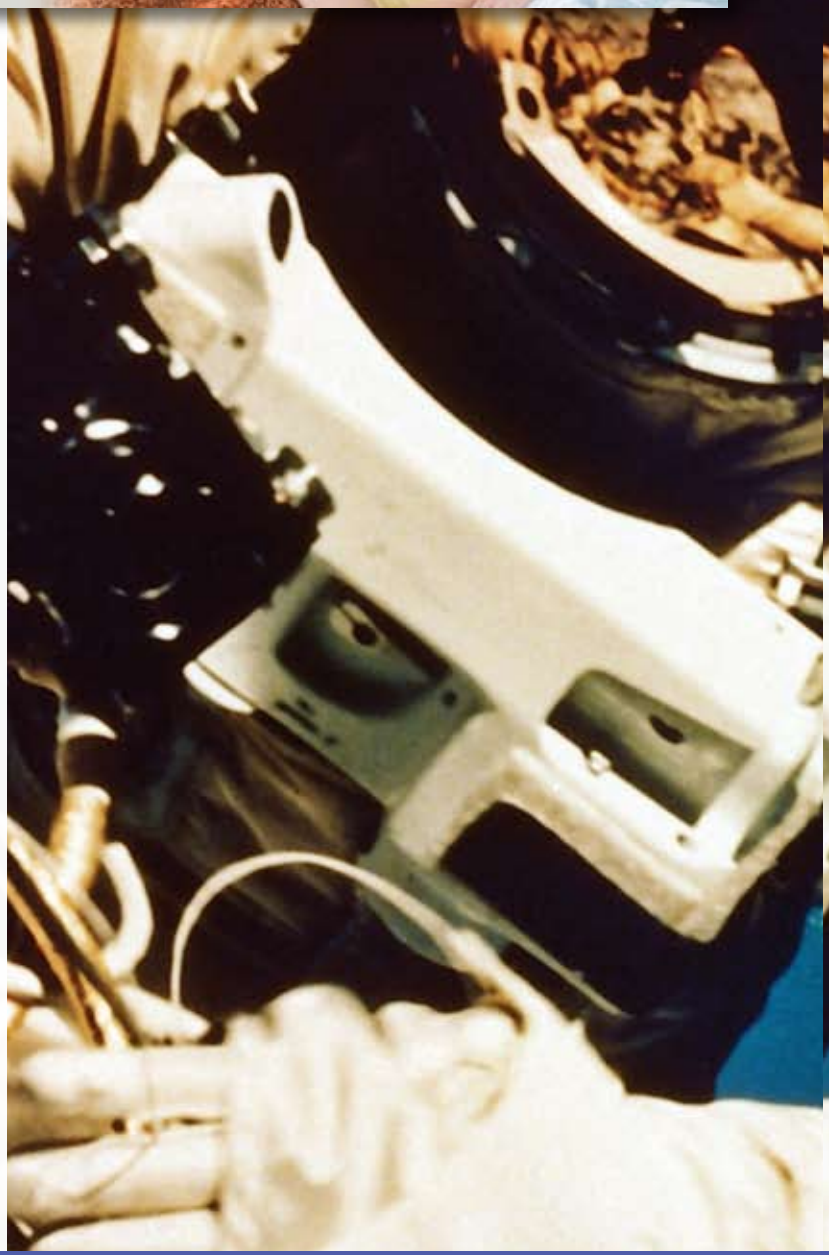
Chapter 11

Modern Missouri

At the beginning of the 20th century, the horse was still the most common way to travel. Only a few households had electricity. Even fewer had a telephone. Most Missourians, if they were men, were farmers or worked in one of the factories that made goods sold around the world. If they were women, they most likely worked at home doing the cooking, cleaning, and child rearing.

If you had told them that human beings, women included, would one day go into space, that their dirt roads would be paved and crowded with automobiles, and that even their children would carry cell phones, they would look at you as if you were insane. Only those with very good imaginations would have thought it even remotely possible.

Now, in these early years of the 21st century, we look back at those early 20th century Missourians and think how old-fashioned they were. But what if someone tried to tell us about life in the 22nd century? Would our digital cameras, our automobiles, maybe even our light bulbs, seem old-fashioned? Can we imagine what life will be like in the 22nd century?



Background: Missouri has been an important part of our country's space program. **Top:** Among Missouri's bridges are many with modern designs. **Middle:** Women are now an important part of business and science. **Bottom:** Our skylines, like this night view of Kansas City, show growth in our cities.

Missouri Close Up

Missouri's Population by Ethnicity and Race

	2000	2005*
White	4,746,952	4,953,810
Black	622,087	667,036
American Indian	26,200	23,201
Asian	60,429	75,409
Hispanic	118,592	156,619
All others	48,595	81,210
TOTAL	5,595,211	5,800,310

* *Estimate*

Missouri's Population by Age

	2000	2005*
Ages 18 and under	1,426,102	1,380,570
Ages 19 to 64	3,413,071	3,648,649
Ages 65 and older	756,038	771,495

* Estimate

Section 1

Transportation

As you read, look for the following:

- the role automobiles and aviation still play in Missouri's economy
- the importance of rail and river transportation
- vocabulary terms **interstate highway, mass transit, Amtrak, barge, towboat, channel**

Below: Missouri has many plants that make cars and vehicle parts.

A covered wagon carrying a pioneer family across the prairie might travel all of 10 miles in a 10-hour day. It took a team of Pony Express riders 11 days to carry the mail from St. Joseph to Sacramento. Today, in 10 hours, your family could fly to Europe; in 11 days, it could make a quick trip around the world.

Automobiles and Mass Transit

Remember that you read about the invention of the automobile and how it changed Missouri by enabling people to travel faster and farther? Our state has played a major role in the automotive industry. At one time, Missouri was the second-leading manufacturer of automobiles in the United States. Missouri still has auto assembly plants (where cars and trucks are made) in Claycomo near Kansas City and at Wentzville and Fenton near St. Louis. Missouri also has a number of smaller factories across the state that make parts for cars and trucks that are shipped to the larger assembly plants.

More cars, bigger cars, and faster cars required the state to improve its highways after World War II. Missouri has the second-largest system of state highways in the country, with more than 15,000 miles of state roads. About 1,200 of those miles are **interstate highways**, which are state-maintained roads with limited access that connect several states.

Not everyone travels by automobile. In Missouri's larger cities, people may choose to take a form of transportation that carries a lot of people at the same time. Another name for this type of transportation is **mass transit**. In most places, this means buses. At one time, people in St. Louis, Kansas City, and other cities used streetcars, which traveled on tracks that ran down the middle of the streets. These were torn up in the 1950s as more people bought cars and cities bought buses that could go to parts of the city that did not have tracks. St. Louis has a *light rail system*, which uses electric-powered cars that travel on railroad tracks. A light rail system is also in the planning stages in Kansas City.

Mass transit helps people who cannot afford a car. It also helps the rest of us by reducing the number of cars on our streets and highways. This means less-crowded streets and highways and less air pollution.

Did you Know?

The very first mile of interstate highway in the United States was constructed in 1956 in St. Charles County, Missouri.

Map 28

Missouri's Interstate Highways

Map Skill: What interstate(s) run through Kansas City?

This Page: Advancements in road construction began after WWII.
Opposite Page, Top: The F-18 fighter plane is made at the Boeing factory in St. Louis.
Bottom: Amtrak provides passenger rail service in Missouri.

