USA

its Geography and Growth

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NOTE

As indicated in the Forward, this edition of ***USA - Its Geography and Growth*** is a "simplified English" version, which provides flexibility for use by children if desired (class sets are available upon application to the United States Information Service, 69 Sparks Street, Ottawa).

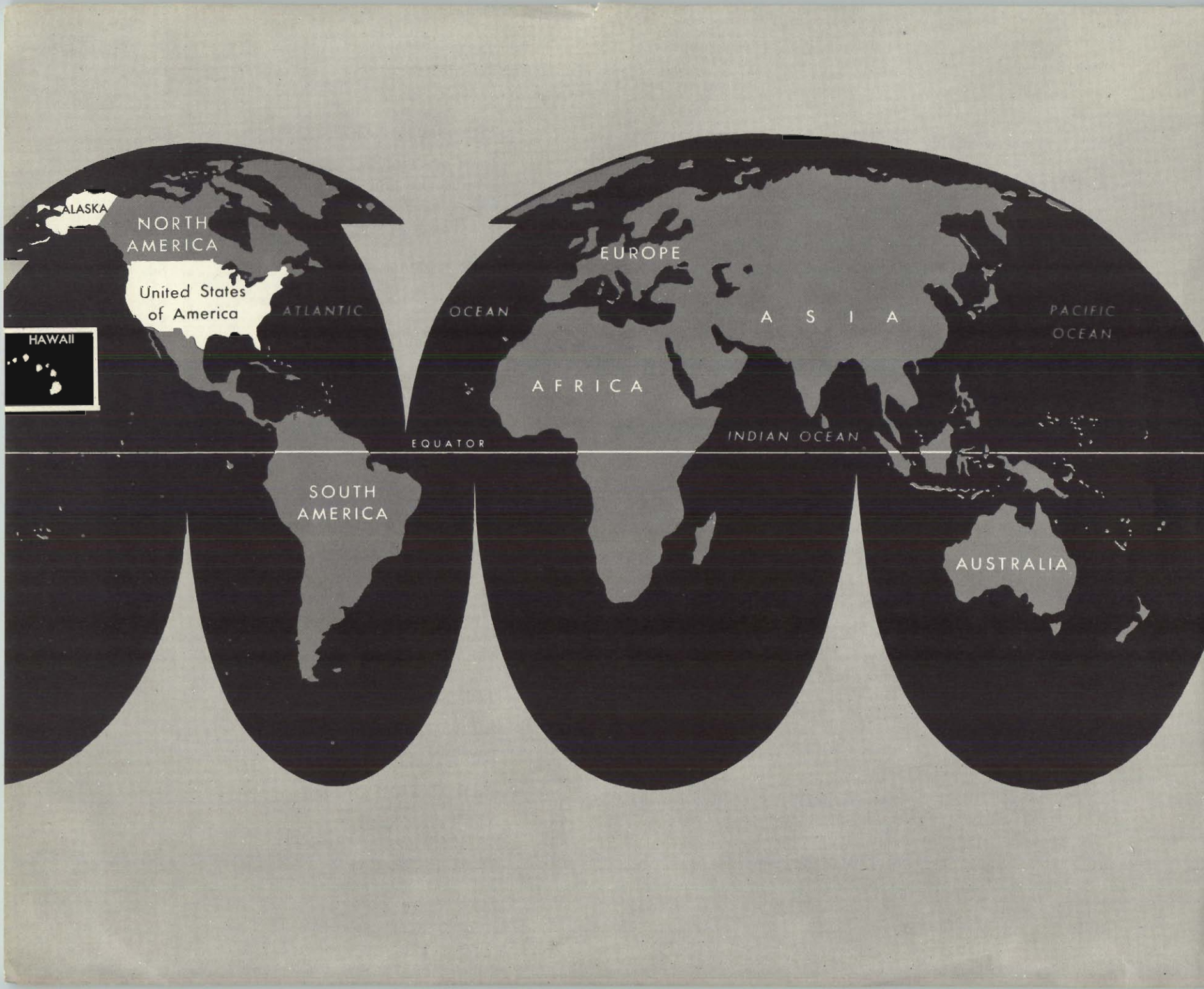
Actually, the simplified English version was prepared by the United States Information Agency in Washington mainly for persons studying English as a second language. This does not cancel its value for certain levels of school work in English-speaking countries however. For your information, the vocabulary is limited to 3000 words.

U.S. Information Service
Ottawa

Foreword

Of the many inquiries that are received by the United States Information Service, a large proportion is concerned with the geography of the United States. Through words and photographs, this booklet written in simplified English as a teaching aid, gives the reader a partial picture of the nation. It tells about some of the ways in which Americans have made use of their land and their resources. Of course, such a brief account cannot tell the whole story. Many more detailed studies have been written on all aspects of the subject. Nevertheless, it is hoped that this introduction to the subject will contribute to a better understanding of the U. S.

Contents


ALASKA
NORTH AMERICA
United States of America
HAWAII
ATLANTIC OCEAN
EUROPE
A S I A
PACIFIC OCEAN
AFRICA
EQUATOR
INDIAN OCEAN
SOUTH AMERICA
AUSTRALIA

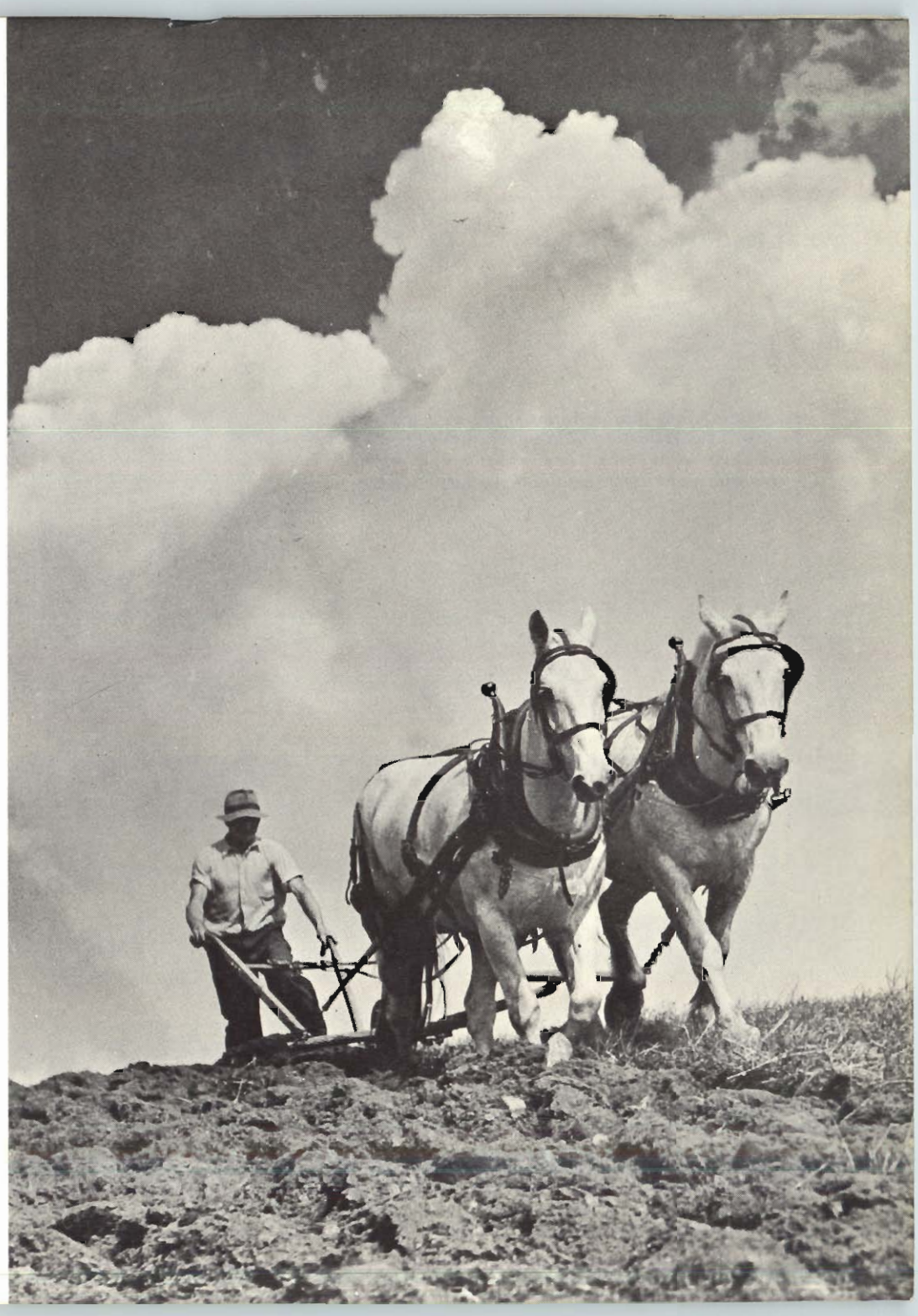
Introduction

Of all the creatures on the earth, only human beings have found ways to stay alive in all parts of our world. There is no end to the many things people have done to make the land produce for them.

Geography, the science of earth and the distribution of life on it, is the raw material with which all people work. What people do with their geography is an exciting story. It is the story that gives human meaning to the facts of the soil, the winds, and the rivers. This booklet will discuss *the partnership of men and geography* in the United States.

The main land of the United States lies in central North America, with Canada to the north, Mexico to the south, the Atlantic Ocean to the east, and the Pacific to the west. Alaska does not touch the main land of the United States. It borders on northwestern Canada. Hawaii, the island state, lies in the Pacific Ocean.

Americans make great use of machines. Their farms are separate instead of being gathered into villages. They depend on maize (corn) as the basis of their economy. Many Americans frequently move about from one part of the country to another.



HOW DO PEOPLE IN THE U.S.A. LIVE?

WHAT IS THEIR COUNTRY LIKE?

Some Americans live on farms so isolated that, on foot, it takes them two days to reach their nearest neighbors; while other Americans live in apartments with many other families in the same building.

Some American farmers must plant and harvest in less than three months, and half the year their land is covered with snow; while others plant in January as easily as in May and raise four crops a year.

Some Americans drive to work and park their cars beside those of thousands of co-workers in the same plant; other Americans work alone, dependent mainly on their own resources for a livelihood.

It takes more than forty-eight hours for a modern train, traveling a mile a minute, to cross the United States.

Reasons for these and other features of life in the United States may be found through a study of the country's geography, and through a study of what the people there have done to make their geography work for them.

All these contrasting conditions exist because the United States is so large and has so many kinds of land, climate, and people. It stretches 1,600 miles (2,560 kilometers) from north to south; 2,800 miles (4,480 kilometers) from east to west. To cross the country in a modern train going a mile a minute (1.6 kilometers a minute), a passenger must ride all day, all night, all day again, and then all night again. The deep green mountain forests of the northwest coast receive more than 100 inches (2.5 meters) of rain each year. The cactus, a plant covered with sharp needles that grows in very dry areas, native to the deserts in parts of the southwest, must live on less than five inches (12.7 centimeters) of rain a year. A traveler from almost any other country can find parts of the United States to remind him of home. He can find cool pine forests dotted with lakes, or mountain peaks covered with snow. He can find meadows with brooks and trees, or sea cliffs, or wide grassy plains, or broad spreads of grape vines, or sandy beaches shining in the sun.

In some parts of the United States, the pattern of life seems to have happened by accident. For instance, there is a little town in New York State where some Scottish glove makers happened to settle almost two centuries ago. Even today that town is a principal supplier of gloves.

Another city happened to be the home of a man who invented a new kind of shirt collar. Ever since then, many people in that city have earned their livings by making shirt collars.

Sometimes when families moved westward to new farmland their wagons broke or they became ill upon the way. As a result, today, 150 years later, their descendants are farmers in little hidden valleys where few would expect people to live.

But these are exceptions. Most people in the United States live in certain ways because the resources of their homeplace have opened certain opportunities to them, and closed others. The choice of work has not been greatly affected by traditional occupations, political borders, the wishes of powerful people, or custom. These have been less important in the United States than in many other countries.

THE NORTHEAST

THE CENTRAL BASIN

THE SOUTHEAST

THE GREAT PLAINS

A PANORAMIC VIEW

THE MOUNTAINS AND DESERTS

Rolling farmland in the Allegheny Mountains

THE WEST COAST VALLEYS

Pacific Ocean
Coast Ranges
Cascade Range
Sierra Nevada Mts.
GREAT BASIN
Rocky Mountains
GREAT PLAINS
COLORADO PLATEAU
CENTRAL LOWLAND
Great Lakes
Appalachian Mountains
Ozark Mountains
Atlantic Ocean
Gulf of Mexico

THE FACE OF THE LAND

On the map, the great mountains look like shadowy masses; the wide plains look like little patches, and the rivers seem as thin as threads.

Today, roads and railways cover the land with many crossing lines. But only a few generations ago, these features on the map represented great dangers and difficulties for travelers. Visitors traveling today over a good road in the Cascade Mountains, in the West Coast states of Oregon and Washington, may see marks on the rocks. These marks were made by ropes, where pioneer settlers painfully lowered their horses and wagons down cliffs to reach the river far below.

In another place, in the Sierra Nevada Mountains, in the State of California, the main road now runs through a mountain pass which was once too narrow for a wagon to go through. Families traveling along that way had to take their wagons apart, piece by piece, go through the pass, and then build the wagons again on the other side.

In the southern part of the Great Plains there is an area so flat and featureless that the first travelers found their way across it with difficulty. They drove stakes into the ground to mark the way for those who came after them. Because of the stakes, this area is called the "staked plains." And travelers in the unmarked western valleys dropped mustard seeds on the ground, depending on the seeds to grow into a bright yellow trail of plants that would lead them out again. Even the gentler Appalachian Mountains were difficult to cross. Men of adventure, almost without equipment, spent their lives finding passes through the mountains and making trails where settlers could follow.

Many modern features on the landscape prove that earlier generations were unwilling to be stopped by the "impossible" natural obstacles in their way. Poles and wire now carry power and communication between ridges that are so deep in snow that only men wearing wide devices for walking on the soft surface can reach them. Railroads run along the sides of mountains. Bridges have been built over deep valleys in mountains. Highways run through the burning heat of deserts. None of these could have been built or repaired without heroic effort.

In a way, much of the geography and history of the United States was determined about 10,000 to 25,000 years ago. At that time the great northern ice cap flowed over the North American continent and ground into it the final major changes. These changes have affected everybody who has lived there since. The passage of these ice flows determined the size and the direction the Great Lakes drain. They changed the direction of the Missouri River (see map on page 42) and carved the channel of the Hudson River (map on page 30). They pushed soil off a huge part of Canada into the United States, thus creating the northern part of Central Agricultural Basin—one of the richest farming areas of the world.

On the Atlantic shore of the United States, the northern coast is rocky and uninviting, but the middle and southern Atlantic coast rises gently from the sea. It starts as low, wet ground and sandy flats, but then becomes a rolling coastal lowland somewhat like the lowland of northern

Much of the north Atlantic seaboard is bleak and inhospitable.

The Appalachians are rolling mountains, lined with gentle valleys.

and western Europe. The Appalachians, which cut down through the east, are old mountains. There are many valleys between them, and there is coal beneath. To the west of the Appalachians there are higher, sloping lands. They were built up from bits of stone that were washed down from the mountains. Then streams cut the slopes into small hills. Beyond these, one finds the great Central Lowland; the way its land lies resembles the plains of eastern Europe, or Manchuria, or the Great Plains of Australia, or certain plains in Africa or South America.

