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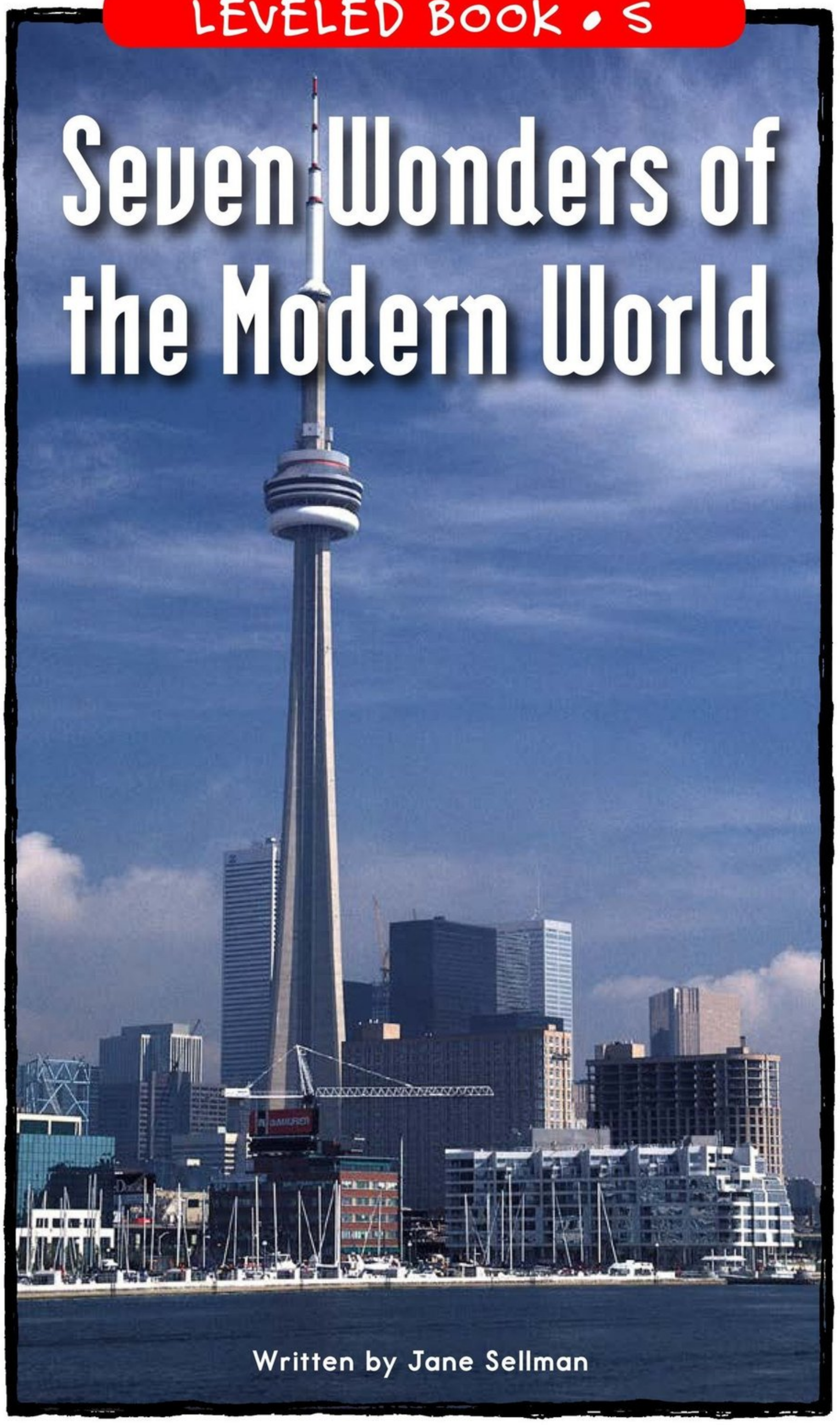
Seven Wonders of the Modern World