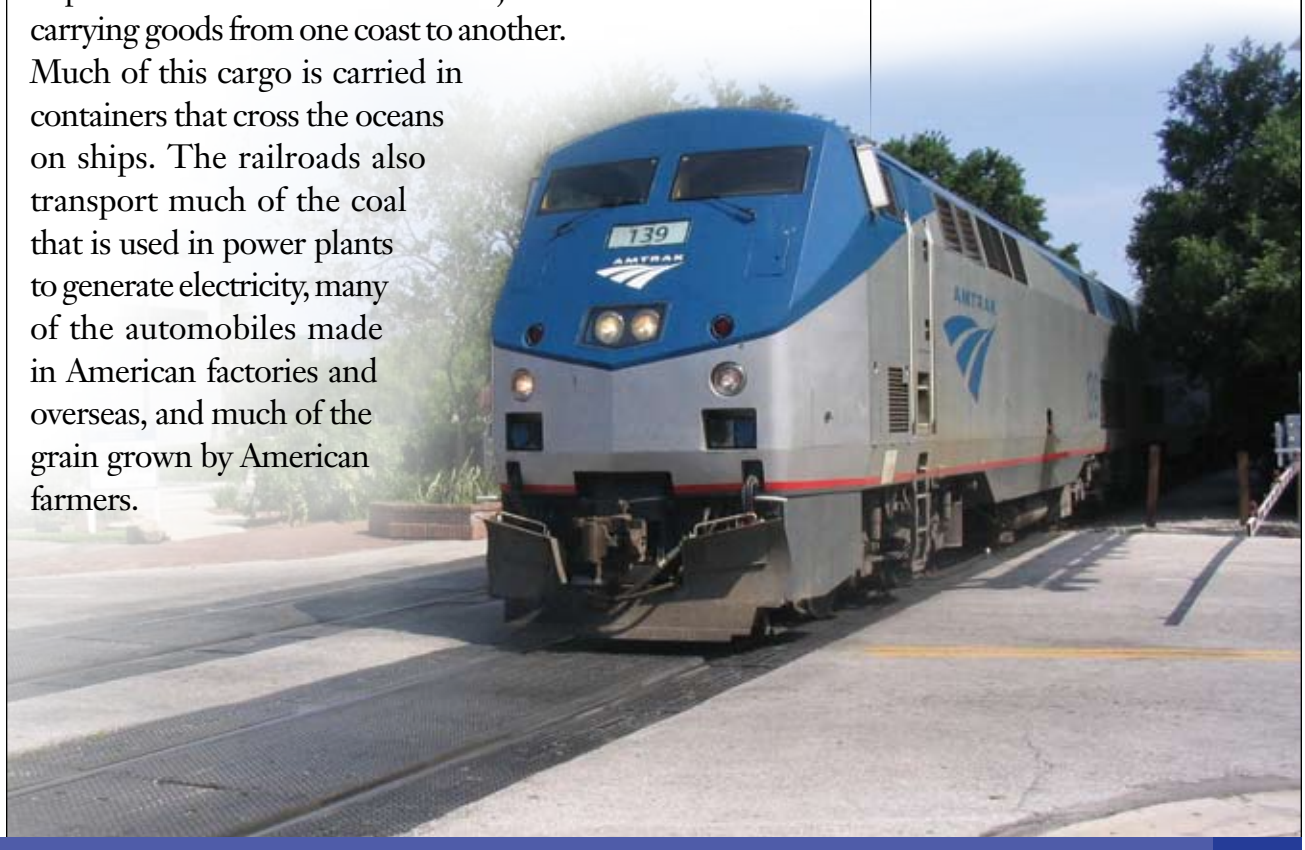
Aircraft

Missouri continues to play an important part in the aircraft industry. The former McDonnell-Douglas Corporation (part of the Boeing Corporation) still has a factory in St. Louis that builds fighter jets for the military. Boeing is the largest builder of passenger jets for airlines, and it builds them at factories around the world.

Both Kansas City and St. Louis have large airports. Airlines fly from these airports to places all over the country and even to foreign countries. Other Missouri cities have smaller airports. Some of these have airline flights to other cities, but most of the planes that use these airports are small planes owned by companies or private pilots.

Railroads

Kansas City is the second-largest rail *hub* (where several railroads cross or meet) in the country. Many of the trains traveling from one part of the country to other parts of the country pass through Kansas City. St. Louis and Springfield are also important rail hubs. The nation's major railroads cross Missouri carrying goods from one coast to another. Much of this cargo is carried in containers that cross the oceans on ships. The railroads also transport much of the coal that is used in power plants to generate electricity, many of the automobiles made in American factories and overseas, and much of the grain grown by American farmers.



Not as many Missouri towns have rail service as once did. Towns have fewer factories than they used to. Those factories that remain have found it cheaper to ship their goods by truck. In some places, the old rail lines have been turned into hiking and biking trails. The longest of these trails is the Katy Trail running from Clinton to near St. Charles in the eastern part of the state.

Before it was possible or cheap enough to fly between cities and before the interstate highways were built, most people took the train for long-distance travel. You can still travel by train on **Amtrak**, the national rail passenger service. Amtrak trains run between St. Louis and Kansas City, stopping in several cities along the way. From Kansas City, you can also take trains to Chicago and Los Angeles. The trains to Chicago stop in La Plata in northeast Missouri. From St. Louis, you can take trains to Chicago or to Dallas, Texas. The trains to Dallas cross southeast Missouri, stopping in Poplar Bluff.

Map 29
The Katy Trail

Map Skill: Where does the Katy Trail turn away from the Missouri River?

River Transportation

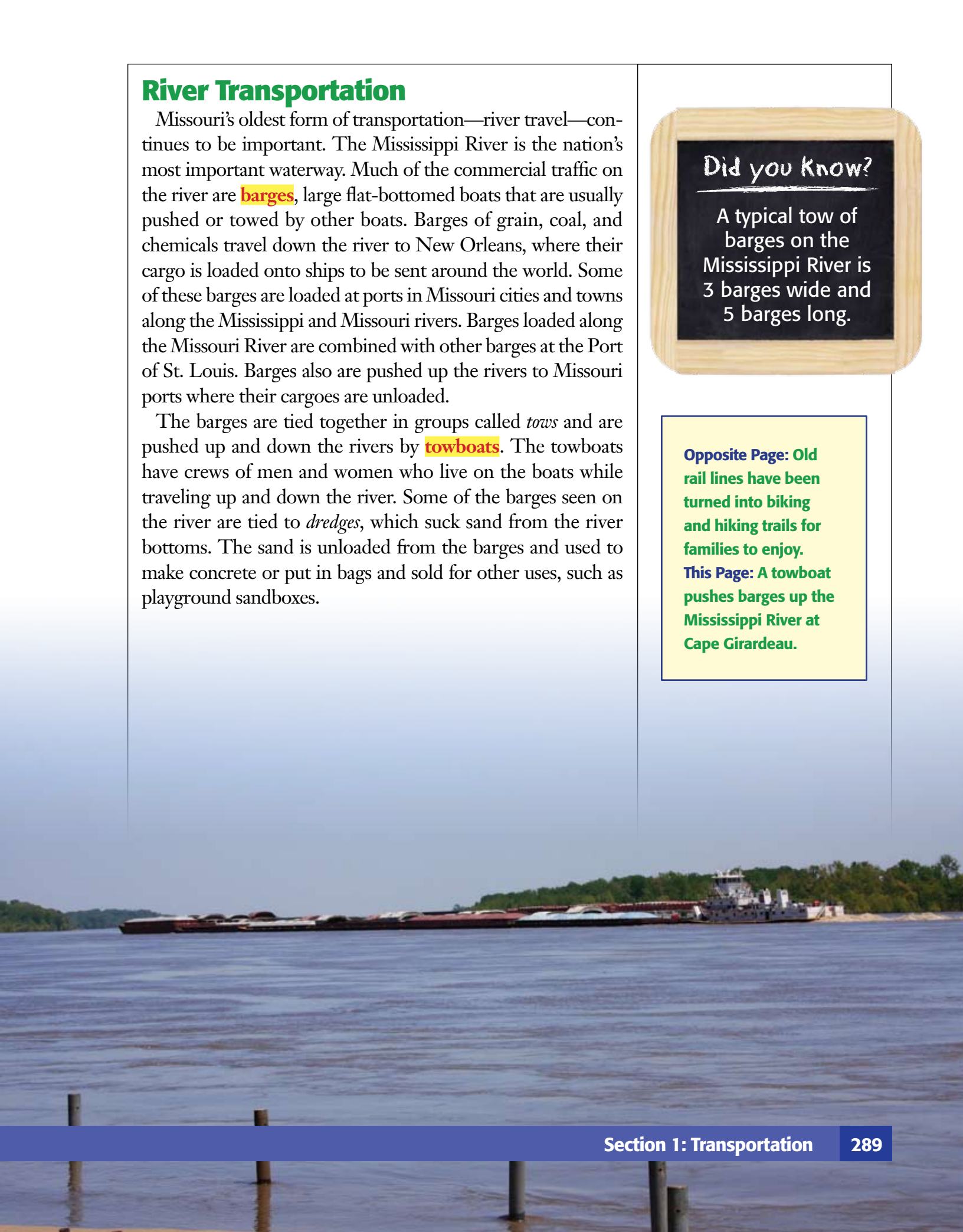
Missouri's oldest form of transportation—river travel—continues to be important. The Mississippi River is the nation's most important waterway. Much of the commercial traffic on the river are **barges**, large flat-bottomed boats that are usually pushed or towed by other boats. Barges of grain, coal, and chemicals travel down the river to New Orleans, where their cargo is loaded onto ships to be sent around the world. Some of these barges are loaded at ports in Missouri cities and towns along the Mississippi and Missouri rivers. Barges loaded along the Missouri River are combined with other barges at the Port of St. Louis. Barges also are pushed up the rivers to Missouri ports where their cargoes are unloaded.

