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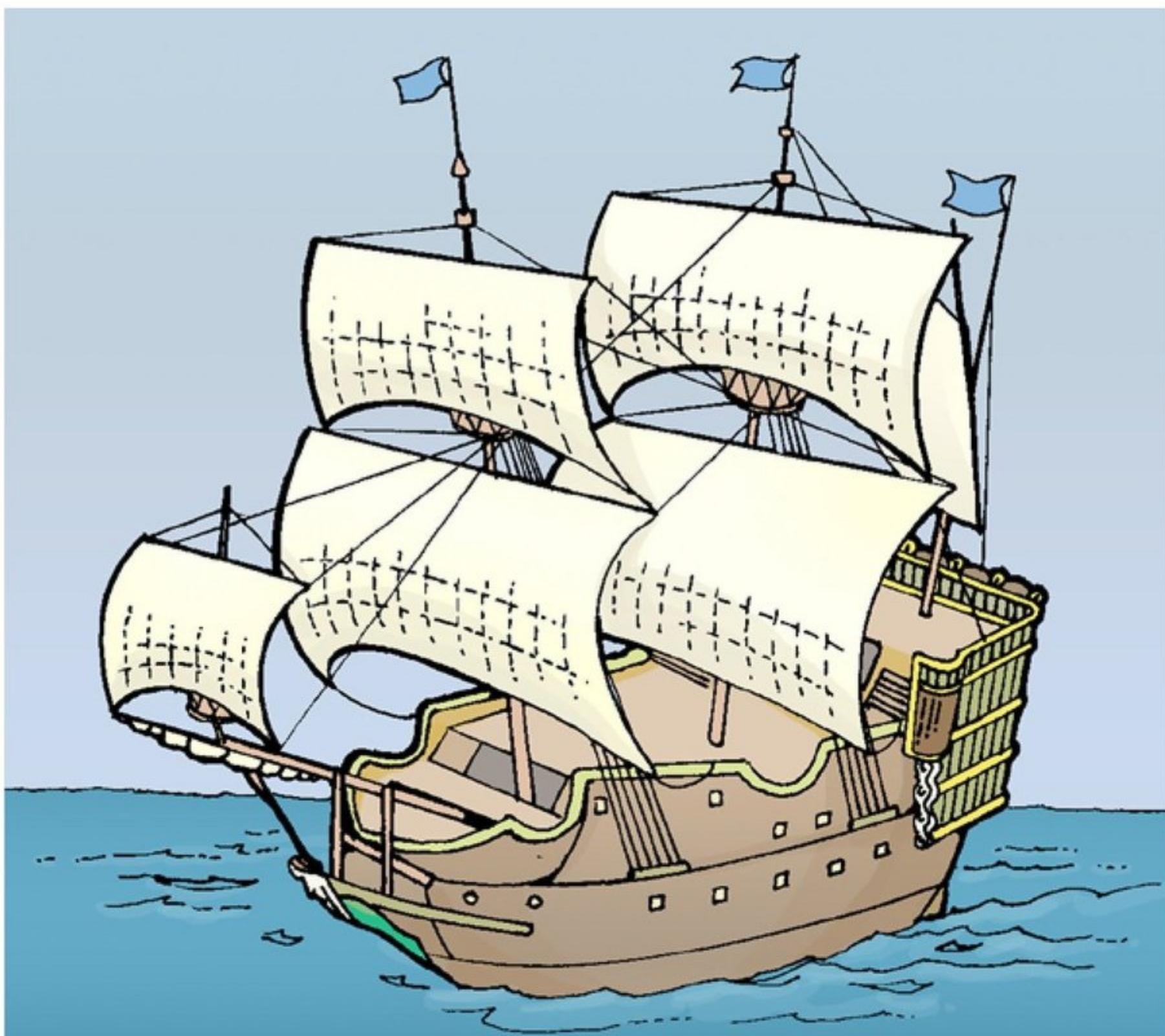
Ships of Discovery



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Written by William Houseman
Illustrated by Cende Hill

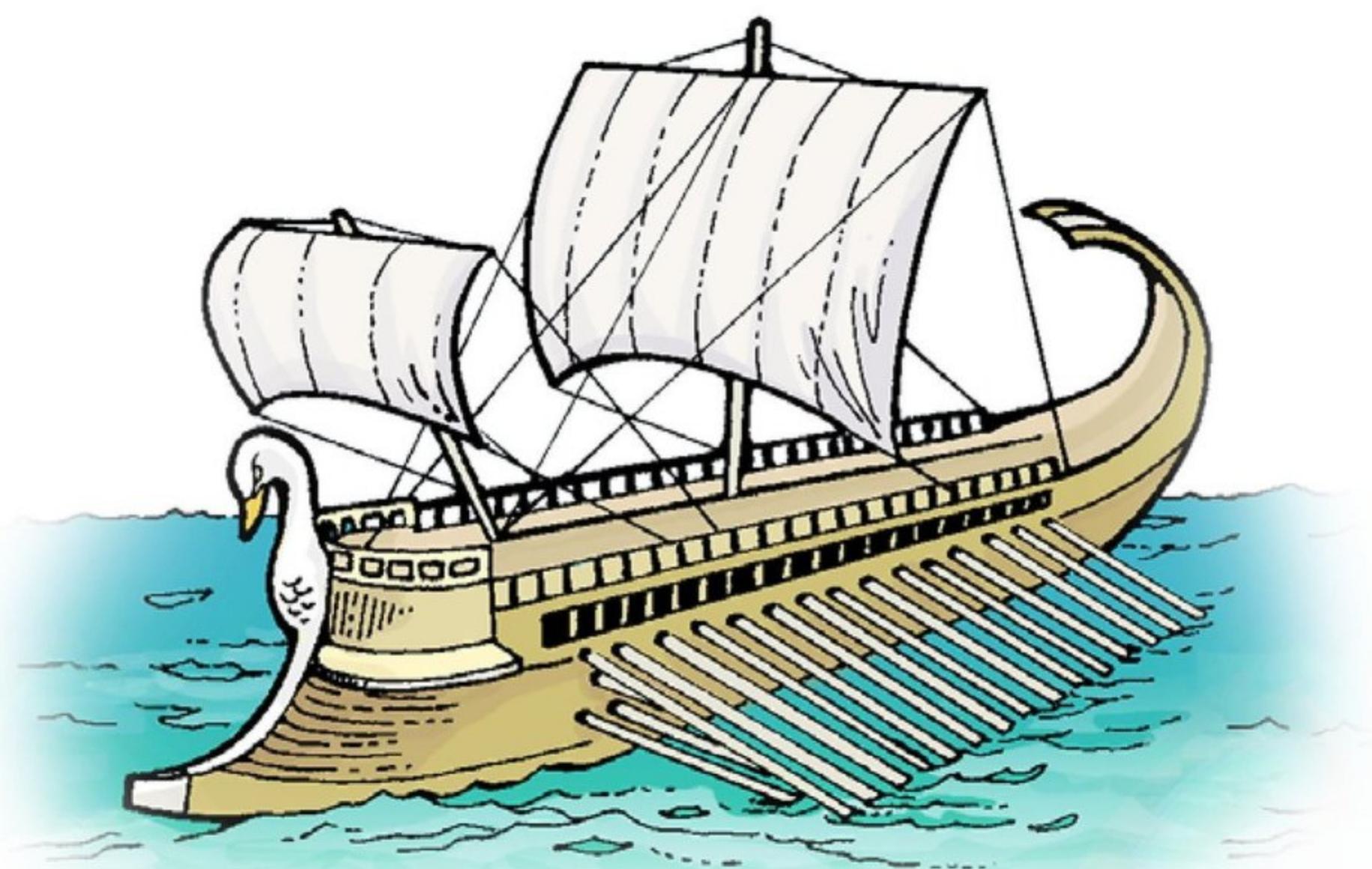
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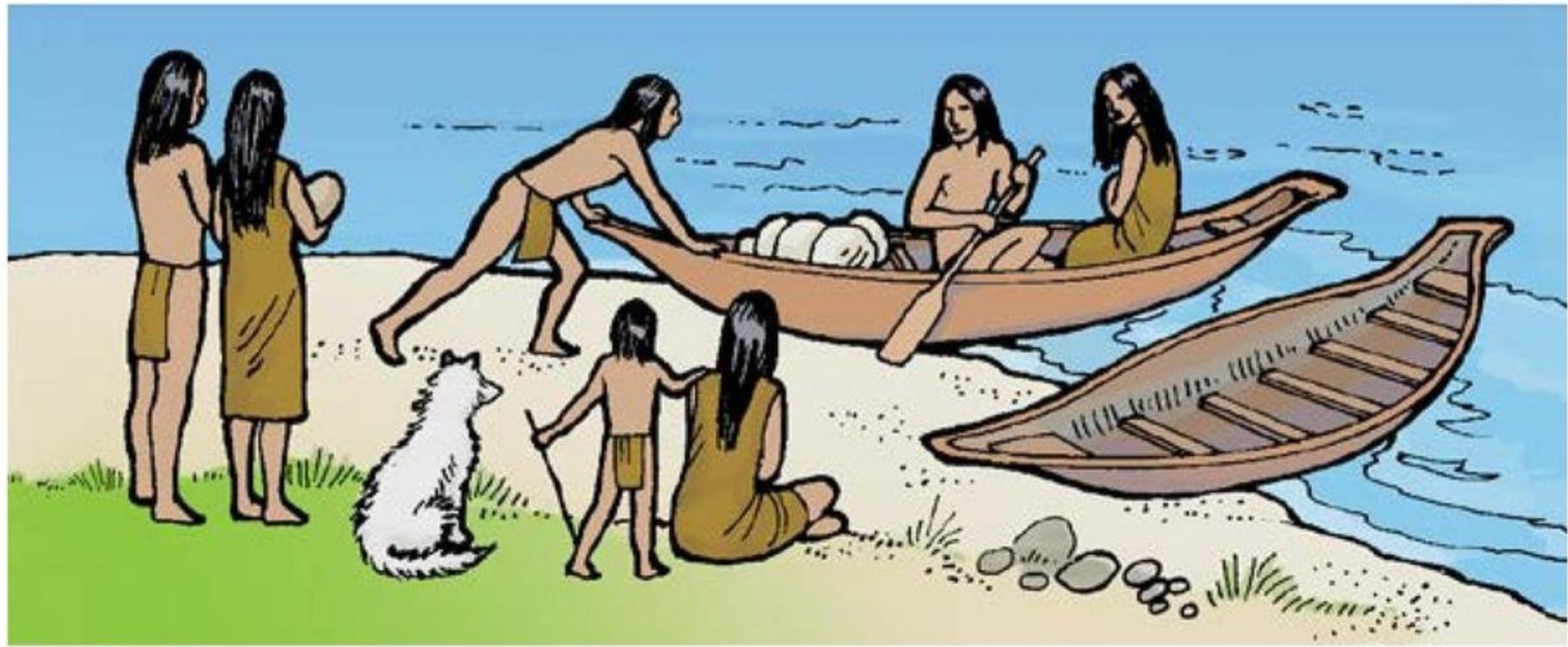


