

THE EARLY ATTACK CARRIERS

'We have hit the Japanese very hard in the Solomon Islands. We have probably broken the backbone of the power of their Fleet. They have still too many aircraft carriers to suit me, but soon we may well sink some more of them. . . . We are going to press our advantages in the Southwest Pacific and I am sure that we are destroying far more Japanese airplanes and sinking far more of their ships than they can build.'—Franklin D. Roosevelt, President of United States, 1942.

AT THE OUTBREAK of World War II, the United States had in commission seven aircraft carriers and one escort carrier. USS *Langley*, the experimental ship officially classed as CV-1, had been assigned to duty as a seaplane tender on September 15, 1936.

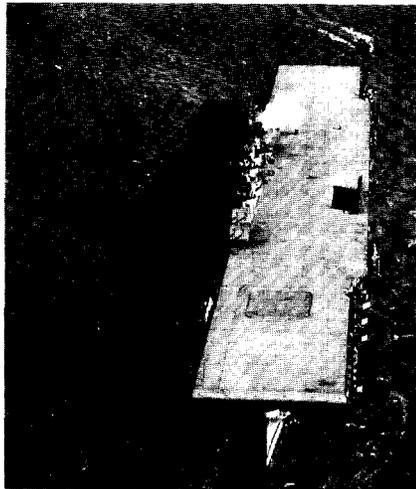
After the abrogation by Japan from disarmament treaties, the U.S. took a realistic look at its naval strength. By Act of Congress on May 17, 1938, an increase of 40,000 tons in aircraft carriers was authorized. This permitted the building of USS *Hornet* (CV-8) and USS *Essex* (CV-9). On June 14, 1940, another increase in tonnage was authorized. Among the ships built under this program were the *Intrepid* and the new *Yorktown*. On July 19, an additional 200,000 tons for carriers was authorized.

Adm. H. R. Stark, then Chief of Naval Operations, reported to the Secretary of the Navy: "In June 1940, the Congress granted the Navy an 11% increase in combat strength and, in July, a further increase of approximately 70%. When these ships and aircraft are completed, the U.S. Navy in underage and overage ships will include 32 battleships, 18 aircraft carriers, 91 cruisers, 325 destroyers, 185 submarines, and 15,000 airplanes. . . .

By Scot MacDonald

"From 1921 to 1933, the United States tried the experiment of disarmament in fact and by example. This experiment failed. It cost us dearly in relative naval strength—but the greatest loss is TIME. Dollars cannot buy yesterday. Our present Fleet is strong, but it is not strong enough."

Additional tonnage was authorized December 23, 1941 and July 9, 1942.

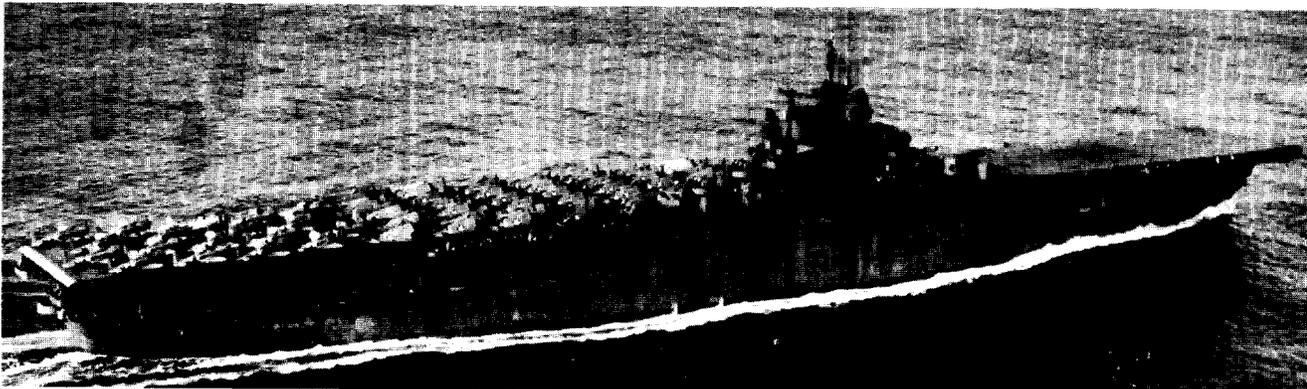


USS ESSEX (CV-9) was first of a series of early attack aircraft carriers of World War II.