The barges are tied together in groups called *tows* and are pushed up and down the rivers by **towboats**. The towboats have crews of men and women who live on the boats while traveling up and down the river. Some of the barges seen on the river are tied to *dredges*, which suck sand from the river bottoms. The sand is unloaded from the barges and used to make concrete or put in bags and sold for other uses, such as playground sandboxes.

Did you Know?

A typical tow of barges on the Mississippi River is 3 barges wide and 5 barges long.

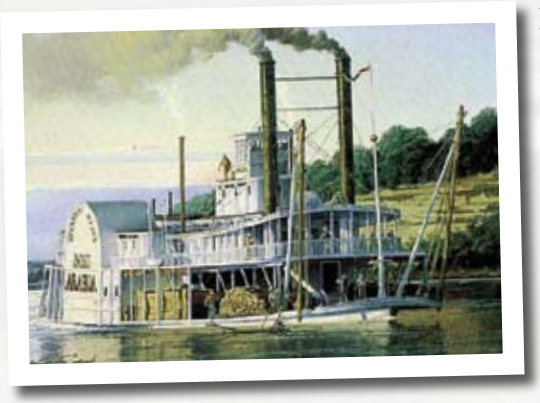
Opposite Page: Old rail lines have been turned into biking and hiking trails for families to enjoy.
This Page: A towboat pushes barges up the Mississippi River at Cape Girardeau.



Spotlight

The Steamboat *Arabia*

Often, when we read about the pioneers who moved to the frontier to farm and build towns, we have to use our imaginations to "see" what everyday life was like. But there is a museum in Kansas City where you can see what frontier life in the mid-19th century was like.



By 1856, small towns dotted the Great Plains, each with stores and merchants selling goods to the farmers and craftspeople. The goods sold by these merchants, the tools and supplies needed by the farmers and craftspeople, and even new residents themselves, were often transported by steamboat up the Missouri River.

Travel by river was an adventure and could be dangerous. The biggest danger was sunken trees called *snags*. The river's frequent floods and ever-changing course washed huge trees, roots and all, into the river. Anchored in the river bottom by those roots and hidden just below the water's surface, the trees were stripped of their smaller branches by the river current. They turned into huge spears pointing downriver. Of the 400 or so boats lost on the rivers, about 300 were sunk by snags.

In September 1856, the steamboat *Arabia* was making a trip up the Missouri River between St. Louis and Sioux City, Iowa. It was loaded with 220 tons of cargo, dozens of passengers and crewmembers, and a mule. It was traveling at about 7 miles an hour—just a little faster than most people can walk. On September 5, it left Westport (present-day Kansas City) and headed for its next stop at Parkville when disaster struck.

A snag caught the bow of the *Arabia*, lifting it out of the water. The pointed end of the tree poked through the boat's oak-timbered hull. Water poured into the boat, and it quickly sank. Luckily for the passengers and crew, the river

was not too deep, and the upper cabins remained above water. The *Arabia*'s lifeboat ferried the passengers and crew to safety on the shore.

By the next morning the *Arabia* had sunk deeper into the mud. Soon the rest of the upper portion of the boat was swept away by the river's current. The hull and its cargo were quickly covered by mud, sand, and silt. Over time, the river shifted course, and a cornfield eventually covered the spot where the *Arabia* had sunk.

In 1987, several men who were interested in riverboat history used old river charts, maps, and a metal detector to find the remains of the *Arabia*. It was a half-mile from the river and buried 45 feet down. After the cornfield was harvested in the fall of 1988, the men began digging in search of the *Arabia* and its treasures. Pumps were necessary to take away the water that seeped into the football-field-sized hole. After three weeks of digging, the workers began uncovering pieces of the boat and its cargo. They also found the skeleton of the poor mule that had been left behind and drowned.

Crate after crate of merchandise and supplies were recovered. There were medicines, spices, wedding rings, eyeglasses, underwear, shoes, buttons, beads, tools, guns, and toys. There were jars of food, including pickles that were still edible, and bottles of French perfume that were still fragrant. Each mud-covered item has had to be cleaned carefully.

The items that have been cleaned and restored are now on display, along with parts of the *Arabia*, at the Arabia Steamboat Museum in the Kansas City River Market. You can see the items that were going to be sold in those frontier stores, the tools that were going to be used by the craftspeople, and the items the new residents were bringing with them to their new homes. You can see what people wore, what tools they used for their everyday chores, the foods they ate, the plates and other dishes they ate from, and the things they held precious. And you can smell and even purchase copies of the perfumes they wore.

To make it possible for the barges and towboats to travel up and down the rivers, the U.S. Army Corps of Engineers maintains channels in the rivers. A **channel** is sort of like a path in the river where the river is deep enough to keep the loaded barges from dragging on the bottom. *Buoys*, floating markers that are anchored to the river bottom, mark the channel. As long as the towboat captain keeps the tow between the rows of buoys, the barges won't run aground.

Also helping the tows go up and down the Mississippi River is a system of locks and dams. To make the river deep enough between St. Louis and Minneapolis, Minnesota, 26 dams have been built (7 of them in Missouri). The river backs up behind the dams in *pools*, which are deep enough for barges. But to get around the dams, the tows have to go through the locks.

Do You Remember?

1. Why would someone want to use mass transit?
2. What is a rail "hub"?

Map 30

Mississippi River Locks and Dams in Missouri

Map Skill: What lock and dam is closest to St. Louis?

Top: River dams help to make the water deep enough for barges to travel safely.