Written by Jane Sellman

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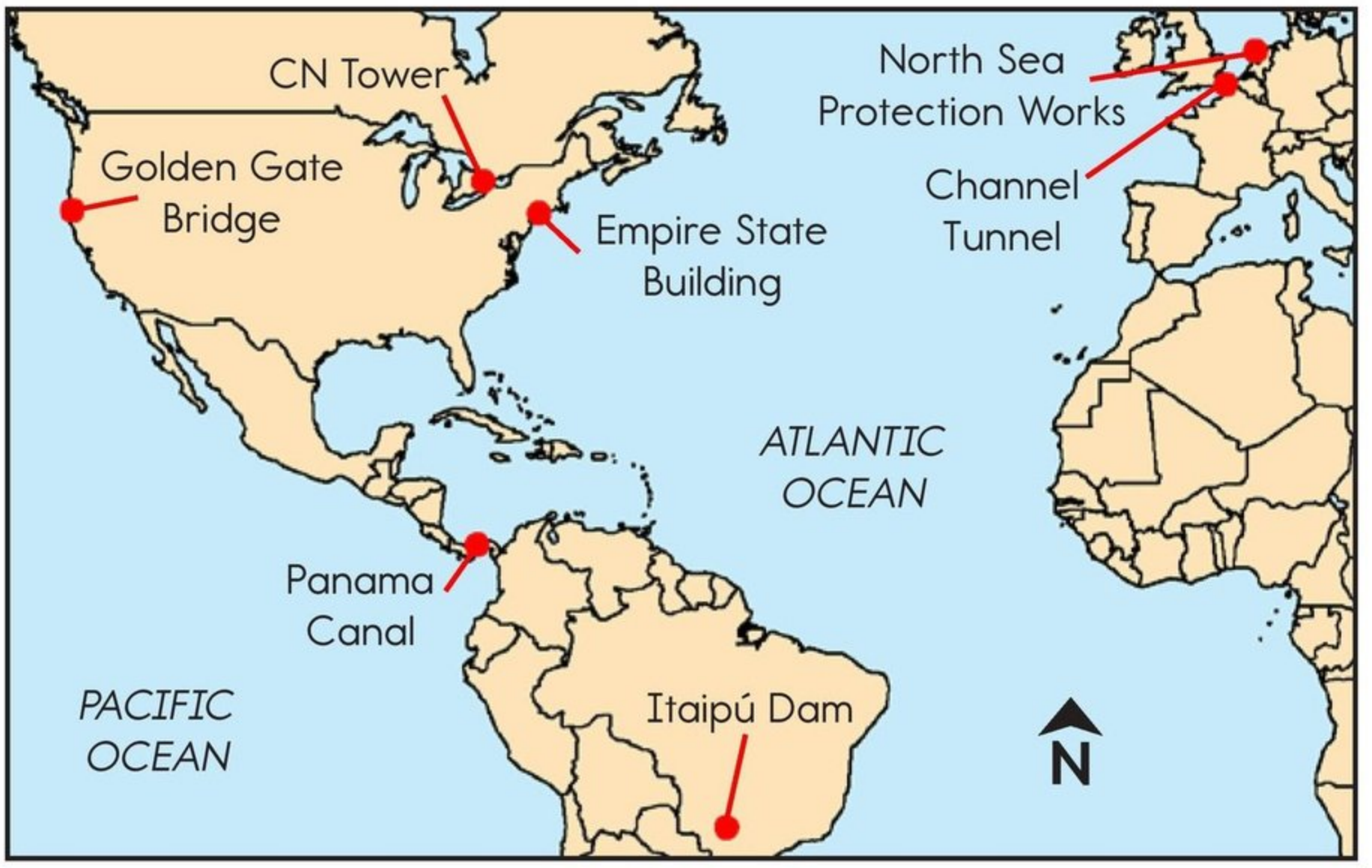

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Picking Wonders

Long ago, **scholars** selected the seven greatest works built by human beings—the Seven Wonders of the Ancient World. These wonders honored the courage and power to do things people thought couldn't be done.