CV-9 was to be the prototype of an especially designed 27,000-ton (standard displacement) aircraft carrier, considerably larger than the *Enterprise* and smaller than the *Saratoga*. These were to become known as the *Essex* class carrier, although this classification was dropped in the '50's.

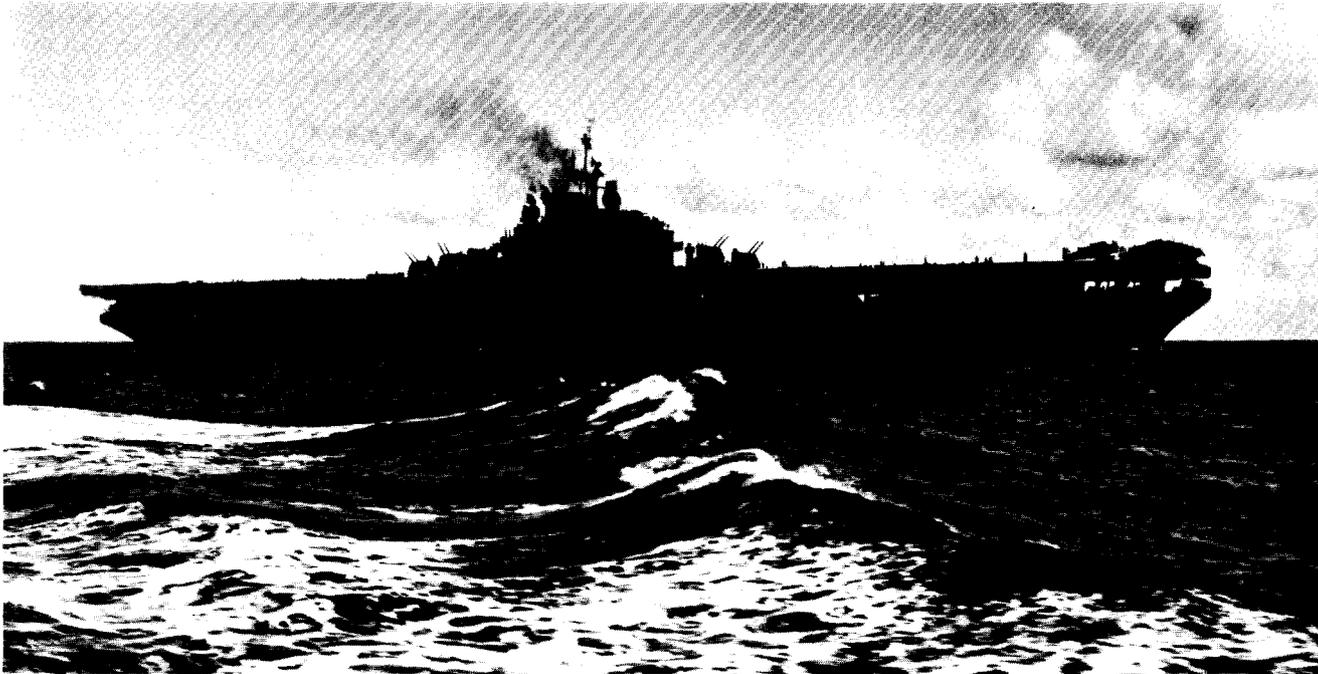
On September 9, 1940, eight more of these carriers were ordered and were to become the *Hornet*, *Franklin*, *Ticonderoga*, *Randolph*, *Lexington*, *Bunker Hill*, *Wasp* and *Hancock*, CV-12 through -19, respectively. Re-use of the *Lexington*, *Wasp* and *Hornet* names was in line with the Navy's intent to carry on the traditions of the fighting predecessors: *Lcxington* (CV-2) was lost in the Battle of the Coral Sea in May 1942; *Wasp* (CV-7) was sunk September that year in the South Pacific while escorting a troop convoy to Guadalcanal; *Hornet* (CV-8) was lost the following month in the Battle of Santa Cruz Islands.

