

# RAFT TO ICE BREAKER

## 1. Introduction

From the earliest times the seas have held a fatal fascination for some men. Born with a driving urge to look over the horizon, they have set out in tiny wooden ships to cross the oceans in search of new worlds. Trade followed and fortunes were made by bringing home gold, spices, and precious stones.

This exhibit depicts the evolution of ice breakers from rafts. The raft was a framework of logs which later became a canoe. The idea of sails added speed to the boat. Scientific development gave a new look to this field where steam and diesel made voyages successful. Aids in navigation improved as they were very essential for sea routes and safety at sea. Now-a-days exist the nuclear power-driven ships.

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2. Rafts
3. Canoes
4. Viking Longboats
5. Cogs and Caravels
6. Carracks
7. Galleons
8. Clippers
9. Sail to Steam
10. Aids of Navigation - The Essentials
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12. Fishing Vessels
13. Naval Warships
14. Research Vessels
15. Cruise Liners
16. Ice Breakers



Man's creation the magnificent sterncastle of the Swedish ship WASA was wrecked in 1628.

1

## 2. Rafts



Anything that floats can be lashed together to make a raft and serve as a boat. Bamboo, wood logs and reeds have all been used as raw materials, tied together with vines or palm fibers. Early rafts served as fishing platforms, allowed transportation across bodies of water.



Raft propulsion is achieved by pushing with poles, pulling with ropes, or paddling. When floating down rivers, the current does all the work. Later, sails were added to reduce effort going downstream; but rafts have no keel or shape to keep them moving in a straight line, so steering is always difficult.



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## 3. Canoes

In ancient maritime history, the first boats are presumed to have been dugout canoes, developed independently by various stone age populations, and used for coastal fishing and travel. A dugout canoe is a boat made from a hollowed tree trunk.



Canoes were used for carrying goods, hunters, fishermen, and warriors. The craft varied in length from about 15 feet—20 feet.



The later model of a canoe is a flat-bottomed narrow canoe having flaring sides. The "sturgeon nose" type of canoe is canvas covered with a "ram" below the waterline.



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## 4. Viking longboats

The Ancient Egyptians had knowledge of sail construction. This is governed by the science of aerodynamics most probably the first sailing boat.



Predynastic Pretyrolyphs Egypt (6000 - 3000 BCE)



Viking boats came in many shapes and sizes, the most iconic and effective Viking vessel was undoubtedly the longship. Long, narrow and flat, longships were fast, durable and capable of navigating both choppy seas and shallow rivers. They were also light enough to be carried over land.



Typically equipped with rowing positions along their entire length, longships also utilised one big square sail, woven from wool. Steering came courtesy of a single steering oar at the back of the ship. Their symmetrical bow and stern design allowed longships to swiftly reverse without having to turn around. This was particularly handy when navigating icy conditions.

4

## 5. Cogs and Caravels

The cog was a design which is believed to have evolved from the longship and was in wide use by the 12th century. In the 1300s, larger loads for war, construction, and commerce were handled by Cogs. In the north, the rudder had replaced the side oar for steering.



The caravel was a ship used in the Mediterranean from the 13th century. A typical caravel of the late 15th century may be described as a broad-beamed vessel of 50 or 60 tons burden. Caravels were usually built with a double tower at the stern and a single tower in the bow. Top speed for a caravel was about 8 knots.



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## 6. Carrack

The carrack was the beast of burden of the 16th century, carrying cargo and troops to faraway lands. It rode high in the water with the prominent forecastle giving it a characteristic "U" shape. The forecastle located directly above the stem, with the bowsprit rising from its top made sailing to windward difficult and would disappear in galleons which come next.

Carracks for exploration like the Santa Maria were small.



6

## 7. Galleons

The Galleon differed from older designs primarily by being longer, lower and narrower, with a square tuck stern instead of a round tuck, and by having a snout or head projecting forward from the bows below the level of the forecastle. These changes made the galleons faster and more maneuverable and enabled them to sail considerably closer to the wind.



Galleon, full-rigged sailing ship that was built primarily for war or commerce, and which developed in the 15th and 16th centuries. The name derived from "galley", which had come to be synonymous with "war vessel".



