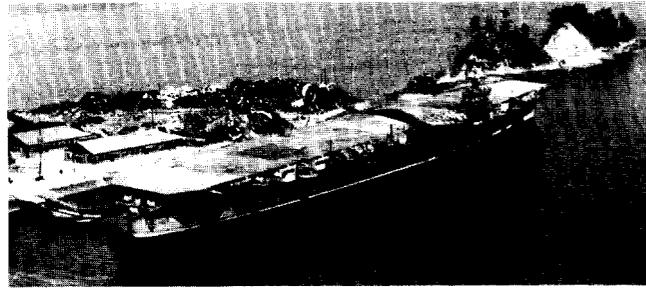


JAPAN'S SECOND aircraft carrier to be named Amagi was of the Unryu class; the first was sunk at Midway. She accommodated 65 planes.



KATSURAGI CAME under attack at Kure, first by planes of TF 58 and then by TF 38. Note the buckled flight deck aft of island structure.

## Evolution of Aircraft Carriers

# THE END OF THE 'BOKUBOKAN' IN WW II

**Japan is beaten, and carrier supremacy defeated her. Carrier supremacy destroyed her army and navy air forces. Carrier supremacy destroyed her fleet. Carrier supremacy gave us bases adjacent to her home islands. . . . Carrier supremacy demolished the island air bases and eliminated the air force which was using them. Carrier supremacy made the island naval bases untenable for such shipping as escaped our subs. Carrier supremacy permitted us to give close, tactical air support to the troops who stormed the island fortresses.**—VAdm. Marc A. Mitscher, USN, quoted in *Naval Aviation News*, October 1945

WHEN JAPAN struck Pearl Harbor on December 7, 1941, she had the strongest aircraft carrier force in the Pacific. This supremacy lasted until June 1942, when the Battle of Midway was fought and won by the U.S. Thereafter, the *bokubokan* ("mother ship for aircraft"), though an effective and dangerous fighter, was an ever weakening force; ships sunk by U.S. planes and submarines were not replaced in sufficient numbers and strength. The study of the Japanese maritime wartime construction is a study of desperation in the face of an inevitable defeat.

At the outbreak of war, Japan had six fine *bokubokan*, the carriers *Akagi*, *Kaga*, *Soryu*, *Hiryu*, *Shokaku* and *Zui-kaku*, in addition to three lighter carriers, the *Zuiho*, *Hosho* and *Ryujo*. The keels were already laid for others and some conversions were being made. At that time, the U.S. had only seven carriers, widely dispersed. At the Battle of Midway, Japan lost *Kaga*, *Akagi*, *Hiryu* and *Soryu*— and never fully recovered from this decisive defeat.

Japan's first wartime constructed carrier was the *Taiho* ("Big Lucky Bird"), a 29,300-ton ship authorized under the 1939 estimates. Built at Kawasaki Dockyard, she was laid down in July 1941, launched in April 1943,

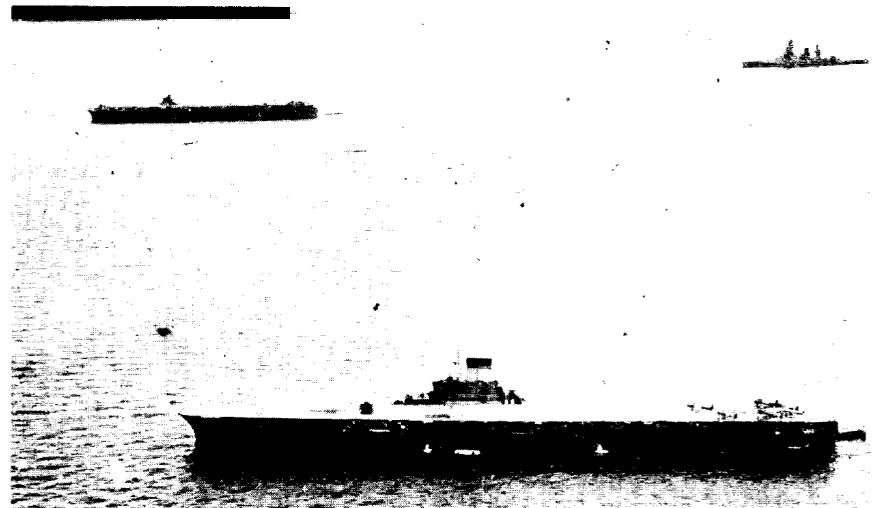
By Scot MacDonald

and delivered in March 1944. She had a cruising range of 10,000 miles at 18 knots, but could reach 33 knots with ease. Kawasaki claims her to have been the most heavily protected flattop in the world at the time of her delivery. And well she might have been; her armor was impressive.