Section 2

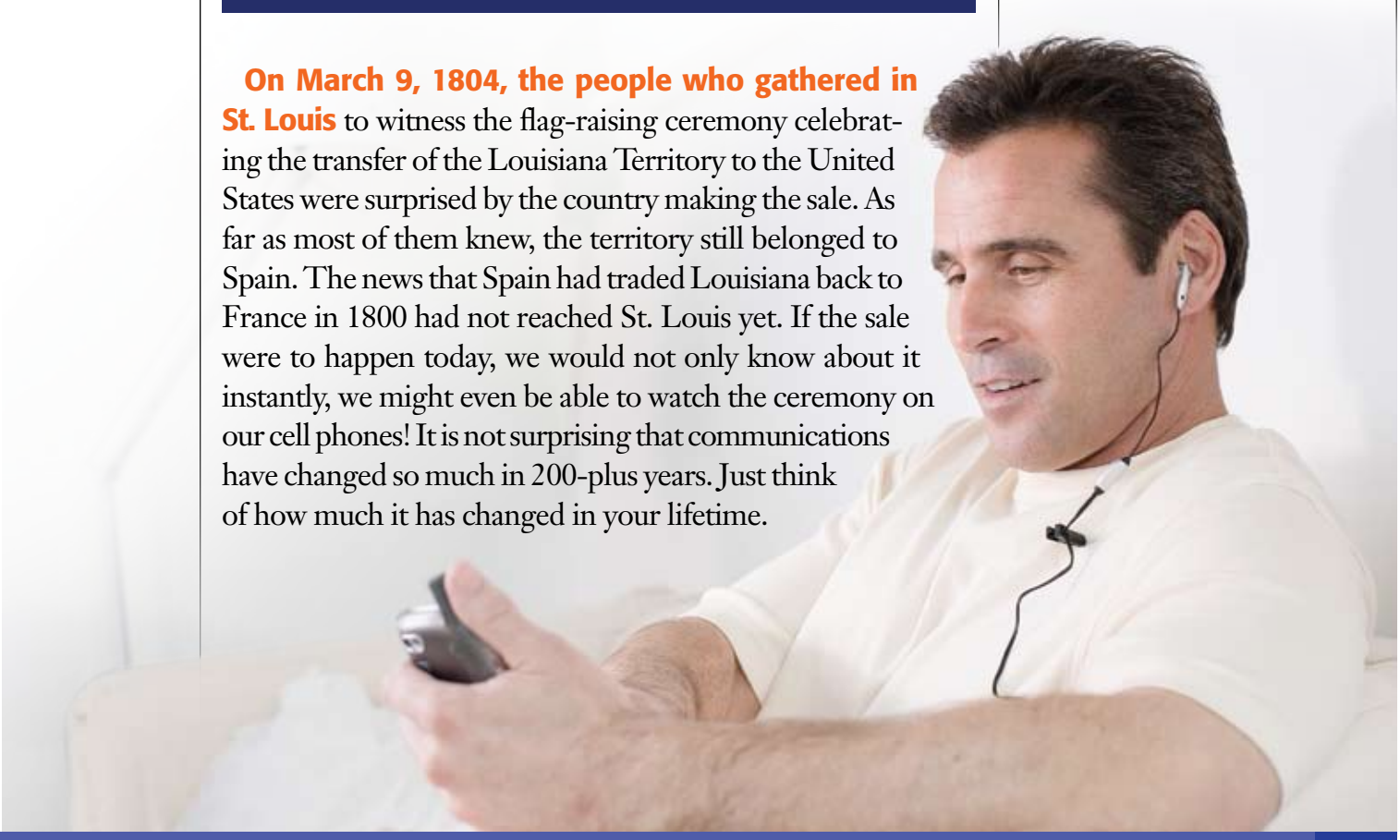
Communications

As you read, look for the following:

- the different ways Missourians communicate
- the role computers and the Internet play in our lives
- the reasons it is still necessary to have newspapers and publishers
- the ways radio and television have changed since their starts
- vocabulary terms **Internet, e-mail, website, World Wide Web, broadcast**

Bottom: Inventions like cellphones and portable media players allow us to talk, watch, and listen to many types of communications wherever we are.

On March 9, 1804, the people who gathered in St. Louis to witness the flag-raising ceremony celebrating the transfer of the Louisiana Territory to the United States were surprised by the country making the sale. As far as most of them knew, the territory still belonged to Spain. The news that Spain had traded Louisiana back to France in 1800 had not reached St. Louis yet. If the sale were to happen today, we would not only know about it instantly, we might even be able to watch the ceremony on our cell phones! It is not surprising that communications have changed so much in 200-plus years. Just think of how much it has changed in your lifetime.



Telephones

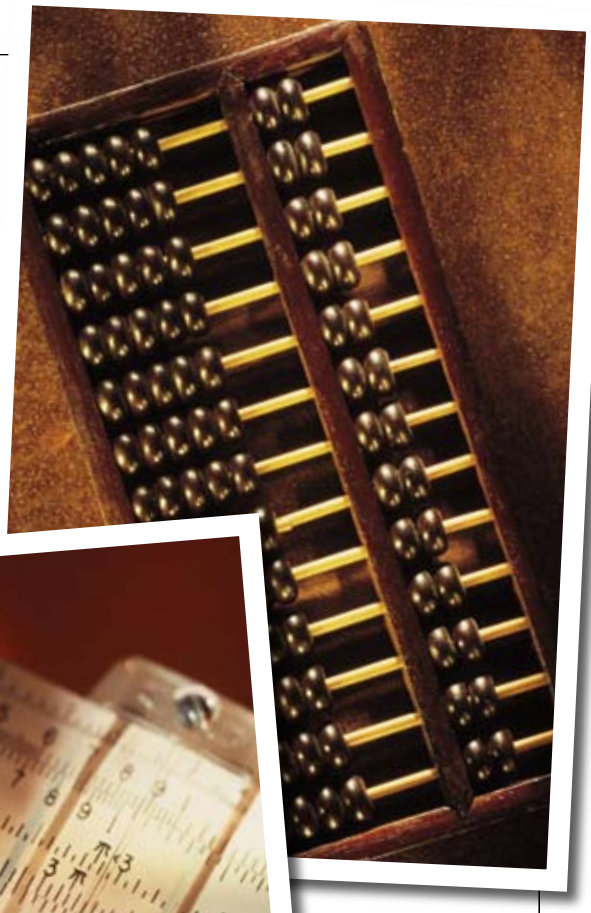
The telephone your parents grew up using did one thing—made and received phone calls. It did not have a video screen. It did not have a built-in camera. It could not download songs or send text messages. It could not be used as a computer or as a game player. There was only one choice in ring tones. It was also not very mobile. It was connected to the wall by a cord, which connected it to a telephone line that connected it to other lines.

There are still telephone wires either strung on poles or buried in the ground that carry phone messages. Your house may still have a *land line*, a telephone connected to the wall with a cord. But more and more Missourians have and use cell phones, which send voice and other data (information) as electronic signals that travel through the atmosphere. When you make a call on your cell phone, the signal is sent to a tower or antenna in your neighborhood. The signal is then relayed (sent on) to the telephone company. If the call is to another cell phone, the signal is sent to the tower or towers nearest the person you are calling. Then the call is relayed to the person's phone. The signal might even be relayed by a satellite in orbit around Earth. If the call is to a land line, the signal is sent from the phone company by a ground line to the telephone with that number.

Computers and the Internet

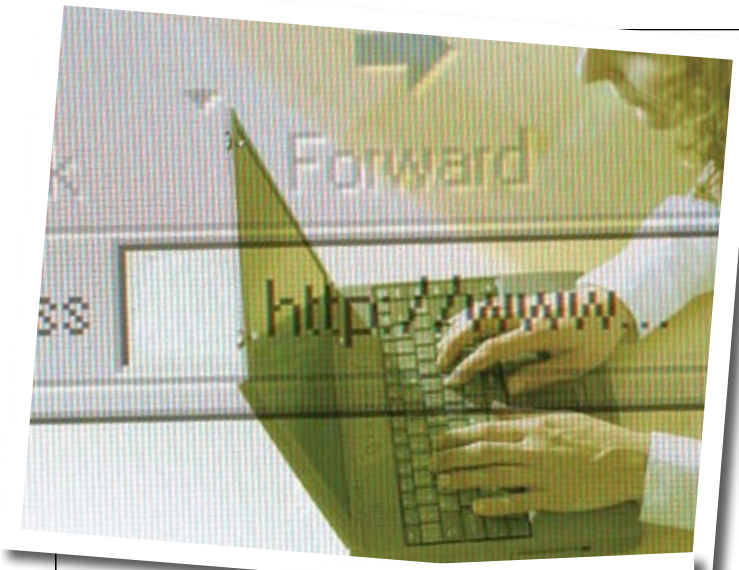
Look around your classroom. There is probably a computer you can use to do research, complete assignments, practice your math, or play spelling games. But keep looking. Almost everything you see in the room is there because, in some way, a computer was used. To begin with, this textbook was researched, written, edited, and printed using computers.