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Introduction

People often settle along rivers, lakes, and seas where they can find fresh water, nutrient-rich soil, and **bountiful** fishing. Long ago, people who lived near large bodies of water were curious about what might lie beyond the horizon. They also wondered if traveling over water might be easier than traveling over land. These thoughts led someone to build the first simple boat.

As boats and ships became larger and faster, people were able to travel farther from home. Advances in technology led to new types of boats that were safer, faster, more comfortable, and carried more cargo. Over time, people found that boats were useful tools for conducting trade or warfare with their neighbors. Let's examine how boats were used to explore the world and how they have changed over time.

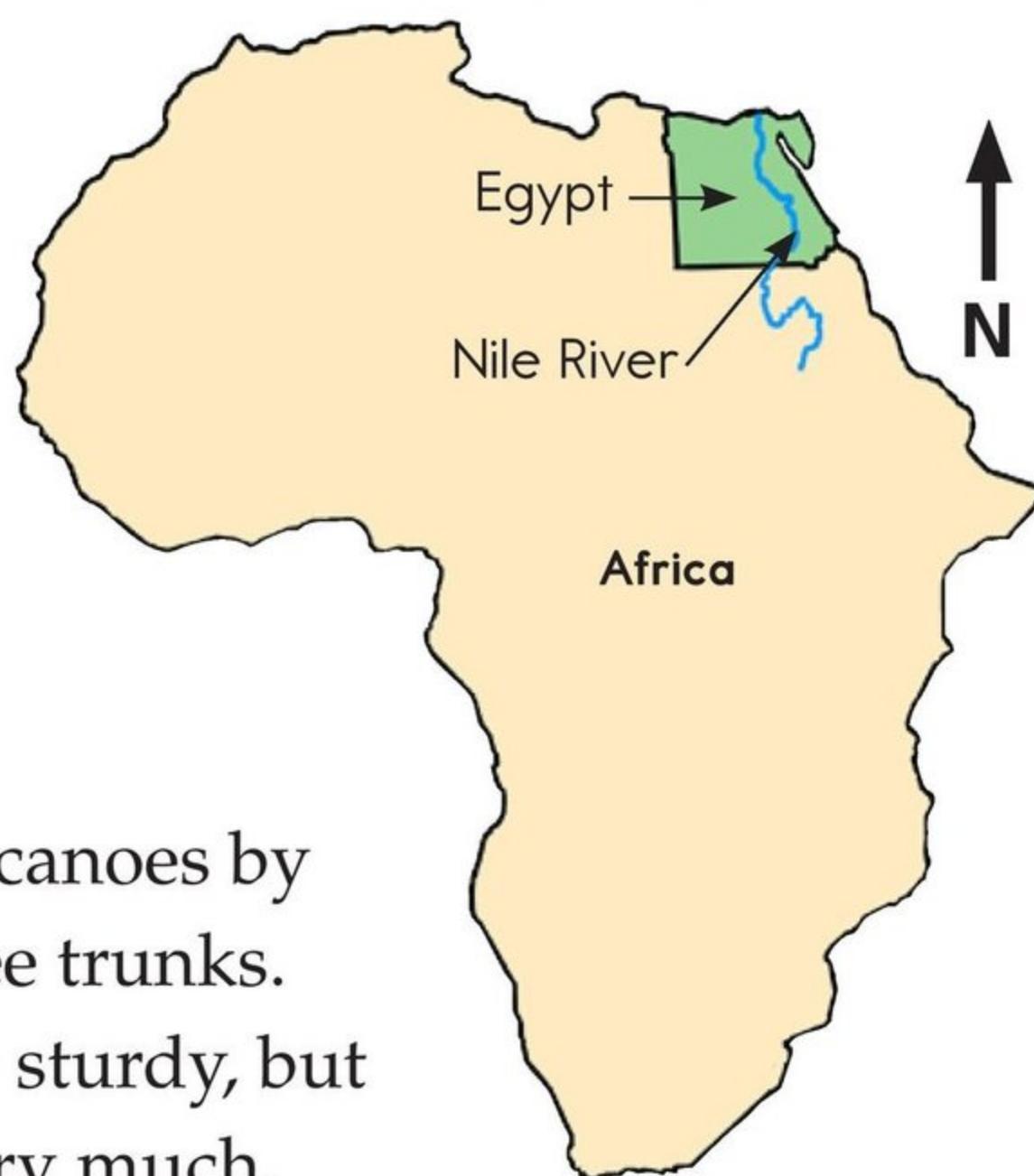
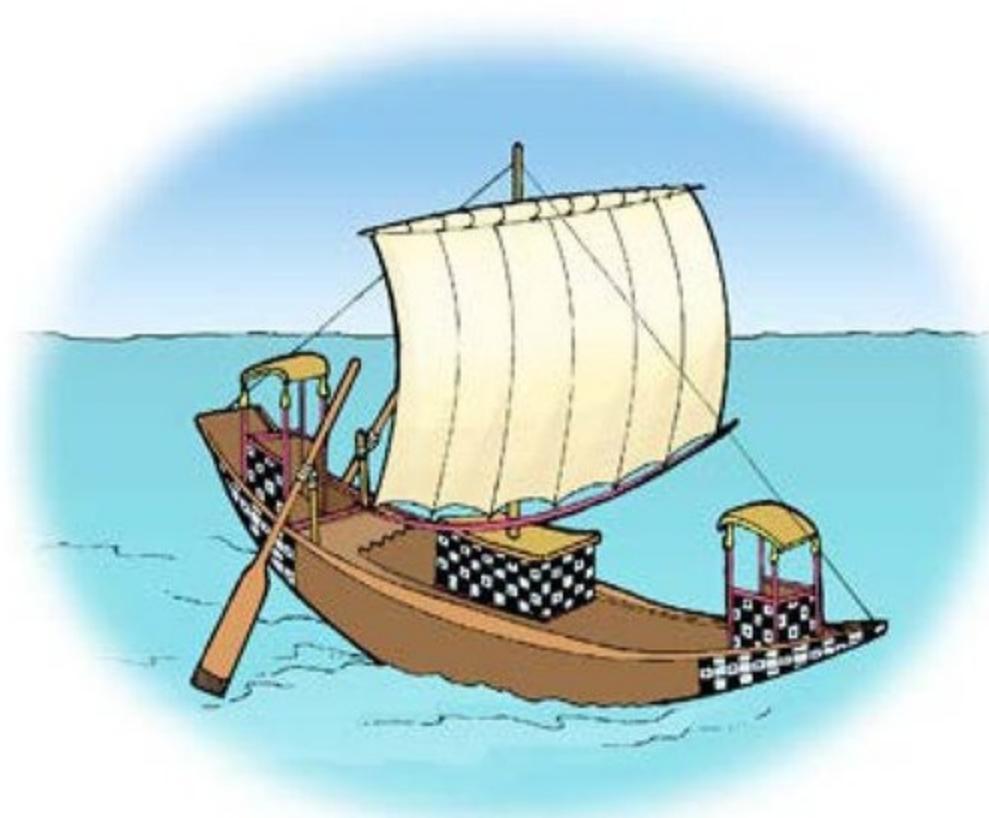
Early Years