The Great Pyramid of Egypt

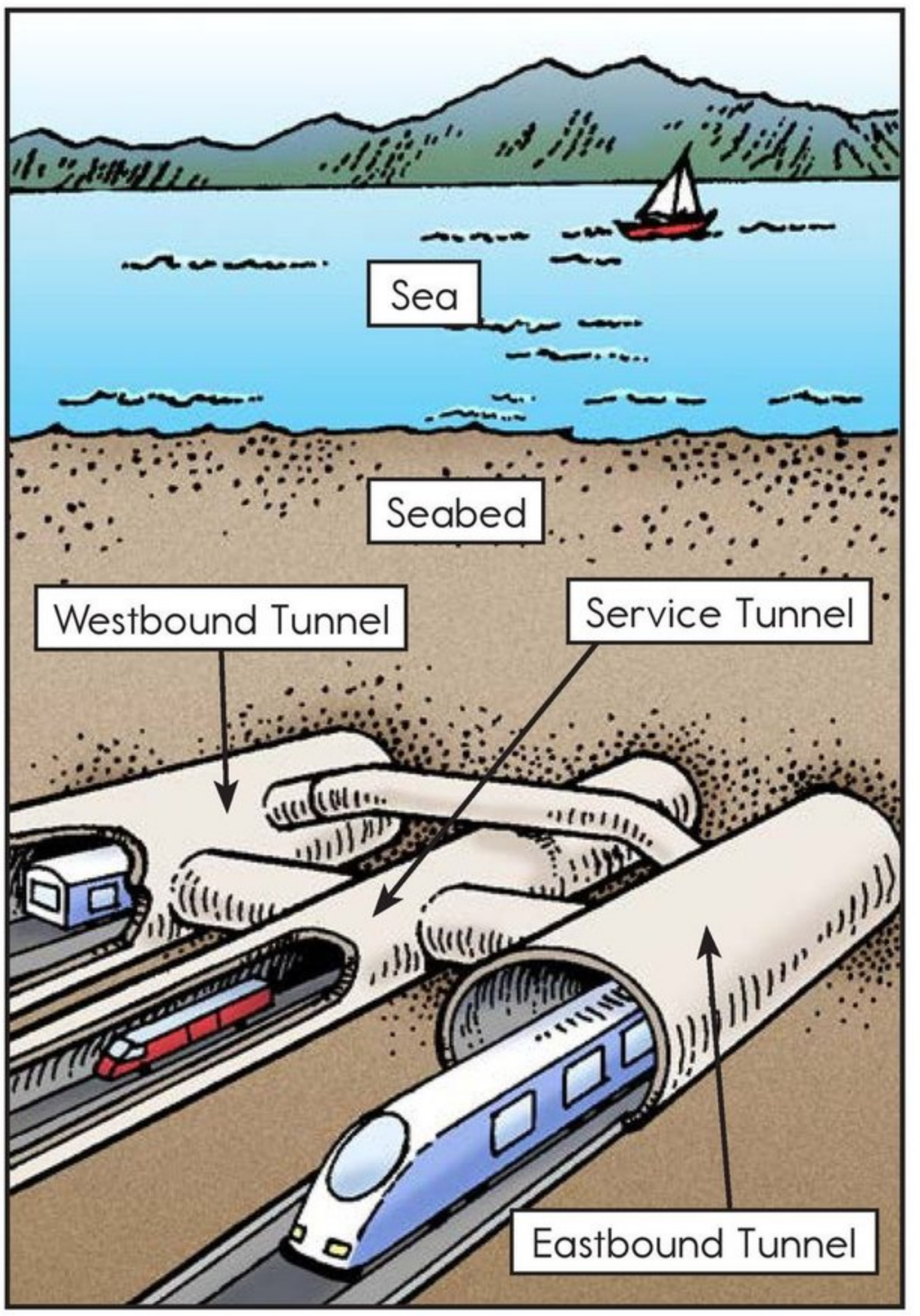
The Great Pyramid of Egypt is the only Ancient Wonder still standing.