By the way, the calculator you use to solve arithmetic problems is also a computer. In fact, the first "computers" were designed to solve arithmetic problems. Five thousand years ago, the Babylonians used an early version of an *abacus* to add up how much grain was harvested. You've probably seen an abacus in class. You might also have seen an old adding machine that used wheels and gears to add and subtract. And, your parents or grandparents might still have a slide rule that they used in high school or college to make *calculations* (using numbers to solve problems).



Over time, we have learned more about mathematics and computer science and have become better at inventing machines and using electronics. We have made computers that can solve harder problems and do so faster than ever before. Now computers are used for more than just adding and subtracting. They are used to guide space shuttles into orbit, to help your parents' car use fuel more efficiently, and in thousands of other ways big and small. At a restaurant, the waiter will enter your order on a computer. We use them to play games and to create all types of information or entertainment.

Opposite Page, Top: Cell phone towers receive and send signals from one phone to another. Bottom: Land line messages are carried by wires strung along telephone poles and through buried cables. This Page, Top: An abacus. Middle: A slide rule. Left: A young girl enjoys playing video games through a television.



Better yet, we can share that information and entertainment with others through the **Internet**. The Internet uses telephone or cable television connections to link computers with each other—whether it is the computer next to yours or one on the other side of the world. One way is through **e-mail**, which allows us to send messages and to attach computer files like documents or pictures to the messages. Another way is through **websites**. People or organizations create a set of web pages and make it available on the Internet through the **World Wide Web** or other systems. People who know the Web address or have a link to the website can look at it. Websites can give us information, entertain us, or help us perform tasks, such as ordering tickets to a concert or applying for a membership in a club. They also help us keep in touch with other people. Some people have websites about their families or are members of networks where they can post pictures and information about themselves to be seen by other members of the network. Still other people share their thoughts and opinions on a *blog* (short for Web *log*, a log being a written record of events).

This Page, Top: Computers are used to share information through the Internet. Above: Today, students are able to do schoolwork and reference many topics on computers. Opposite Page, Top: The *Missouri Gazette* was Missouri's first newspaper.

Newspapers and Publishing

Newspapers continue to be an important way for people to keep up on the news or to find information they need or are curious about. Missouri's larger cities have daily newspapers. Many towns big and small have a weekly newspaper. Whether they are published (printed and sold) each day, each week, each month, or even less often, newspapers carry news and information. They have pictures of news events and people, places, or objects in the news. Newspapers have sports items and entertainment like the comics or a Sudoku puzzle. They also have advertising to help merchants sell their goods or to announce upcoming events. The money advertisers pay for the ads and the money you pay to buy the newspaper help the newspaper pay its workers and expenses.

There are not as many newspapers as there used to be. Now people can also get news and information from television and radio or from the Internet. Many newspapers have websites to help report the news faster. But for many people, the favorite way to find out what happened and what will happen is to hold a newspaper in their hands and read it.

People also like to read magazines and books. Hundreds of magazines are published in Missouri. Most are written for a small audience interested in a particular subject. For example, *The Angus Journal* is published in St. Joseph for farmers who raise Angus cattle. *Bluegrass Now*, a magazine printed in Rolla, is read by people who like bluegrass music. There are also more than a hundred book publishers in Missouri. Most print a small number of books on subjects of special interest to small groups of readers, such as doctors or engineers or people who like poetry or stories about the Civil War. Two large book publishers in Missouri are Scholastic and Walsworth Publishing Company. Scholastic prints school textbooks and other educational materials and has warehouses in Moberly, Neosho, Jefferson City, and St. Louis. Walsworth publishes school yearbooks at its factory in Marceline.

Did you Know?

The Pulitzer Prizes for journalism and the arts were created by Joseph Pulitzer, at one time owner and editor of the *St. Louis Post-Dispatch*.

This Page: A radio broadcasting studio. Opposite Page, Top: Families enjoy watching television and in-home movies. Below and Left: Cable wiring and satellite dishes bring more channels than ever before.

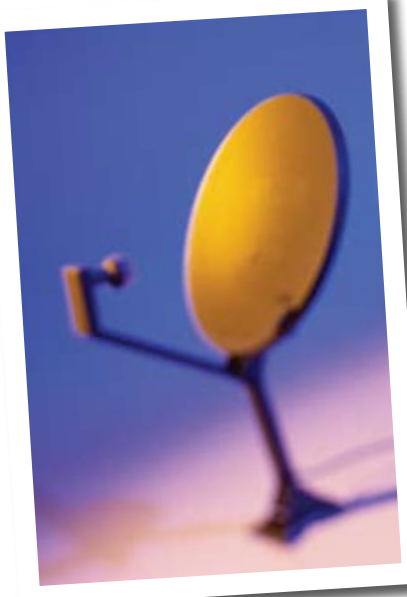
There are also people who publish their own books using computers and printers at home. Most only print enough copies for their friends and family, but a few also sell copies of their books at local bookstores. If you are a fan of comic books or *graphic novels* (with stories told in pictures like a comic book), you may have seen some of these self-published books.

Radio and Television

There are more than 370 radio stations in Missouri. They broadcast (send out) local and national news, music of every kind, sports, farm reports, talk shows, weather forecasts and warnings, religious programs, and educational programs. Some have powerful signals that can be heard all across the country; some have weak signals and are heard in only a small area, such as a college campus. There is at least one station in each county in Missouri, and most counties have several. Missouri's larger cities each have dozens of stations. Some broadcast in languages other than English.

Not only people in Missouri, but also people around the world can hear many of the radio stations in Missouri over the Internet. There are also "radio" stations that can be heard only on the Internet.

In 2007, there were 25 television stations in Missouri. These are stations that broadcast "over the air," meaning their signals can be received by anyone close enough to the station's broadcast tower with an antenna connected to their television. They include stations that provide entertainment, news, weather, and sports programs and stations that broadcast educational programs. On some of the stations, national broadcasting networks provide the programs.



Many of these stations are also broadcast over cable and satellite networks along with hundreds of other stations or channels. Your home may be connected to a cable system or it might have a satellite dish to receive the broadcast signals.

Commercial radio and television stations are supported by the commercials you hear and see. *Public* broadcasting stations are supported by donations from listeners and viewers, by grants, and in a small way by the government with tax money.

Do You Remember?

1. What were computers first used for?
2. What is the difference between commercial broadcasting stations and public broadcasting stations?

Did you Know?

Missouri's first television station was KSD-TV (now KSDK-TV) in St. Louis. It first went on the air in 1947.

Section 3

Modern Technology

As you read, look for the following:

- how modern technology affects health care, education, and the workplace
- why it is important to learn to use modern technology
- vocabulary term **biomedical research**

You have read about changes in technology throughout Missouri's history. The canoes used by the Native Americans and first European explorers to travel on the state's rivers were replaced by steamboats. The steamboats were replaced by diesel-powered towboats. Stagecoaches were replaced by automobiles on the state's roads, and the roads themselves went from being dirt paths to concrete-paved highways. Messages that once would have been delivered by the Pony Express are now sent by e-mail. And just think how different the explorations of Lewis and Clark would have been if they could have used digital cameras to take pictures of all that they saw and used laptops to send messages back to President Jefferson. New technology continues to change our lives.

Health Care

More than 618,000 soldiers died in the Civil War. Two-thirds of them died from diseases or infection—not from battle wounds. Doctors in those days could do very little to fight diseases or infections from wounds. They did not have the tools to examine the body to figure out what might be wrong. Even if they could figure it out, they did not have the drugs to fight the diseases or the tools and know-how to make repairs. Children and adults regularly died of diseases, injuries, and infections that we hardly worry about today.