The oldest record of sea travel comes from Egypt. People may have been sailing the seas even earlier, but the Egyptians were the first to leave us records of their journeys. More than 6,000 years ago, the Egyptians took to the water and carved images of themselves in stone to record the event. Originally, they built **primitive** boats by carving out the trunks of trees.

But the Egyptians were not the only people to make boats from trees.

Many other cultures that looked for ways to cross the water also carved boats from trees.

Far away, in America, native people were also building dugout canoes by hollowing out tree trunks. These boats were sturdy, but they couldn't carry much.

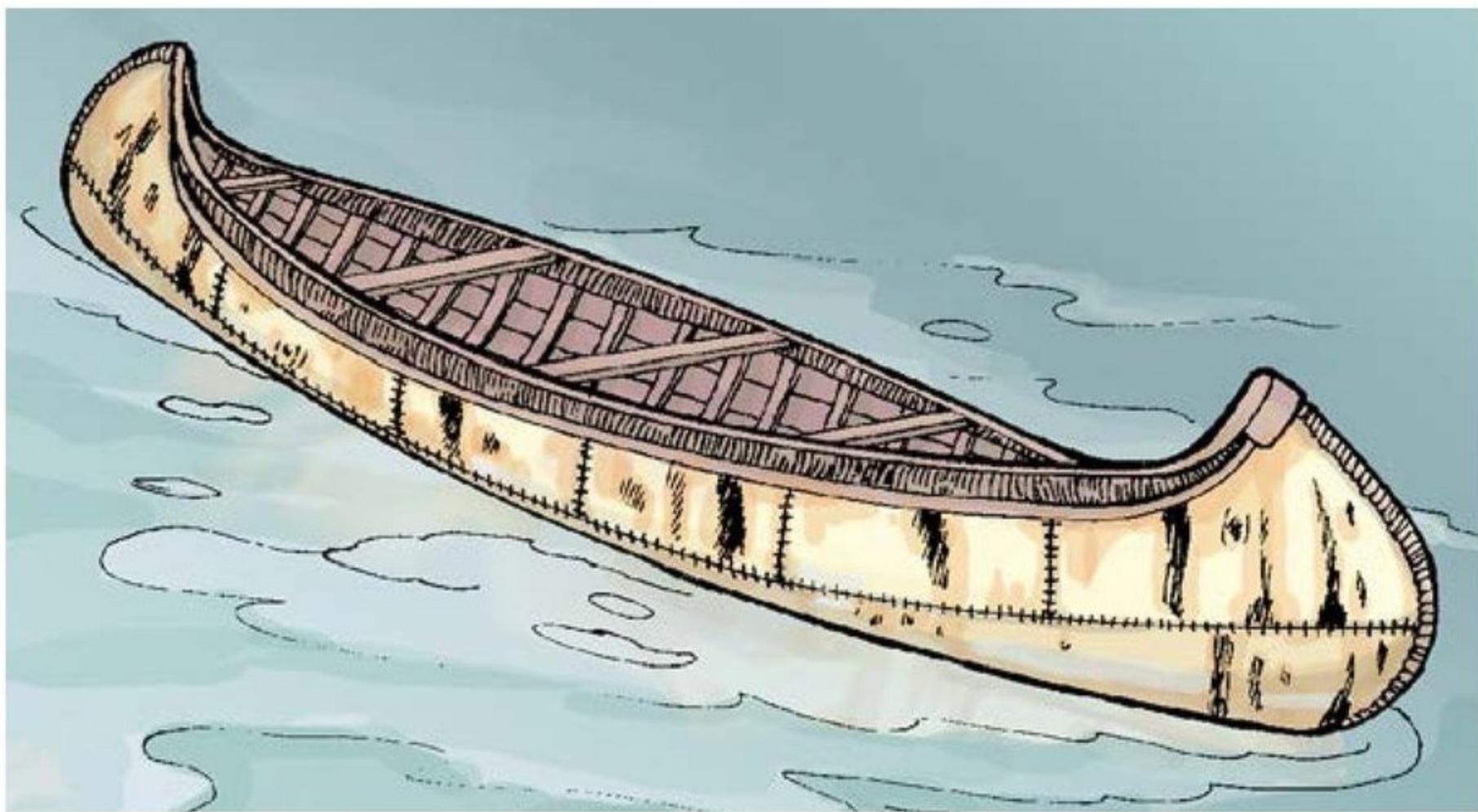


Over time, people wanted to transport larger cargoes over waterways. It became necessary to construct boats that could carry many people for long voyages as well as food, animals, and other items to trade. Canoes carved from a single oak tree and steered with a pole were good enough for crossing a lake or going down a river. However, they didn't work well for transporting bulky objects. Imagine trying to row a narrow canoe across a wide lake with six sheep crammed around you!



Dugout canoe

Humans have always wanted to perfect their inventions. So it was natural that people searched for methods to build bigger, faster, and safer boats. People realized that they needed better boats to explore places far from their homeland.



Birchbark canoe

The next evolution in boat building was the use of wooden beams to make a frame. The frame was then covered with wooden planks or bark from trees. Some cultures even used animal skins stretched over the frame to create a **hull** (the outer shell of a boat). These boats were bigger than earlier designs but were also more streamlined and able to hold more cargo. People also developed paddles and oars to move in deep water, where poles could not reach the bottom.

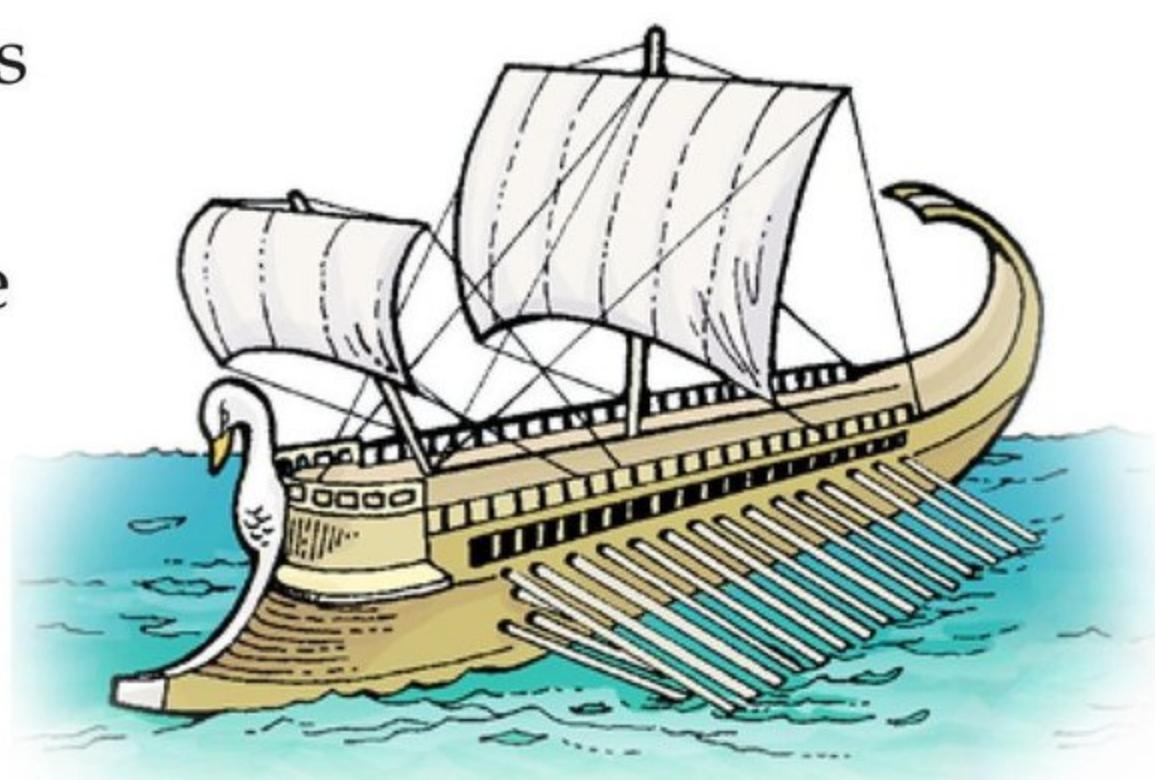
The Egyptians were the first to cover a wooden frame with long, flat pieces of wood to create a hull. Some of their boats measured as long as 21.3 meters (70 ft). The Egyptians were also first to use sails. Sails eliminated or reduced the need for people to row the boats. Some boats used both rowers and sails.

