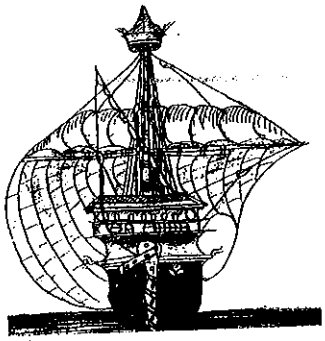
15 A Boy Named Christopher Has a Dream



A fully rigged 15th-century ship called a *caravel*, looking much like Columbus's *Niña* and *Pinta* did.

When Christopher Columbus was a boy he had two dreams. One was to go to sea; the other was to get to China. When he grew up, he thought he had done both.

Columbus was born in Genoa, an Italian city on the Mediterranean Sea. Genoa was prosperous because of the sea trade, and many Genoese boys wanted to be sailors. Columbus became one of the best the world has ever known.

Columbus knew about China because he had read Marco Polo's book. He had read it carefully. His copy of the book is full of notes.

Most people in the 15th century couldn't read. That meant they were ignorant of many things. Some believed the world was flat. They thought if you sailed too far you'd fall off the edge. But people who could read, like Columbus, knew that wasn't so. Scientists had proof that the world was round, and they told about it in books.

There was a problem, though. No one was quite sure how big the world was. So no one knew how far you would have to sail to go around it. One way to try and figure that out was by measuring lines of longitude and latitude.

Longitude and latitude are very useful lines. How about looking at a map? That is the only way you'll understand what is coming next. (Check in an atlas–or turn to the next page). Do you see the thin lines going up and down and across the map? Those are lines of longitude and latitude. They are imaginary lines—you won't see them if you look down from an airplane. They are drawn on maps to help map readers divide up the globe. Latitude and longitude lines make it easy to read a map and measure the earth.

Columbus first went to sea at age 14. When he was 26, he was shipwrecked off Portugal and swam to shore. He sailed to Iceland, too, and may have seen Norse maps.

Columbus's brother was a mapmaker. That was a big help to Columbus.

Think of the earth as a big, fat man. Put a belt around his middle. That belt is a line of latitude. We call it the equator, or zero-degree line of latitude (0°). Latitude lines are numbered north and south of the equator. Now give the fat man a round cap. The edge of the cap is the Arctic Circle, which is the 66½-degree line of latitude north (66½°N) of the equator. The center of the cap is the North Pole (90°N). Turn the fat man the other way, and the cap on the globe becomes the Antarctic Circle; now it has the South Pole as its center. (And now those numbers are 66½°S and 90°S.)

Lines of latitude circle the globe and run parallel to each other. Some people even call them "parallels." (Parallel lines are an equal distance from each other and never touch, like the sides of a ladder.) Lines going the other way—from the North Pole to the South Pole—are lines of longitude. Longitude lines are not parallel. They all touch at the poles but spread far apart at the equator.

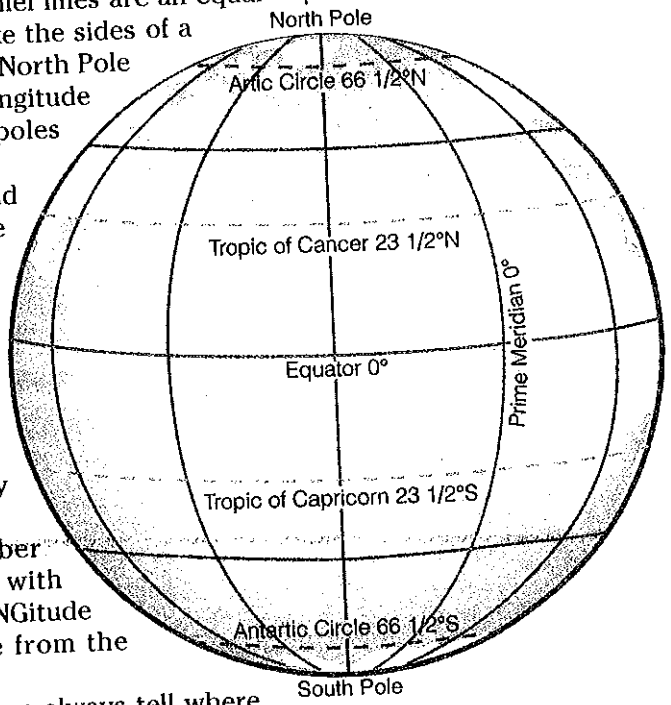
One more thing: those lines of longitude and latitude are actually circles. They circle the globe. If you divide the earth at the equator—that zero-degree line of latitude—you get two halves. Those halves are hemispheres. (Another word for a globe or ball is a *sphere.* Half a sphere is a hemisphere.) We live in the northern hemisphere. If you divide the world in half along a line of longitude, you will also get two hemispheres; this time they are eastern and western hemispheres.