Hundreds of years later, a group of **engineers** asked experts around the world to select seven new wonders. Their list of Modern Wonders honored the same ideas as the Ancient Wonders.

- Channel Tunnel (England/France)
- Netherlands North Sea Protection Works (Netherlands)
- Canadian National Tower (Toronto, Canada)
- Empire State Building (New York City, United States)
- Golden Gate Bridge (San Francisco, United States)
- Panama Canal (Panama)
- Itaipú Dam (Brazil/Paraguay)

Channel Tunnel

Let's start in England and France. Imagine traveling 31 miles (50 km) through an underwater tunnel at close to 100 miles (161 km) per hour. The Channel Tunnel, or Chunnel, provides speedy travel between England and France. The trip takes about 20 minutes.



How the Chunnel looks under the sea

People had dreamed of this tunnel for years. The work was hard and risky. It took about 13,000 people from 1987 to 1994 to build three tunnels a total of 95 miles (153 km) long. First, workers dug huge chunks of chalk and clay from the bottom of the English Channel. Then they built the tunnels under the water!

Cars drive off a Channel Tunnel train.

Passengers can now ride through the Chunnel in buses and cars that are loaded onto the widest trains ever built. One tunnel allows train travel from England to France, while a second allows travel in the opposite direction. The third tunnel is a service tunnel used for repairs and emergencies.

Safety: A Top Priority

A couple of years after the Chunnel opened, a fire started in one of the tunnels. A fire could have killed many, but the Channel Tunnel had plans for emergencies.

People were taken off the train and led to the tunnel used for repairs and emergencies. Some people became sick from the smoke and were taken to the hospital. However, no one died or was seriously hurt. The safety plans saved the day.

Netherlands North Sea Protection Works

Now let's travel north from France to the Netherlands, where much of the land is below sea level. During storms, floods destroyed homes and farmland. In the early 1900s, the Dutch suffered the effects of war and terrible storms. Food shortages were a problem. They decided to find new ways to protect the land and people from the sea.

In 1927, the people started to build the North Sea Protection Works. They dammed areas along the coast to create lakes and farmland.

Farmland created by the North Sea Protection Works

Floodwalls keep surges of water during storms from flooding the land.

But other areas couldn't be dammed. More dams would hurt the country's **shipping industry** and wildlife **habitats**. So they built a floodwall unlike any other. The wall was built with giant gates that stay open when the sea is calm. This allows ships to come and go, and keeps the wildlife safe. During storms, the gates can be closed to prevent flooding.

The North Sea Protection Works gave the Dutch over one-half million acres of land for farming, livestock, and homes. The people also gained protection from floods.

Canadian National Tower

Next we cross the Atlantic Ocean from the Netherlands to Toronto, Canada, where visitors can stand on an **observation deck** of the Canadian National, or CN, Tower and see Niagara Falls, about 85 miles (137 km) away. Over 1,800 feet (548 m) high, the tower is the tallest freestanding structure in the world.

CN Tower

In the 1960s, Toronto had built many tall buildings. Many were so tall they blocked **radio and television signals**. The city needed a tower tall enough so that no building could block signals coming from it. Plans were drawn up for the CN Tower.

Building something so tall was not easy. Workers used instruments on planes flown over the CN Tower to make sure it was straight. Builders used a helicopter to place the antenna at the tower's top. Around the tower's base, they constructed a four-level observation deck that was lifted into place high above the ground when it was finished. The top level, Skypod, is one of the highest public observation decks in the world.

The Tower is a popular tourist attraction. On the bottom observation level, the Glass Floor, visitors walk on a see-through surface and look down at the city below.