But there are diseases, injuries, and other medical conditions we do worry about. Medical researchers are looking for ways to treat diseases like cancer, Alzheimer's, and heart disease. They hope to repair birth defects or problems caused when a person's genes are damaged and conditions caused by head injuries or paralysis caused by spinal cord injuries.

They are doing this by developing new drugs, new ways to operate on the body using tools such as lasers, new vaccines and treatments to prevent diseases, and new therapies to help injured people recover. All of this is called **biomedical research**.

Missouri is home to several drug companies and also to several medical and nursing schools that train doctors and nurses. Medical scientists are discovering how the body works, why things go wrong, and how the body heals. For example, researchers at the Central Institute for the Deaf in St. Louis are studying the ways the ears of some animals can repair themselves, looking for possible ways to help human ears repair the damage that causes hearing loss. Scientists at the Stowers Institute for Medical Research in Kansas City are studying how our genes work and what goes wrong with our genes to cause certain disorders or diseases.

Medical researchers are also learning ways to make our lives healthier. Your school has probably changed its cafeteria menu in recent years to serve healthier foods. You've probably been told to get more exercise and not to spend so much time in front of the television. Maybe your city or town has passed laws to *prohibit* (stop) smoking in public places like restaurants and has added walking paths and exercise areas to its parks. And you've no doubt heard more than one lecture on staying away from alcohol and other drugs and playing it safe by wearing a helmet when on your skateboard or bicycle.

Did you Know?

Andrew Still, a former Army surgeon in the Civil War, was a Missouri doctor whose studies of the human body led him to develop new ways to treat disease and injuries that came to be called osteopathic medicine. The Kirksville College of Osteopathic Medicine, the first school to train doctors in those new methods, was founded in 1892.

Opposite Page: Researchers examine cells to learn and find answers for health issues that face our society. This Page, Top: Dr. Andrew Still.

Education

One hundred years ago, you would have been sitting in a classroom that may or may not have had electricity. Your teacher would have used chalk to write problems on a slate blackboard. You would have copied those problems with pencil and paper. Fifty years ago, your school would have had electricity. If your school had a projector, your teacher might have shown you a movie or a filmstrip. For homework, the teacher might have handed out problems printed in blue ink that had the unmistakable odor of a *mimeograph machine*.

All of this might still happen at your school. However, chances are your teacher now uses technology to show you images from a computer connected to a screen in the front of your room, and on which your teacher might write additional information or problems for the class . A part of your homework might include using a computer in your classroom or in the school's computer room. Handouts and homework your teacher will give you for this chapter were probably printed from the compact disc (CD) that came with the teacher's manual.

You likely still use a pencil and paper to do arithmetic assignments, but your language arts teacher probably wants your essay typed and printed using your home computer or one available at the library. Computers are not the only new technology in use at your school. For example, if you are going to school in a newer building or one that has been recently remodeled, the builders used construction materials that are more energy efficient (meaning they make the best use of energy) than those used in the past.

Above: Teachers use projectors and computers to help present lessons to the class.

The Workplace

All the new technology you are using in school is not just to make it possible for your teacher to teach you more or to make doing your homework easier. The computer and technology skills you are learning, along with the basic skills of reading, writing, and arithmetic, will help prepare you to work in the global economy.

At one time, manufacturing drove the American economy. A lot of manufacturing still goes on in this country, but more and more of the economy involves the creation and use of information and ideas. Many American companies have factories around the world. It is still up to workers in this country to handle the orders for goods, to arrange for the transportation from one country to another, to keep track of parts and supplies, and to manage employees—all jobs that use technology very similar to what you use every day in the classroom. Even jobs in manufacturing involve modern technology to control the machines and program the movements of robotic arms and other devices.

There will always be a need for people who use their muscles to get the job done. If that is what you choose to do as a profession, you will find a use for technology. Auto mechanics, for example, uses computers to *diagnose* (determine what is wrong) engine trouble. Farmers use global positioning satellites to know where in their fields they should apply more fertilizer or plant a different variety of wheat.

Top: Engineers at construction sites use computers to help them with projects. Left: Computers are an important part of textile manufacturing also.

Do You Remember?

1. Name one way biomedical research is improving health care.
2. How has technology affected the workplace?

Spotlight

Wind Energy

There is a farm in northwest Missouri that is harvesting a renewable energy source—the wind. The Bluegrass Ridge Wind Farm near King City in Gentry County is the first of its kind in Missouri. Two more wind farms were already being planned in other northwest Missouri counties when the Gentry County farm was dedicated in the summer of 2007.

Northwest Missouri is the only part of the state where the wind blows strong enough and steady enough to make wind-generated energy practical. The steady breezes blowing off the northern Great Plains push the blades of 27 windmills spread across 9,000 acres of farmland. Each windmill is more than 300 feet tall and has 3 blades, which look like large airplane propellers. Each blade is nearly as long as a football field.

The blades are connected to an *axle*, which turns when the wind spins the blades. The axle, in turn, spins a 25-ton generator that produces electricity. The electricity is collected by a local power company that uses it as part of the electricity it sells to customers in Missouri, Iowa, and Oklahoma.

The Bluegrass Ridge Wind Farm can generate enough electricity to power 34,000 homes. That is a very small fraction of the homes served by the power company. However, the owner says the wind-generated electricity replaces electricity that would have to be produced by a coal-burning power plant that pollutes the environment and contributes to global warming.

The wind farm also benefits King City and Gentry County. The company that operates the farm pays rent to local farmers on whose land the windmills stand. It pays taxes to the local governments and school district. In addition, the farm has become a tourist attraction. Tourists coming to see the windmills often stop in King City and other nearby towns to eat and shop.

Section 4

The Future

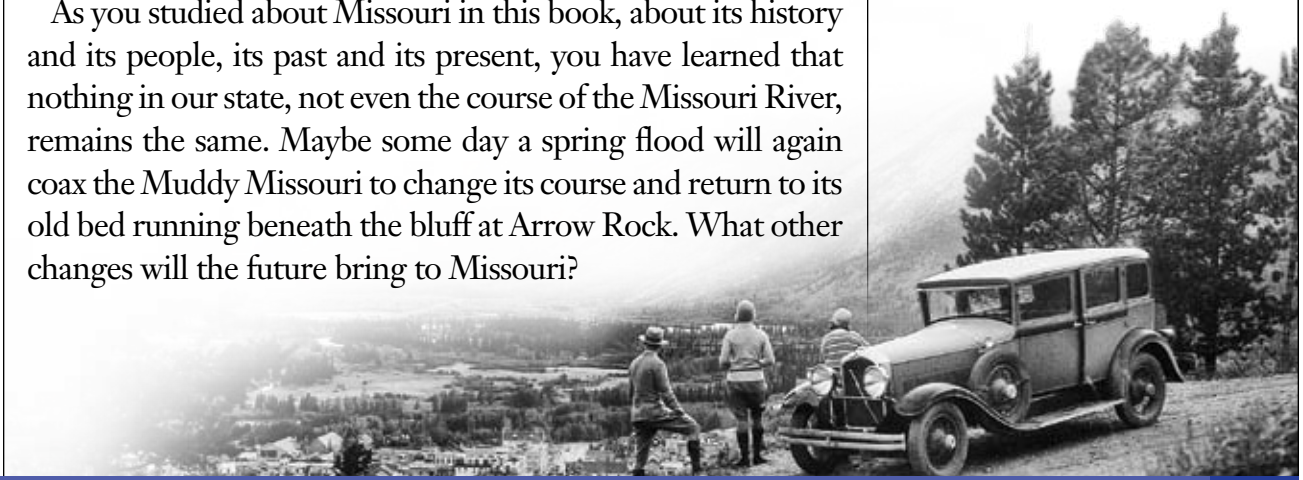
As you read, look for the following:

- the types of population changes that are taking place in Missouri
- how those changes will affect schools and health care
- the environmental challenges facing us now and in the future
- vocabulary terms **bilingual, baby boom, suburb, urban sprawl, fossil fuels, global warming**

This Page: Our landscape looked different many years ago.