7

## 8. Clippers

A clipper was a type of mid-19th-century merchant sailing vessel, designed for speed. Clippers were generally narrow for their length, small by later 19th century standards, could carry limited bulk freight, and had a large total sail area. They were renowned for their beauty, grace, and speed.



Clipper ships were so named because they were fast sailors, a term derived from "clip", that is getting as much propulsion as possible from the available wind.



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## 9. Sail to Steam

The birth of steam power and their trans-Atlantic voyage was powered by steam technology first practically applied to ships by Robert Fulton. The first successful steamboat was the Clermont, which was built by American inventor Robert Fulton in 1807.



Steamboats were water vessels propelled by steam and started to appear on western rivers in 1807. Robert Fulton built a steamboat and became known as the "Father of Steam Navigation." Steamboats would have an engine that would burn coal to turn water into steam and power the boat.



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## 10. Aids of Navigation - THE ESSENTIALS

The arts of navigation were improving at the same time. The compass was devised at the beginning of the 14th century. An angle-measuring instrument called a sextant, to measure the angle of the stars above the horizon. Accurate charts so the navigator can find the position of the ship in latitude and longitude or about the land or a hazard such as rocks and shallow water called shoals.



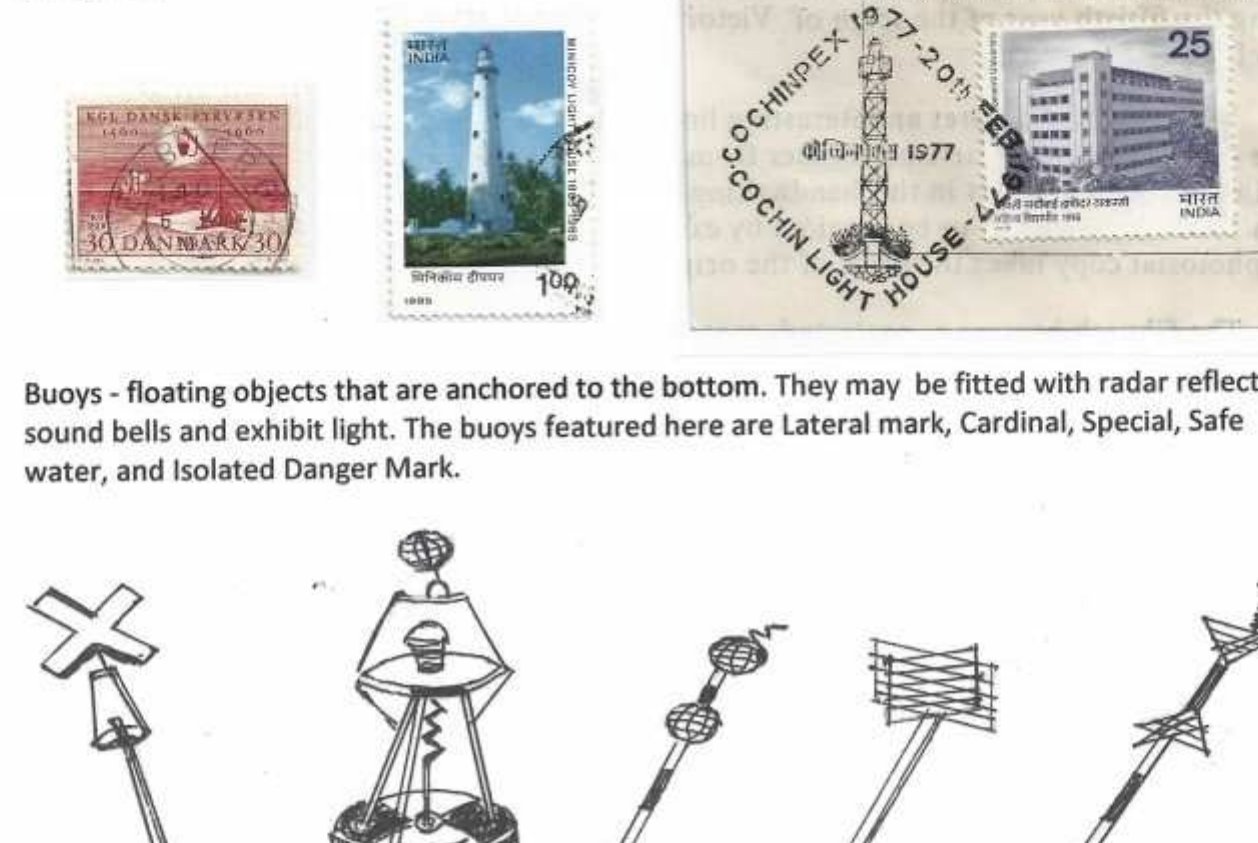
Sailors use telescopes of long-focal length to sight distant ships and landfalls. Nineteenth-century instruments were made with brass draw tubes.