Soon, the Greeks and other peoples around the Mediterranean Sea were building large boats powered by sails. About 3,000 years ago, sailing ships were built with two masts, each one carrying a sail. The addition of a second mast made ships much easier to steer and also made them much faster.

Five hundred years later, the Greeks had developed a ship with four sails. This ship was safe enough to leave the Mediterranean Sea and travel down the west African coast.

Some of the fastest ships at the time were built for battle. They had as many as three levels of rowers on each side. Arranging the rowers above each other on separate **tiers** provided a lot of power in a small amount of space. Greek ships with three tiers of rowers were called **triremes**.

These larger ships allowed people to travel to and explore distant places. During this period, exploration and trade moved beyond the Mediterranean Sea.

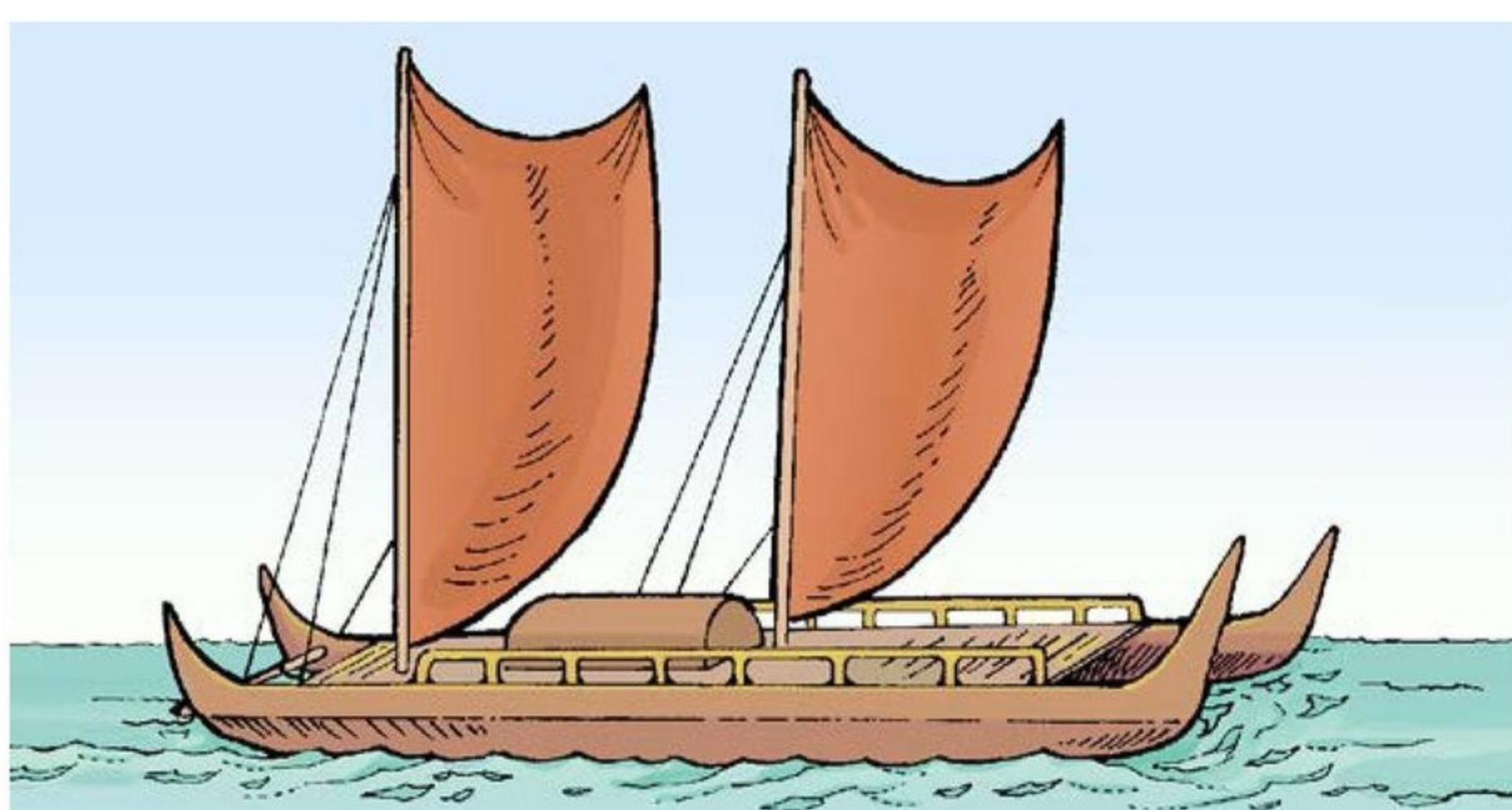


Greek trireme

The Polynesians

In the South Pacific, groups of Pacific Island peoples were building boats that could sail in the open ocean. Over 3,500 years ago, these people were traveling east, well beyond the islands where they lived. They also explored areas off the Asian mainland. More than a thousand years ago, these people made journeys of thousands of miles in open boats.

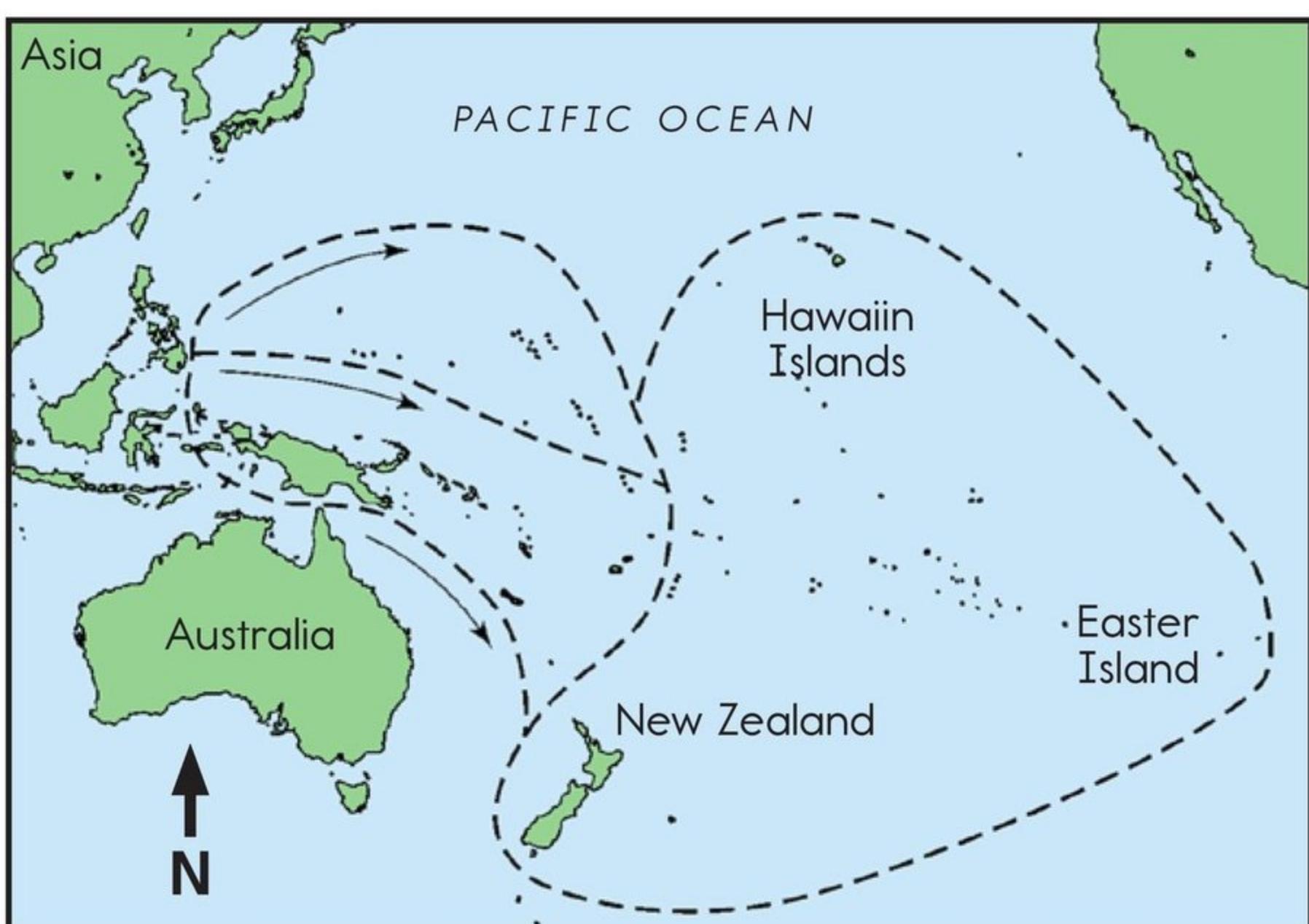
These Polynesian sailors built a boat that was an early version of the modern **catamaran**. They took two canoes and connected them using large wooden poles. A deck was then built to span the poles. These boats usually measured about 15 to 18 meters (50-60 ft) long. The central deck held masts for sails and had enough space for several people and their supplies for a lengthy voyage.