It is appropriate to comment here that the ships' names at commissioning date did not all bear the same name at the date of their programming. Names were changed during construction. *Hornet* (CV-12) was originally *Kearsarge*, *Ticonderoga* (CV-14) was



FIGHTER AIRCRAFT of Air Group 9 are parked aboard the aircraft carrier *Essex* during her shakedown cruise in the Caribbean in 1943.

During WW II, U.S. shipyards built and Navy commissioned 16 sister ships. Including post-war production 24 *Essex* class were commissioned.



USS RANDOLPH (CV-15) was the 13th Essex class carrier to be commissioned. She was the first of these carriers to enter combat without returning to the builder for post-shakedown work. She participated in the Iwo Jima, Okinawa, and Third Fleet operations against Japan in 1945.

the *Hancock*, *Lexington* (CV-16) was *Cabot*, *Wasp* (CV-18) was *Oriskany*, and *Hancock* (CV-19) was originally *Ticonderoga*.

Last two of the 13 originally programmed CV-9 class aircraft carriers, *Bennington* (CV-20) and *Boxer* (CV-21), were ordered on Dec. 15, 1941.

In drawing up the preliminary design for USS *Essex*, particular attention was directed at the size of both her flight and hangar decks. Aircraft design had come a long way from the comparatively light planes used in carriers during the Thirties. Flight decks now required more takeoff space for the heavier fighters and bombers being developed. Most of the first-line carriers of the pre-war years were equipped with flush deck catapults, but owing to the speed and size of these ships very little catapulting was done—except for experimental purposes. With the advent of war, airplane weights began to go up as armor and armament got heavier; crew size aboard the planes also increased. It was inevitable, noted the Bureau of Aeronautics toward the war's end in 1945, that catapult launchings would become more common under these circumstances. Some carrier commanding officers reported that as much as 40 per cent of launchings

were effected by the ships' catapults.

The hangar area design came in for many conferences between Bureaus and much more official correspondence. Not only were the supporting structures to the flight deck to carry the increased weight of the landing and parked aircraft, but they were to have sufficient strength to support the tricing up of spare fuselages and parts (50 per cent of each plane type aboard) under the flight deck and still provide adequate working space for the men using the area below.

"At present," noted the Bureau of Construction and Repair in April 1940, "it appears that a few of the smaller fuselages can be triced up overhead in locations where encroachment on head-room is acceptable, and that the larger fuselages will have to be stowed on deck in the after end of the hangar. The number to be stowed will depend upon the amount of reduction in operating space in the hangar which can be accepted."

Capt. Marc A. Mitscher, then Assistant Chief BUAER, answered: "The question of spare airplanes is now under reconsideration in correspondence with the Fleet and the results decided upon will have a bearing in the case of CV-9."

A startling innovation in CV-9 was

a port side deck edge elevator in addition to two inboard elevators. Earlier, BUAER experimented with a ramp arrangement between the hangar and flight decks, up which aircraft were hauled by crane. This proved too slow. BU SHIPS and the Chief Engineer of A.B.C. Elevator Co., designed the engine for the side elevator. Essentially, it was a standard elevator, 60 feet by 34 in platform surface, which travelled vertically on the port side of the ship. Capt. Donald B. Duncan, *Essex's* first commanding officer, was enthusiastic. After the first four months of operation after commissioning, he wrote to BUAER:

"The elevator has functioned most satisfactorily in all respects and it is desired to point out some of the operational advantages realized with this type of elevator.

