in a half circle. The idea was, if possible, to use our catapults and to stay in our center position when launching our planes so there wouldn't be any wide separation. As it happened, we had westerly winds on the East-bound convoy so we had to turn around to launch planes and to take them aboard. Consequently, the separation was fairly large due to the fact that it was what is called a high speed convoy, 'nine knots!'"

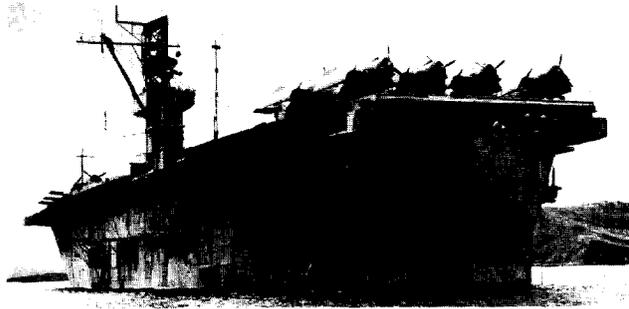
Though this tactic met with considerable success at first, it was primarily defensive. A new technique was found more effective. A small task group took up a position where it could throw

length of 553 feet, a speed of 18.3 knots, a trial displacement of 23,235 tons, and carried 120 officers and 960 men. They were armed with two five-inch, 38 calibre guns, two quad and ten twin 40mm AA mounts. They were equipped with two hydraulic catapults forward.

"With the CV's, except *Ranger*, being employed in the Pacific," wrote historian Land, "planning for the North African landings depended on the completion of the AO conversions of *Suwannee*, *Sangamon*, *Chenango*, and *Santee*. For this reason, *Suwannee* had to cut down on its pre-commissioning period, fitting out, and shakedown in order to be substituted in the final plans for the much smaller *Charger*,



BOGUE CLASS escort carriers were products of the 1942 shipbuilding program. They were converted from Maritime Commission C-3 hulls.



USS SUWANEE was one of four escort carriers converted from Cimarron class fleet oilers. They were rushed to completion for battle duty.

closer together, opening up larger areas of the North Atlantic for the German subs to search. The Germans solved this problem by developing the "wolf pack" technique of operating in groups, then concentrating for the kill when convoys were sighted.

"It was this technique which created the British desire for aircraft escort vessels in late 1940 and 1941," wrote Dr. Dater. "With the entry of the United States into the conflict the Germans found easy picking off the American coast, but it was only a matter of time until land-based air on this side of the Atlantic drove them out to sea once more. There in mid-ocean was a vast area in which the convoys did not have the assistance of aircraft. By early 1943 it became evident that the decisive campaign was to be fought in that area."

The air officer of the *Bogue* described escort procedures during March and April 1943:

"The ship was stationed inside the convoy for this work. The convoys were in columns of five ships each with about 700 yards between columns.

its support to either of two convoys in a general area. Escort carrier-based aircraft scouted ahead, searching out German U-boats before the submarines could make contact. This permitted the carriers to be released from the difficult maneuver necessary in the central slot of the convoy. Out of this technique emerged the successful hunter-killer tactic that eventually freed Allied shipping in the North Atlantic.

The *Sangamon* class escort carriers, built as fleet oilers under the Merchant Marine Act of 1936, were completed in 1939, but in the 1942 shipbuilding program were slated for reconfiguration to aircraft carrier characteristics. Only four hulls were on hand. "Had more oiler hulls been available," wrote Lt. Land, "they would have become the prototype of the small carrier for the ensuing year's program. But the overwhelming need for fleet oilers—to make possible our logistic advance—prevented this type of hull from being again used for carriers, until 1944."

The *Sangamons* had an over-all

the ex-BAVG which had been doing regular duty as qualification carrier in Chesapeake Bay. *Santee*, likewise, was barely completed in its essentials and had had hardly any exercise with its air group before its first combat operation was to begin."

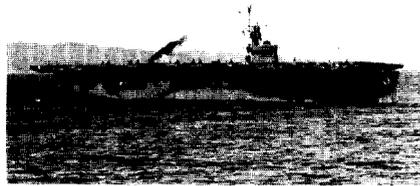
Capt. William D. Sample, commanding *Santee*, wrote of the hectic early days aboard:

"*Santee* left Norfolk Navy Yard 13 September 1942 with Yard workmen still on board and her decks piled high with stores. During that first month, the *Santee* returned to the yard twice and was never free of the Yard workmen. The completion of the ship continued while the fitting out and shakedown were proceeding together. At the end of the month, the air group had operated aboard only a day and a half and guns had been fired only for structural tests

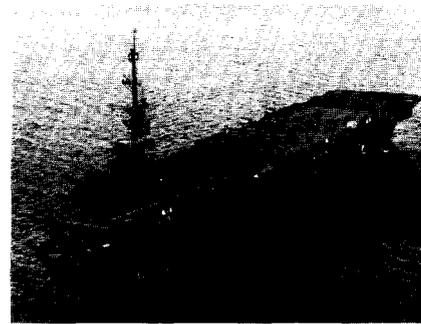
"The Navy Yard had done an almost impossible task in getting the ship out in time for the pending operations but, in so doing, only the essentials had been completed, and it was then necessary for the ship to install, adjust, calibrate and repair until the ship could



ARMY P-40 Warhawk fighter catapults from the deck of a Sangamon class to North Africa.