Across the north of the Central Lowland, one finds the Great Lakes, which the United States shares with Canada. The Great Lakes extend for almost a thousand miles (1,600 kilometers). They are thought to contain about half of the fresh water of the world. These five large lakes were dug out of the land by the ice cap creeping south that once covered the northern United States. In winter ships cannot use the lake, as the water freezes into sheets or blocks of ice.

The Great Plains are like the flat top of a great table which is slightly tilted, so that the Great Plains keep rising to the west until they are stopped by the Rocky Mountains, "the backbone of the continent." Scientists call them young mountains. They are the same age as the Alps in Europe, the Himalayas in Asia,

In the Great Plains, the land stretches as far as the eye can see.

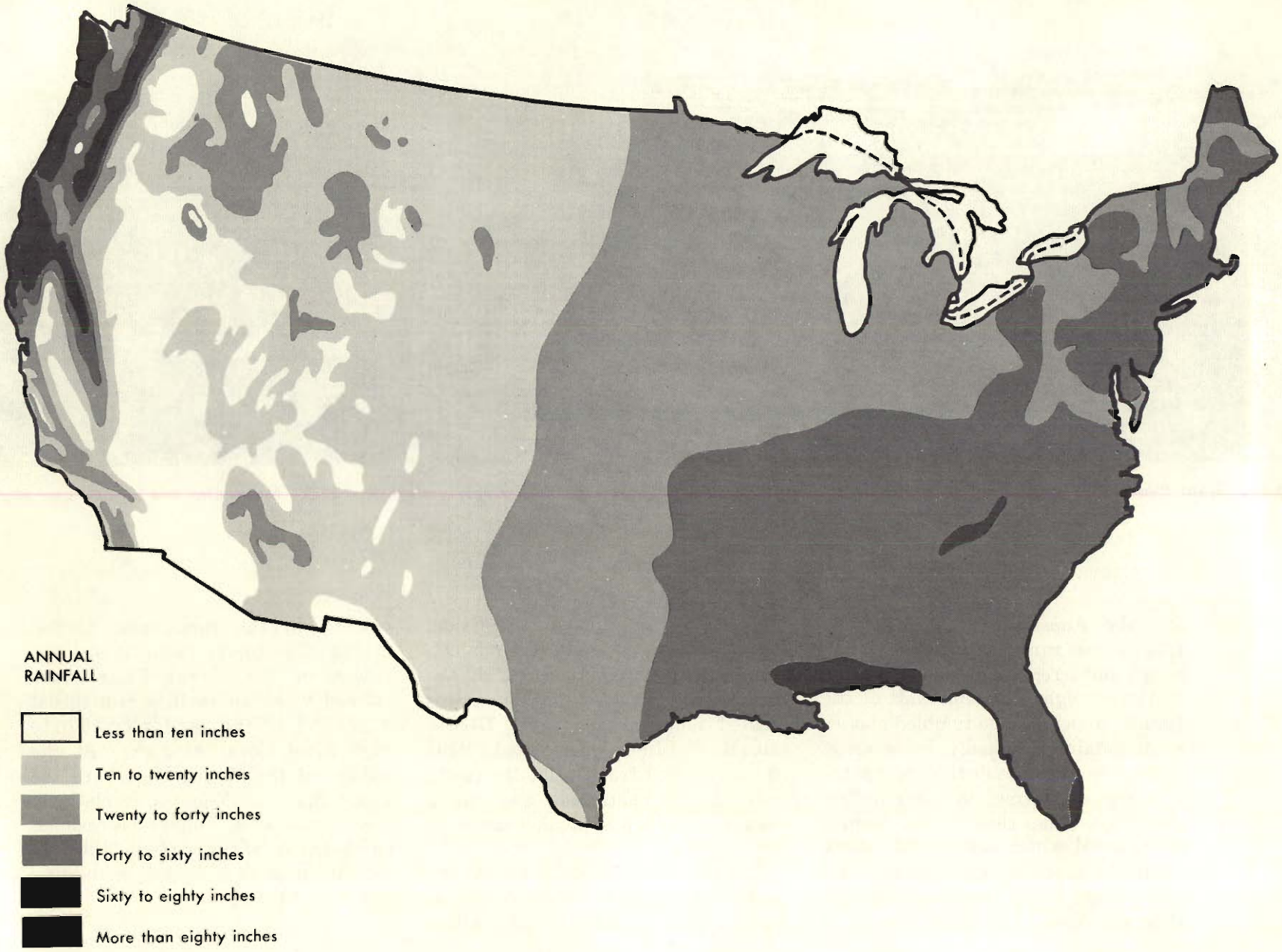
Comparatively young, the Rocky Mountains are jagged and high.

and the Andes in South America. Like those ranges, they are high, rough and irregular in shape.

At first sight, the land west of the Rockies appears to be tumbled masses of mountains. Actually, however, it is made up of quite distinct and separate regions, formed in many different ways. One region was formed of material which was washed down from the Rockies and pressed into rock. That is the region of the high Colorado Table Lands, in which the mile-deep (1.6 kilometer), Grand Canyon of the Colorado River is cut.

But another region, the high Columbia table land to the north, was created much as the great Deccan table land of India was created. Melted rock poured from inside the earth, burying old mountains and filling valleys to a depth of thousands of feet (meters).

The volcanoes which threw out the melted rock built the Cascade Mountains. They include the only active volcano in the continental United States. The Sierra Nevadas and the ridges of the Great Basin were formed when an earth strain thrust a portion of the earth's crust into high tilted blocks of rock. At the border of the Pacific Ocean are the Coast Ranges. These are relatively low mountains, where occasional earthquakes show that in this region the process of mountain building has not yet stopped.

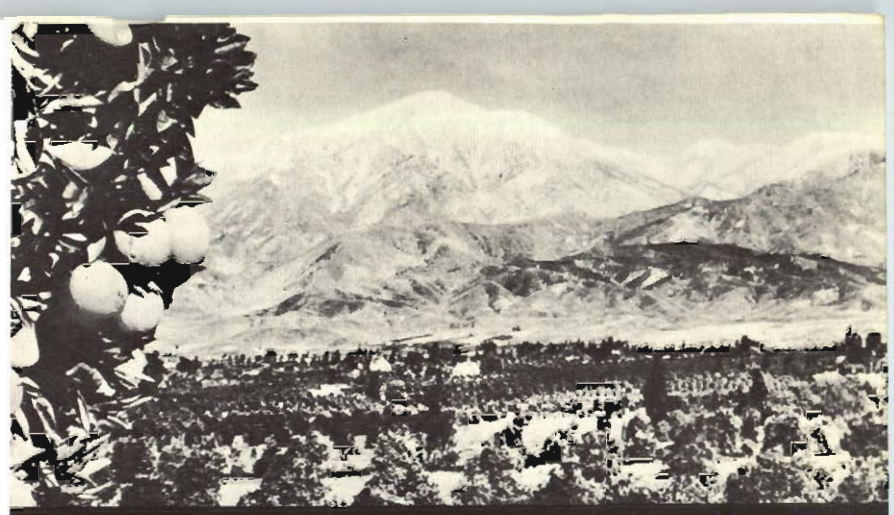

ANNUAL
RAINFALL
Less than ten inches
Ten to twenty inches
Twenty to forty inches
Forty to sixty inches
Sixty to eighty inches
More than eighty inches

THE RAINFALL

In the northern half of the world, the western portions of continents are especially favored by the prevailing winds. This is because the western lands gather the rains as they come off the ocean, blown by storms that circle from west to east.

The greatest geographical misfortune of the United States is that the Cascade Mountains and the Sierra Nevada Mountains run north and south so close to its west coast. Because they are so close to the coast, these high mountains catch the largest share of the life-giving rains that come in from the ocean. As a result, there is too little rain for North American regions which lie in the same wind paths as the British Isles, France, Germany, Italy, and eastern Europe. Almost the whole western half of the United States lies in the "rain shadow" of mountains, which means that very little rain falls. In a great part of that area, farmers must depend on water from the snows or rains that are trapped by mountains.

One of the most important geographic boundaries in the United States is the 20-inch (51 centimeter) rainfall line which runs north and south, almost through the middle of the country. East of this line, farming is relatively easy, and the population is relatively large. West of the line, one finds dry-farming, the feeding of animals on pasture grass, or man-made crop watering systems, and fewer people. East of the Rocky Mountains, running all the way from the Canadian border to Mexico, there are several hundred thousand square miles (kilometers) where almost no trees grow. In this section of the country, as well as in the Great Basin and Colorado table land to the west, there are deserts which receive as little as five inches (12.7 centimeters) of rainfall a year. Yet west of the Sierra Nevada Mountains, there are places in which 100 inches (2.54 meters) of rain falls each year.



West of the Sierra Nevada Mountains, rainfall makes the land rich.

Because rain and clouds are stopped by the Sierra Nevadas, land on the eastern side is semi-arid, suitable only for grazing or dry-farming.

THE RIVERS

1. MISSISSIPPI
2. MISSOURI
3. OHIO
4. COLUMBIA
5. COLORADO
6. RIO GRANDE

THE RIVERS

The Mississippi is one of the world's great continental rivers, like the Amazon in South America, the Congo in Africa, the Volga in Europe, or the Amur, Ganges, and Yangtze in Asia. The waters of the Mississippi are gathered from two-thirds of the United States. Together with the Missouri River (its principal branch), the Mississippi flows almost 4,000 miles, (6,400 kilometers) from its northern sources in the Rocky Mountains to the Gulf of Mexico. This is one of the longest water courses known.

The Mississippi has been called "father of waters." Through all its lower course, it wanders along, appearing lazy and harmless. But people who know the Mississippi are not deceived by its lazy appearance. Americans have had many bitter struggles with Mississippi floods. Finally Americans had to learn that nothing can be gained by fighting against the rages of the mighty river. To live in peace with the river, people have had to accept some of the river's own terms. They have had to work

patiently at saving and rebuilding soil, grasslands, and forests, far back to where the waters begin to gather. Without such work, there could be no hope of taming the Mississippi.

Where the still untamed Missouri River pours into the Mississippi, from the west, it colors the river deep brown with small pieces of soil. Farther down the stream, the clear waters of the Ohio River join the Mississippi. The Ohio is the Mississippi's principal eastern branch. Where the two rivers join, the visitor may see a sign of a difference between the rainy east and the dry west. For many miles (kilometers) the visitor can observe the great difference between the waters of the two streams as they flow side by side in the same river, without mixing. The waters from the west are deep brown: they have robbed the soil in a land where few plants grow. The waters from the east are clear and blue: they come from hills and valleys where plentiful forest and plant cover has kept the soil from being washed away.

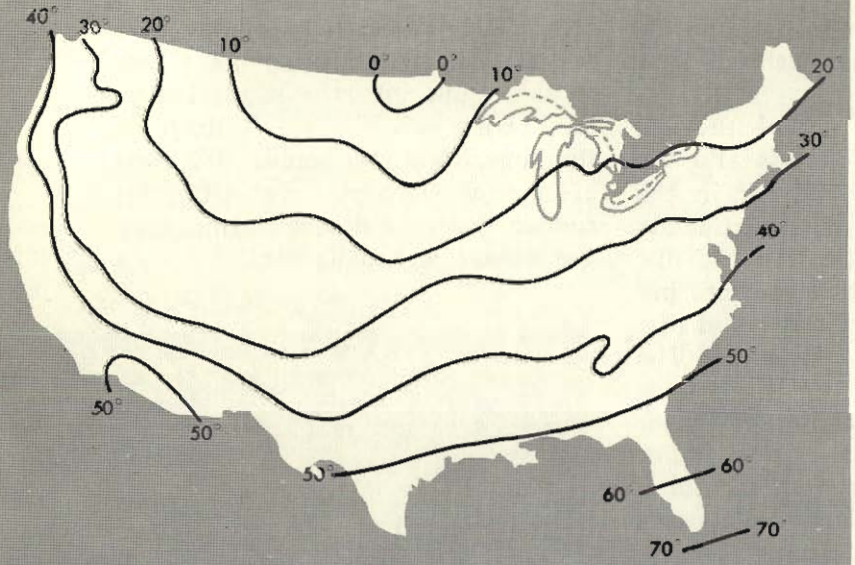
Like the Mississippi, all the waters east of the Rockies finally reach the Atlantic; all the waters to the west of the Rockies finally arrive at the Pacific. For this reason the Rocky Mountains are known as the Continental Divide. There are many places in the Rockies where a visitor may throw two snowballs in opposite directions and know that each will feed a different ocean.

The two great rivers of the Pacific side are the Colorado and the Columbia. The Colorado is in the south; the Columbia rises in Canada and drains the north. In the dry western country, both rivers are important and necessary sources of life. But they are very different. The Columbia was wild in pre-historic times, cutting and shaping the land. Now, however, it flows with quiet dignity. But the Colorado is still a river of enormous fury—wild, restless, and angry. It races and plunges, cutting deeply into the desert rocks. For hundreds of miles (kilometers), it resists any attempt to cross it. But with all its fury the Colorado has been dammed and put to work. All the farms and cities of the southwestern corner of the country depend on its waters. When projects that are now being built are completed, every drop of the Colorado's water will have served man before it reaches the sea. However, it will probably never be as useful as the Rio Grande: of which it is said that all the water that flows into the ocean from that river has been used five times for irrigation, and has been drained back five times.

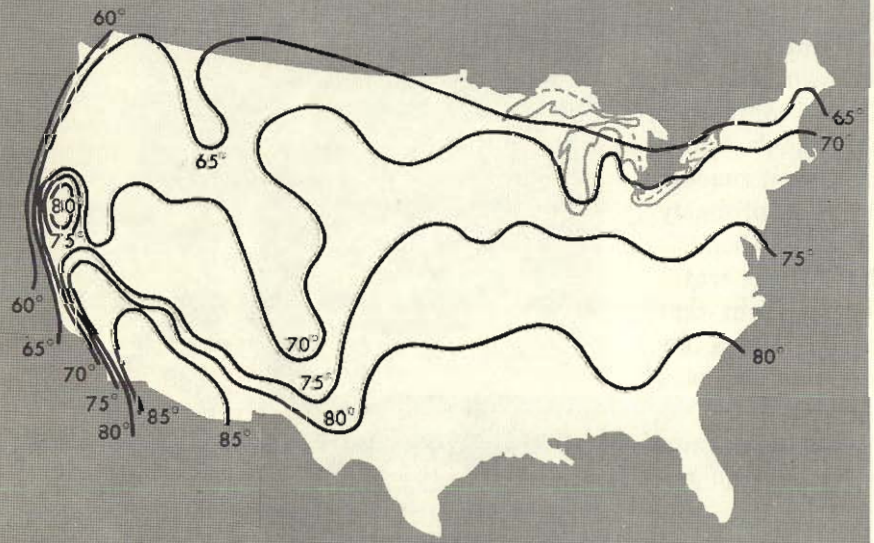
The Great Basin is a strange drainage area. Its rivers seem to go nowhere. This region is so dry that the atmosphere sucks up its rivers or they sink into the sands before they can reach the sea. Much of the time, they are simply dry beds of narrow streams. But after the sudden and rare desert storms, they are savage and dangerous.

