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Tazewell County Board

Continuing a Family Tradition of Community Service

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The Story of the World War II Ice Aircraft Carrier

“Behold ye among the heathen, and regard and wonder marvelously: for I will work a work in your days, which ye will not believe, though it be told to you.”

Habakkuk 1:5, the Old Testament prophet

This is the true story of the British Navy’s Project Habbakuk (note the miss-spelling is on the British part, not mine), an answer to the shortage of steel during the war. First introduced in 1942, the center piece of this project was the proposed HMS Habbakuk which would have been the largest Aircraft Carrier ever built. Compared to other British Aircraft Carriers of the time, the HMS Habbakuk would be 62 times larger!

O’, and by the way, did I mention it would be built of ice? Well, not fully a floating ice box, but we will get to that shortly.

Britain was looking for anything that could be used for the war that did not require steel, which was in very short supply. In steps American scientist Geoffrey Pyke. Working for the British Government, he started looking into ship designs that could be used to win the Battle of the Atlantic. The Allied forces were losing a considerable amount of merchant shipping in the Atlantic Ocean, due to German submarine forces and the lack of adequate air cover in the mid-Atlantic. The range of operating aircraft was not sufficient to cover this area and aircraft carriers were in short supply to allow for shorter range flying. Plans for an Allied invasion of Europe were also underway and it was felt that large floating platforms were needed to assist the assault forces.

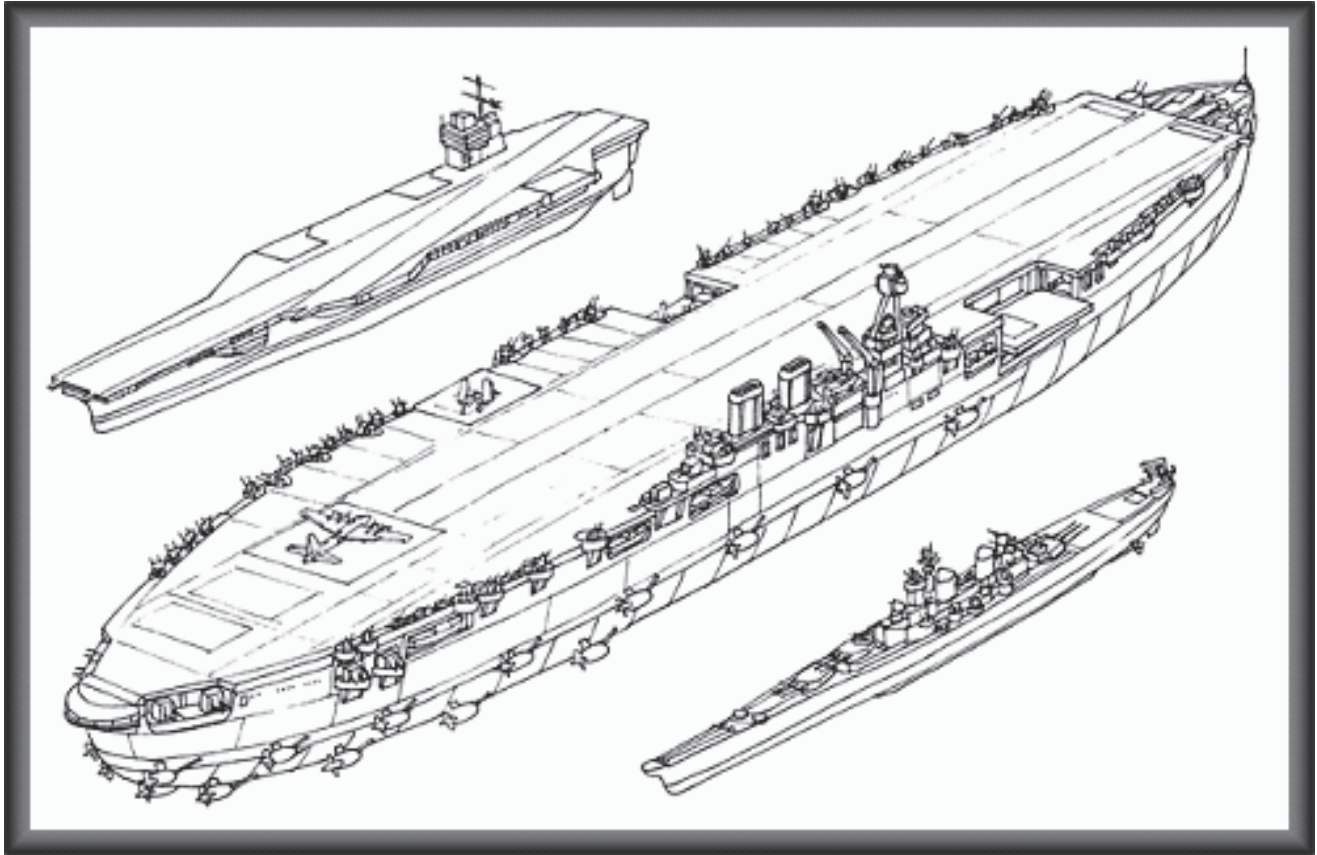
Geoffrey Pyke’s answer was ice. His idea was that because ice was unsinkable, the berg ships would be insulated and impervious to bomb and torpedo attacks. They would be easy to repair as water only had to be poured into holes and frozen, thus making the ship whole. The ships would be cheap to make so that a vast number could be made. One problem had to be overcome. Ice split too easily and Pyke suggested the addition of some kind of building material could solve the problem.