CASABLANCA (CVE-55) was first of 50 escort carriers mass-produced by Kaiser shipyard.



COMMENCEMENT BAY class was concerned to provide trans-ocean convoys with air cover.

use her battery and equipment The service experience necessary to test many of the questionable features of the ship's design was soon obtained in a wintry gale encountered en route to Bermuda. The two forward boats were carried away, the new upper decks proved to be sieves and the repair work of the ship's force got underway in earnest."

The carrier *Chenango* was used, in the North African operation that followed, as a ferry carrier for Army P-40's on the outward trip, as a fuel supply ship while moored at Casablanca, and as a fleet escort—with a borrowed air group furnishing air cover-on the return trip.

Her sister ships, however, launched TBF-1 *Avengers*, SBD-3 *Dauntless* and F4F-4 *Wildcat* aircraft in support of landing operations for the capture of Casablanca and Port Lyautey. They were units of Task Force 34. As part of the Northern Attack Group, *Sangamon* and *Chenango* assisted troops landing at Mehedia, not far from Port Lyautey. *Ranger* and *Suwanee* provided air cover for the Center Attack Group at Fedhala, northeast of Casablanca. *Santee* was the only carrier assigned to the Southern Attack Group, providing combat air patrol and anti-submarine patrol for the landing force at Safi—the only port in Morocco, other than Casablanca, that would permit the landing of 28-ton General Sherman tanks. It was for the capture of Casablanca that these tanks were needed.

Between November 8-11, 1942, *Suwanee* launched 255 combat sorties; *Santee*, 144, and *Sangamon*, 183.

During *Sangamon's* participation in the Northern Attack Group operation, her planes were called upon to neutralize a Kasba or citadel, which guarded the Port Lyautey airdrome. Several

SBD's delivered bombs on target. "The garrison then," wrote Samuel Eliot Morison, "came out with their hands up and our infantry walked in." By November 15, *Sangamon's* part in the invasion of North Africa was completed and she sailed for Hampton Roads.

Planes in the *Suwanee* joined those based in the *Ranger* in bombing missions during the Battle of Casablanca. The *Suwanee*, like the *Santee* at Safi, encountered light winds. Many landings were made aboard with only 22-knot winds across the deck.

Despite the greenness of the crews in the *Sangamons*, generally, they gave a good account of themselves. Commented CinCLant: "The CVE's proved to be a valuable addition to the Fleet. They can handle a potent air group and, while their speed is insufficient, they can operate under most weather conditions and are very useful ships."

Their missions in the invasion of North Africa completed, *Sangamon*, *Chenango*, and *Suwanee* were dispatched to the Pacific. By the end of 1942, U.S. carrier strength in the Pacific had been reduced to the *Enterprise* and the *Saratoga*.

In the meantime, President Roosevelt announced a need for more escort carriers. Shipbuilder Henry J. Kaiser had impressed the President with the merits of a plan which would permit the mass production of escort carriers, under a program to be supervised by the Maritime Commission.

The first of these, USS *Casablanca* (CVE-55), was commissioned July 8, 1943, and gave its name to the class—CVE-55 through CVE-104. They were also referred to as Kaiser class escort carriers. The Kaiser yard completed its 50-ship program on July 8, 1944. This was an impressive achieve-

ment in wartime production program.

The *Casablanca* class had an over-all length of 512 feet, 3 inches, a speed of 19.3 knots, a trial displacement of 9570 tons, and carried 110 officers and 750 men. They had one five-inch, 38 calibre gun and eight twin 40mm AA mounts. The aircraft complement consisted of 12 TBM's and 16 FM-2's; in the flight deck was a single hydraulic catapult, forward.

Final details were worked out for a new class escort carrier during the trials of the *Sangamon* and *Santee* and during the planning for the 1944 building program. These ships were the first Navy-designed escort carriers for which hull and propeller model tests were carried out at the David W. Taylor Model Basin. The design was formally approved by CNO on December 10, 1942 and the contract was let on January 23, 1943. The first of these carriers was the *Commencement Bay* (CVE-105) from which the class got its name. It had an over-all length of 557 feet, a speed of 19 knots, and a trial displacement of 23,100 tons. Few of these ships saw action in the war—the *Commencement Bay* was commissioned in November 1944. Only nine others were commissioned before V-J Day the following September. They incorporated all lessons learned since the *Long Island* was commissioned.