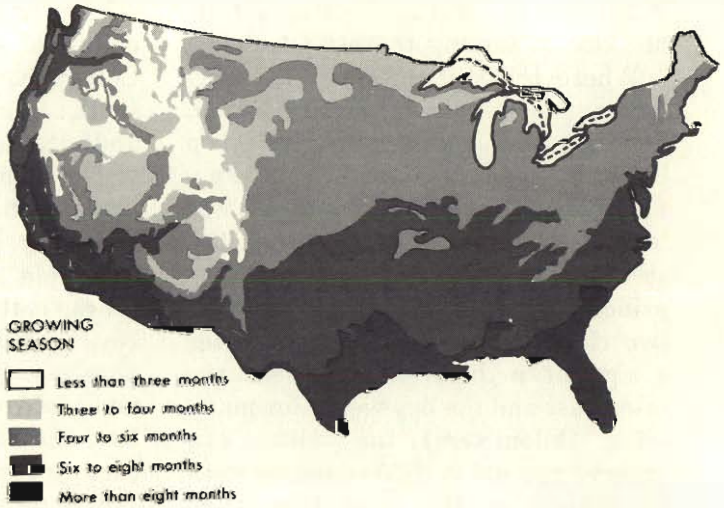
Before the Rio Grande reaches the Gulf of Mexico, its waters are used as much as five times for irrigation purposes. This is the border between Texas and Mexico.

TEMPERATURE FOR JANUARY



TEMPERATURE FOR JULY





THE TEMPERATURE

If there were no mountains or oceans, and if the winds circled the earth with perfect regularity, then the amount of heat and the length of the farmer's growing season would progress at the same rate from north to south. Instead, there are all kinds of unexpected differences in climate, as we can see from the two temperature maps of the United States at the left. For instance, all along the western coast, the temperature changes little between winter and summer. In some places, the average difference between July and January is as little as 15 degrees Fahrenheit (or less than 10 degrees centigrade). In

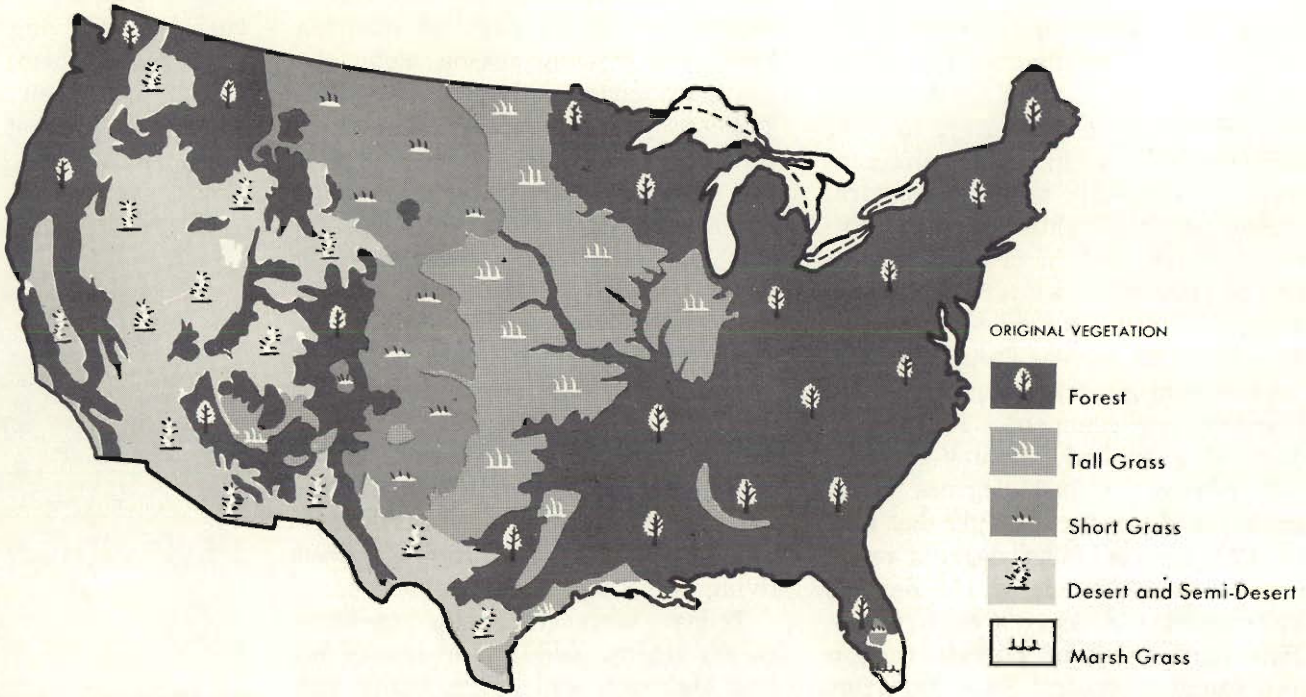
such places, people wear light coats all the year around. The climate along the northern part of this coast is similar to the climate of England or New Zealand. But in the north central part of the country, summer and winter are like two different worlds. People in the north central region need the lightest kind of summer clothing, and the heaviest woolen or fur clothes for winter. There the average difference between July and January is 65 degrees Fahrenheit (36 degrees centigrade) and more violent extremes are common. The coldest days of a typical January may be –40 degrees, (–39.6 degrees centigrade) and the hottest July day may be 110 degrees (48.4 degrees centigrade)—a difference of 150 degrees Fahrenheit (88 degrees centigrade). This is the sort of climate that is also found in central Asia, far from the moderating influence of the oceans. In the eastern part of the United States, the difference between summer and winter is also very noticeable, but not so extreme. Near the southwestern corner of the United States, the climate is mild and springlike in winter, but in summer it is hotter than on the equator.

Differences of this kind have become very important to living standards in the United States. Because of good transportation, every region of the country can benefit from the temperature peculiar to every other region. For example, the GROWING SEASON map on page 18 shows a long crop-growing season along the southeast coast and also in several small strips and pockets to the west. In these regions crops grow well during a large part of the year. Until rather recently, however, this fact was of no special importance to Americans in other regions of the country. People in the colder climates did not often get fresh vegetables and fruits to eat during the winter. In earlier times, relatively few people lived in the warm regions of the country, especially in the west. Those regions were not heavily cultivated; they did not provide a good living for a big farm population.

Today, however, swift, machine-cooled trains, and motor trucks on fine highways can carry fruits and vegetables from these warmer regions to every part of the United States. As a result, more people can make a good living in these areas. All winter they supply people everywhere in the United States with fresh fruits and vegetables at reasonable prices. These fruits and vegetables are rushed to markets which are 1,000—or even 2,000—miles (1,600—or even 3,200—kilometers) away.

Some plants and animals live best in a cool climate, or in a climate which combines coolness and dampness. These "local" specialties, too, benefit the whole country and provide better living for the farmers who produce them. In a way, Americans "send their climates" to each other. This is not just a luxury for a few: it is part of everyday life for almost everyone.

Farmers in the State of Maine are accustomed to harsh winters and short growing seasons. Their countrymen in California, however, make the most of a growing season which often lasts 265 days.



THE PLANT LIFE

When early voyagers approached the land that is now the United States, they noticed a sweet and surprising "land smell," which told them they were near the shore. This "land smell" came from the great, thick forest that covered all the eastern part of the country. The wind carried this pleasant odor far out to sea.

Today, Africa and South America still have great forests like the ones that greeted the first European visitors in North America. And long ago, enormous woodlands probably covered great parts of Europe and Asia. But European colonists who came to the eastern coast of America had never before seen such forests. The apparently endless woods, unbroken except by rivers and occasional masses of rock, seemed strangely wonderful to these settlers. The great wild forests impressed and inspired them. They began to dream of developing the land and its fruits.

In those days, every growing boy wanted to learn the secrets of the forest. It was both an exciting and a natural thing to do. And this is a tendency that has

continued among Americans until the present day. Even in the parks of a big city, American children still love to pretend that they are living in a forest. There is very widespread enjoyment of hunting, hiking, and camping out-of-doors.

No one knows just why the woods ended where they did, or why the tall grass of the prairies, the wide, treeless plains, began where it began. The explanation remains a mystery, for the eastern part of the prairies' tall grass lands have soil that is good for trees. Some people believe that, long ago, Indians burned off the forest there in order to force game animals out to the hunters. Or perhaps some special conditions of soil and rainfall were responsible. This seems to explain it more nearly, but nobody really knows. The early settlers wrote that the prairie grass was very beautiful, interlaced with flowers in the spring, and so tall that a man on foot could not see over it.

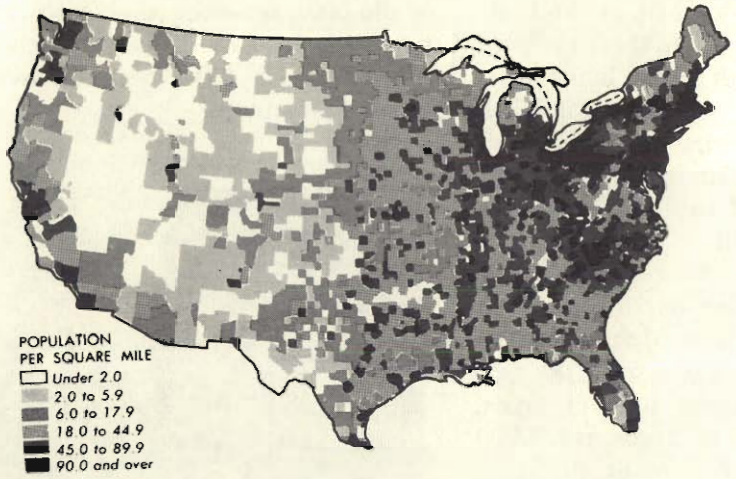
It is clear why the tall grass became short grass farther west. The reason is clearly lack of rainfall. The line where the two kinds of grass change roughly follows the important 20-inch (51 centimeter) rainfall line which we have discussed earlier.

Still farther west, the vegetation, or plant life, map looks quite mixed. Forests cover the slopes where mountains catch enough rain. A few favored grassy meadows lie in the high mountain valleys. On the dry lowlands and on high table lands dry, harsh bushes grow; so do kinds of grass common to dry regions. But some places, here and there, are too dry or too full of salt for even this poor desert growth.

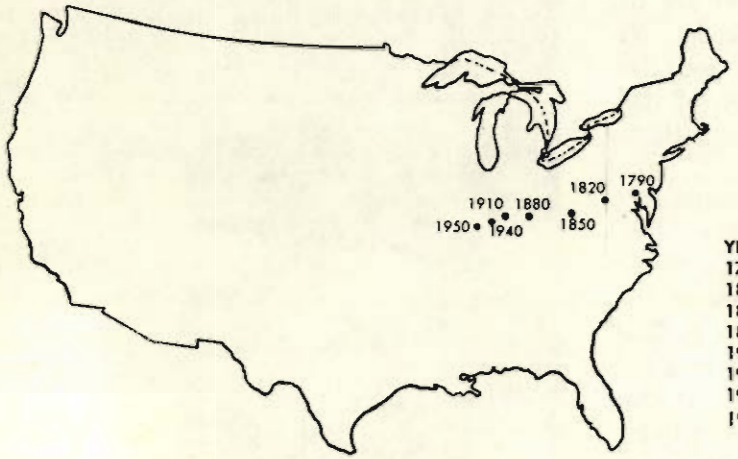
The greatest wonder of all is the plant growth on the northwest coast, where the mountains catch the heavy Pacific rains. Here one finds the forests of huge sequoia and fir trees. Some of these great trees are 3,000 years old. They are among the largest and oldest living things known. Some were seedlings when Troy fell, and they were already forest giants when Rome was built. The silent forests are filled with columns of great tree trunks, and they are lighted dimly by rays of sun that are filtered through leaves far above. To many visitors, these forests seem like cathedrals. In some parts of the west, laws protect and preserve them, as a national treasure.

The different original plant life regions correspond quite closely to the different economic regions of the United States today. (Turn to the map on page 29 for examples.) This is not really surprising. The original plant life was determined by the way the land lay, rainfall, river drainage, temperature, and soil. These same things have determined people's use of the land, too—together with transportation routes and the rich resources which have been discovered under the ground.

Forests of giant fir trees are landmark of the northwest coast. Diagonally across the country, in the subtropical Everglades of Florida, another type of evergreen plant forms a "river of grass" 100 miles long.



Every ten years since 1790, the United States Government has taken a count of all the people in the country. From these figures, census officials are able to say where the exact "center of population" is. This is the point where there is an equal number of people to the north, south, east, and west. This map shows how the center of population has moved steadily westward since 1790.



POPULATION GROWTH

YEAR	NUMBER OF PEOPLE
1790	3,929,214
1820	9,638,453
1850	23,191,876
1880	50,155,783
1910	91,972,266
1940	131,669,275
1950	150,697,361
1960	179,323,175 (estimated)

THE POPULATION

When the first census, or the counting of people, was taken in 1790, much of the country had not even been explored, and much of the land did not belong to the United States. Many parts still belonged to France and Spain. The "western settlers" of that day were in the Appalachian Mountains.

By 1850, the United States had acquired the western part of the country, by purchase and by treaty. This region had been unified politically, and there were about as many people living west of the Appalachians as east of these mountains. However, almost the whole vast west was inhabited only by small scattered bands of Indians. At that time, people seriously believed that the task of settling and developing the country would require at least 500 years, and perhaps 2,000.

The speed with which it actually was settled is one of the most exciting stories in American history. Within the space of a single lifetime, millions of acres (hectares) of forests and prairies were converted into farms and industrial cities, and scattered with universities, churches, and meeting halls.

At first the settlers pushed forward in thin lines, along the rivers; then they began to fill the remaining spaces throughout the middle of the

country. And then, dramatically, the movement of population jumped to the Pacific. The reason was the discovery of gold on the central west coast, in 1849. By then, too, a route had been found through the mountains to the fine farming valleys of the northwest coast.

The last regions to be settled were the dry plains just east of the Rocky Mountains. In the meantime, the cities of the east grew at an astonishing rate.

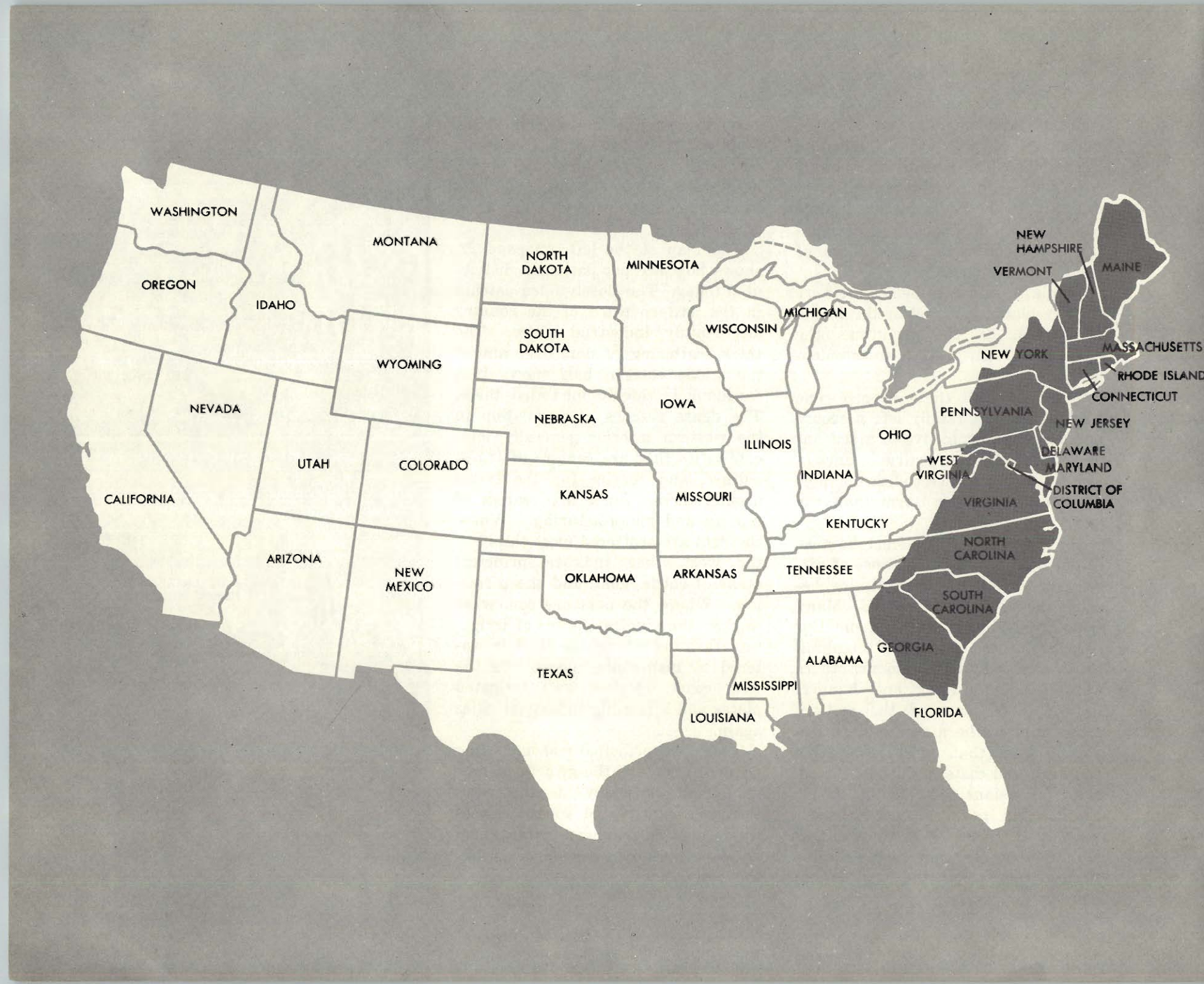
Where did all these people come from? Many a family left a secure home in the east to live in a sod hut on the windswept prairie. Such a family had moved west with the hope of making a better farm than the one "back home."