What he found he named “Pykecrete”. Put a mix of water and fourteen percent sawdust in a mold, let it freeze, and you have Pykecrete. It doesn't shatter like ice, it's strong enough to use in building projects, and strangely, it doesn't appear to melt. It would be a perfect answer to the materials supply problems facing Brittan, as both ice and wood were abundant.

With this new material, he drew up plans for the HMS Habbakuk. This gigantic aircraft carrier would be 2,000 feet long, 300 feet across the beam and 200 feet in depth. This floating airfield would have had hangar capacity for 200 Spitfire fighters or 100 Mosquito bombers complete with every facility in the shape of operational and repair shops, etc. It would have been propelled at a speed of seven knots by Diesel-electric machinery with a normal consumption of 120 tons a day. Fuel capacity for 5,000 tons was to be provided, which would have given the ship a radius of action of 7,000 miles. The complement was

to have been 404 officers and 3,216 petty officers and men. Displacement was to be around 2,000,000 tons.

For comparison, the largest British Aircraft Carrier of the time was only 673 feet long, 96 feet across the beam and 29 feet in depth. With the largest British Aircraft Carrier having a displacement of 32,100 tons and aircraft capacity of 60 aircraft, the HMS Habbakuk would have no equal. Here is another way to compare it; the United States nuclear powered Nimitz Class Supercarriers, with an overall length of 1,092 feet and displacements of over 100,000 tons, are currently the largest capital ships in the world but would like toys compared to the HMS Habbakuk.



A possible design for Geoffrey Pyke's iceberg aircraft supercarrier, HMS Habbakuk. To give a sense of scale, shown here next to an Iowa-class battleship (lower right) and a Nimitz-class supercarrier (upper left).

As with any theory, eventually it needs to be proven. First step was showing his work to his supervisor, Lord Mountbatten, the Chief of Command Operations. Whatever he showed Mountbatten impressed the man so much that he showed it to his good friend Winston Churchill - while he was in the bath. Lord Mountbatten walked into the bathroom and dropped a chunk of Pykecrete into Churchill's bath with him. Lord Mountbatten pulled out his pistol and shot the Pykecrete. The bullet did not penetrate the block; rather it ricocheted off the ice. Both men looked at the block of Pykecrete and as time passed, and things probably got a little awkward between them, the Pykecrete didn't melt in the warm bath water. Churchill was sold on the idea and authorized construction of a prototype model. For the best possible results, the ship would need to be built in Canada or Russia, where the ship could be naturally frozen.

In January 1943, Patricia Lake, Canada, was chosen as the test site for building a prototype vessel. The planned vessel was to be 2,000 feet long and the prototype was to be a 1:10 scale model of this. In actual fact, the beam was to approximately this scale, but the length was only 60 feet, about a third of scale. Patricia Lake was chosen for this work on account of having rail connections at Jasper and being a suitably cold, remote area that already had military training involvement in the area as camouflage. The first experiments had used natural lake ice, in a Canadian winter. The model ship was to use plain ice, but partly natural and partly refrigerated. Construction proceeded through March 1943 by building a wooden cabin on the frozen lake, installing refrigeration equipment and a nest of 6 inch cold air ducts, and then increasing the height of the ice wall around the cabin.

In an effort to gain American support and continue the work, at the Quebec Conference of 1943 Lord Mountbatten brought a block of Pykecrete along to demonstrate its potential to the admirals and generals who had come along with Winston Churchill and Franklin D. Roosevelt. Mountbatten entered the project meeting with two blocks and placed them on the ground. One was a normal ice block and the other was Pykecrete. He then drew his service pistol and shot at the first block. It shattered and splintered. Next, he fired at the Pykecrete to give an idea of the resistance of that kind of ice to projectiles. The bullet ricocheted off the block, grazing the trouser leg of the American Chief of Naval Operations, Admiral Ernest King, and ended up in the wall. Despite this second successful shooting test, the American leadership didn't buy into it.

As the project proceeded, it became more and more clear that ships of the size they wanted would take too long to make and would not be available soon enough. Plus the cost became too high with a price tag of 10 million pounds. In December of 1943, the project was officially closed. Sadly, Geoffrey Pyke did not find success adjusting after the war. After dealing with sharp criticism over the post war years about his proposed aircraft carrier, in the evening of Saturday, February 21st, 1948, Pyke consumed a bottleful of sleeping pills. His landlady found his body the following Monday morning. The coroner gave a verdict of suicide at a moment of mental unbalance.

As for his prototype built on Patricia Lake, it was abandoned in June of 1943 and last another three summers with no maintenance floating on the lake. Finally it broke up and sank. In the 1970's remains of the model were found and studied. Another diving expedition to the site in 1985 found the remains of the model on a steep slope just off-shore, at a depth between 85 and 140 feet. Although the refrigeration equipment was removed before sinking, there remain the wooden walls of the hull, an "incredible jumble" of cold air ductwork and also a great quantity of the bitumen used as part of the insulation. As of June, 2011, large sections of the hull and one side of the wooden wall could still be found.

So what are we to make of this? World War II produced many unusual prototypes and ideas beyond this one. When you stand back and just look at the facts, the project was somewhat a success. The actual building materials (ice and wood pulp) were readily available to Brittan. In the end though, the amount of steel needed to build the facilities needed to build the ship would have been much than if they would just build several conventional aircraft carriers. The cost was also unrealistic. In the end, time may yet provide a need for "Pykecrete". While we laugh today at the idea of an ice aircraft carrier, someday we may see this as an important breakthrough that was not appreciated in its own time. As we find all too often, out-of-the-box ideas that are originally given little credibility can and all too often do come back to life and find a need to fulfill.

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