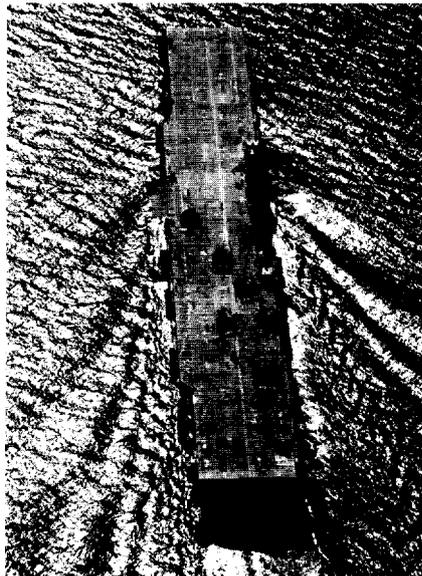
"Since there is no large hole in the flight deck when the elevator is in the 'down' position, it is easier to continue normal operations on deck, irrespective of the position of the elevator. The elevator increases the effective deck space when it is in the 'up' position by providing additional parking room outside the normal contours of the flight deck, and increases the effective area on the hangar deck by the absence of elevator pits."

The elevator performed well, its machinery less complex than the two inboard elevators, requiring about 20 per cent fewer man-hours of maintenance. Capt. Duncan recommended that consideration be given using two deck edge elevators, one on each side. BUAEER, in forwarding the recommendation to BU SHIPS, offered another advantage for consideration: a conventional elevator suffering a casualty while in the "down" position "would leave a large hole in the flight deck while the deck edge type would cause only minor and non-critical loss of flight deck area."

BU SHIPS, obviously pleased with the operational performance of the new elevator—the first of its kind—reluctantly turned down the recommendation, however. The Bureau noted that the addition of a starboard deck-edge elevator would not permit an *Essex* class aircraft carrier to transit the Panama Canal. Any other location for a second such elevator would involve structural and arrangement changes too extensive to be considered.

On April 28, 1941, keel for the USS *Essex* was laid at Newport News Shipbuilding and Dry Dock Co. On October 2, the following year, her prospective commanding officer filed his first weekly progress and readiness report to the Chief of Naval Operations. He noted that there was marked speed-up of work on the ship during the preceding month and estimated that the ship would probably be delivered on February 1, 1942.

"There are certain items that have been authorized for installation on the CV-9-19 class carrier," he said, "but will not be accomplished on this vessel



USS YORKTOWN (CV-10) was third *Essex* commissioned, sponsored by Mrs. F. D. Roosevelt.

prior to delivery." The ship was launched July 31, 1942.

RAdm. Walter S. Anderson, president of the dock trials and inspection team of CV-9 on December 23, 1942, noted a few of these discrepancies in his report:

"Due to late authorization of a number of changes arising out of recent war experiences, the volume of uncompleted hull work was greater than normal. . . . The Board regrets that the catapults for this vessel were not delivered in time for installation, as military value of the vessel would be much improved thereby. . . . Only the starboard flight deck track was installed. . . . This class of carriers is designed to include cruising turbines as part of the main drive turbine installation. However, due to produc-

tion difficulties and as a result of efforts to expedite delivery, cruising turbines were omitted. Space and connections for their future installation are provided and this can be accomplished with very little alteration. . . ."

Nevertheless, the Board was pleased and impressed with progress on construction of the *Essex*. Adm. Anderson recommended acceptance of the ship. "On 31 December 1942," he said, "only slightly over 20 months will have elapsed since keel-laying, which is, in the opinion of the Board, a record worthy of commendation. This indicates a high degree of cooperation between the Supervisor of Shipbuilding, the Newport News Shipbuilding and Dry Dock Co., and representatives of the officers and men of the ship's company." On the last day of 1942, USS *Essex* was commissioned.