Many people left the east because of personal failure, or because of discontent with their prospects, or because they wanted adventure. Many came from abroad, mostly from Europe. Of these, many were seeking political or religious freedom; others were fleeing poverty and hunger. Before 1880, most of the settlers came from northern and western Europe. After that, most came from southern and eastern Europe. Thousands of Asians came to the Pacific Coast. The peak of movement was reached in 1900. That year, almost 4 million people came to the United States from across the seas. That year, too, marked the closing of the frontier: there was no longer good, new land ready for the plough or the herd. Nevertheless, since 1900, the nation's population has more than doubled.

The map at the left, on page 22, shows how the population is distributed today. The closely filled patches in the eastern third of the country are mainly industrial cities. The thick scattering of dots over almost the whole eastern half shows that farmland is thickly inhabited there. The dense patches of population in the western interior generally indicate cities that are centers of trade, culture, and service for the farms around them. Some are centers of mining and manufacturing. Where the dots are scattered most thinly in the west, they indicate principal areas of cattle, goat, and sheep raising. Where the dots are somewhat thicker, they indicate areas of irrigation farming where the land is watered by man-made means. On the west coast we find well irrigated places and a few big industrial cities again.

Today, the principal reason causing people to move is the growth of new industries, especially in the west. People are attracted to the places where new geographical or industrial development means new opportunities for better jobs.

This is the way New York City's Broadway looked in 1826, when the city's population was less than 200,000. Today, Fifth Avenue and 42nd Street meet at what is often called the "busiest corner in the world."


WASHINGTON
OREGON
CALIFORNIA
IDAHO
NEVADA
MONTANA
WYOMING
UTAH
ARIZONA
COLORADO
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
WEST VIRGINIA
PENNSYLVANIA
NEW YORK
NEW HAMPSHIRE
VERMONT
MAINE
MASSACHUSETTS
RHODE ISLAND
CONNECTICUT
NEW JERSEY
DELAWARE
MARYLAND
DISTRICT OF COLUMBIA

THE 50 STATES

The United States began as a nation of 13 states. These were the colonies which had broken away from Great Britain in 1776, and had fought a six-year War for Independence. The original 13 colonies were then located in the area that is marked gray on the map. Today this gray area is occupied by 16 states, and 34 other states have been admitted to the nation, one by one.

The newest states are Alaska and Hawaii, admitted in 1959. Washington, in the District of Columbia, is the national capital. It was named in honor of George Washington, the first U.S. president. The District of Columbia, which was named for Christopher Columbus, discoverer of America, is 69 square miles (179 square kilometers) in area; and is not part of any state.

Many of the state lines look as if they had been laid out according to a regular, squared pattern. Indeed, the whole country west of the original 13 states was surveyed in regular blocks, a mile (1.6 kilometers) square. This way of dividing the land is reflected in the borders of the states. The men who organized the United States and established this surveying plan were very much interested in mathematics, the science which treats of the exact relations between quantities and operations. One of the philosophers who most influenced them was Sir Isaac Newton, the great English mathematician, who had shown how the whole universe moves in accordance with mathematical rules. The Americans who organized the survey liked to think that such a sense of order could be brought into the affairs of men. Thus, in the Constitution of the United States, the powers given to each state are limited by the powers given to the national government. At the same time, the powers given to the national government are limited by the powers given to the states. This prevents both the national government and the individual states from becoming too powerful. The branches within the national government are also designed to balance and check each other, as if they were planets being kept within their own paths in the sky.

One result is that states which share the areas where water runs off slopes, or one mountain range have had to learn to work with each other, to develop their resources properly. Sometimes this has been difficult—just as it is difficult for different nations to agree—but it has been done. Today there are many "treaties" and agreements and shared projects among states in the United States. As long as the resources are still being developed, a need to agree will continue between different interests and different state governments.

With their neighbors to the north and south, the people of the United States have learned to work and plan together in the same way. The borders which they share with the nations of Canada and Mexico are the longest militarily unguarded frontiers in the world.

WHAT THE STATE NAMES MEAN

Northeastern States

Maine — (English) "Coast of the Mainland"
New Hampshire — (English) Named for Hampshire in England
Vermont — (American folk version of French) "Green Mountains"
Massachusetts — (Indian) Named for the Mass-adchu-senk tribe; means "Big Hill People"
Rhode Island — (Dutch or English) Meaning disputed. Named either for the island of Rhodes in the Mediterranean, or an English adaptation of the Dutch for "Red Island"
Connecticut — (Indian) "At the Long River-Mouth"
New York — (English) Named for the Duke of York, who became colonial owner of the land in 1664
Pennsylvania — (Latin) "Penn's Woods." Named for William Penn, colonial founder in 1681
New Jersey — (English) Named for the Isle of Jersey
Delaware — (English) Named for Lord de la Warr, colonial governor of Virginia in 1610
Maryland — (English) Named for Queen Henrietta Marie, wife of Charles I, in 1634
Ohio — (Indian) "Fine River"
Michigan — (Indian) "Big Water" or "The Clearing"
Indiana — (Latin) "Indian Land"
Wisconsin — (Indian) Meaning uncertain, but may be "River with Holes in its Bank Where the Birds Nest"
Illinois — (Indian) Named for an Iroquois tribe; means "Brave Men"

Southeastern States

Virginia and West Virginia — (Latin) Named in 1607 for Queen Elizabeth I of England, called the Virgin Queen
North Carolina and South Carolina — (Latin) Named in 1629 and 1665 for Kings Charles I and II of England
Kentucky — (Indian) "Meadow Land"
Tennessee — (Indian) Probably the name of a Cherokee Indian town; meaning unknown
Georgia — (Latin) Named in 1732 for King George II of England
Alabama — (Indian) Named for the Alibamas tribe; means "The Thicket Clearers"
Mississippi — (Indian) "Big River"
Florida — (Spanish) "Easter Season"

North Central States

Minnesota — (Indian) "Cloudy Water"
North Dakota and South Dakota — (Indian) Named for the Dakotah tribes; meaning unknown
Montana — (Latin) "Mountain Land"
Iowa — (Indian) Named for the Ouaouiatonon tribe; meaning unknown
Nebraska — (Indian) "Shallow River"
Wyoming — (Indian) "Large Plains"

South Central States

Missouri — (Indian) May mean "Big Muddy" or "Big Canoe"
Kansas — (Indian) Named for the Kansa tribe; meaning unknown
Colorado — (Spanish) "Red"
Arkansas — (Indian) Named for the Alkansa tribe (Quapaw Indians); meaning unknown
Louisiana — (French) Named in 1682 for King Louis XIV of France
Oklahoma — (Indian) "Red People"
Texas — (Indian) A salutation meaning "Friends!"
New Mexico — (Indian) Named for the Aztecs of Mexico; means "Temple of the God"

Western States

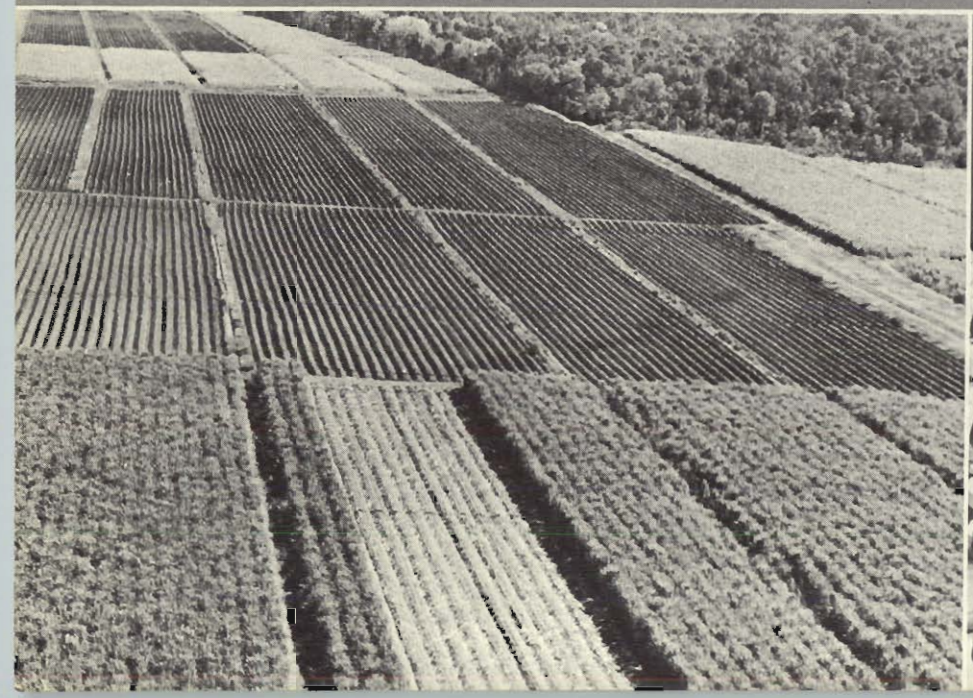
Idaho — (Indian) A greeting of the Comanche tribes, meaning "Good Morning!"
Washington — (English) Named for George Washington, first President of the United States
Oregon — Derivation and meaning are unknown, but believed to trace back to an engraving error on a French map of 1715
Utah — (Indian) Named for the Ute tribes; meaning uncertain but may be "Those Who Live High Up"
Nevada — (Spanish) "Snowed Upon"
California — (Spanish) Allusion to a mythical island of a Spanish romance, which was supposedly ruled by a Queen named Calafia
Arizona — (Indian) "Little Spring of Water"

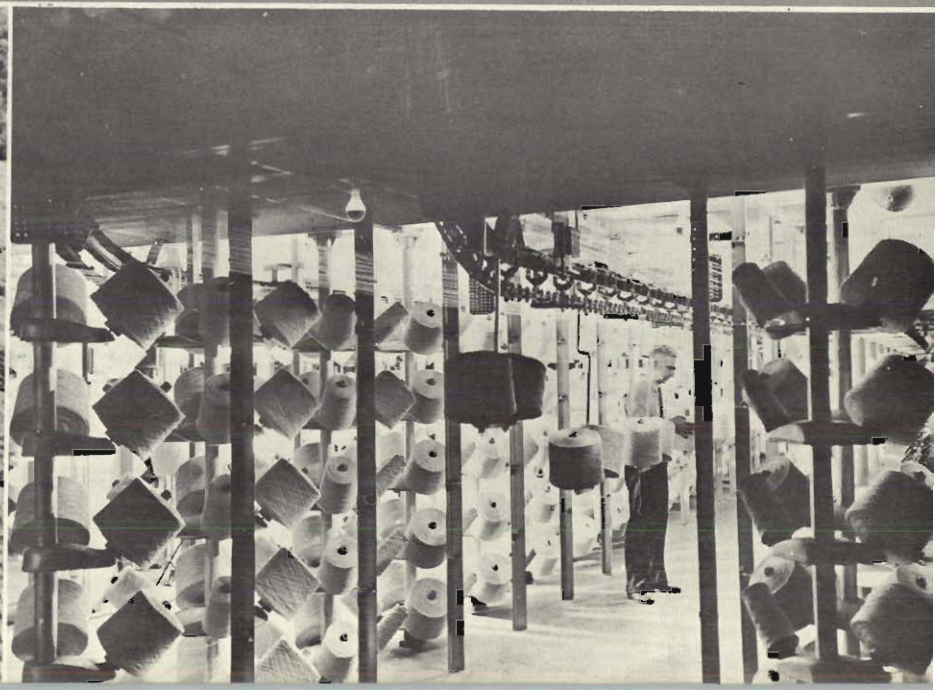
ALASKA — Russian version of an Eskimo word for the peninsula.
HAWAII — Perhaps a derivative of a native word for "homeland."

The Capital

District of Columbia — Seat of the Federal Government, named for Christopher Columbus, discoverer of America
Washington — City in the District of Columbia, capital of the United States. Named for George Washington, first U. S. President

One of the world's greatest problems is that of supplying food for its growing population. In the United States, horses have been replaced almost completely by machines, thus freeing 64 million acres formerly devoted to hay and fodder, for the production of food for humans. Improved agricultural methods such as that shown in the Louisiana cane field, below, are increasing yields. This, with the development of synthetic fibres, releases land once needed for raising cotton.





The United States has a reputation as a land of rich natural resources. It is also noted for its great use of machines. If this country had such vast natural resources, why was it necessary to use machines to such an extent?

Actually, much of the land in the United States is in steep mountain or hill slopes. Because much of it lacks enough rainfall or steady rivers, only a little more than one-third of the land can, or should be cultivated. But people in the United States a century ago did not fully understand this. In addition, they did not know that some of their methods of farming were ruining good land. To people who looked out across the rolling prairies, it seemed that the country's good farm land must be almost unlimited.

Perhaps it was fortunate that they thought so. As a result, the people supported a national policy of giving away a great part of the nation's land to individual settlers. If the new settler farmed his land for five years, it then belonged to him.

This policy was one of the chief causes of high wages in the United States. City employers had to pay good wages to keep good workers; for if city workers did not earn a good living, many of them left to settle new farm land, or to try their luck in the trading villages or mining camps of the west. It was also hard for established farmers to hire laborers, because most farm workers preferred to settle new land and have farms of their own.

The price of labor was so high that it became absolutely necessary for industrialists and farmers to develop and use machines. They also had to keep improving these machines. And because labor was so expensive, not much of it was wasted in jobs that did not produce well.

This widespread use of good machines helped individual workers and farmers to produce more than they could with hand labor. When the land frontier was gone, half a century ago, machines were already opening up new "frontiers"—finding new opportunities for advancement. Machines made it possible to develop swiftly mines, waterways, transportation, and industry. They created wealth that could be used for rebuilding ruined land.