To tell longitude from latitude, remember that the first syllable of LATitude rhymes with FAT—like the belt around our fat earth. LONGitude starts with "long"—like the long distance from the North Pole to the South Pole.

If you know longitude and latitude, you can always tell where you are, on land or sea. Latitude is easy to figure out if you can read the stars, or if you measure the angle of the sun at noon with an instrument called a sextant. But longitude isn't easy, especially on a ship. You need to know exactly how far you have traveled from where you started. You probably know the math: distance equals speed multiplied by the time taken.

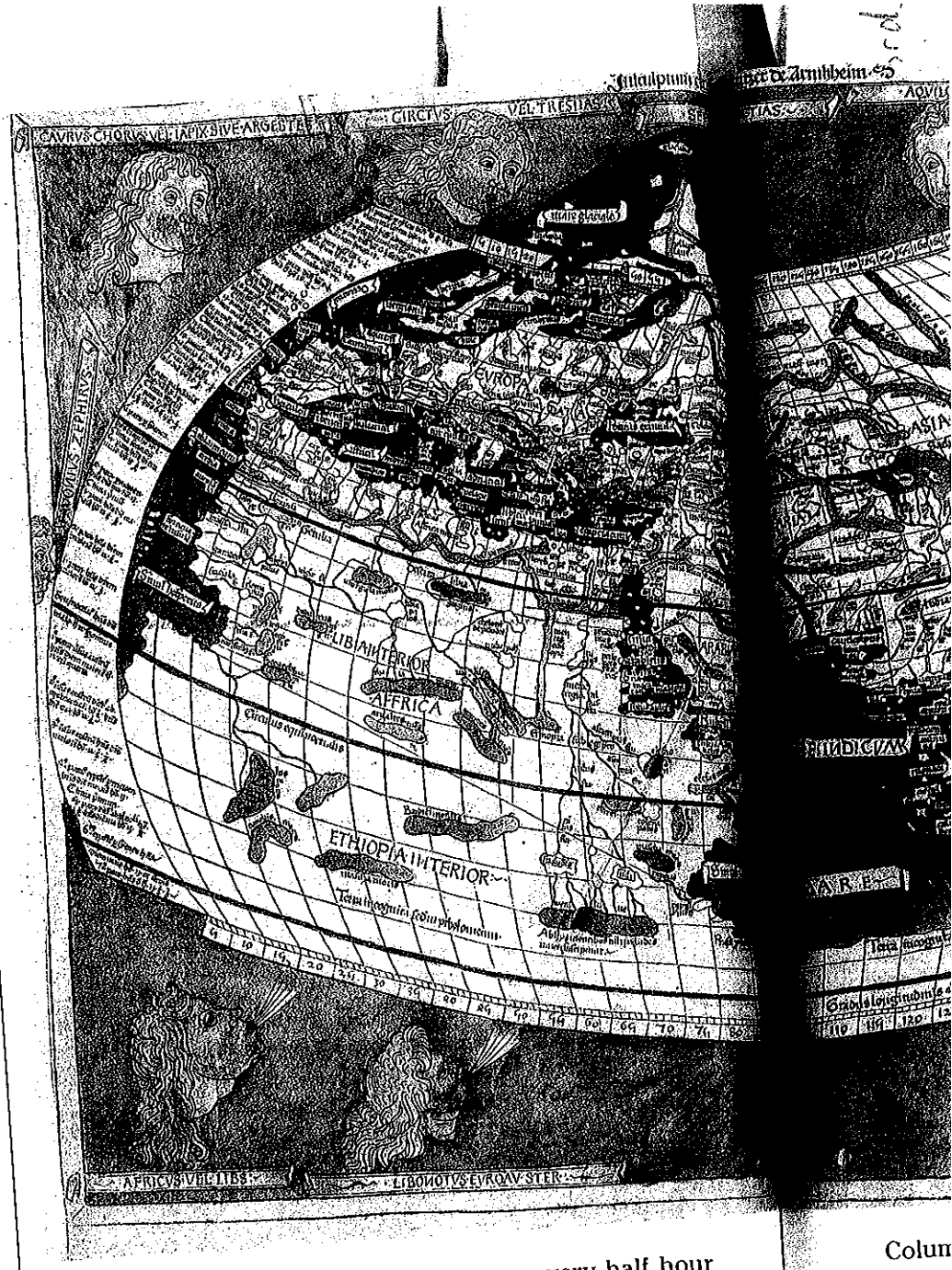
A seaman could make a crude guess at his ship's speed by watching its hull cutting through the water. But to calculate exactly the time you've taken, you need a really accurate clock that keeps very good time. To tell time in the 15th century, ships had hourglasses

Some people call lines of longitude "meridians." They help measure time.