Polynesian catamaran

These early boats provided a safe means of travel from one island to another. The Polynesians settled many new islands they discovered. By the beginning of the year AD 1000, they lived on nearly every island they could find in the Pacific Ocean. Their new homes included Hawaii, New Zealand, and Easter Island.

The Polynesians were accomplished sailors. They became so familiar with the ocean that they could determine their location by the size and shape of the waves. They also knew how to navigate using the stars. They could easily travel great distances by going from island to island. The Polynesians grew to accept sea travel as a way of life.



Routes of Polynesian expansion

The Vikings

More than 1,300 years ago, another group of people in another part of the world began to build larger boats. These people were the Vikings. They lived in the northern part of Europe. The Vikings were well known as warriors and conquerors. The Vikings were used to traveling over water. By the year 700, they were sailing boats that were superior to any others on the ocean.



Viking knarr

The boats they built, called *knarrs* (kuh-NARS), were used primarily for trading. These boats were up to 16.5 meters (54 ft) long and 4.5 meters (15 ft) wide.

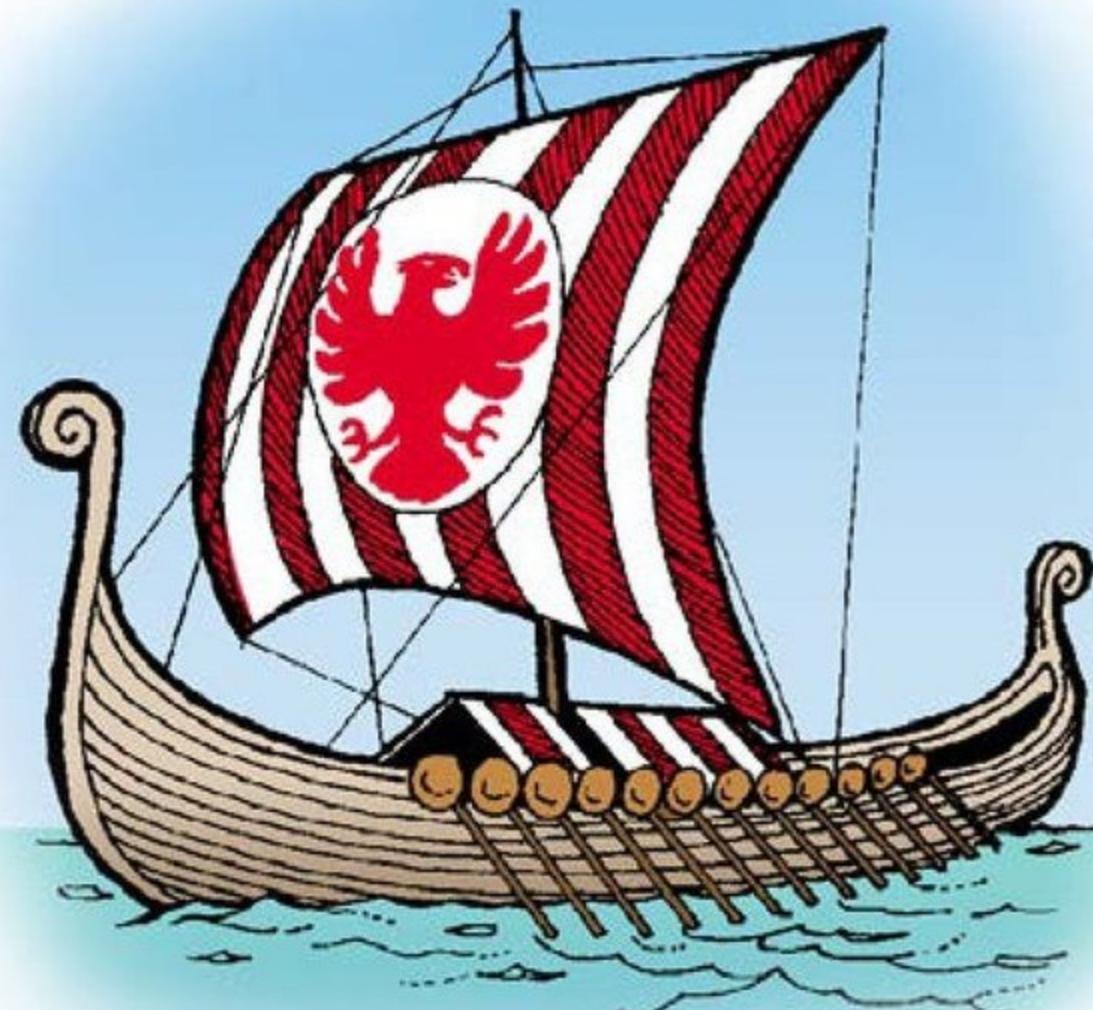
Because they were flat bottomed, the knarr boats could carry heavy loads, and they were wide enough to carry large amounts of cargo. They were also very stable and could travel safely across the open ocean.

At that time, most sailors did not like to lose sight of the coast, but the Vikings were fearless. They used a wooden dial called a sun compass to navigate. Viking explorers were willing to travel into the unknown to claim new lands and seek adventure. They were also the first Europeans to visit North America.