Capt. Duncan was proud of his new command, but not so impressed as to ignore certain discrepancies that still existed. The ventilation system, for instance, was less than satisfactory. BU SHIPS sent representatives to the ship to assist in correcting discrepancies, during sea trials March 1 in the North Atlantic and, a month and a half later, when the ship was again at Norfolk and still had complaints.

As other CV-9 carriers were launched, the complaints continued to be registered. BU SHIPS investigated the ventilation system as installed in USS *Intrepid* (CV-11) and outlined corrective measures in future carriers of the class.

Requested to comment on the adequacy and operation of the trash burner installed in the *Essex*, Capt. Duncan started off quietly enough. "It is most unsatisfactory," he said. Then



VIEWS IN FEBRUARY 1944, her flight deck covered with parked aircraft, USS *Lexington* (CV-16) had already been commissioned one year.

Her namesake, CV-2, was sunk in the Battle of the Coral Sea. CV-16 earned the Presidential Unit Citation, 11 battle stars, and other awards.

he warmed to his subject. "It is doubtful if it could be worse. It is in the very center of the office spaces. There is no satisfactory place for collection of trash waiting its turn to be burned. All of it has to be carried through the passageways in the vicinity of the departmental offices. The heat from the trash burner when it is operating (which is not often because it is usually broken down) is such as to make the surrounding spaces almost untenable.

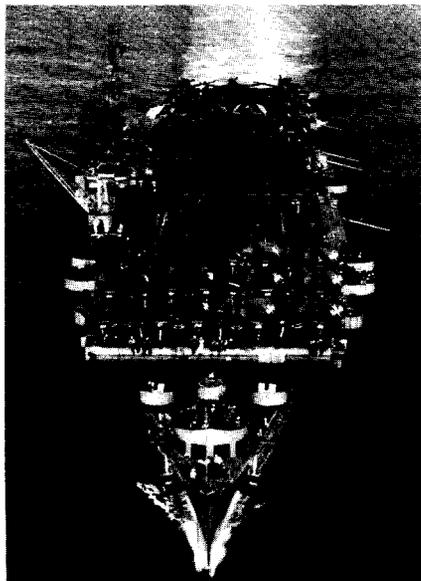
"The design of the trash burner is poor. Its construction is worse. The ship had not been in commission a month before it practically fell apart. The brick work fell down, the door fell off and it suffered other casualties too numerous to mention. It has taken constant attention from the Engineer's force to keep it operating at all and the heat generated in the compartment in which it is located is such that it is physically impossible for men to stay in it for continuous operation."

The trash burner was redesigned.

Lexington was commissioned on February 17, 1943, followed by *Yorktown* on April 15, *Bunker Hill* on May 25, *Intrepid* on August 16, *Wasp* on November 24, and *Hornet* on November 29 that year. In 1944, *Franklin* was commissioned on January 31, *Hancock* on April 15, *Ticonderoga* on May 8, *Bennington* on August 6, and *Randolph* on October 9. The last of the programmed 13 CV-9's, *Boxer*, was commissioned on April 16, 1945.

The lighting system installed in the *Lexington* came under the scrutiny of BUSHIPS. Generally, it was considered inadequate—"in intensity and quality"—in many passageways and compartments, in addition to the running, signal, and anchor lights. A survey of the system produced the following action on the outside lights: the ahead masthead light was relocated to the forward edge of the foretruck (frame 92), the ahead range light was moved forward and shielded from illuminating the deck below, the astern masthead light was moved higher, so as not to interfere with gunnery, and the astern range light was removed.