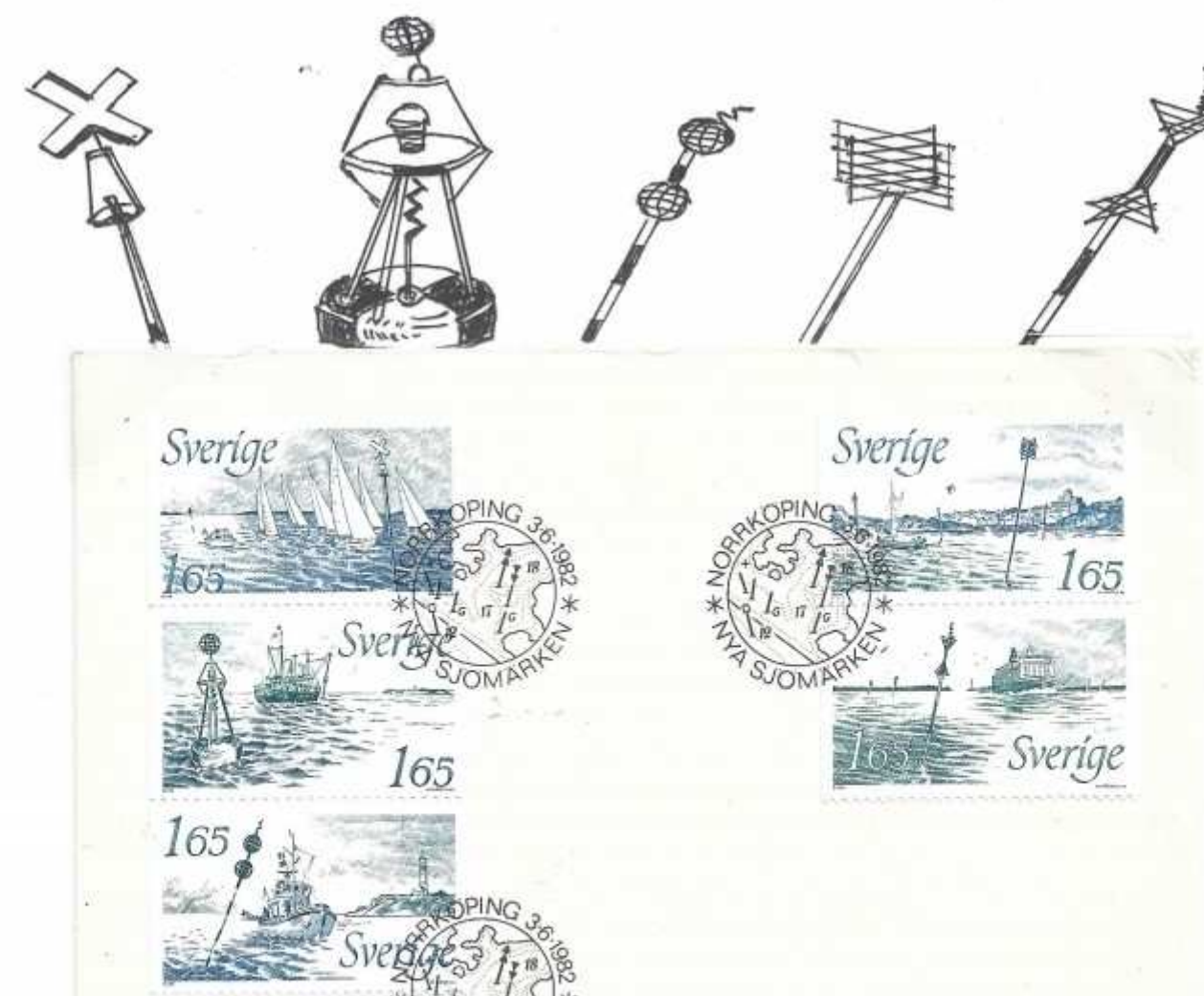
10

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The term "aids to navigation" includes buoys, day beacons, lights, lightships, radio beacons, fog signals, marks and other devices used to provide "street" signs on the water. Beacons - structures that are permanently fixed to the seabed or land such as light houses. Light houses are used to mark channels and fairways, shoals, rocks, wrecks, and other dangers to navigation.



Buoys - floating objects that are anchored to the bottom. They may be fitted with radar reflector, sound bells and exhibit light. The buoys featured here are Lateral mark, Cardinal, Special, Safe water, and Isolated Danger Mark.



11

## 12. Fishing Vessels

Fishing vessels are indispensable to maritime operations. They fulfil a vital need for reconciling demand with supply in the fisheries sector so much so that in their absence, a quite simple yet equally essential activity would come to a standstill.



As is in any domain, even in the aspect of fishing boats, various evolutionary methodologies have come to be adopted over the course of time. Presently there are numerous types of fishing vessels that are in operation in the maritime industry, each with a purposeful quality unique to its own. Deep-sea fishing is an arduous task because to catch the desired sort of fish one must face the complexity and uncertainties of oceans. The trawler, the modern fishing vessel, was developed in the 19th century.



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## 13. Naval Warships

Warships protect the movement over water of military forces to coastal areas where they may be used against the enemy. The first destroyers were essentially coastal craft, their larger successors could accompany battle fleets to sea. It soon became apparent that a destroyer was in effect a superior sort of torpedo boat, capable of delivering its weapon against capital ships. By World War II the aircraft carrier - a ship capable of launching, recovering, and storing aircraft, could themselves destroy ships. Some of these roles can be combined into a single vessel but others require a dedicated vessel.



Modern warships are generally divided into seven main categories, which are: aircraft carriers, cruisers, destroyers, frigates, corvettes, submarines and amphibious assault ships.



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## 14. Research Vessels

A research vessel is a ship or boat designed, modified, or equipped to carry out research at sea. Research vessels carry out several roles. Oceanographic and hydrographic research are quite different from those of fisheries research. Due to the demanding nature of the work, research vessels are often constructed around an icebreaker hull, allowing them to operate in polar waters.



A hydrographic survey ship is a vessel designed to conduct hydrographic research and survey. Nautical charts are produced from this information to ensure safe navigation by military and civilian shipping. The other research ships are Fisheries research, naval research, polar research, oil exploration.