For many people in the world today, the rich resources of the earth still lie unused. United Nations experts say that two-thirds of the world's people lack the proper food for health; yet the countries where these two-thirds live possess at least *80 percent* of the world's natural resources. Many of these countries are "old"; that is, people have lived there for a long time. They have the priceless possession of rich cultures, and of people who love their land and want to see it flourish and bloom. But they are "young" in another sense—even younger than the United States. They are young in the practice of making their geography and their resources work for the good of their peoples.

The people of the United States have made many mistakes while developing their resources. They still have big problems. Even today, some Americans do not care for their land as wisely as the farmers of many other countries. They have to be shown and taught methods that use the soil well. But today, as never before, people in the United States are trying to learn how to use their land properly.

Between 1920 and 1959, the population of the United States increased by more than 60 percent. Except for the addition of Alaska and Hawaii as states, the usable land area remained almost the same. Yet Americans were better fed and better clothed in 1959 than in 1920.

This was accomplished largely through the wide use of machines, which we have already mentioned. Trucks, automobiles, and farm machinery have replaced horses almost

completely as a means of farm labor. As a result, more than 80 million acres (32 million hectares) of land, which were once needed for growing hay and other animal feed, have been freed to produce food for human beings. The use of machines has also meant that the farmer can do more than he used to do by hand methods. The average farmer now produces twice as much each working hour as he produced in 1940.

Scientists have bred new hybrid plants and animals, the result of mating two different types of plants or animals, which yield more food. New ways have been found for controlling harmful insects, for preserving food, for packaging, storing, and marketing farm products. All together, these have made the farmer's labor produce more food.

In addition, great progress has been made in using the land itself. Through improved methods of enriching the soil and its wise use, farms are yielding more per acre (hectare) than ever before. In many areas like the Great Plains, land that was once used wastefully for grazing is now used to produce food.

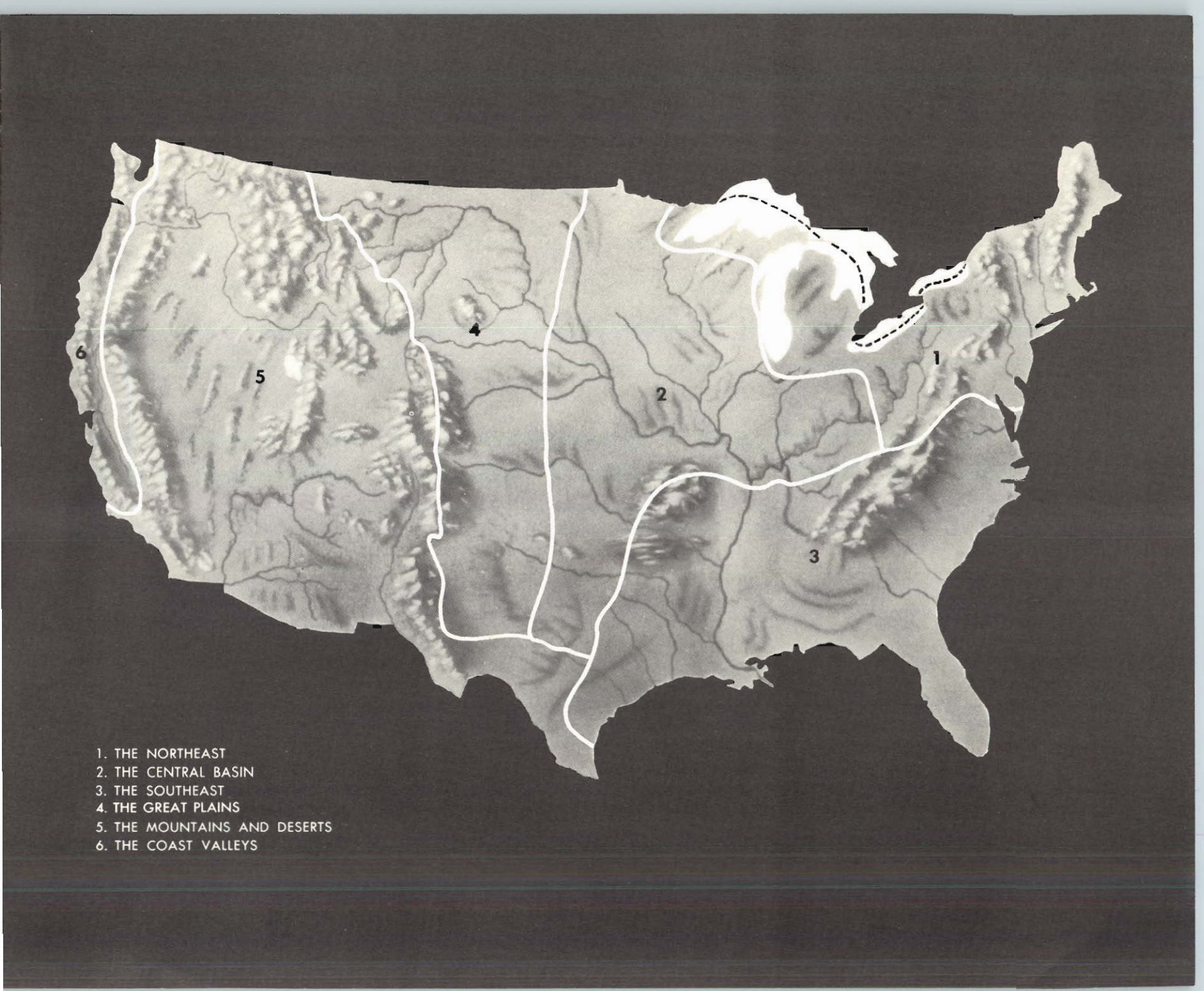
But perhaps the most remarkable achievements have resulted from irrigation. West of the Mississippi River alone, these projects have saved 6 million acres (2.4 million hectares) of land that could not be used before. These great irrigation developments now give water to 100,000 farms, and supply power to many farm communities.

In this book we will see the problems which the people in each region of the United States have faced, and some of the things they have done to solve these problems. But what will happen in the future? How can the land in the United States continue to feed a constantly increasing population? Many Americans are trying to find an answer.

Scientists know that there are 50 million acres (20 million hectares) in the vast western United States which can be irrigated. These 50 million acres (20 million hectares) could be a source of food for many millions of people. Scientists know that an equal amount of land can be reclaimed by draining low, wet lands, and that another 90 million acres (36 million hectares) of sandy pinelands and wet grass lands can be cleared for cultivation. And they know that future advances will improve food production.

The people of the United States are really only in the midst of their job of using their resources properly. But what they have done thus far has made them appreciate how much more may be possible.

THE MAP: We have divided the United States mainland into six regions, as shown in the map at right, and we shall examine each one separately. No man-made boundaries separate these regions. Their borders are determined, instead, by climate, topography, natural transportation routes, soil, or other geographical factors. Each region has its own geographical inheritance, and each has offered its own opportunities and problems to the men and women who have chosen it as their home.

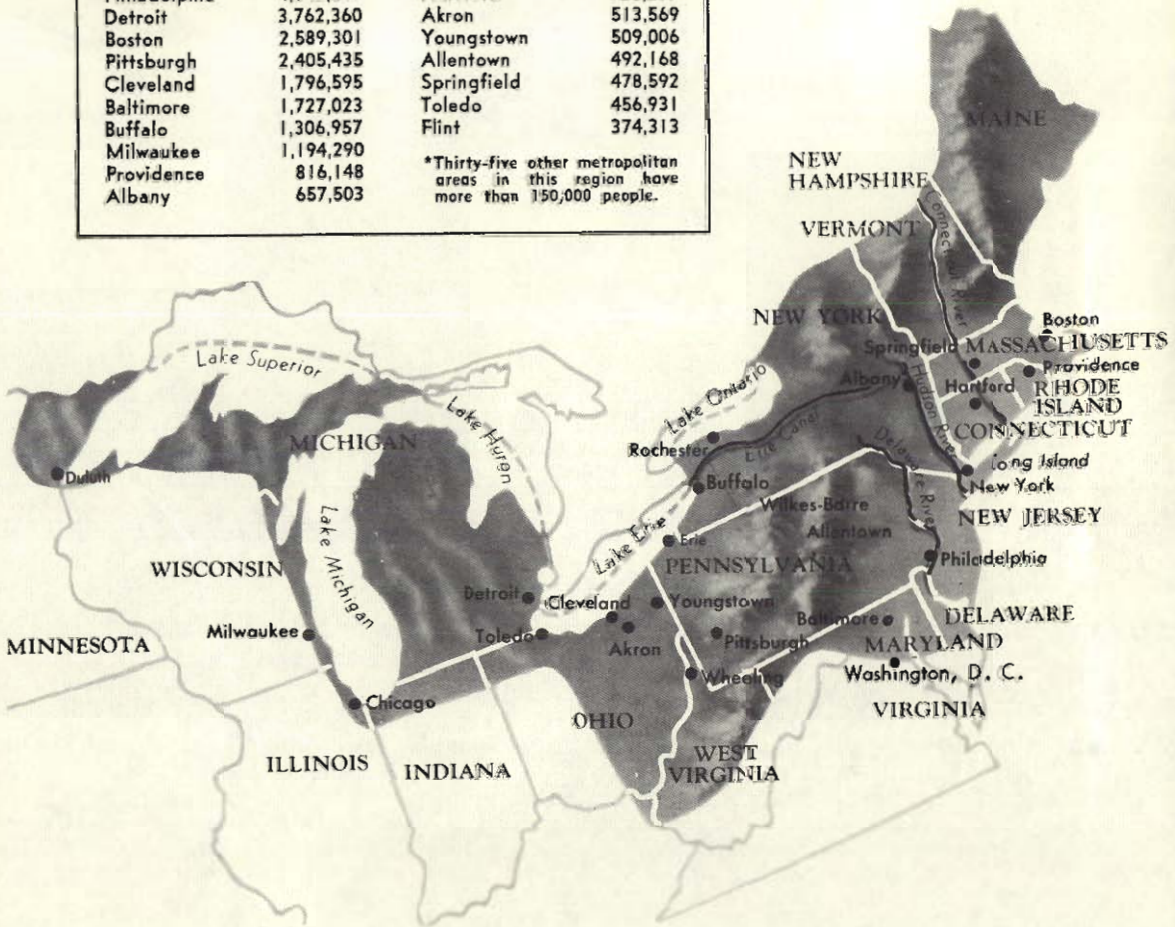


1. THE NORTHEAST
2. THE CENTRAL BASIN
3. THE SOUTHEAST
4. THE GREAT PLAINS
5. THE MOUNTAINS AND DESERTS
6. THE COAST VALLEYS

The Northeast

METROPOLITAN AREAS	POPULATION (1960 Census)	METROPOLITAN AREAS*	POPULATION (1960 Census)
New York	14,759,429	Rochester	586,387
Chicago	6,794,461	Syracuse	563,781
Philadelphia	4,342,897	Hartford	525,207
Detroit	3,762,360	Akron	513,569
Boston	2,589,301	Youngstown	509,006
Pittsburgh	2,405,435	Allentown	492,168
Cleveland	1,796,595	Springfield	478,592
Baltimore	1,727,023	Toledo	456,931
Buffalo	1,306,957	Flint	374,313
Milwaukee	1,194,290		
Providence	816,148		
Albany	657,503		

*Thirty-five other metropolitan areas in this region have more than 150,000 people.



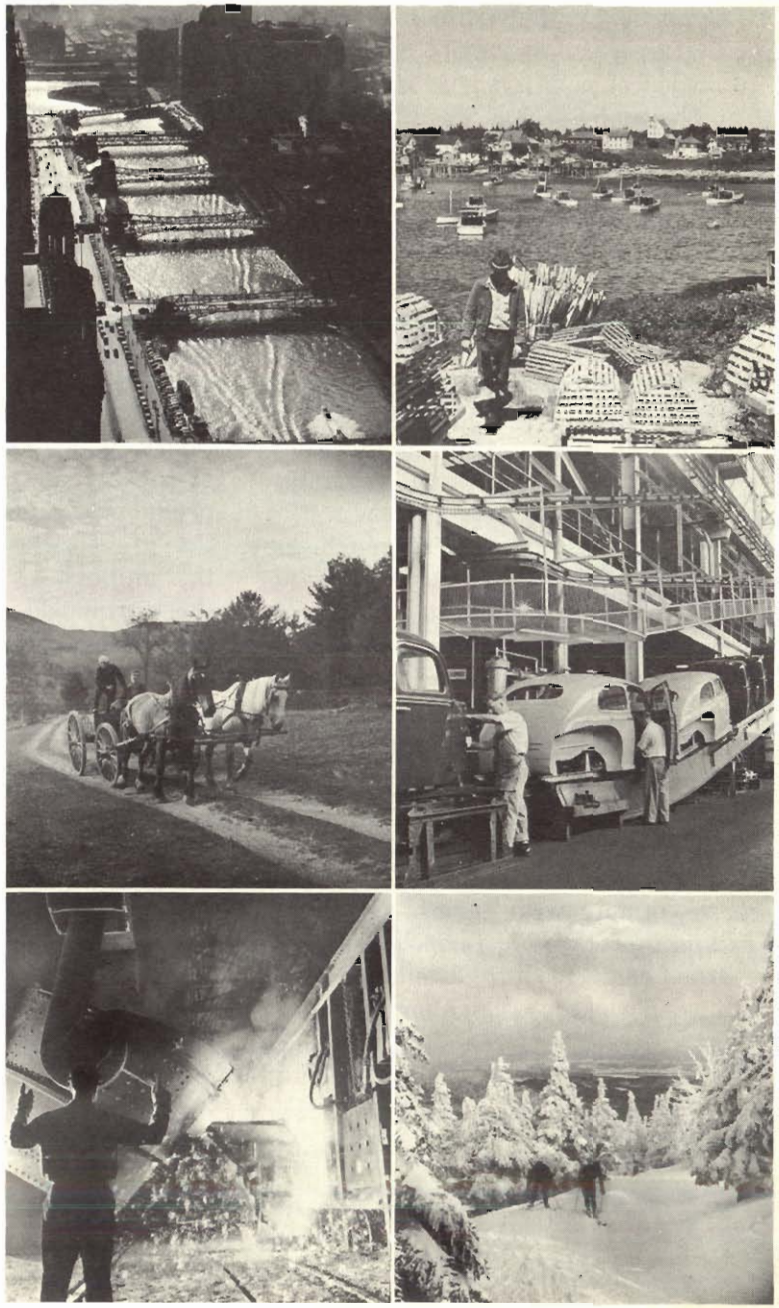
Of the ten largest metropolitan areas in the United States, six are in the industrial Northeast. In the geography of the United States, the term "metropolitan area" has more meaning than the term "city." For the boundaries of a city are often drawn arbitrarily through well populated places; they are political boundaries. "Metropolitan area," on the other hand, means the entire cluster of urban population about one center. It may include only one city and its suburbs, or it may include several cities and towns close together which make up one population and economic unit. In the United States it is common for people to live in one town or city and to work in a different city of the same metropolitan area. Each workday morning, tens of thousands of people pour by automobiles, buses, trains, and ferries into such cities as New York, Chicago, or Philadelphia, and at night return to their homes across city, or even across state, lines. Here the principal metropolitan areas of this region, which are shown on the map above, are listed in order of their size.

THE "MELTING POT"

This is the part of the United States which most visitors see, and the part that is most often described. The tall buildings of New York, the steel mills of Pittsburgh, the automobile assembly lines of Detroit—these and many other symbols of industrial America belong to this region. Here are most of the country's cities of industry and commerce.