A view from the Glass Floor of the CN Tower

Empire State Building

Empire State Building

We move southeast of the CN Tower to the Empire State Building in the United States. Started in 1930, it was the tallest building of its time and rose in the New York City **skyline** in one year and forty-five days. Construction began during the Great Depression. Many people were looking for jobs, so they didn't mind the danger and hard work of building it so quickly. They built four and one-half floors a week, and put together the 58,000-ton frame in less than a month.

The 1,250-foot (381 m) tall, 102-story building became a New York City **landmark**. It has 73 elevators, 1,860 steps, and 6,500 windows. People come from around the world to see the city from the observation deck.

Golden Gate Bridge

Traveling to the west coast of the United States, we find the Golden Gate Bridge in San Francisco. Local residents wanted a bridge across the narrow **waterway** between San Francisco Bay and the Pacific Ocean. After 65 years of planning, construction started in 1933, providing jobs during the Great Depression.

Men worked on towers 746 feet (227 m) above the water. That's a little more than half the height of the Empire State Building. The men worked with thick cables in bundles a yard wide. They worked in the cold, fog, and wind, and with the constant danger of falling. In fact, 11 men fell to their deaths while working on the bridge.

The Golden Gate Bridge spans the entrance to San Francisco Bay.

Suspension Bridge

To build this type of bridge, workers first had to construct tall towers. Then they strung strong and thick cables between the towers. The floor, or deck, of the bridge was hung from the cables. The cables were secured, or held in place, at each end of the bridge.

You can see the thousands of wires inside the cable being walked on (top) in the cross-section above.

On the day the Golden Gate Bridge opened in 1937, people walked its 4,200-foot (1,280 m) length—that's almost a mile. The first cars traveled across the next day. Since then, over a billion and a half vehicles have used the bridge. Once the longest and tallest **suspension bridge** in the world, it is still one of the biggest and most spectacular. It has even survived a major earthquake.

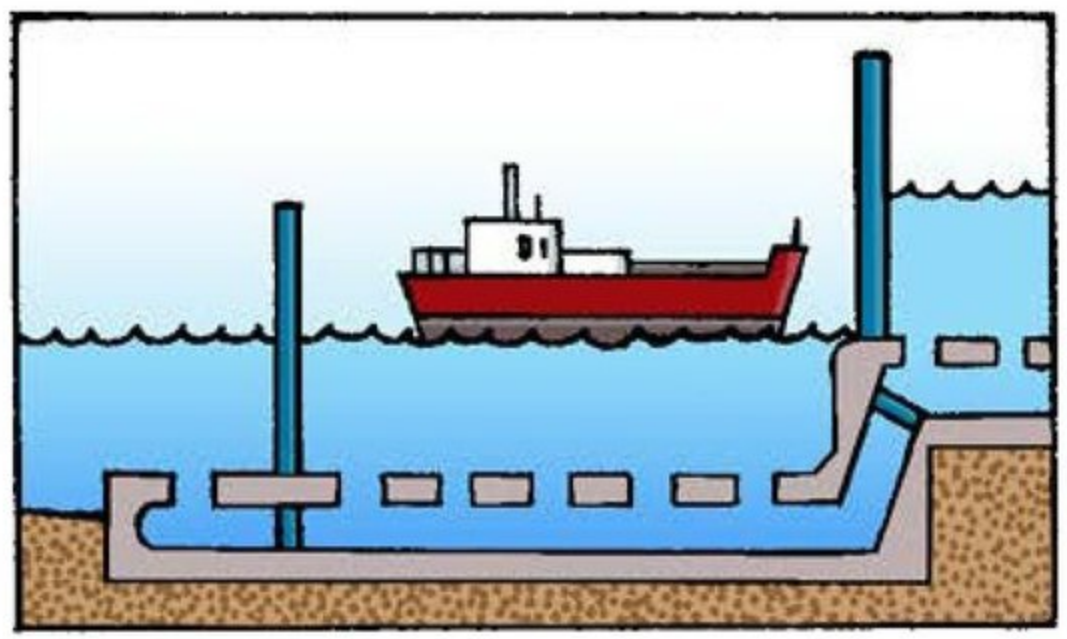
Panama Canal

Our next stop is south of the United States in the country of Panama, where a lake almost connects the Atlantic and Pacific Oceans. As early as 1534, people talked about digging through the land to extend the lake to the oceans. Work started on the Panama Canal in 1904 and took 10 years to finish. Before the canal, people had to sail around South America to get from one ocean to the other.