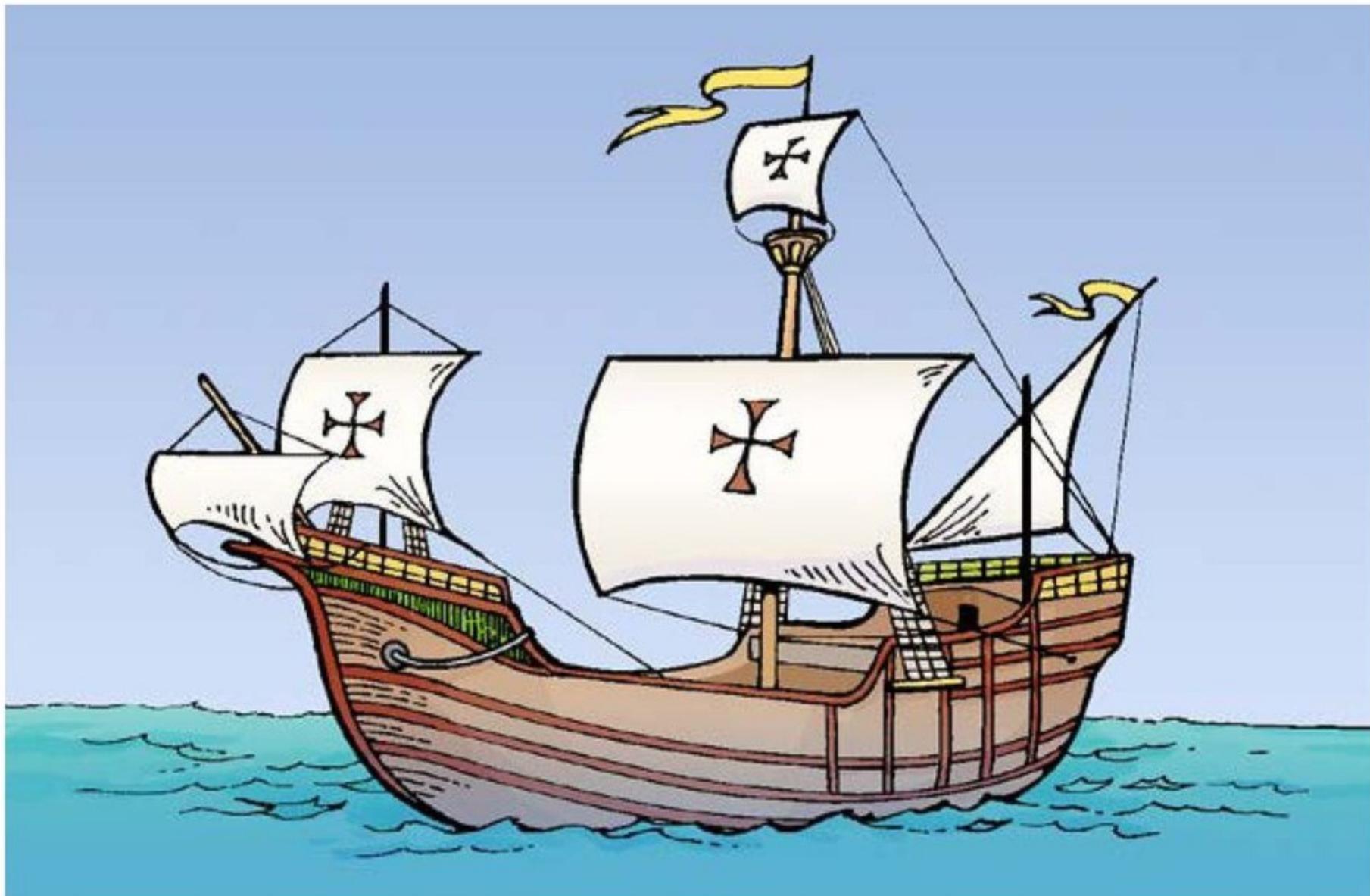
The Vikings also built warships known as longships. Longships looked the same in the front and in the back. Because of the design of their longships, Viking attackers could easily change direction. Longships were able to travel as fast as **15 knots**.

(A knot is a way to measure speed on water. One knot is a little faster than one mile per hour.) Some of the larger longships carried as many as 200 warriors.

The combination of large, speedy, easy-to-handle ships and a fierce fighting spirit made the Vikings tough to defeat. The Vikings ruled the ocean for nearly three centuries.



Viking longship



Caravel

Age of Discovery

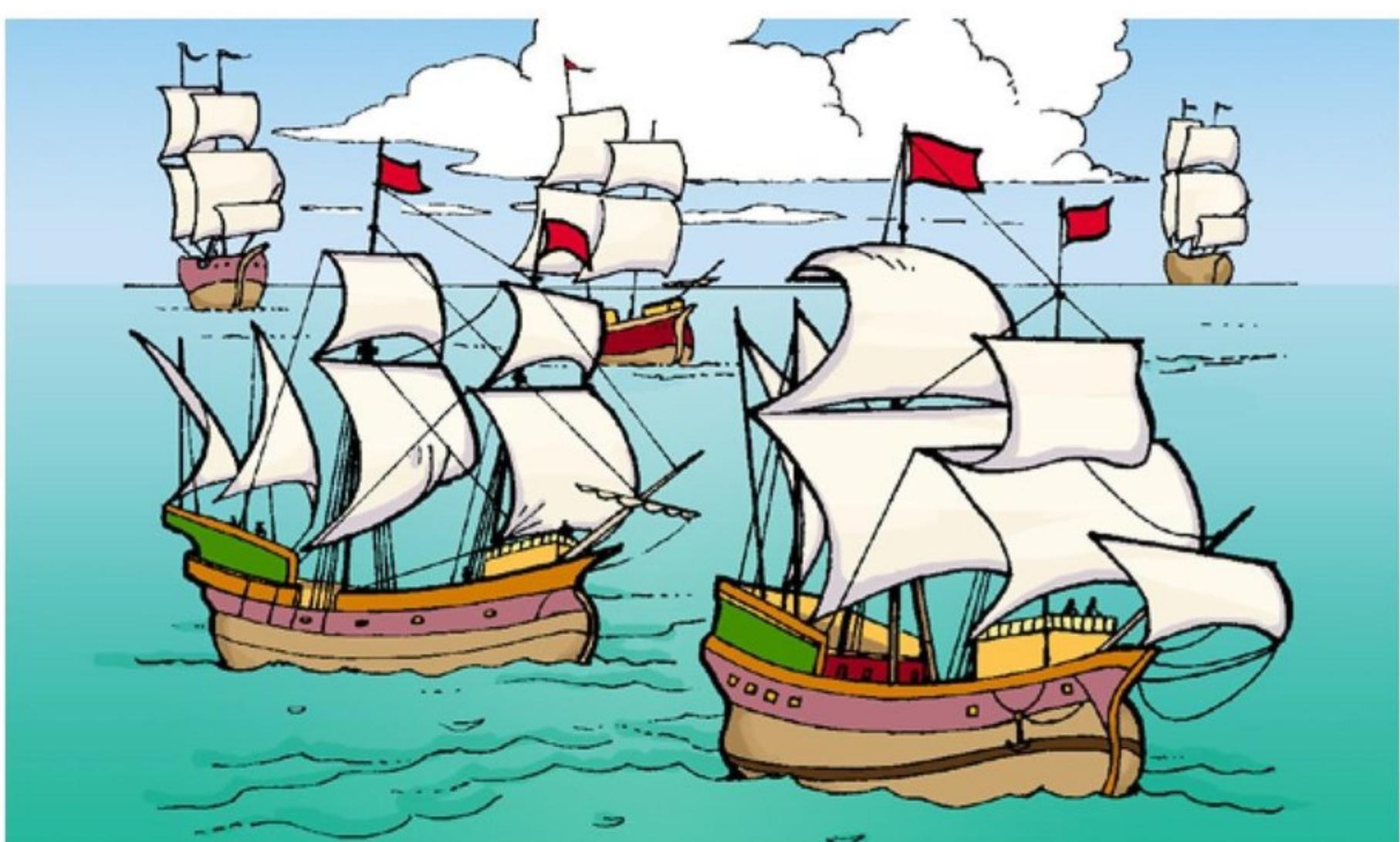
Until the 1400s, most sea explorers remained close to their home waters. But with the coming of the Age of Discovery, things changed dramatically. Every European sailing nation wanted to find new lands. The race was on, and the Americas were the prize.

Shipbuilders searched for ways to build faster and safer ships. In the 1400s and 1500s, Christopher Columbus and other explorers used small, swift, sturdy ships known as **caravels**. These ships had three masts to carry sails. This design made the ships faster and easier to steer. Caravels had square sails on the front and the middle main masts and a triangular-shaped sail on the rear mast.

The *Santa Maria* was the largest of Columbus's ships at 27.4 meters (90 ft) long and 9.1 meters (30 ft) wide. Compared to modern ocean liners and cargo ships, these ships were tiny. They didn't even have rooms where the crew could sleep at night. Sailors just had to lie down on the deck or in the hold.

But even though caravels were small, the explorer Ferdinand Magellan set out to sail five of these ships around the world with a crew of 260 sailors.

Almost three years after they began the trip, they returned. Only one of Magellan's ships and eighteen of the crew made it around the world. Magellan was not one of the survivors. He was killed somewhere in the Philippine Islands.