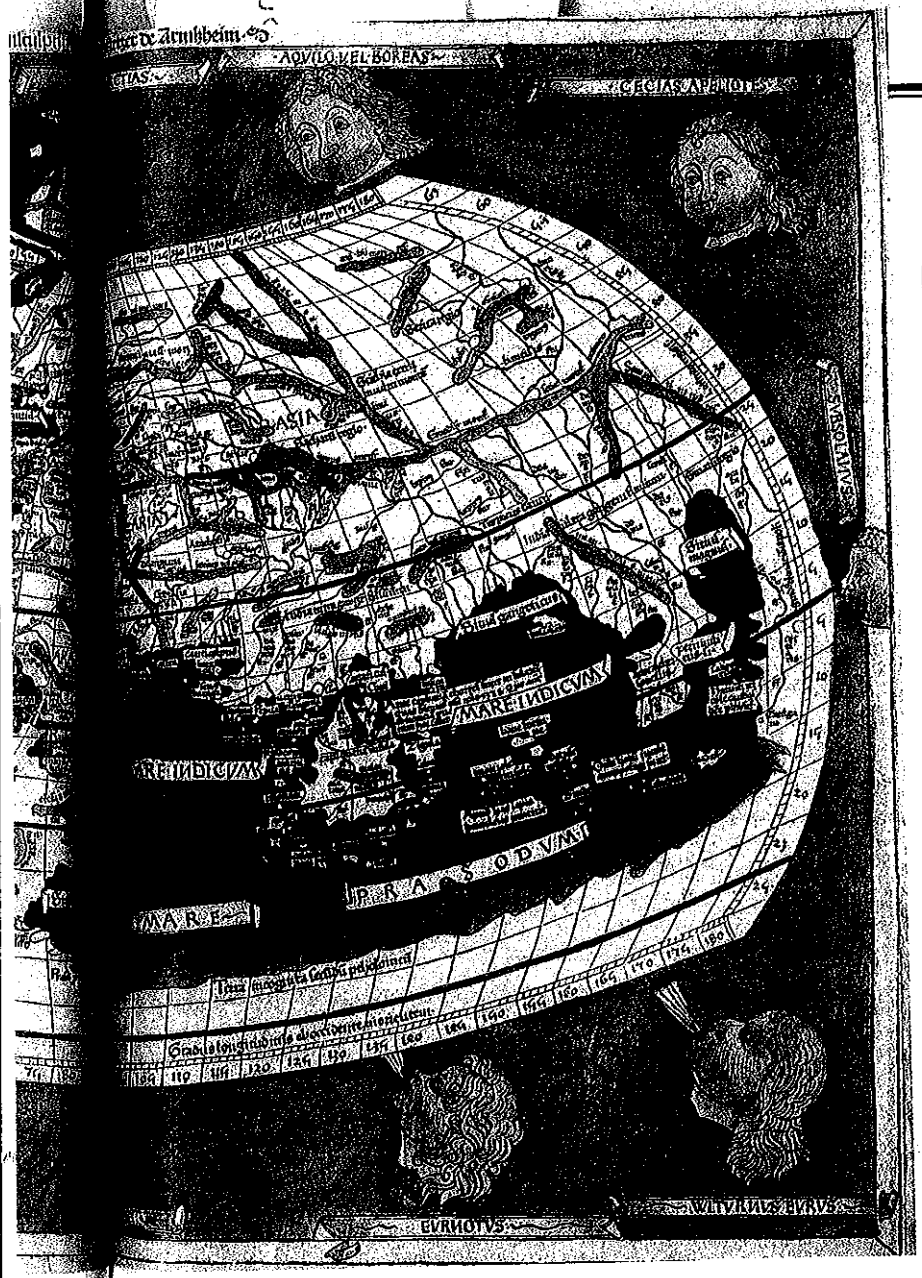
The lines that run horizontally (across) the globe show latitude. The vertical lines (up and down) show longitude. To tell where you are on earth, you need two numbers: a latitude and a longitude. Virginia Beach, Virginia (where I live), is at about 37°N (latitude) by 76°W (longitude).