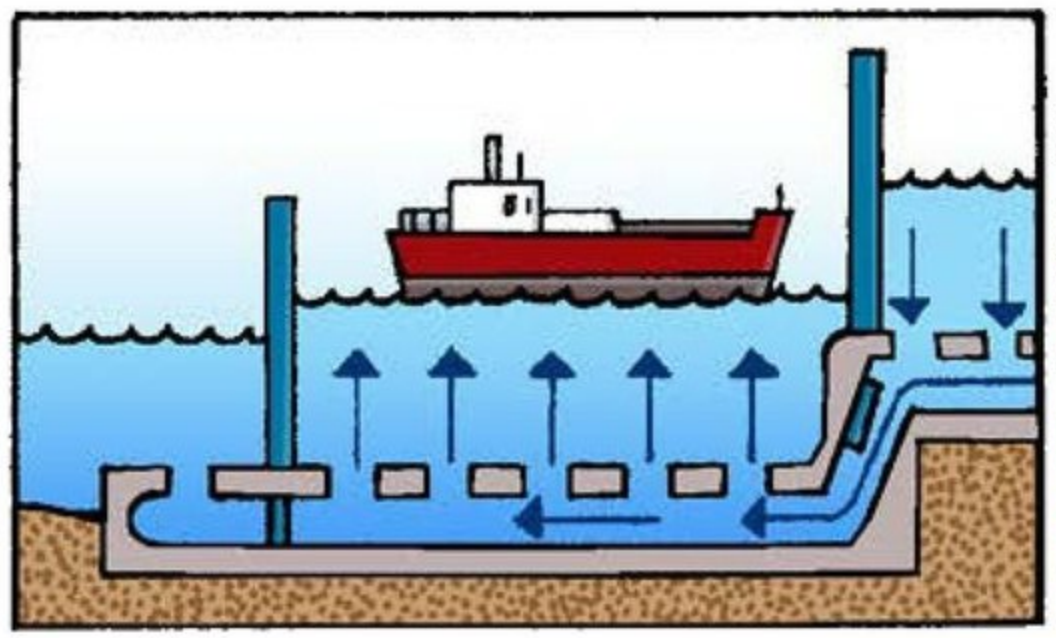
During digging, disease, landslides, and mudslides caused problems. After they finished digging, they built a system of chambers to raise and lower ships from the oceans to the lake. Ships enter chambers on one side of the canal that take them to the lake. The ships make their way across the lake to chambers that take them down to the ocean on the other side.

A ship prepares to enter the Panama Canal.