If you go to Arrow Rock State Park just across the Cooper County line in southeast Saline County, one of the hiking trails will take you along the top of a bluff. In the winter, when the leaves have fallen and the trees no longer block your view, you can look out across cornfields that stretch eastward to a line of cottonwood trees. That line of trees is along the bank of the Missouri River, about a mile away. If you had stood on that same bluff as Lewis and Clark and their men worked their way up the river, you would have looked down on them because, in 1804, the river flowed against the bottom of the bluff.

As you studied about Missouri in this book, about its history and its people, its past and its present, you have learned that nothing in our state, not even the course of the Missouri River, remains the same. Maybe some day a spring flood will again coax the Muddy Missouri to change its course and return to its old bed running beneath the bluff at Arrow Rock. What other changes will the future bring to Missouri?



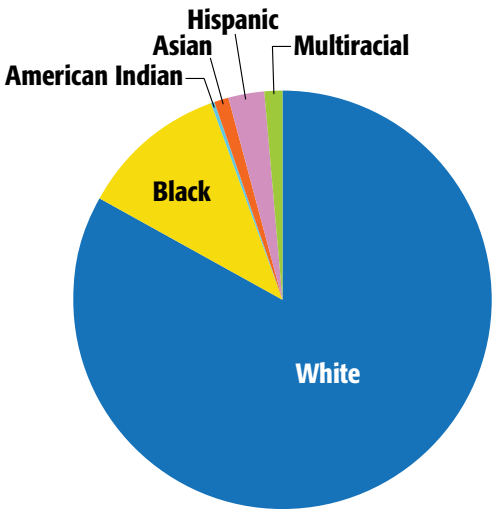
Population Changes

You have read in previous chapters how the face of Missouri's population has changed over the years. The vast majority of the state's population continues to be white (85 percent in 2005). But more and more, a picture of typical Missourians includes people of color. There are actually three times as many people in Missouri today who claim American Indian heritage (meaning that at least one of their ancestors was a Native American) than there probably were in Missouri when it became a state in 1820. At the time of statehood, there were about 10,600 black Missourians, almost all of them slaves. They made up about 13 percent of the population. In 2005, blacks made up 11.5 percent of the state's population, a total of about 667,000.

In 2005, there were an estimated 75,000 people in Missouri who were of Asian heritage. That is three times as many as there were in 1990, making them one of the fastest-growing ethnic groups in the state. But the fastest-growing group are people from Central and South America, sometimes called Hispanics or Latinos. In 1990, the census reported 60,429 Hispanic Missourians. In 2005, the estimate is that there were more than 156,000. Since 1980, the Hispanic population of Missouri has grown by 130 percent.

Background: The population of Missouri is made up of many ethnic backgrounds. Bottom: The Hispanic population is the fastest-growing group in Missouri.

Figure 20
Missouri's 2005 Population by Race



Although Hispanics and Asians still make up a small percentage of the total population, the numbers of Hispanics and Asians now living in Missouri is comparable to the number of Europeans who came to Missouri toward the end of the 19th century and the beginning of the 20th. Back then, this large group of newcomers meant that, in some parts of Missouri, English was not the first language you heard spoken in the streets or printed in the newspapers. It was not unusual to have classmates in school who were still learning English.

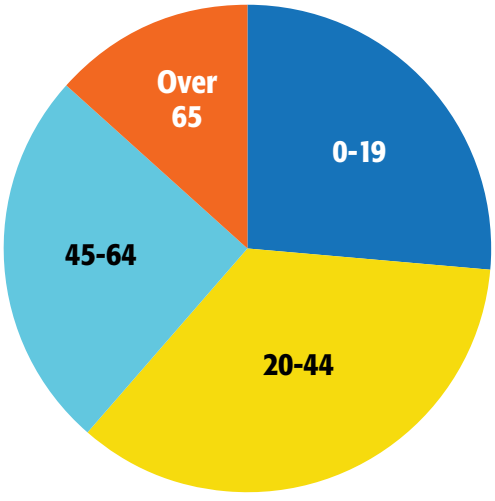
Today, you can go to neighborhoods in many parts of Missouri and hear Spanish or Chinese or Vietnamese spoken in restaurants and stores, see it printed on signs, and have classmates who are learning English as a second language. The growth in the number of Spanish-speaking people in Missouri and in the United States means it is possible that, by the time your grandchildren are in school, the country will be **bilingual**, meaning there are two languages spoken. That is why a growing number of schools, maybe even your own, have added classes in Spanish.

Top: Many restaurants and stores in our communities show the influence of these growing ethnic populations. Bottom: Signage in our public buildings is many times shown in two languages.

Right and Below: The "baby boom" after 1946 has led to there being a large population of people who are 60 and older, like your grandparents.

Also growing is the number of older Missourians. In 1900, one out of every three Missourians was under the age of 18. In 2005, only one out of four were under the age of 18. It might not sound like a big difference, but stop and think about the needs of younger people and how they are different from the needs of adults. After World War II, large numbers of returning soldiers and their wives started families. More children were born in the United States between 1946 and 1964 (about 79 million) than in any other 18-year period in the nation's history. So many were born that the period was called the **baby boom**. Now those babies born at the beginning of the boom are in their 60s, retiring from their jobs, and becoming grandparents. When they were your age, more schools had to be built to make room for them, and more teachers had to be trained to teach them. Now we will need more retirement homes and more doctors, nurses, and aides to care for them.

Figure 21
Missouri's 2005 Population by Age



Environmental Challenges

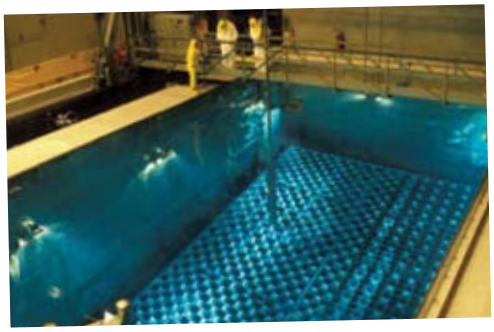
The growing number of people, not just in the United States but also around the world, and the greater use of technology have increased our use of natural resources and are threatening our environment.

There are 2.7 million more people living in Missouri today than there were in 1990, and our state is not even among the fastest growing in population. Much of the growth has not been in the cities, but in the **suburbs**, the communities surrounding the cities. When St. Louis, for example, was at its highest population in the 1950s with more than 800,000 people, most of those people lived in multifamily housing and were just a short walking distance from the grocery store or a quick streetcar or bus ride to work. Since most married women in those days did not work outside the home, fewer people were actually traveling to work each day.

For many reasons, including a desire to own a bigger home, to get away from the crowded and noisy city, and to avoid having to send their children to integrated schools, people started moving to the suburbs just outside the city. When they, too, became crowded or ran out of housing, people moved even farther from the city. New houses were often built on former farmland or in places that before were home to wildlife. Places like Lee's Summit near Kansas City grew from just 2,500 people in 1950 to more than 81,000 people in 2006. This spreading out of the population from the central city to the outer suburbs and surrounding rural areas is sometimes called **urban sprawl**.

This Page: Suburbs have grown immensely with new neighborhoods around all of our cities.

Right: More people means more cars on our roads. **Below:** A view of the Callaway fuel pool.



For many people, this meant moving to places that did not have buses or other mass transit and that were farther from their workplaces and farther from the grocery and other stores. They had to drive longer distances to work and to the store. More women began working outside the home, adding more cars onto the roads and more pollution into the atmosphere.

More and larger houses in the suburbs meant a greater demand for electricity, a demand that only grew as more technology in the form of air conditioners, microwaves, computers, televisions, and DVD players made its way into homes. This meant the construction of more power plants, most of which burn coal to generate electricity.