A long, long time ago (it was about 17 centuries before Columbus lived), there was a marvelous library and center of learning at Alexandria, in Egypt. A Greek mathematician named Eratosthenes (air-uh-TOSS-thuh-neez) was in charge of the library. He figured out the earth's size and got it just about right! How did he do that? Look up Eratosthenes in an encyclopedia and you'll find out. Trouble was, no one could test his measurements without sailing around the globe (and no one dared). A few centuries later, when the great and famous Ptolemy came along with other ideas about the size of the earth, everyone forgot about Eratosthenes.



filled with sand, which you turned over every half hour when the sand ran out. If the sailor who turned over the hourglass dozed off—well, you can see how easy it was to make mistakes. So ships at sea hardly ever knew exactly where they were (that problem wasn't solved until the 18th century, when very good clocks began to be made).

Columbus did not worry. He knew Spain and Japan (he called it Cipango) were on the same line of latitude—so if he could just stick with it, he figured he'd land in Japan. And he would have—if the American continent hadn't gotten in the way.



This German map from 1482 is the kind of map that gave Columbus his ideas about how the world looked. The original was drawn by the famous Greek astronomer-geographer-mathematician Ptolemy, who lived in Egypt in the second century (he died in 168 C.E.). So maps like this one were very much out-of-date when Columbus came along. (Columbus was born 13 centuries after Ptolemy died.) Still, they were the maps almost everyone used.

Columbus, by the way, was very smart. He did everything well, except one thing. When he measured the earth he goofed.

He figured the earth was much smaller than it is. He also figured that Cathay was much larger than it is. Actually, it wasn't Columbus's fault that he was mixed up. He studied the work of an ancient Greek geographer named Ptolemy (TOE-luh-me), and if Ptolemy had been right, China would be where America is. If you compare Ptolemy's map on this page with a modern map, you will see just how mixed up Columbus was.

The Iberian peninsula (today Spain and Portugal) was a collection of kingdoms in the 15th century. Isabella was queen of powerful Castile. Ferdinand was king of neighboring Aragon. They married and combined their lands. Together they fought and drove out the Muslims who had controlled much of the region since the 8th century. Their new Christian kingdom was called Spain. In 1492 Spaniards set out to bring Christianity to the New World. (Check an encyclopedia to learn more of Spain's important history.)

Ptolemy was not only a famous geographer, he was also a famous astronomer. His ideas on the earth and sky were taught in universities. Then Columbus sailed off—and it was soon clear that Ptolemy's geography wasn't perfect. Could it be that his idea about the solar system—that the earth was at its center—might be faulty, too? Copernicus, a Polish priest and scientist, thought so. He moved the sun to the center of the solar system. And that idea (it wasn't easy to think so differently from everyone else) is often said to be the beginning of modern science.

Now, as you know, people who could read knew the world was round. They understood that if you went west from Europe you would finally get to Asia. But no one wanted to try going that way—it seemed too dangerous and too far. Most people believed there were ferocious monsters in the deep waters. Every sailor knew the dangers of storms at sea.

Because Columbus believed the earth was small and because he was a superb sailor, he thought he could make it to Cathay.

So he went to Portugal to ask for help. Remember Prince Henry the Navigator and his mathematicians? Well, Henry had died in 1460, but the Portuguese were still world leaders in exploration and navigation. When the Portuguese mathematicians figured out the size of the earth, it came out much bigger than it did for Columbus. Today we know they had it just about right. But, back then, nobody was sure because nobody had actually sailed around the globe. Anyway, the Portuguese weren't willing to take the risk. They turned Columbus down.

So did almost everyone else. Columbus took his ideas to one person after another. Each one said "sorry," except King Ferdinand and Queen Isabella of Spain, who said "perhaps." Maybe they were just being polite, because they seemed to forget all about Columbus. Years passed. He asked them again; this time they said "no." One thing you can say for Columbus: he never gave up. He was on his way to see the King of France when a messenger called him back to Spain. Finally, Ferdinand and Isabella had agreed to help. They gave him three small ships and some sailors, and sent him in search of China and Japan.

Columbus knew all about Marco Polo's travels. This scene, from a famous Catalan world map drawn in 1375, shows Marco Polo, with his father Niccoló and his uncle Maffeo and their helmeted Mongol escorts, crossing Asia on horseback. Camels carry their goods. The Catalans live in the ancient region of Catalonia in northern Spain. In the Middle Ages they were among the best navigators and geographers of Europe.