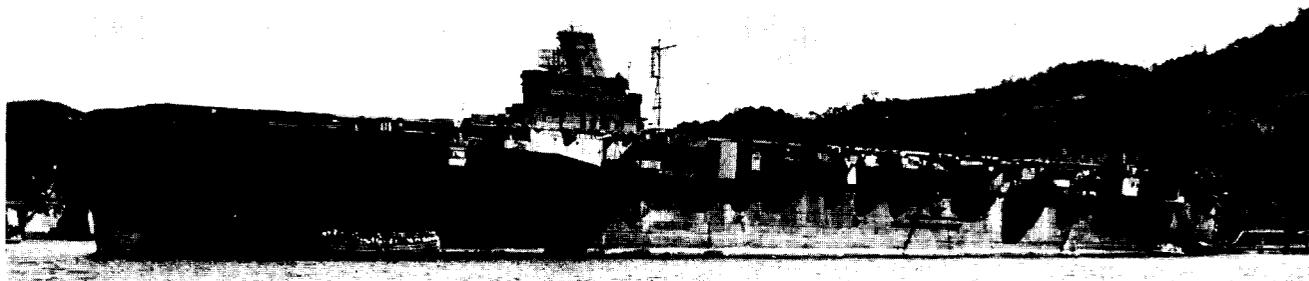
*Taiho* had 3¾ inches of plating on the flight deck between her two ele-

vators, covering a distance of some 164 yards. The platforms on these elevators were two inches thick and weighed 100 tons. Such weight required a low center of gravity for the ship, resulting in a very short distance between the water line and the flight deck, the same height as that of the *Hiryu*, a carrier some 12,000 tons lighter.

In designing and constructing this carrier, the slanting, low smokestacks of her predecessors were abandoned and



CARRIER TAIHO, foreground, accommodated 53 aircraft. She was sunk 180 miles north northwest of Yap 3 months after commissioning. *Shokaku* class carrier in background (1) with BB *Mutsu*.



CONVERTED TRANS-PACIFIC liner, the *Junyo*, was originally the *Kashiwara Maru*, displaced over 24,000 tons standard, had 12 five-inchers and accommodated 53 aircraft. Sister ship, *Hiyo*, was ex-*Izumo Maru*. Both were badly damaged by U.S. subs, *Hiyo* sunk by CVL-24 planes.

she returned to the "stack in island" type, the stack emerging high on the island and inclining outwards at 26°.

*Taiho* was an excellent carrier, but she had a short life: three months. On June 19, 1944, during the Battle of the Philippine Sea, she was hit by a torpedo from the U.S. submarine *Albacore*, damaging gasoline pipes and crippling her bow elevator while it was in the down position. Though her speed and maneuverability were not seriously affected, she did lose the ability to launch aircraft because of the elevator difficulty. Gas fumes spread through the ship. In a few hours she exploded and sank.

Five modifications of the *Taiho* class were ordered in the 1942 program, but none was laid down, owing to shortages and crowded shipyards.

The *Unryu* ("Cloudy Dragon") class was next to enter the scene. This ship was constructed under the 1941 estimates. Seven sister ships were ordered in the 1942 program. Two were never named and never laid down.

*Unryu* was a modification of the *Soryu's*, the plans simplified for quicker construction. She displaced 17,150 tons standard. Sister ships *Katsuragi* and *Aso* were slightly heavier, displacing 17,400 tons, while *Ikoma*, *Kasagi* and *Amagi* were heavier yet, 18,300 tons. They had a speed of 34 knots, except for *Katsuragi* and *Aso* which, because of shortages, were equipped with destroyer type engines and could

only reach a relatively slow 32 knots.