This is the part, also, that owes the greatest debt to Europe. For into this area of industry came millions of Europeans, who made of it what became known as the "melting pot." The "melting pot" changed people from many nations into Americans. More than any other part of the country, this section belongs to the European culture and traditions.

Seeing this great area today, it is hard to realize that it was wilderness only 300 years ago. The effect of that wilderness upon the settlers was a powerful force in developing the United States. As soon as permanent settlements were made in the new land, a new sort of people developed. Slowly but surely, men changed the ways of life they brought with them. During three centuries of westward movement, the wilderness was the single most powerful force in the making of a new people.



Chicago • Fishing village, Maine • New England farm • Detroit assembly line • Steel plant • Skiing in Vermont

Even today, the visitor who expects only factories, apartment houses, and crowded streets is surprised. In the Northeast he sees more wooded hills than factory chimneys, more fields than roads, more farm houses than office buildings. The cities—so big, so busy, so complex—are hard for the human mind to grasp easily. But, in contrast, the features of the land over most of this northeastern region are on a small and gentle scale. It is a country of many brooks, of low mountain ridges, of rolling hills, of groves, pastures, and vegetable gardens. Only a few places in the Northeast is a visitor so much as 10 miles (16 kilometers) distant from rich farms. Those few places are not in the hearts of the large cities. Instead, they are in areas of true wilderness, such as the forests of the northern part of the state of Maine, where to this day the only way of crossing great stretches of land or water is by foot or canoes. Everywhere, the outer reaches of cities mingle with farms. In many towns there are old farm houses and barns, changed into dwellings, now crowded close by neighboring buildings.

So the observant visitor quickly guesses that he is in a relatively old farming region, on which a pattern of cities and industries has grown and spread. What he cannot see is how the look of country has changed with this growth of industry. Only a few generations ago (or less) the majority of these farms produced grain to sell. They also produced a great many types of plants, meat, and domestic birds for the farm family itself. Today, most of the farms are devoted to dairy cattle, or vegetables, or chickens, or fruit. Most of the farmers specialize in growing products that can be rushed fresh to the great cities nearby and sold to the millions of people there. Thus, the farms do not simply continue operating as in the old days before industry grew so big here. They are a needed modern part of the region's economy.

This change in the farms' products gives us an idea of a very important factor in American geography: the "market." Usually, when we hear this word, we think of a city or village square where people are buying and selling. But when the economist or geographer speaks of the "market," he means all the people and organizations in an area that are able to buy goods. And when we examine the industries of the United States' Northeast, we find that many of them are there because the area is a good "market," because there are many well-paid workers and prosperous farmers nearby, who have the money to buy clothing and goods and equipment for their homes. Makers of such items bring in raw materials and produce these goods near a large "market." This costs less than to ship the finished items, and arrange their sale, from a distance. These industries employ many workers in the area, adding to the population and the "market" in this way.

Why, then, is this region so thickly populated, and what do its people do for a living? We already have part of the answer: a great many people live and work here just because it *is* a place of big cities with well-paid workers. They earn their livings by providing goods and services for each other. But that is not the whole answer. There are several great geographic reasons why people in this region turned so heavily to trade and industry.

One of the most important of these reasons is the sea.

Today, four of the eight heavily populated areas in the Northeast are around the seaports of Boston, New York, Philadelphia and Baltimore. (On the map, Philadelphia appears to lie inland, but it is on the wide, deep tide water of the Delaware River mouth and is a good harbor for the largest sea-going vessels.) At these points, materials from across the sea enter the United States, and the products of the land are sent there for export across the sea. But these four areas are not only important points for reloading and transferring goods. Indeed, in this region, shipping and everything connected with it is of much less importance than industry.

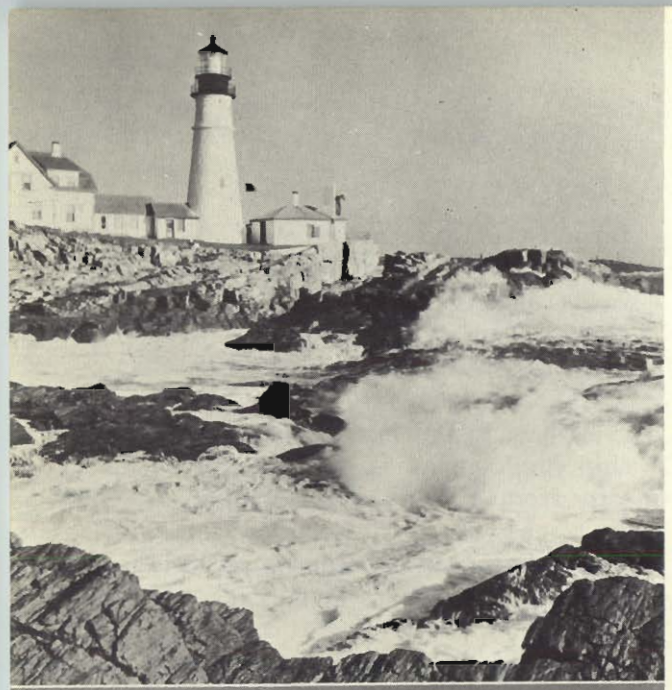
People have found that places where all kinds of goods come together, and where transportation lines meet, are excellent for making raw or partly finished materials into finished goods. The importance of these northeastern cities, both as ports and as manufacturing centers, did not simply come about by chance, however.

On a coast line like this, with good harbors, the sea is a ready-made means of transportation. But the land is not. About 1815, when the settlement of the United States westward from the coast had already become an important movement, trade routes from the ports to the interior began to be a serious problem. The slow wagon trains of that time, drawn by horses or oxen, were too expensive for moving freight any great distance. Americans had long admired Europe's canals, and a canal seemed the best solution to the transportation problem in New York State. From the eastern end of Lake Erie, all the way across the State to the Hudson River, there is a long strip of low land. The Hudson itself flows deep and without waterfalls to New York harbor. For the small population and the agricultural economy of the time, such a canal was a most ambitious project, but—after several years of work—it was completed in 1825. Freight costs from Lake Erie to New York were immediately cut to about *one-tenth* of what they had been. New York, which had previously been smaller than Philadelphia and Boston, quickly became the leading city of the coast. In the years which followed, traffic on the Great Lakes was joined to the traffic on the Mississippi River; and then New York City became the end point of a great inland shipping system that extended from the Atlantic far up the western branches of the Mississippi. The coming of the railroads made canal shipping less important, but it tied New York even more closely to the interior.

Exports from New York were greater than imports. Consequently, shipping companies, on the return trip from Europe, were willing to carry passengers for very low fares. Thus, New York became, too, the greatest port for receiving new arrivals.

Many of these people remained in the city; their labor helped its industries grow. But millions of others saw New York only as the first step in what has been called the "American dream." This was the belief that the humblest person could, by his own efforts, achieve security for his family, and could know that his children could do better than he. As soon as the new settler landed in New York, and started to make a permanent home, he was never again English or Spanish or Polish. In the new nation, the European class system was not important, and the millions who landed in New York became a new people, shaping a new nation.

While the Erie Canal was being built in New York State, the people



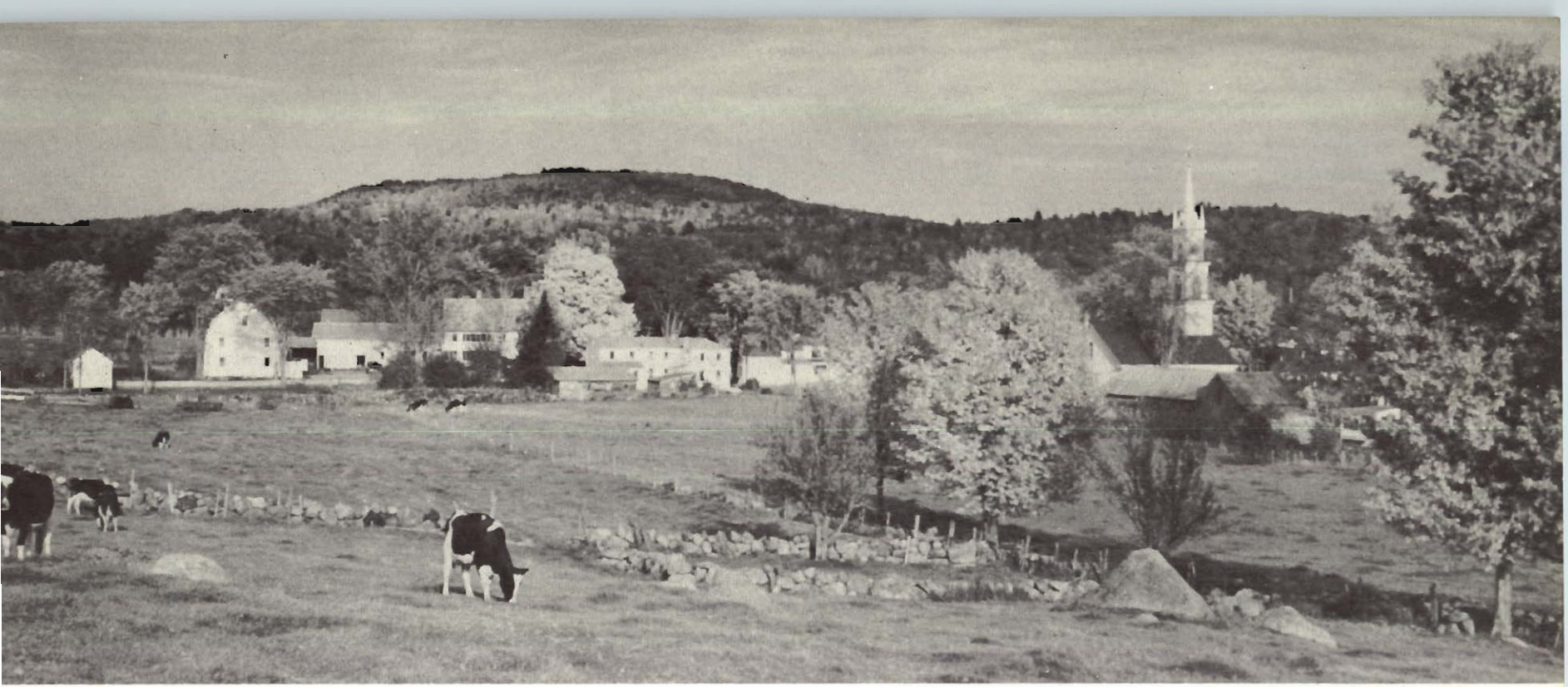
Portland Head Light, Maine, is a scenic vacation spot.

A public beach only 90 minutes from New York City.

of Philadelphia began to worry about the future of their port. Unlike New York, they had no easy canal route, over one river system, to the interior. Mountains barred the way either to the Great Lakes or to the Ohio River, the eastern branch of the Mississippi. Nevertheless, the people of Philadelphia built a canal. Where it reached the ridges that separated the eastern slopes from those to the west, railroad tracks came to the edge of the canal. The canal boats were lifted onto special railroad cars, to be carried over the mountains. Philadelphia's canal was one of the major engineering feats of nineteenth-century America, but all the work was in vain. Shipping on the Erie Canal was so much cheaper that Philadelphia's canal was little used. But the Philadelphians swallowed their disappointment and looked about for some better plan. Coal had been discovered near several upper branches of the Delaware River, and now the people worked hard to deepen the stony streams, and to build canals to the mines. This plan succeeded. The combination of the port with cheap shipping for fuel assured Philadelphia a position as a manufacturing center. Later, railroads provided the much-needed tie with the interior.

The fear that their port would lose its importance worried the people of Baltimore, too. Their city is situated where the hard rocks of the Appalachian hills and the soft soil of the coast come together. This made waterfalls, and the waterpower gave them an early advantage for manufacturing. But they saw that this was not advantage enough, and conditions were not right for building a canal. Instead, they constructed the first railroad across the mountains. In this way, Baltimore became a vital center for export and for import, too. Yearly, about 6,000 vessels move into Baltimore's natural harbor. Lumber, ores, crude oil—raw materials from the world—are unloaded and reshipped by rail or coastal tank ship to American industry, in exchange for grain and machines. World trade helps to make Baltimore America's sixth largest port.

Boston, alone of these four ports, did not develop primarily through export trade. Although it is the largest port for shipping fish in the United States, it is in a region which early became an important center of industry, and therefore required raw materials. So Boston was primarily an import point. Second, it was an export city for the northeastern corner of the country. This northeastern corner, which is called New England, had special problems of its own.

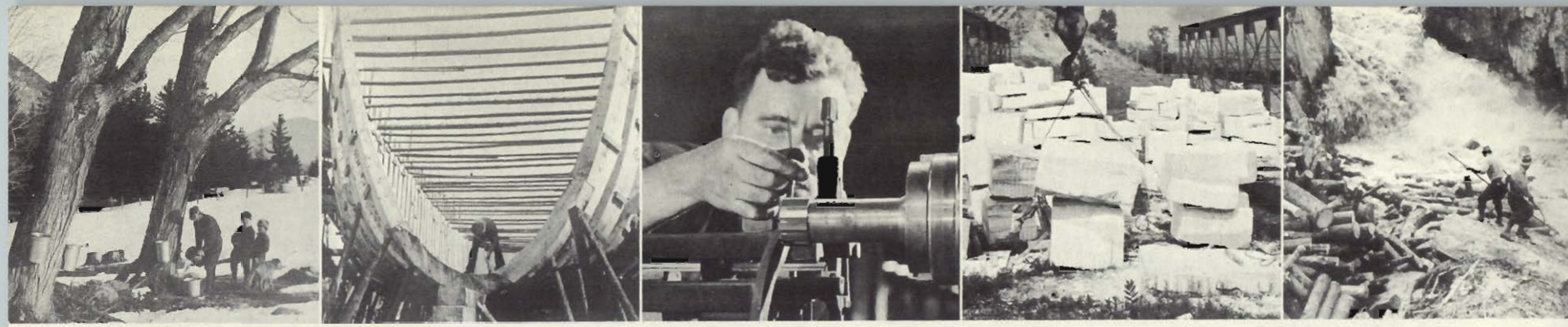


Stone from New England fields has been removed patiently by generations of farmers, and used for their fences.

THE STONY SOIL

Generations of hard-working farmers in New England have declared that the chief product of their land is stones. More than 10,000 years ago, the ice caps that covered this part of the country dug away the hard rocks that lay close to the surface. When the melting ice retreated, it left the rock bare. Over the centuries, a thin layer of soil formed on top of the rock. To clear this land for farming, the New England farmers had to remove stones of every size, in addition to cutting trees and digging out the stumps of trees. This work of removing stones has been an endless process, for the frosts of each winter bring more stones up to the surface through the thin soil. Even today, farms which have been worked on for more than 200 years still yield their annual crop of stones. But this same rocky soil that created such problems for farming was a great aid to industry. In the mountains and hills of New England, these rocks created large quantities of water power. Every brook had its waterfalls, and very early in the 19th century, New England people began to build little mills beside many of these waterfalls, for weaving cloth or for wood or metal turning machines.

In one way, the opening of the Erie Canal in 1825 was an economic threat to New England. When large amounts of grain from farther west began to reach the towns on



Maple sugaring, shipbuilding, machine tools, marble quarrying, lumbering: a few of New England's diversified industries.

the eastern coast, New England farmers had difficulty selling their own small crops in the markets. Some farmers moved westward to better land, some turned their farms back to pasture and raised sheep to supply wool for the nearby mills. A great many farmers found work in industry. For the transportation route that brought grain to the east could also be used to take the products of industry to the west. The New Englanders quickly understood this fact and used it to their advantage. Did the frontier hunter need a better gun? Did the prairie farmer need a better plough? New Englanders watched for such opportunities, and before long their stony soil became "the workshop of the nation."