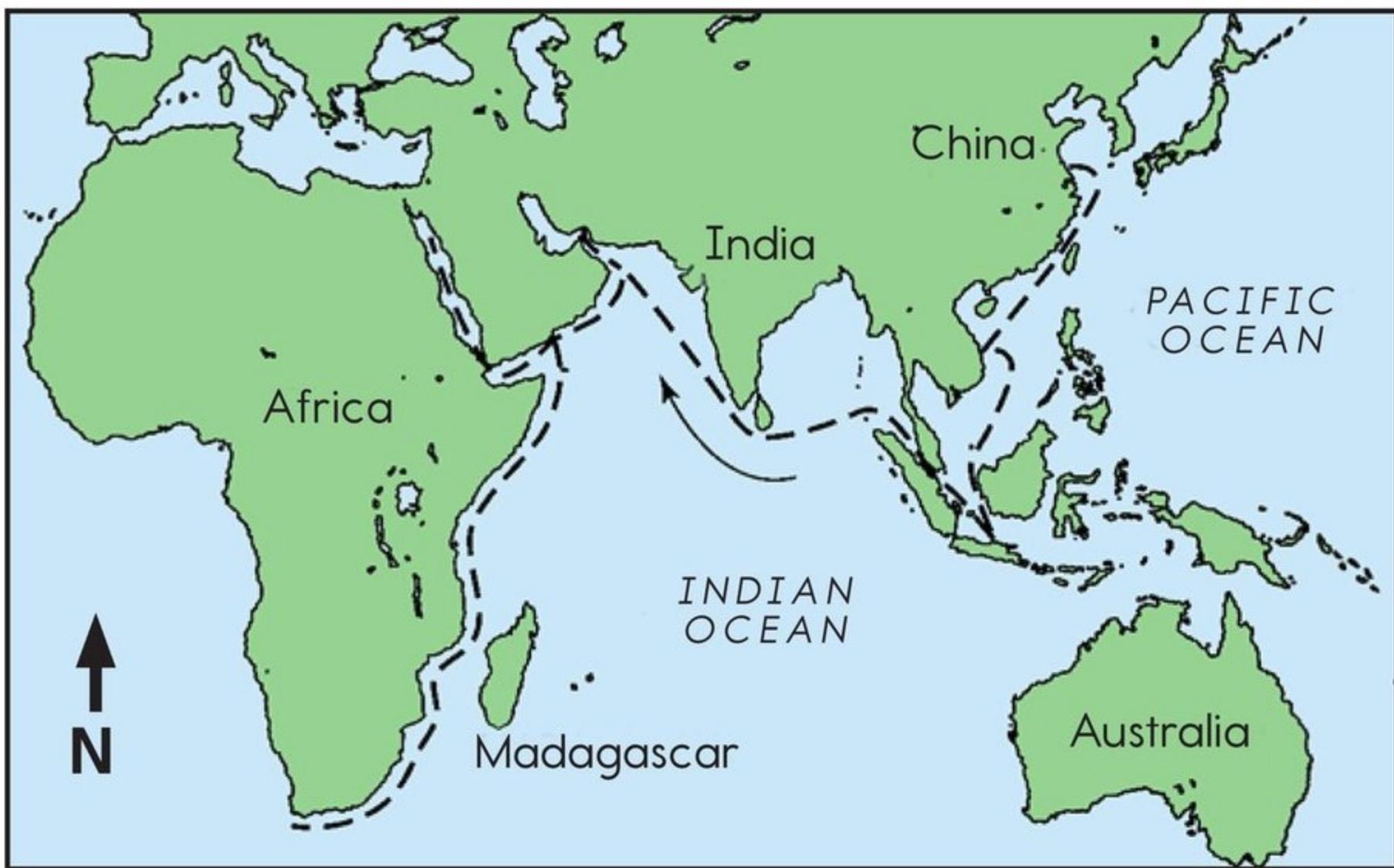


Magellan's ships

The Chinese

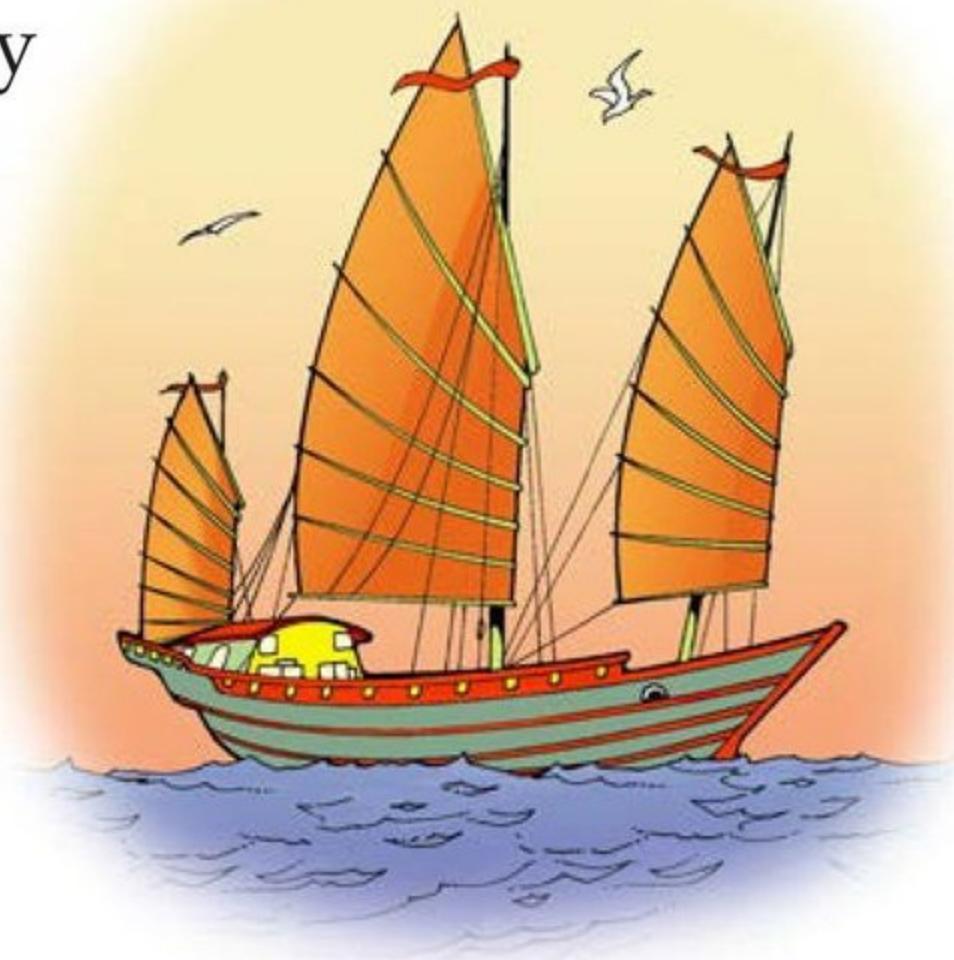
While European explorers were sailing the world, the Chinese had also taken to the sea in another part of the world. By the 1400s, they were skilled sailors. Chinese people had long since invented the magnetic compass. They reinforced their rectangular sails with bamboo, which made them sturdy and easy to furl and unfurl. Sailors could even climb the sails like ladders!

From 1405 to 1443, the most famous Chinese explorer, Zheng He, traveled on seven long voyages with a fleet of sixty-two treasure ships. The Chinese called these ships *junks*. Zheng He's junks were much larger than European ships. His largest ship was so big that it could have held all three of Columbus's ships on its deck. This huge ship was 121 meters (400 ft) long and 45.7 meters (150 ft) wide. But these ships were still small compared to today's modern ships. In addition to the sixty-two main trading ships, more than a hundred smaller support boats were in the fleet. The Chinese sailed all the way to Africa to trade as well as to show the might of the Chinese empire to the rest of the world. Zheng He even carried a giraffe home to the emperor.