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## 15. Cruise Liners

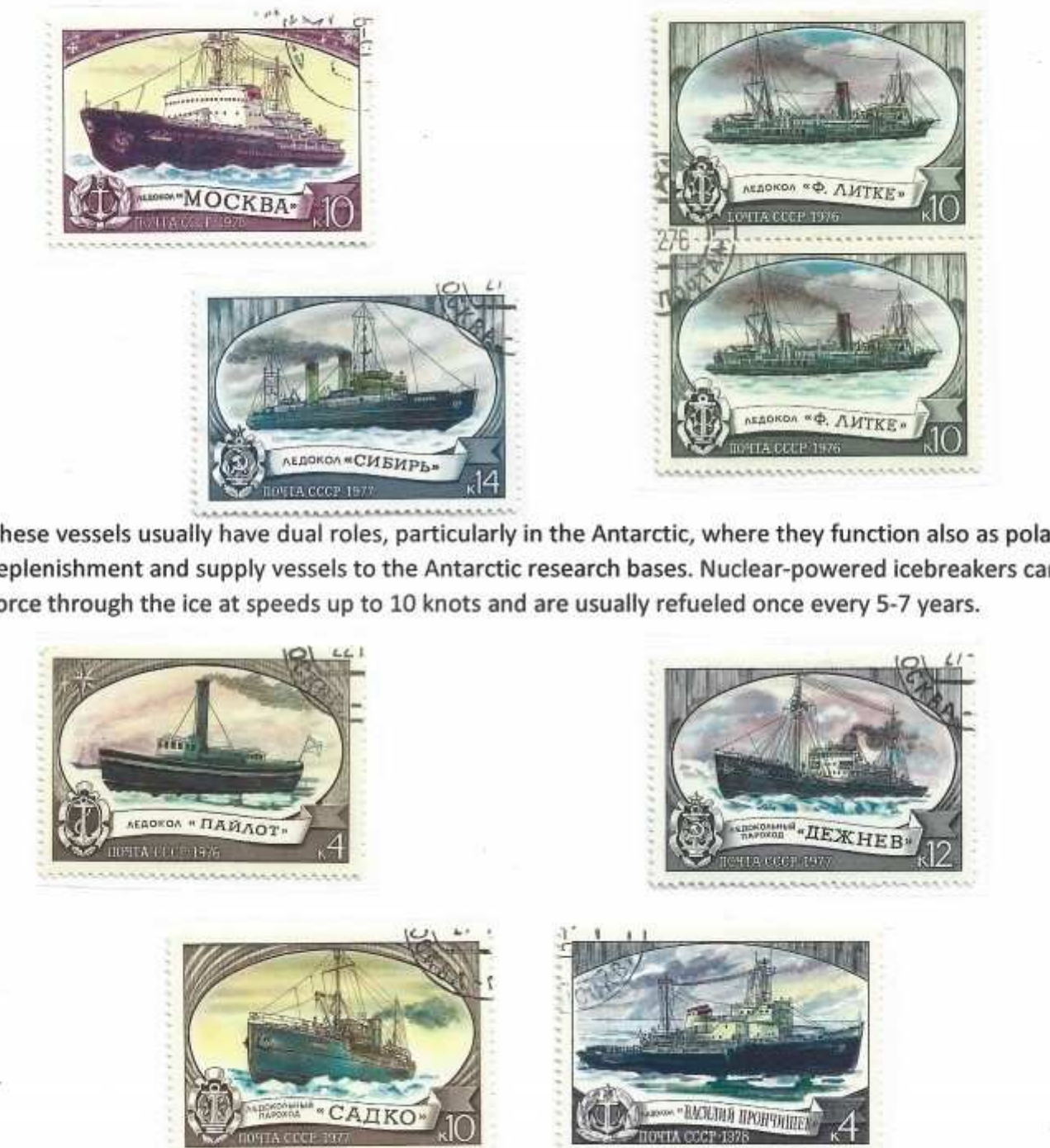
Cruise ships are large passenger ships used mainly for vacationing. Unlike ocean liners, which are used for transport, they typically embark on round-trip voyages to various ports-of-call, where passengers may go on tours known as "shore excursions".



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## 16. Icebreakers

Icebreakers are a special class of ships that are designed to break even thickest of the ice and make some of the most inhospitable paths accessible to the world, navigating through the ice-covered waters, especially in the Polar Regions. The significant features that make the ice-breakers different from other vessels are its strengthened hull to resist ice waters, a specially designed ice-clearing shape to make a path forward and extreme power to navigate through sea ice.



These vessels usually have dual roles, particularly in the Antarctic, where they function also as polar replenishment and supply vessels to the Antarctic research bases. Nuclear-powered icebreakers can force through the ice at speeds up to 10 knots and are usually refueled once every 5-7 years.