In time, many such "workshop" areas appeared in other parts of the country. These other shops could do many jobs as well as New England, and they were closer to fuel or markets. Farm machine factories grew up in the west. Metal smelters, or ore refining plants, were built near richer mines. Textile mills moved southward. But New England kept its position as a great production center. By this time, it had the great advantage of long experience with processes, and its workers had developed important skills. Today, New England makes many of the machine tools that are the basis of all mass production. And New England makes equipment such as heavy electrical motors, looms for weaving cloth, and machines for manufacturing shoes. It also produces instruments that perform very exacting tasks.

Life in New England has always required clever, careful planning. It is still chiefly a place of carefully planned specialties. For instance, farms on the strip of good land along the Connecticut River specialize in the kind of tobacco in which cigars are wrapped. The tobacco is grown with great care, under acres (hectares) of thin cloth which shades the delicate leaves. The stony farms are devoted to dairy cattle. The farmers also tap the sweet juices from maple trees to make maple sugar. People in thinly populated Maine combine part-time farming with part-time small industry, lumbering, or fishing. In one part of Maine, at the far northern tip of the state, people have developed a most highly cultivated area of potato farming. Throughout the whole New England area, many people specialize, too, in services for vacationers and tourists. New England is a favorite choice for holiday trips, because of the beauty of the region, with its forests, mountains, and sea, and because of its cool summers and heavy snows.

If the United States had been settled from the west instead of from the east, New England might still be a wilderness with little wealth except its natural beauty and its coastal fisheries. That statement is often made. Whether or not the statement is true, certainly no section of the United States better illustrates the importance of human imagination in the partnership of men and geography.

THE BASE OF INDUSTRY

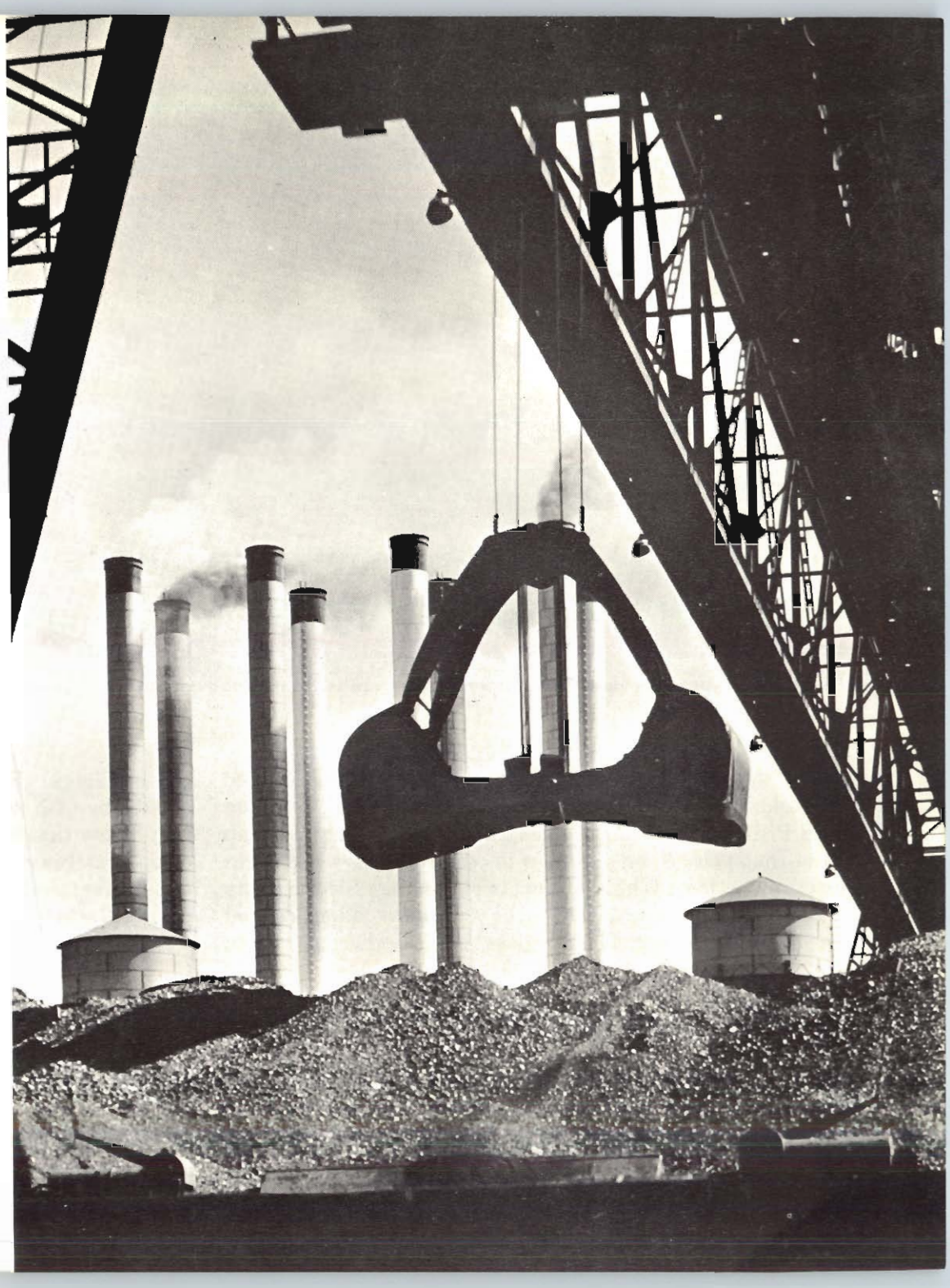
Beyond the western and southern shores of Lake Superior, the earth is marked with pits where giant electric machines dig up soft red iron ore. Each huge bite may weigh as much as 14 tons (13 metric tons); four loads may fill a railroad car.

Far to the southeast, in the Allegheny hills of western Pennsylvania and West Virginia, cars loaded with coal crawl out of mines beneath the ground.

These two gifts of the earth are brought together by the ships that travel across the Great Lakes and by the shore railroad lines that supply their ports.

The first French travelers on the North American continent discovered how easily they could travel across long distances by water. They found that they could go up the St. Lawrence River and travel by canoe through the Great Lakes to a point farther west than the mouth of the Mississippi River. This is a distance nearly as far as from London to Tripoli.

The greatest part of America's heavy industry depends upon these three resources: iron ore from the



A huge crane loads coal at Detroit steel plant.

Mined from open pits near Lake Superior, iron ore is transported to eastern industrial cities via Great Lakes waterway system.

Lake Superior area, coal from the Allegheny region, and transportation across the Great Lakes. From Wheeling and Pittsburgh, to Milwaukee and Duluth, every built-up area that you see on the map on page 30 plays a part in the production of heavy industrial goods. Steel-making is the basic industry, but there are many other related industries in this area, too—glass, metals other than iron, chemicals, rubber, and the making of machines.

Pittsburgh, in the heart of coal fields, was the first of the great steel cities. It was cheaper to bring the ore to the coal than to take the coal to the ore. The Pittsburgh area produced a great quantity of the steel for the railroads that opened America's west. It produced steel for the bridges that spanned the rivers, and for making very tall buildings. Today, the Pittsburgh area still produces about one-fifth of the nation's steel. Pittsburghers say they know that spring has come to the city when strings of open railway cars begin to arrive, loaded with red iron ore, to replace the piles of ore which have been used up during the winter. Today, the Pittsburgh area ships out a special coal for making steel to other great steel areas—Chicago, Youngstown, Detroit, Toledo, Cleveland, Erie, Buffalo, Wheeling.

Several of the cities on the Great Lakes grew up first as grain milling centers. Even today, grain is carried in great quantities across the lakes to mills in the city areas. Detroit, which is the center of the automobile industry, had a rather special start. It began as a wagon-making

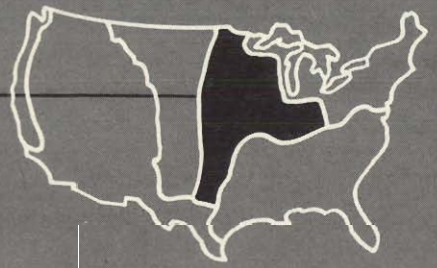
Heart of the nation's great steel industry is Pittsburgh, where furnaces fired with coke convert the iron ore into steel.

town, using wood from the forests that covered the land area which separates Lake Michigan and Lake Huron. The first citizens of Detroit even laid out the streets of the city to resemble a great wagon wheel. Early in the 20th century, the makers of wagons and carriages turned to making automobiles. By good fortune, they found that the new raw materials which they needed were also available near Detroit.

An almost unbelievable quantity of freight is carried across the Great Lakes, because most of the Lake shipments are raw materials. Materials which pass between Lake Superior and Lake Huron weigh about as much as all that go through the Panama and Suez Canals, combined. For four months of the year, ice prevents the use of the Lakes. Thus, during the open water season, complicated machine loaders and unloaders are needed for transporting the huge quantities of freight. Ten thousand tons (9,100 metric tons) of ore are commonly loaded aboard a freighter in three hours, and this much work has been done in less than 17 minutes. Grain which once took seven days to unload by hand is now transferred from ship to wheat elevators, tall storage bins, in an hour.

On their last trips in the fall, the freighters sail home, perhaps in heavy fog, against the thickening ice that threatens to keep them prisoners for months. Before the ship has tied up at the dock, buckets of the unloader on the dock have swung into position, ready to remove the ship's freight. Not a moment of working time is lost.

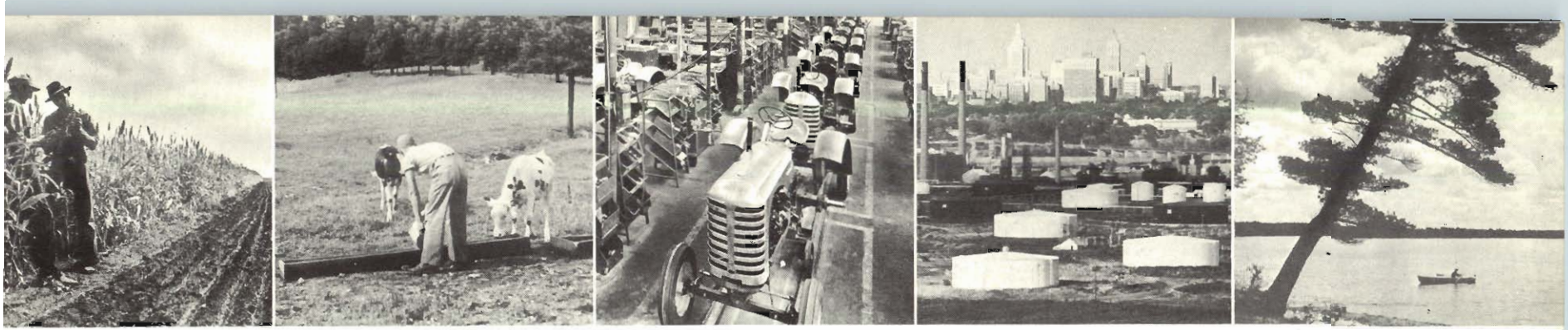
The Central Basin



METROPOLITAN AREAS	POPULATION (1960 Census)
St. Louis	2,060,103
Minneapolis-St. Paul	1,482,030
Cincinnati	1,071,624
Kansas City	1,039,493
Louisville	725,139
Indianapolis	697,567
Dayton	694,623
Columbus	682,962
Forth Worth	573,215
Oklahoma City	511,833
Omaha	457,873
Tulsa	418,974

METROPOLITAN AREAS*	POPULATION (1960 Census)
Wichita	343,231
Peoria	288,833
Davenport	270,058
Des Moines	266,315
Fort Wayne	232,196
Madison	222,095
Rockford	209,765
Evansville	199,313

*Sixteen other metropolitan areas in this region have more than 100,000 people.



Kansas corn field • Dairy farming • Wisconsin tractor plant • Oil storage tanks outside Tulsa Oklahoma • Bemidji Lake in Minnesota

THE PLAINS

Just as the wilderness near the seacoast changed the European settler into a colonist, so the great plains —the vast grass lands—turned the colonist into a new type—an American. After the settler had crossed the Appalachian Mountains, he turned his face toward the Mississippi River, and he turned his back toward Europe. The Atlantic Coast continued to be the child of Europe's culture. It gained knowledge and polish through its constant contacts with other nations. But the vastness of the plains, also called prairies, often made other continents seem unreal, or relatively unimportant.

For almost the first 200 years of American settlement, the only way to make a new farm was by clearing the forest. This was a long, hard job. Many of the trees were giants, so big that a man had to chop for two days before he could cut down a tree. The pioneer farmer also had to build his house and barn, his fences, and often his own furniture and tools. He could clear only a few acres (about a hectare) each year. For years, the stumps of the trees would resist burning or loosening, so the farmer plowed and planted maize around and between the stumps. Hidden roots often broke his horse's harness or even broke the plow itself. But after years of such effort, with a little more land cleared each season, the farmer finally had a good sized farm among the tall trees. When new settlers arrived in great numbers, this cleared land became very valuable. The first frontier farmers would then sell the farm, buy better cattle and equipment, and move on again westward. In this way, the farmer's labor created capital for agriculture.

By the early 19th century, frontier farmers finally reached the edge of the great eastern forest. They had arrived at the eastern pocket of that prairie, in what is now the state of Illinois. Many of those who recorded their feelings told of their joy in leaving the dark forest and coming out into the sunny open grass lands. Here, at last, they could see the great arch of the sky. The land that they saw was not really flat; it rose and fell in low, graceful slopes. And it was not entirely without trees. Along the streams there were narrow strips of wood.

The prairie soil was richer than most of the forest land. But the pioneer farmers did not know this. In their experience, and in the experience of their fathers, the only good soil was soil in which trees grew. So they settled in the forest at the edge of the grass.

After some years, however, late-

Great Plains cattle in stockyards near a large rail center.

Farms like this are common in Wisconsin, a leading dairy state.

Kansas City was a trading post, outfitting pioneers going west 100 years ago. Today 12 trunk-line railroads meet here.

comers or unusually daring families decided to try their luck on the open land. At first, other families laughed at them. One such man, for instance, lost an election as a country official because his neighbors were sure that only a fool would settle on the prairie. They thought he lacked the good sense that was required for public office.

And indeed, the first prairie settlers had their serious troubles. The wooden and cast iron plows of the time could not cut through the deep, thick prairie sod. New Englanders, with their experience in mechanics, invented a much larger, heavier plow. This could break and turn the sod. But the soft soil stuck to the rough iron, making the plow so heavy that a team of six oxen could scarcely pull it. The solution to the problem was steel, which could be sharpened and polished smoothly. The first steel plow was made by a prairie farmer, using strips from an old saw, in 1833. A few years later, John Deere, one of the first makers of farm machines in the United States, began to manufacture steel plows. Rapidly, the prairie became the nation's richest agricultural region.

THE METROPOLITAN AREAS

In this region, city and countryside have supplemented each other especially well. Each has helped the other develop. For instance, the spring wheat of the north used to yield only a dark inferior flour until a miller in Minneapolis developed a new purifying method. This made expansion of wheat-growing practicable also and helped establish Minneapolis as a great milling center. St. Louis, an important cattle market, developed a shoe manufacturing industry which became a larger user of cattle hides. Peoria, Minneapolis, Des Moines, Fort Wayne, Evansville, Rockford, and Madison all make farm machinery or tractors.