Not one of these ships took an important part in any engagement. Both *Unryu* and *Amagi* were completed in August 1944 and were used for transport duty. Exactly 105 days after her commissioning, *Unryu* was sunk by a torpedo from the submarine *Redfish*. *Amagi* suffered two attacks from U.S. carrier-based aircraft while the ship was at Kure. The second attack, on July 24, 1945, capsized her.

*Katsuragi* also came under attack by U.S. carrier planes four days later, also at Kure. She suffered minor damage because she was protected by camouflage. After the war, she was used for repatriation and was scrapped in 1947.

Neither *Aso*, *Kasagi* nor *Ikoma* was completed by the end of the war. *Aso* was launched November 1, 1944, *Ikoma* on October 17, and *Kasagi* two days later. They were 60% to 80% complete when work on them was halted because of material shortages. *Aso* was used as a target ship for Kamikaze training attacks and did not survive this abuse. *Ikoma* was moored at Shodo Jima where she sustained bomb damage toward the end of the war. She and *Kasagi* were scrapped. Seven more *Unryu* class ships were added to the 1942 program, but they never got beyond the paper work.

The Japanese wartime carrier construction program, though ambitious, was not at all successful. What few successes they did enjoy were short

lived. Since the pressure was on—especially after the Battle of Midway—it was natural that they would turn to quick conversions. In this area, too, the results were discouraging.

The submarine depot ships *Taigei*, *Tsurugisaki*, and *Takasaki* were the first to be converted. They became the *Ryuhō*, *Shohō* and *Zuihō*.

*Ryuhō's* structure was weak when she entered the yard for conversion. While being strengthened and given carrier characteristics, she was hit by several bombs from one of the B-25 bombers led by Jimmy Doolittle and launched from the USS *Hornet*. This, of course, delayed completion. When conversion was completed, she displaced over 15,000 tons standard. She had a speed of 26.5 knots, was armed with eight five-inchers, and accommodated 31 aircraft. *Ryuhō* saw much action, participating in the battles of the Philippine Sea and Leyte Gulf in 1944. In March 1945, she was moored at Kure, bombed by carrier-based U.S. aircraft, and gutted by fires.

*Shohō* and *Zuihō* both displaced over 13,000 tons standard upon completion of conversion. *Zuihō* was completed in December 1940, while *Shohō* was completed nearly two years later. Both had a speed of 28 knots, were armed with eight five-inchers, and accommodated 30 aircraft.

*Shohō's* first battle was her last: she was sunk by carrier-based aircraft of the *Lexington* and *Yorktown* on May 7, 1942, during the Battle of the Coral Sea. *Zuihō* was not much luckier. Her contributions to the Battle of Midway and the Aleutians campaign were negligible. At the Battle of Leyte Gulf, she was sunk by carrier-based aircraft.

The conversions of the *Ise* and *Hyuga* from battleships proved to be one of the most puzzling experiments undertaken by the Japanese after the



IN WAR PAINT here, the light carrier *Ikoma* was laid down at Kawaaki dockyard in 1943 but was never completed. Work on her stopped January 1945. TF 38 planes damaged hull the next July.

Battle of Midway. Their aft turrets were removed and abbreviated flight decks were installed. A large hangar, an elevator, and two catapults were added, permitting the ships to launch all her aircraft in 20 minutes.

The planes scheduled for these ships were sent to Formosa before the ships were completed. The conversions were employed in the Battle of Leyte Gulf. By this time, Japan had run out of aircraft to supply them, and the ships were used solely in their capacity as battleships. They were later sunk, in July 1945, by U.S. carrier-based planes.