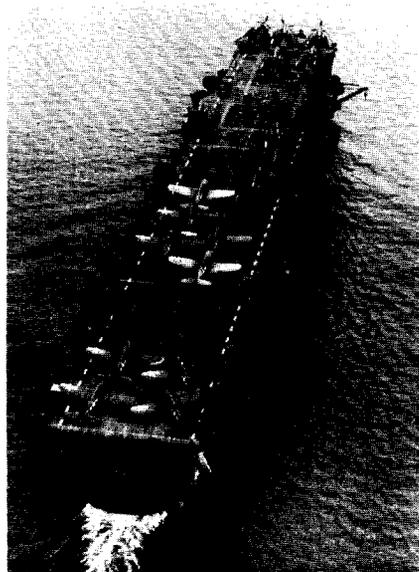
Nineteen more Essex-class ships were ordered or scheduled, starting with ten of them on August 7, 1942. They were *Bon Homme Richard* (CV-31) *Kearsarge* (CV-33), *Oriskany* (CV-34), *Reprisal* (CV-35), *An-*



THE USS COWPENS (CVL-25), was one of nine cruiser-to-aircraft carrier conversions.

tietam (CV-36), *Princeton* (CV-37), *Shangri La* (CV-38), *Lake Champlain* (CV-39), *Tarawa* (CV-40), and *Crown Point* (CV-32)—later renamed *Leyte*. The last three ordered were *Valley Forge* (CV-45), *Iwo Jima* (CV-46), and *Philippine Sea* (CV-47). The keels were laid for *Reprisal* and *Iwo Jima* on July 1, 1944 and January 29, 1945, but both were cancelled on August 11, 1945. Six additional 27,000-tonners, CVs 50 through 55, were canceled on March 27, 1945.

In recap, after WW II erupted and



USS INDEPENDENCE (CVL-22) has SBD's and TBF Avengers on deck in July 1943 in Pacific.

until its successful conclusion by Allied forces, the U.S. Navy ordered 32 aircraft carriers of the CV-9 class, of which the keels of 25 were laid down. A total of 17 were actually commissioned during the war years. The total number of CV-9's commissioned—including those commissioned after the war—was 24.

Several characteristics marked the *Essex* class carriers upon their introduction to the Fleet. The pyramidal island structure, for instance, rose cleanly from the starboard side, topped by a short stack and a light tripod mast. The port elevator was also a distinguishing feature, along with the two inboard elevators. *Ticonderoga*, *Randolph*, *Hancock*, *Bennington* and *Boxer*, as well as hull numbers from CV-31 on, had rounded bows extending beyond the flight deck.

Overall lengths varied within this class; they were either 872 feet long or 888. It is interesting to note that they had a uniform water line length of 820 feet. All were armed with 12 five-inch .38 caliber dual purpose guns, but some had 17 quadruple 40mm anti-aircraft mounts while others had 18. A few also had 20mm AA armament. Generally, there were accommodations aboard each for 360 officers and 3088 enlisted men.

Except for CV-2 and CV-3, *Lexington* and *Saratoga*, the power plants were increased over other aircraft carriers in the Fleet. The machinery was "entirely modern in design and arranged so as to gain the maximum resistance to derangement and battle damage. There are eight control superheat boilers arranged in four fire-rooms. Steam lines are such that the boilers in each fireroom can be connected to one main machinery unit so that the plant can be operated as four separate units." They had four screws.

These carriers had better protecting armor than their predecessors (again excepting *Lex* and *Sara*), better facilities for handling ammunition, safer and greater fueling capacity, and more effective damage control equipment.

THE TACTICAL employment Of U.S. carriers changed as the war progressed. In early operations, through 1942, the doctrine was to operate singly or in pairs, joining together for the offense and separating when on the defense—the theory being that a

separation of carriers under attack not only provided a protective screen for each, but also dispersed the targets and divided the enemy's attack. Combat experience in those early operations did not bear out the theory and new proposals for tactical deployment were the subject of much discussion. As the new *Essex* and *Independence* class carriers became available, these new ideas were put to the test.