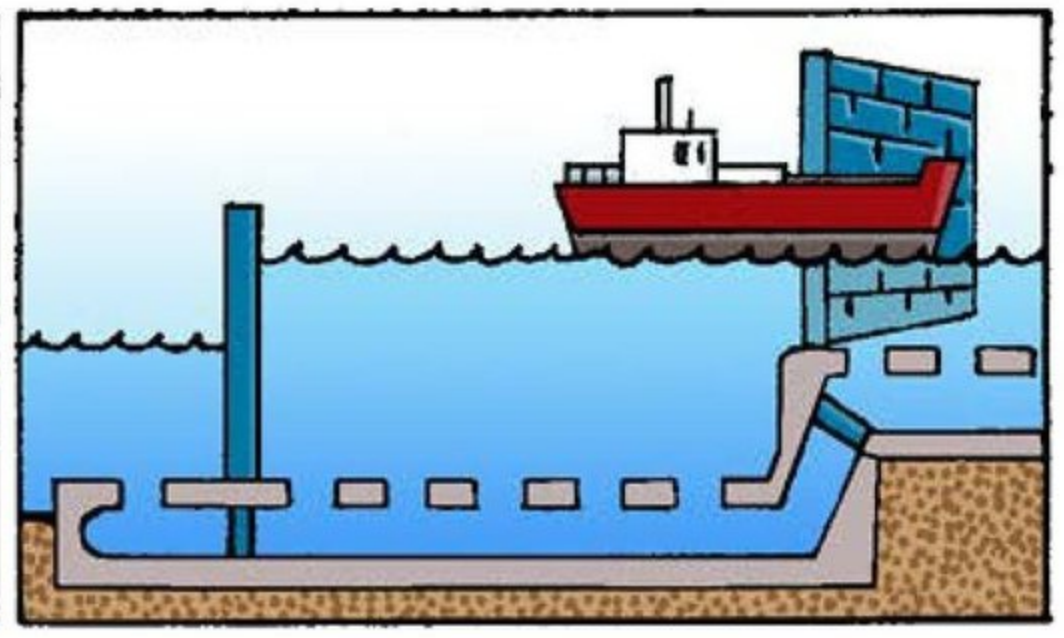
Today, the canal can handle about 50 ships a day; it averages about 14,000 ships a year.



❶ A ship enters the canal chamber, where it is raised from sea level to lake level.



❷ Water flows into the chamber from the lake to make sure the water is the same height on both sides of the gate.



❸ The gate opens and the ship moves into the lake.

How the Panama Canal Works

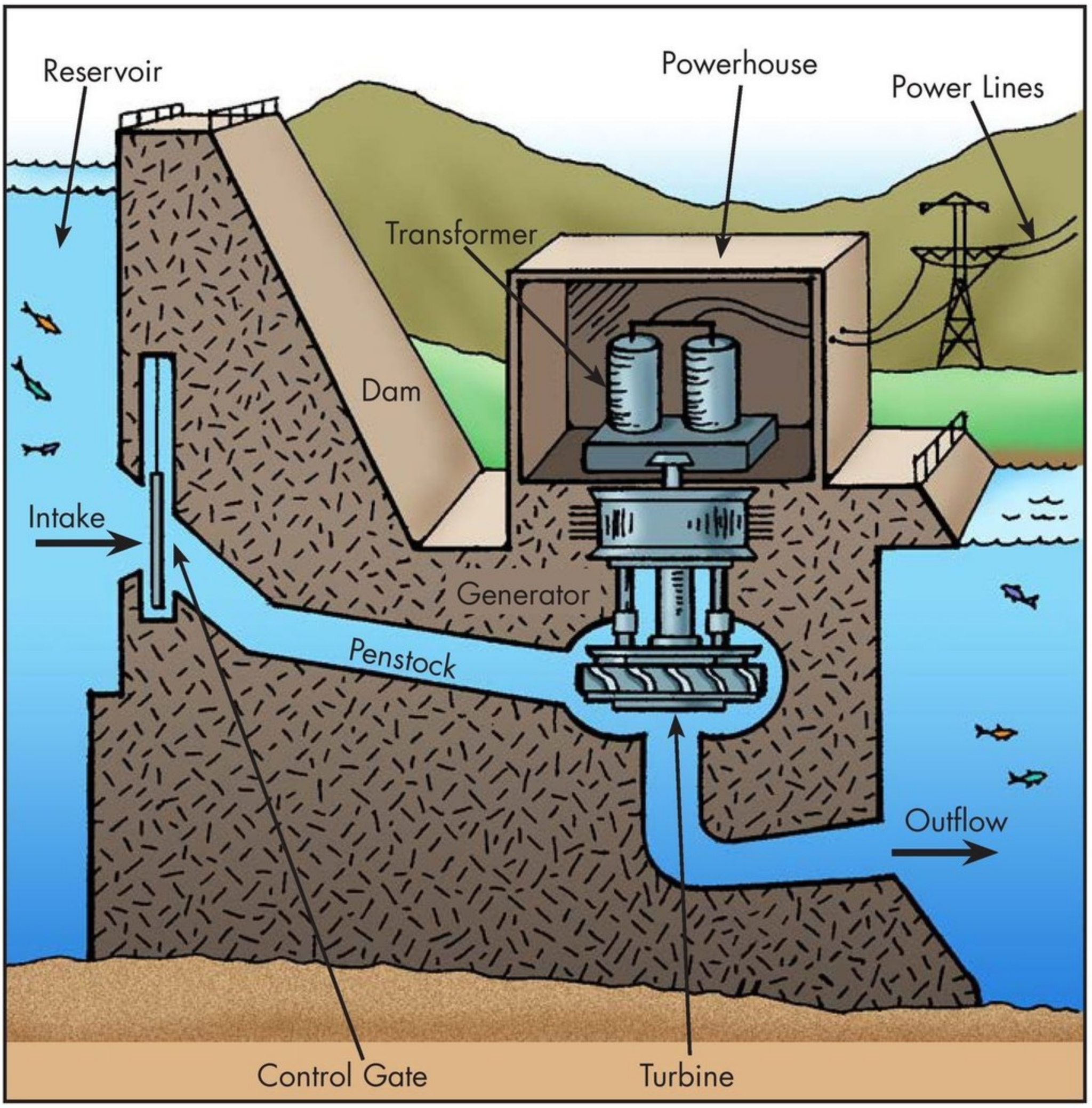
There are three chambers on each side of the lake. This means that water flows from one chamber to the next three times to raise and lower the ships on each side.