Another conversion, that of the *Ibuki* from an improved *Mogami* class cruiser, also had a rough time of it. She was authorized under the 1941 program, but shortly after her launching in May 1943, work on her was halted for six months while authorities haggled with the possibility of reconverting her into a fast oil tanker—much needed by the Japanese navy. The decision made, work renewed, this time at a furious pace. Four of her eight boilers were pulled out and this space used for the storage of fuel oil. A hangar and two elevators were installed, and a bridge was placed on her starboard side. She was capable of 29 knots and could carry 27 aircraft. But work stopped again, this time when the construction of small submarines took priority in the shipyards. She was never finished; at the end of the war the *Ibuki* was scrapped.

The most ambitious conversion and the most disappointing career was that of the *Yamato* class battleship *Shinano*. Laid down as a battleship but not completed when hostilities broke, the possibility of converting her to a carrier was entertained. This possibility became a necessity after the Battle of Midway. Survivors of this battle pointed out serious deficiencies in car-



**THE RYUHO** was officially classified as an aircraft carrier of the *Zuikō* class but characteristics differed considerably. During her conversion, she was damaged by *Hornet*-based B-25 bombers.

rier construction and designers at the Naval Technical Bureau listened well. Heavier armored flight decks were needed to protect them from dive-bombing attacks. Fuel and ammunition stowage spaces needed redesign.

Originally, plans for the conversion of the *Shinano* called for her to act as a "hotel ship," supporting land- or other carrier-based planes; she was not to carry aircraft of her own. This plan was changed and by September 1942 the new design was completed and construction began.

*Shinano*, basically, was to be a CVB. Heavy emphasis was placed on armor. Large bulges below the water line were to minimize torpedo damage. At the water line, an eight-inch thick belt of armor was retained. Four-inch thick armored deck had already been installed before conversion started and this deck became the hangar deck. Rolling metal curtains opened up the forward two-thirds of this deck for night operations and rough seas. The remaining third was closed completely when the curtain was rolled into place. Her flight deck and elevators were designed to withstand 1000-lb. bombs. With this weight, *Shinano* displaced

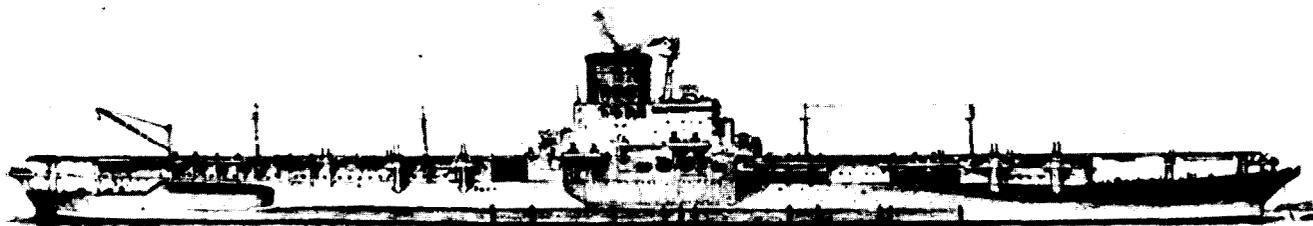
68,000 tons during her trials at sea.

The Battle of Midway also called attention to the ship's ventilation system. All ducts were protected with 1½-inch armor. Wood was eliminated from the ship wherever possible. A fire-resistant paint was introduced, and a bubble fire-extinguishing system was installed.

The carrier was launched on November 11, 1944 and commissioned November 19th. On the 20th, yard workers still aboard, crewed by green hands, she got underway for Kure where the air complement was to board.

It was at this point that USS *Archerfish* picked her out on radar while surfaced. The submarine maneuvered for position and waited until the carrier and her three-destroyer escort crossed her line of fire. *Archerfish* fired six torpedoes; four hit the carrier. Slowly, she flooded and listed; by 1018 the following morning, all hands were ordered to abandon ship. A few minutes later, *Shinano* capsized and sank—with half her crew still aboard.

For many in the Japanese Navy, the powerful *Shinano* was the last hope. With her sinking, Japanese carrier aviation died, never to operate again.



**JAPAN'S MOST** ambitious conversion was the CVB *Shinano* from the hull of a *Yamato* class battleship. Pre-surrender burning of the Imperial

Naval Technical Bureau archives destroyed existing photographs of top secret ship. This 1950 drawing was made by LCdr. Shizuo Fukui, IJN.