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PRINTED MATTER



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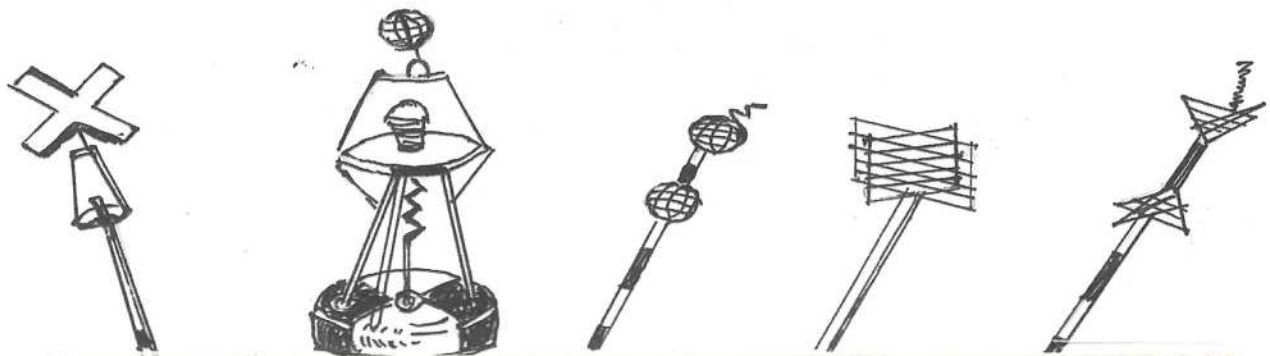


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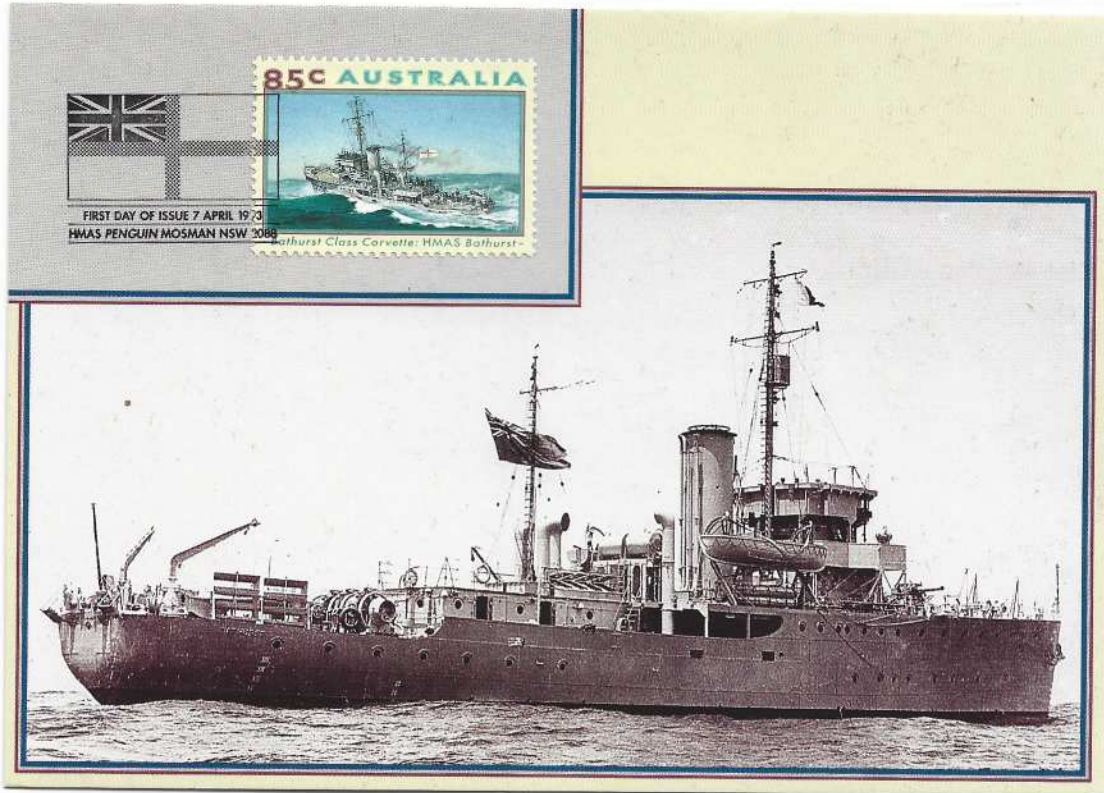


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