Itaípú Dam

Now we head south from Panama to the countries of Brazil and Paraguay. In 1975, the two countries teamed up to build a **hydroelectric plant** to produce more electricity for their people. They would build it on the Paraná River, on the border between the two countries, because a hydroelectric plant needs water and a dam to create electricity.

Builders overcame big challenges. They changed the course of the Paraná, the seventh largest river in the world. They dug up and removed more than 50 million tons of dirt and rocks. They used enough concrete to build a city for four million people and enough iron and steel to build 380 Eiffel Towers.

The result was a series of dams as well as a **power plant** one-half mile (.8 km) long. The power plant has broken records for the amount of power it produces. It now supplies most of the power for Paraguay and about a quarter of the power for Brazil.



How Does a Hydroelectric Plant Work?

The Itaipú Dam is a giant wall with gates that hold back water from the Paraná River. When the gates of the dam are opened, water goes through a pipe to a turbine. The turbine has blades—like a fan, only much larger. The water makes the blades turn. The blades cause powerful magnets in the generator (something like a motor) to turn. When the magnets pass copper coils inside the generator, electrons get moved around. Electrons are tiny bits of energy. These electrons are turned into electricity.

Tourists visit the Itaipú Dam.

Conclusion

Someday, new lists of wonders will be made. Works greater than these are already being built. However, these Seven Wonders of the Modern World are proof of the power and courage of human beings in the 1900s.

Glossary

engineers people trained to design buildings or bridges (p. 4)

habitats place where plants and animals live in their natural environment (p. 8)

hydroelectric plant factory that uses water to make electricity (p. 16)

landmark a building important to the history of a place (p. 11)

observation deck a place for looking at what is around a building (p. 9)

power plant factory that makes electricity (p. 16)

radio and television signals electromagnetic signals that transmit pictures and sounds (p. 9)

scholars educated people (p. 4)

shipping industry the business of using ships to transport goods (p. 8)

skyline the outline against the sky that buildings make (p. 11)

suspension bridge bridge that hangs the part people walk or drive on from cables (p. 13)

waterway a body of water ships can use (p. 12)

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