As the escort carriers gained experience, they earned the respect of the Fleet by proving themselves versatile in anti-submarine warfare. The *Sangamon* class first demonstrated combat capability in the support of the North African invasion. The first major carrier-supported amphibious landing in the Pacific was the capture of the Gilberts and Marshalls. Eight escort carriers participated, two of the *Bogue* class, three of the *Sangamon* class, and

three of the *Casablanca* class. The changing status of these vessels is reflected in their redesignation. Originally identified as aircraft escort vessels (AVG's), they were redesignated on August 20, 1942, auxiliary aircraft carriers (ACV's), and finally, on July 15, 1943, a directive changed the escort carrier symbol to CVE, reclassifying them as combatant ships.

At the end of the North African invasion, RAdm. Calvin T. Durgin (then Capt.) evaluated the effectiveness of the escort carriers when he presented his report:

"Due to their low speed, lack of protection and light armament, it is considered hazardous to employ a CVE group in operation where there is likely to be an effective enemy opposition. Such a group can, however, be used to advantage, and is capable of inflicting substantial damage to the enemy in assault where the enemy air and sea opposition is negligible or when it is being contained by other superior forces. When this situation exists, the CVE is well equipped to provide all support until landing strips are established ashore, and it can be effectively employed for bombardment spotting, combat air patrols over beaches and surface forces, for all forms of air reconnaissance missions and for bombing, rocket and strafing attacks."

His experience with escort carriers was to stand him in good stead. On December 13, 1944, the functional type command, Escort Carrier Force, Pacific, was created; RAdm. Durgin was placed in command.

The establishment of this force was

made possible by the increasing number of carriers—notably of escort design—made available to the Fleet. Experience at Palau and Morotai and the difficulties encountered later at Leyte all pointed to the need for better planning in advance of operations if the CVE's were to perform efficiently their enlarged responsibilities. Adm. Durgin's command held administrative control over all escort carriers operating in the Pacific, except those assigned to training and transport duty.

On December 15, 1944, the escort carriers provided direct support for landings on Mindoro, and in the assault area on the next two days. Between January 3-22, 1945, 17 escort carriers covered the approach of the Luzon Attack Force against serious enemy air opposition from Kamikaze pilots. This force of ships, Task Group 77.4, conducted preliminary strikes in the assault area, covered the landings in Lingayen Gulf, and supported the inland advance of troops ashore.

In 1945 the CVE's saw a great deal of action. On the last three days of January, six escort carriers under RAdm. Sample (as Capt., first C.O. of *Santee*) provided air cover and support for landings by Army troops at San Antonio near Subic Bay, and at two other nearby Philippine beaches. In February, Adm. Durgin directed his carriers in the battle for the capture of Iwo Jima. In March, the Okinawa campaign began, the last, and, for naval forces, the most violent major amphibious campaign of World War II. As Task Group 52.1, Adm. Durgin,

with an original strength of 18 escort carriers, conducted pre-assault strikes and supported the occupation of Kerama Retto, joined in the pre-assault strikes on Okinawa, and, from a fairly restricted operating area southeast of the island, supported the landings and flew daily close support for operations ashore until the island was secure on June 21.

The U.S. suffered few losses to the enemy in these ships. Five carriers of the *Casablanca* class were lost in the Pacific; one *Bogue* class was torpedoed in the Atlantic. During the war years, 76 CVE's of various classes were commissioned, in addition to the *Long Island*, commissioned months earlier. Seven more *Commencement Bay* class were commissioned during the post-war years. During the war, four sister ships to *Long Island* were transferred to the British, as were 34 additional escort carriers of the *Bogue* class. Four were sunk; at the end of the war, the rest were returned to the U.S. from Lend-Lease and were either sold or placed in the reserve fleet.

Through fulfilling a basic need of transporting large numbers of assembled aircraft to various theaters of war, the quickly conceived and executed escort carrier developed into an anti-submarine warfare weapon that defeated the German U-boat threat in the North Atlantic. They provided combat capability in the support of fleet operations in both the Atlantic and the Pacific. In short, they displayed a versatility, proved under the pressures and urgencies of a war that engulfed the world.



VADM. (THEN RADM.) Calvin T. Durgin was the Commander Escort Carrier Force, Pacific.



NINE ESCORT CARRIERS break formation in the Pacific to take up stations. Originally designed for escort ASW work in the North Atlantic, they were designated combatant ships in July 1943.