More vehicles on the roads and more demand for electricity have meant more carbon emissions from the burning of **fossil fuels** like coal and gasoline. Some scientists are convinced that these carbon emissions are acting like a blanket in our atmosphere, holding in the warmth generated by the sun's rays striking Earth's surface, much in the same way a greenhouse does. This, they believe, is raising the temperature of our atmosphere and changing our climate—a process called **global warming**.

Scientists are uncertain of all the effects global warming will have in the future, but we can see some of the effects it is having now in the melting of glaciers and snow on high mountain peaks. Also some plants and animals have disappeared from places that are now too warm for them to survive. Disease-carrying mosquitoes have spread to places that used to be too cold.

Did you Know?

Missouri has one nuclear power plant. The Callaway Unit One reactor and generator near the village of Reform in Callaway County began producing electricity in 1984 and today produces about 12 percent of the state's electricity.

Scientists fear that a continued melting of the ice in the polar regions will raise the level of the oceans enough to flood coastal areas, including port cities and valuable farmland.

The question is whether we can stop global warming or slow it down enough to give humans time to adapt to the changes it will cause. Over time, the atmosphere can cleanse itself of the excess carbon, but only if humans stop adding carbon faster than it can be removed. People are already trying to do this by using less energy (by doing something as simple as using energy-saving light bulbs or carpooling to work or school), using cleaner fuels that don't put carbon into the atmosphere, and finding new technologies for using renewable energy like solar power and wind power.

People who today are only students, including you, will grow up and create many of the solutions to this problem. The things you are learning in school now will give you the know-how to meet not only the challenge of global warming, but also the challenges of feeding the world, fighting disease, and providing clean water.

In earlier chapters, you have read about how hard life was for the children of the pioneers who settled Missouri or for the children of the immigrants who came here to help build new lives in Missouri. Many of them grew up determined to make life in Missouri better. Because of their vision and hard work, life today in Missouri is better. How much better it will be in the future just may be up to you.

Do You Remember?

1. What is the fastest-growing group of Missourians?
2. What are the communities surrounding cities called?

Top: Carpooling and mass transit put less pollution into the air. Bottom: High efficiency light bulbs use less energy.

Spotlight

The Flood of 1993

In most years, the summers in the Midwest are sunny and dry with only a handful of days seeing any rain. But in the late spring and summer of 1993, it rained and rained and then rained some more. By early June, the soil could hold no more rainwater.

It rained in Kansas, Nebraska, Iowa, and Missouri on 20 of the 31 days in July—and they weren't just light rains. From June to August, 24 inches fell on northeast and central Kansas and on north and central Missouri. Thirty-eight inches fell on east-central Iowa. That is more rain in three months than most of the region receives in a full year. The rain filled streams and rivers to overflowing, covering fields and flooding small towns. All of these rivers and streams were tributaries of either the Missouri or Mississippi rivers, and their waters were flowing downstream toward Missouri.

The Mississippi River had been out of its banks in Missouri since April, but people living along the river were used to that. However, as the rain kept falling and the rivers kept rising, people who thought they were safe soon had to evacuate. In hardest-hit St. Charles County, 10,000 people had to leave their homes as water, sometimes as deep as 20 feet, covered a third of the county (200 square miles).

The water covered highways and railroad tracks, cutting rail service between Kansas City and St. Louis. It closed bridges, forcing people to drive dozens of miles or more to find an open bridge. In many places, the only way to travel was by boat. The floodwaters swamped sewage and water treatment plants. More than 100,000 people in the St. Joseph area went days without running water.

The flood did not come all at once. The rivers rose over a period of days, giving tens of thousands of volunteers time to fill and stack sandbags on top of levees and around buildings and homes. Volunteers were able to build a wall that kept the flooding Mississippi out of Ste. Genevieve. Too often, though, the rivers simply rose too high, knocking over the sandbag

walls and washing away the levees. When this happened, the rivers quickly rushed in with great force. Near Hardin in Ray County, the raging waters washed caskets out of a cemetery and left them in fields and across highways many miles downstream.

The rivers reached record heights. At Kansas City, the Missouri River reached 48.9 feet—16 feet above flood stage and 2 feet higher than the previous record. The Missouri River also set records at Boonville, Jefferson City, Hermann, and St. Charles. The Mississippi River at St. Louis reached a record high of 47 feet on July 20 and then broke that record 12 days later when it reached 49.47 feet. The river reached the steps leading up to the Gateway Arch. But the Arch, like most of St. Louis, was either high and dry or protected by floodwalls. Floodwalls also protected Hannibal and Cape Girardeau.

Beginning in August, the rivers began to recede. They left behind ruined roads, trash and debris, dead animals and wrecked automobiles, houses and barns washed off their foundations or collapsed into piles of rubble. Those houses that were left standing were filled with stinking mud, and mold covered all of the walls. It was weeks and months before people could return to some places. In some cases, they never returned home.

The town of Cedar City, across the Missouri from Jefferson City, ceased to be. Its residents moved away, and the town site was turned into athletic fields. Downriver at Rhineland, the residents decided to move their town to the top of a hill overlooking the Missouri River valley.

Across the Midwest, 400,000 square miles were flooded, including 15 million acres of farmland. The flooding led to the deaths of at least 50 persons and caused $15 billion in damages. It is one of the greatest natural disasters in the nation's history.

Opposite Page: A bird's eye view of the flooding along the Missouri River near Cedar City. **This Page, Left:** The flood waters came extremely close to the Gateway Arch in St. Louis. **Right:** Images like this one near Jefferson City, showing destruction and ruined roads, were all too common during the floods.

Chapter Review

Summary

This chapter brings you to the present in Missouri. It tells you about the way the auto and aviation industries continue to be important to the state's economy. It tells you about modern communications and transportation.

In this chapter, you also learned how technology is changing Missouri and the way we live. You read how it is helping medical researchers, teachers, and businesses and why it is important to learn the skills necessary to understand and use new technology.

Finally, this chapter posed some questions about the future in Missouri—how population changes and problems with our environment are posing challenges right now and will continue to pose challenges for future generations, including your own.

Remember

Write a sentence or two explaining how the following groups of terms are related.

1. interstate highways
   mass transit
   Amtrak
2. towboat
   channel
   barge
3. Internet
   e-mail
   website
   World Wide Web
4. baby boom
   suburb
   urban sprawl
5. fossil fuels
   global warming

Understand

Answer the following questions with complete sentences.

1. At the beginning of the 20th century, what was the most common form of transportation for Missourians?
2. How has Missouri played a role in the automobile industry?
3. Where is the largest rail hub located in Missouri?
4. Why don't Missouri towns have as many rail services as they once did?
5. What is our nation's most important waterway?
6. Why don't we use newspapers as much or as often as we used to?
7. Why do newspapers continue to be important?
8. What type of research has led to new discoveries in medicine?
9. What reasons did people have for moving out of the cities and into the suburbs?

Think About It

1. Name several ways you use computers every day in your classroom or at home.
2. Do you think the burning of fossil fuels has led to global warming? If so, how?

Write About It

1. Write a short paragraph comparing schools of long ago and schools of today. How are the schools alike? How are they different?
2. Write a short story about what you think life will be like by the 22nd century.

Use The Internet

The flood of 1993 had a profound effect on many Missourians. Visit either website el.erdc.usace.army.mil/flood/fl93home.html or mo.water.usgs.gov/Reports/1993-Flood/index.htm to view maps and graphs of the flooding. Write down three interesting facts you learned about the flooding from looking at the maps. Share your facts with the class.

Work Together

1. With a partner, create a pictorial timeline showing how radio and television have changed through the years.
2. With a partner or in a small group, create a TV commercial advertising Missouri. Your commercial should include information about places to visit, the weather, festivals, and other things to do. Present your ad to the class.
3. With a partner or in a small group, create a flowchart that shows the changes in transportation in Missouri.