Route of Chinese exploration and trading

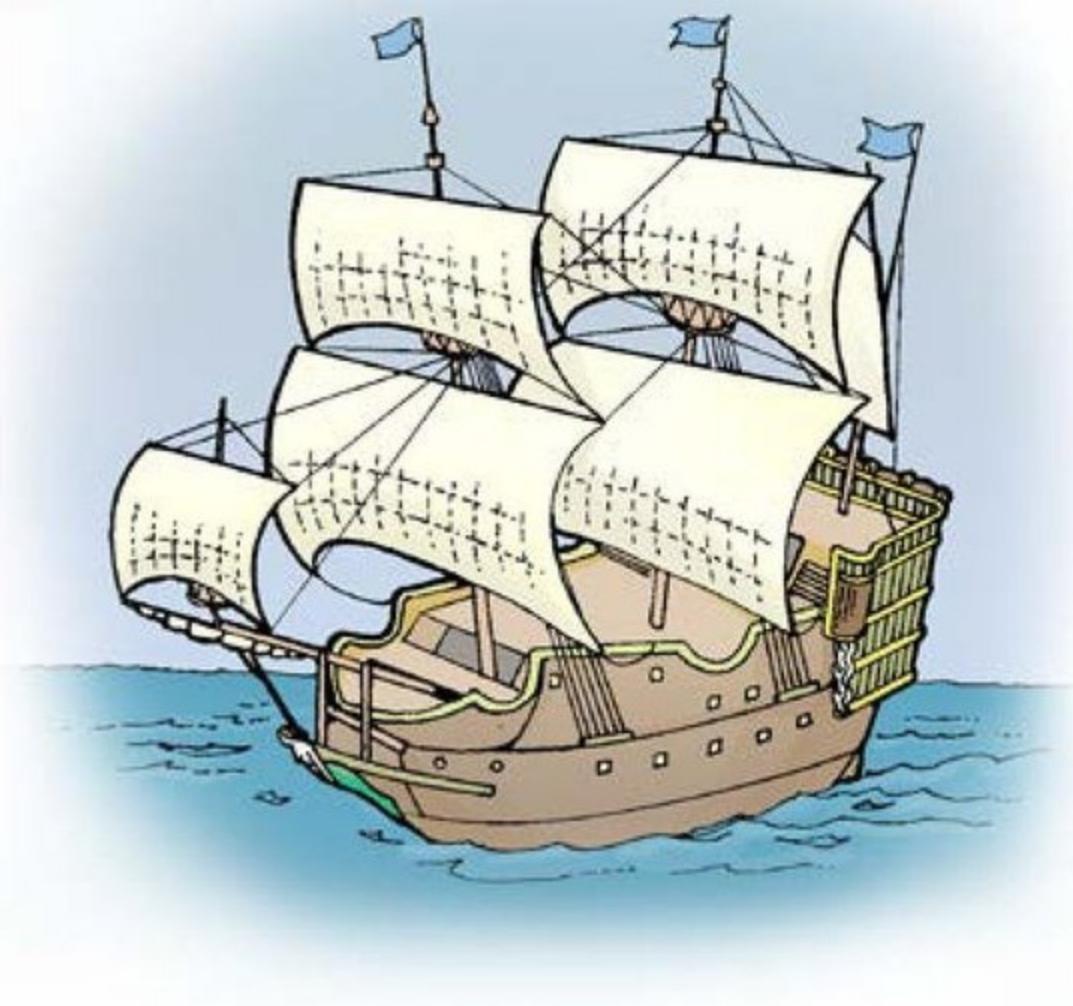
War with their Asian neighbors caused the Chinese to turn their attention away from exploration. The emperor made ocean voyages illegal and had all the treasure ships destroyed. If the Chinese had continued their explorations, we might be studying how the Chinese discovered America. And North and South Americans might be speaking Chinese instead of French, English, Spanish, and Portuguese.



Chinese junk

Later Years

As sea exploration continued, the Spanish led the way. By the 1500s, European shipbuilding had experienced vast improvements. The newest ships, called **galleons**, were larger, faster, and more comfortable. It took two thousand oak trees to build one galleon. These vessels were as long as 42.7 meters (140 ft), but were still small compared to Chinese ships. Many of them had nice, comfortable living quarters, at least for the officers. Galleons served as both trading vessels and warships. Because of their great size, these warships could carry many cannons on board, making them dangerous in battle.

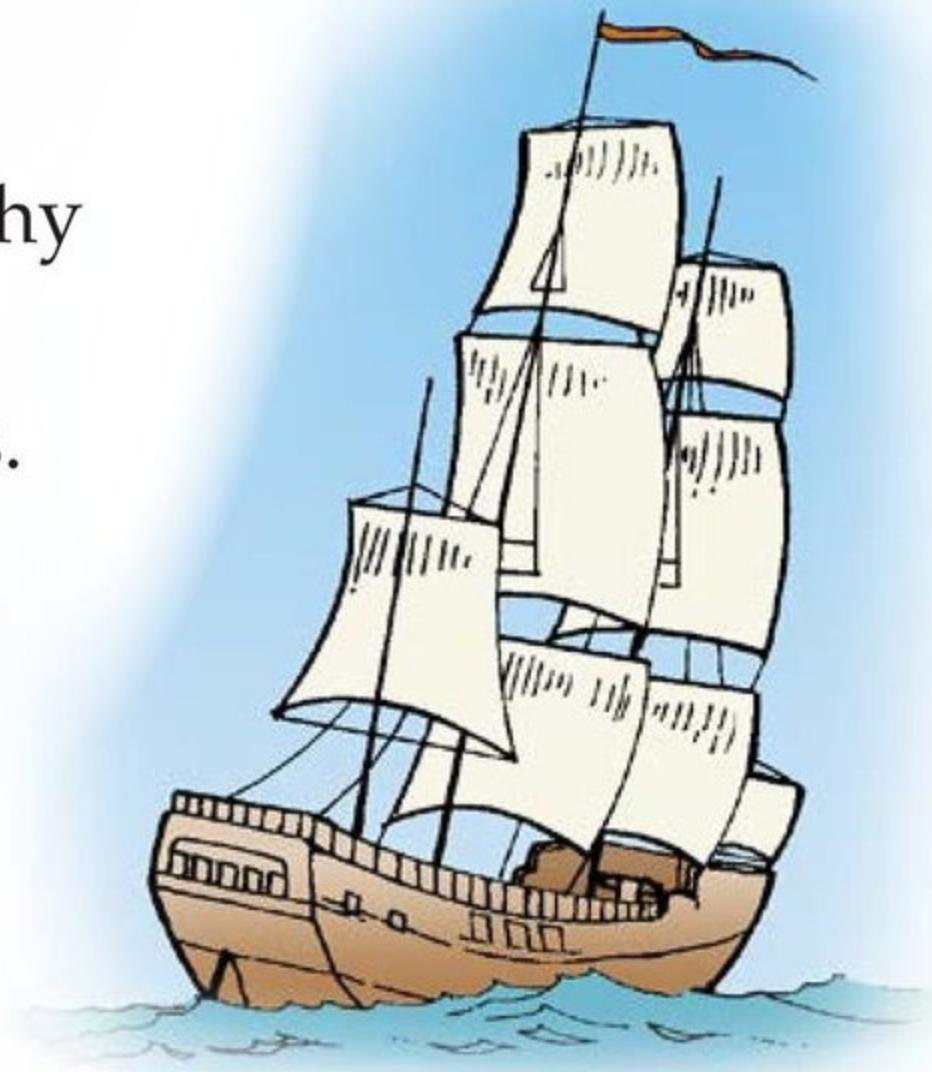


Galleon

In the late 1700s, Captain James Cook began some of the greatest explorations of his time. In his first ship, the *Endeavour*, Cook sailed around the world. His ship was only 32 meters (105 ft) in length. It also had a shallow hold, sitting only 4.3 meters (14 ft) deep when fully loaded.

Cook was interested in knowledge and science and brought three scientists with him when he traveled. He also took many artists to document their discoveries. Cook observed the stars as he sailed, and whenever he came to a new land, he learned about its plants and animals. His work broadened the European understanding of the world.

Cook was a great sailor and an intelligent explorer. He also kept his crew healthy by making them eat foods such as limes and cabbages. Until Cook's time, up to one-half of the crew on a long voyage would die of **scurvy** or other diseases. Cook knew his success as an explorer depended on keeping his crew in good health. Soon, all British sailors knew that they needed to eat vitamin C to survive. Sadly, although Cook tried to remain friendly everywhere he went, he was killed in a fight in Hawaii in 1779.



The *Endeavour*

Conclusion

By the middle of the 1800s, sailors had explored and mapped most of the world's coastlines. As people settled farther from their homelands, larger ships were needed to move people and supplies over great distances. Very fast ships called clipper ships carried people across oceans in a matter of days. Some of these ships had as many as thirty-five sails and could travel even in very light winds.

By the 1870s, however, the steam engine largely replaced wind power. The industrial revolution swung into full gear, and machines became more significant to everyone. Bigger and faster ships than had ever been imagined suddenly became possible. Today, steam is outdated and ships run on different types of fuel. Some submarines and aircraft carriers even run on nuclear power! Giant cruise ships carry thousands of people at a time like floating cities.

When we look at some of the ships used by early explorers to sail across oceans, we have to admire their courage. Explorers and their ships of discovery helped create the world we live in.

Glossary

bountiful (<i>adj.</i>)	plentiful; abundant (p. 4)
caravels (<i>n.</i>)	small European sailing ships used in the 1400s and 1500s (p. 13)
catamaran (<i>n.</i>)	a sailing vessel with twin hulls and a deck connecting the hulls (p. 9)
galleons (<i>n.</i>)	heavy Spanish sailing ships of the 15th to early 18th centuries used for war or trade (p. 17)
hull (<i>n.</i>)	the main body of a sailing vessel (p. 7)
knarrs (<i>n.</i>)	Viking merchant ships (p. 11)
knots (<i>n.</i>)	units of measurement of a ship's speed equal to one nautical mile per hour (p. 12)
primitive (<i>adj.</i>)	appearing to be at an earlier stage of development (p. 5)
scurvy (<i>n.</i>)	a life-threatening illness common to early sailors that was caused by a lack of vitamin C (p. 18)
tiers (<i>n.</i>)	rows or levels arranged one above another (p. 8)
triremes (<i>n.</i>)	ancient galleys equipped with three banks of oars (p. 8)

Ships of Discovery
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