The *Independence* class carriers—light carriers, designated CVL's—were products of an effort to increase this country's sea-going air strength in the early days of the war. Nine keels to light cruisers of the Cleveland class were laid down at the New York Shipbuilding Corp. yard at Camden,

name was changed to USS *Langley* and she was given the designation CVL. (Actually, all these cruiser-to-carrier conversions were originally designated CV's when the decision to convert was made; all were redesignated CVL's on the same day.)

The *Newark* (CL-100) had a rougher time of it. On June 2, 1942, she was changed to CV-30; on June 23, her name was changed to *Reprisal*, which she kept for a little over six months. On Jan. 6, 1943, her name was again changed, to *San Jacinto*.

The light carriers displaced 11,000 tons standard. In design, the bridge was box-like in appearance, with a small crane forward. They had four stacks, paired off in twos, on the star-

board side of the island. Task Force 15, which conducted the raid, consisted of *Yorktown* (CV-10), *Essex* (CV-9) and *Independence* (CVL-22), the cruisers *Nashville* and *Mobile*, the battleship *Indiana*, and ten destroyers. Aircraft were launched from the carriers at a point approximately 130 miles north of the island.

On October 5-6, 1943, RAdm. Alfred E. Montgomery led Task Force 14 on a second raid on Wake Island. The task force was comprised of two task groups, operating a total of six aircraft carriers—*Essex*, *Yorktown* (CV-10), *Lexington* (CV-16), *Independence*, *Belleau Wood*, and *Cowpens*—seven cruisers and 24 DD's, the largest carrier task force yet assembled.



FAST CARRIER task forces included both *Essex* and *Independence* class carriers, shown above, and viewed from USS *Lexington* in January 1945.



ON A PHOTO mission, a TBM passes USS *Shangri La* (CV-38), named in honor of the Doolittle raid on Japan and paid in full by War Bonds.

N. J., three of them before the war started. They were to have been the *Amsterdam* (CL-59), *Tallahassee* (CL-61), *New Haven* (CL-76), *Huntington* (CL-77), *Dayton* (CL-78), *Fargo* (CL-85), *Wilmington* (CL-79), *Bufalo* (CL-99), and the *Newark* (CL-100). They eventually became the *Independence*, *Princeton*, *Belleau Wood*, *Cowpens*, *Monterey*, *Langley*, *Cabot*, *Bataan*, and the *San Jacinto*, CVL's 22 through 30, respectively.

Naming and designating these last four sometimes went through a rigorous and confusing metamorphosis. Neither *Cabot* nor *Bataan* encountered any difficulty. The names and designations were reached in June and July 1943 without attending problems. But *Fargo* was named *Crown Point* (CV-27) when the decision was reached to convert her to an aircraft carrier. Then, on July 15, 1943, her

board side, aft of the island. These stacks angled out from the hangar deck and rose vertically above the flight deck level.

As the *Essex* and *Independence* class carriers joined the Fleet in increasing numbers, it was possible to operate several carriers together, on a continuing basis, forming a carrier task group. Tactics changed. Experience taught the wisdom of combined strength. Under attack, the combined anti-aircraft fire of the task group carriers and their screen provided a more effective umbrella of protection against marauding enemy aircraft than was possible when the carriers separated. When two or more of these task groups supported each other, they constituted a fast carrier task force.

The first attempt to operate a multi-carrier group occurred on August 31, 1943, during a raid on the

In the course of the two-day strikes, ship handling techniques for a multi-carrier force, devised by RAdm. Frederick C. Sherman's staff, were tested under combat conditions.

Adm. Chester W. Nimitz, then Commander in Chief, Pacific Fleet, dispatched his congratulations. "The thorough job done on Wake by planes and ships of your task force will have results reaching far beyond the heavy damage inflicted."

The words were prophetic. Lessons learned from operating the carriers as a single group of six, as two groups of three, and three groups of two, provided the basis for many tactics which later characterized carrier task force operations. With the evolution of the fast carrier task force and its successful employment in future operations, the rising sun of the east began slowly to sink in the west.