Metropolitan areas in the eastern part of the region are linked closely with the industrial Northeast. For instance, the Ohio River (which forms the southern border of Illinois, Indiana, and Ohio) is a busy traffic artery between the Pittsburgh area (see map, page 30) and the Mississippi River, and much heavy industry has grown up along its banks. Similarly, some cities — such as Chicago and Milwaukee — which we have considered in the Northeast because they are part of the Great Lakes industrial system, also handle large quantities of farm products from this region and manufacture farm equipment.

Good markets, together with coal in the eastern and central parts of this region and petroleum in the southwestern part, have combined to make diversified manufacturing centers of nearly all the metropolitan areas throughout this primarily farming region.

THE BIG CROPS

Across the center of this region lies America's greatest maize-producing area called "The Corn Belt," because throughout the U.S. maize is known as "corn." In Ohio, Indiana, Illinois, Iowa, and Nebraska, the fields of tall corn, or the fields of hay or beans, resting from corn, stretch endlessly, mile after mile, until the eye tires. Wherever conditions are right for the highest yields — hot, sunny summers with plenty of rain and rich soil — corn is the preferred crop of the Central Basin. But this does not mean that other parts of this basin are poor for farming; on the contrary, they combine conditions which make them excellent for other crops or livestock. For example, in the cooler north, particularly in Wisconsin, is the United States' leading dairy country, its chief supplier of cheese and butter. In the drier western and southwestern parts of the region lies much of the nation's best wheatland. Unusually nutritious grasses in the southeastern corner have made northern Kentucky the principal area for breeding and raising fine horses. Beef cattle are raised throughout the whole basin.

THE GARDENING OF THE ICE CAPS

The climate of today is very different from the climate of long ago. That long-ago climate helped prepare much of this region for farmland. When the ice sheets of the last ice age pushed down from the north, reaching as far south as the Missouri and Ohio Rivers, they did not encounter mountains or hard rocks in the Central Basin, as they did in New England. The rocks of the Central Basin area were soft. As a result, the same ice flows that left New England with such poor soil, brought riches here. Like a giant gardener, the ice leveled the land by cutting off the tops of hills and filling the valleys. Even more important, it crushed rocks, making fine powder. It mixed the old surface soil with this powdered rock, and with fresh minerals that it brought up from deeper layers of soil. It dug the basins of the Great Lakes from old river valleys and carried the fine, fresh soil southward, laying it as much as 300 feet (more than 90 meters) deep in some places.

Along with all their benefits, however, the ice sheets created one problem. They changed the way the land drained. Water ran off very slowly in rainy years. The farmers worked their ploughed soil carefully, breaking it into small bits, because until very recently this was considered good for planting. The smallest bits of earth were carried downward by rain, and formed a hard layer beneath the plowed soil. Consequently, in rainy seasons, the ploughed earth would often hold the water while the crops spoiled. Then the earth would let the water drain slowly off the surface, instead of sinking into the soil.

Farmers on these lands quickly found that they must

When glaciers like this were resisted by hard rock or mountains, they scraped off topsoil, leaving boulders when they retreated.

supply a system of drains. They dug ditches. They laid hundreds of thousands of miles (kilometers) of drains (made of tile) to let some of the water pass slowly out beneath the soil. To pay for building and repairing these drainage systems, groups of farmers organized a new kind of local governmental unit, the "drainage district." Farmers who would benefit from draining a certain area came together to vote on the extent of the project and the methods to be used. Then they worked together to carry out the decisions of the majority.

In some places in Ohio, floods or loss of soil or road construction complicated the problem. In such places, by 1920, these "drainage districts" became "conservation districts," or areas where the farmer worked out common problems to save the land. This was a very important step in the social development of the nation. It was a step toward the nationwide soil saving plan which was adopted in 1933. Today there are thousands of local "conservation districts" throughout the United States. These are formed and controlled by farmers themselves, as the first "drainage districts" were—but they receive advice and help from agricultural experts who are paid by the state and nation.

Improvements which are made through the "conservation district" method commonly increase a farmer's yield by 10 or 20 percent. Sometimes the improvement is even greater. The districts include 88 percent of all the nation's farm and pasture land. In other parts of the country, farmers have worked together in similar ways, to deal with problems that the prairie farmer never knew.

In the Central Basin, where the ancient glaciers met no resistance, they left a deep layer of rich topsoil in their wake.

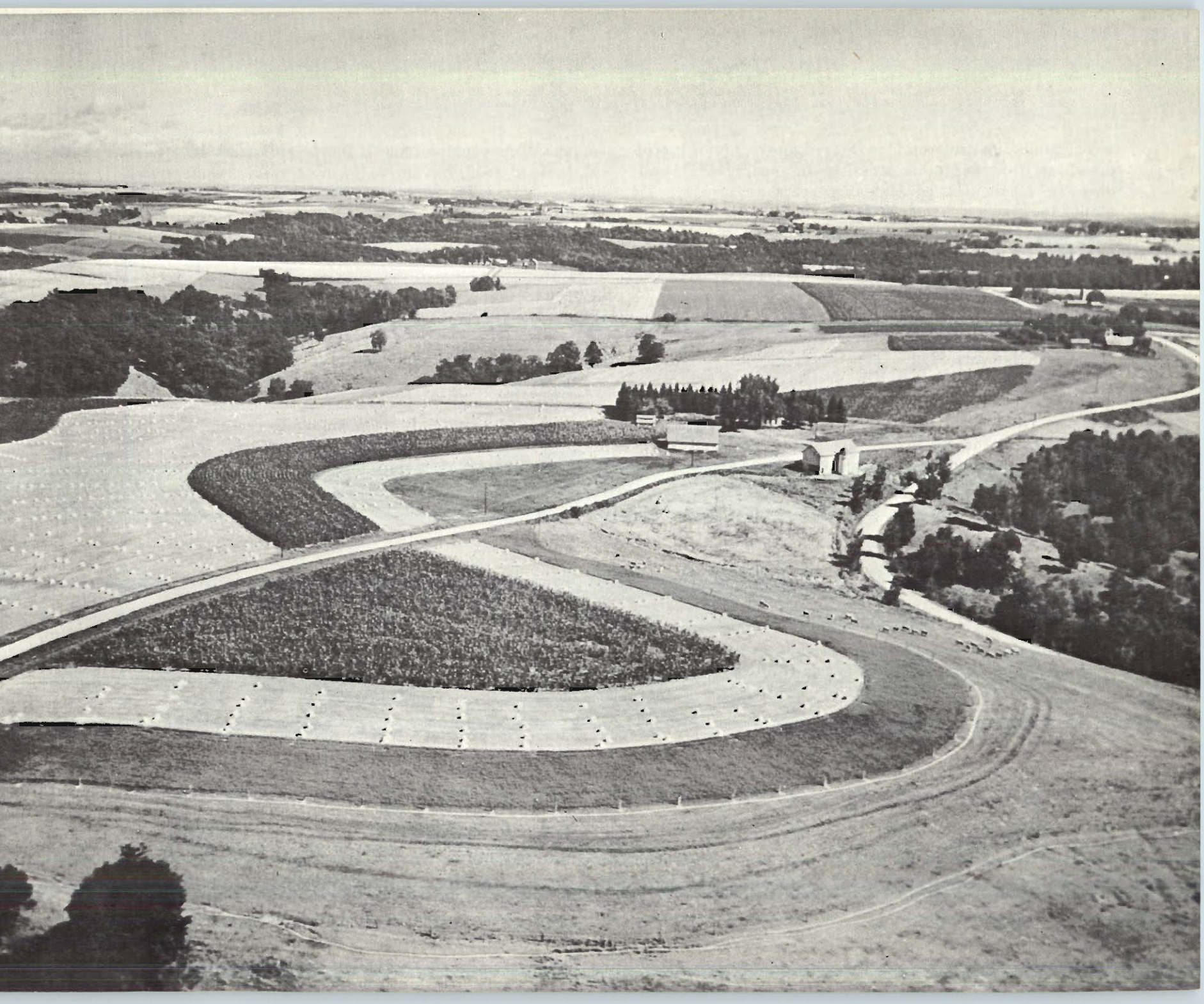
The corn harvest is the most important in the United States. Two-thirds of the nation's farmers grow this bountiful crop, principally as food for livestock.

THE MAIZE BELT

On hot, still midsummer nights in the Corn (Maize) Belt, there are small, mysterious noises in the fields. The farmers like to go out and listen to these sounds. They claim they can hear the maize growing. This used to be considered a joke, but the farmers have been proved right. The maize grows fast, sometimes two inches (five centimeters) during a night. By late summer, it may be 10 or 15 feet (three or four meters) high. A person can easily get lost in a big field of full-grown maize because there is no way of looking over it or through its tall, heavy growth of thick stalks and broad leaves. One can get out only if one walks straight ahead between two rows of the plants, perhaps for a mile (kilometer) or more to reach an equally straight road at the edge of the field. Everything in the Maize Belt seems to be in straight lines and squared-off. The roads, barn yards, houses, fields, and buildings, all seem to have this shape. But the effect of such regularity pleases the eye because (except in very dry years) nature is so obviously generous with the good things of the earth. Even in the winter snows, maize makes the landscape bright. The gleaming gold of the grain shines through the open sides of the storage sheds.

Maize is not only the King of the Maize Belt; it is the most important of all American crops. It is basic to American agriculture, just as iron is basic to American industry. In the United States, two-thirds of all farmers grow maize. And maize is grown on one acre (hectare) out of every four cultivated acres (hectares) in the United States.

Contour planting is used on these rolling Minnesota fields.



The annual maize crop is greater than the nation's crop of wheat, rice, and other small grains combined. Probably one of the United States' greatest resources is its ability to grow great quantities of maize.

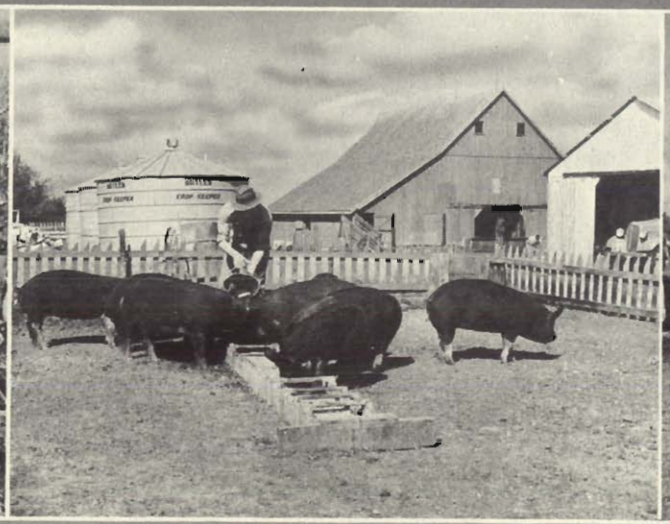
However, most Americans who do not live on farms see only one kind of maize. They see only "sweet maize," a garden vegetable that they eat fresh or preserved. Occasionally, they may eat cakes that are made of maize ground into meal. But these uses account for only a tiny fraction of the crop. What happens to the millions of bushels of this grain?

Most of the crop, after it is harvested, is made into other products. The majority of farmers sell little of their maize as grain. For instance, the principal products sold by farmers in the Maize Belt are cattle, hogs, and poultry, or domesticated birds. This is because about three-fourths of the maize crop is fed to animals. It reaches the table as food, but in the form of milk, cream, cheese, butter, eggs, beef, lamb, pork, or poultry. Much of the remainder also becomes food, but industry changes it into oil; thick, sweet juices; flour and powders. Used in these ways, maize is the foundation of the nation's food supply. It is also the foundation of much of the food which is exported by the United Nations. Scientists have found that all the ancient civilizations of North and South America were also based on maize. They believe it first grew in the upper basin of the Amazon River in South America.

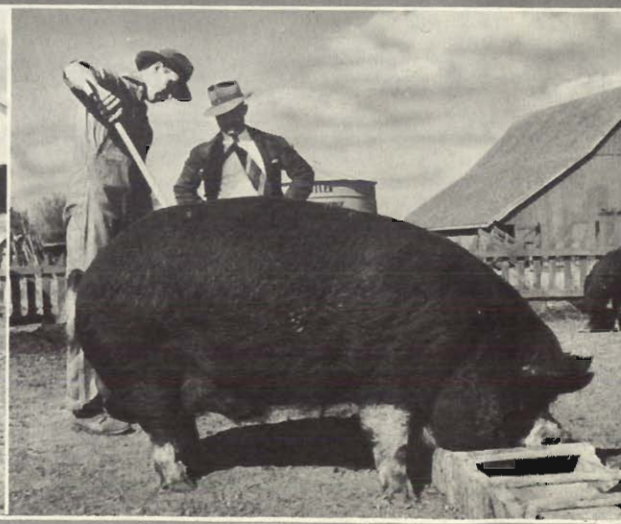
Most grains are too expensive to be fed in such great quantities to animals. There are two main reasons why farmers in the United States are able to use maize in this way. One is that maize grows so well. An acre (hectare) of corn requires only one-twelfth as much seed as

HERE IS HOW CORN IS TRANSFORMED INTO MEAT, MAKING IT THE NATION'S MOST IMPORTANT CROP:

Corn-picking machines handle 12-15 acres a day. An efficient crop, corn has a high yield per acre.



Nearly three-fourths of all corn harvested in the United States is fed to meat-producing animals.



The grain then reaches consumer as meat, dairy products, poultry, or in form of processed food.

an acre (a hectare) of wheat, for instance. Yet the yield of grain from the acre (hectare) of maize is several times as high as the yield from the acre (hectare) of wheat. The other reason is that farmers have worked out high-yield methods in all the important maize-producing areas. The Maize Belt farmer uses machines for every step of his operation. He uses machines for planting, enriching the soil, cultivating, spraying, and killing weeds. He uses machines for harvesting the grain, and for removing the thick natural wrappings, and for removing the grain from the long, round center on which it grows, and for cutting the stalks. The farmer needs all these machines because he may be farming as many as 250 acres, (100 hectares) and caring for a large herd of cattle, with no human helpers except a son, who spends several hours of the day in school. On a Maize Belt farm, the most impressive buildings are the large barns, and the sheds for the machines. The farm-house looks small beside them.

Farmers first began to keep careful records of maize production in 1866. Between 1866 and 1939, the maize yield in the United States averaged between 20 to 30 bushels of shelled grain an acre (1.7 to 2.6 hectoliters an hectare). Suddenly, in 1940, it began to increase greatly each year. By 1948, the yield was 43 bushels an acre (3.7 hectoliters an hectare). It is still increasing. In the Maize Belt, where yields of 50 bushels an acre (4.3 hectoliters an hectare) had been considered good, 90 and 100 bushels an acre (7.8 and 8.7 hectoliters an hectare) became common. (The highest recorded yield is 224 bushels an acre (19.5 hectoliters an hectare), produced in the state of Iowa.) Such a vast and rapid change, in the most basic crop, represents a real agricultural revolution.

This has been a very quiet sort of revolution, however, because the chief difference between the older maize agriculture and the new is simply that the farmer plants a different kind of seed. In the past, for centuries, farmers saved the best ears from each year's crop for the next year's planting. Today, the farmer buys new seed every year from maize developers. The increased value of the crop more than pays for the extra cost.

Maize which is grown from the new kinds of seed is called "hybrid maize," that is, a maize which re-

HOW FARMERS GROW RECORD CORN CROPS:

Fertilizer mixed with seed replenishes the soil.

Science has bred more productive hybrid strains.

Machinery makes it possible to farm more acres.

sults from the mating of different types of the same grain. All kinds of hybrids are developed for such basic qualities as higher yields, stronger stalks, and roots that are more active in seeking out water in the soil.

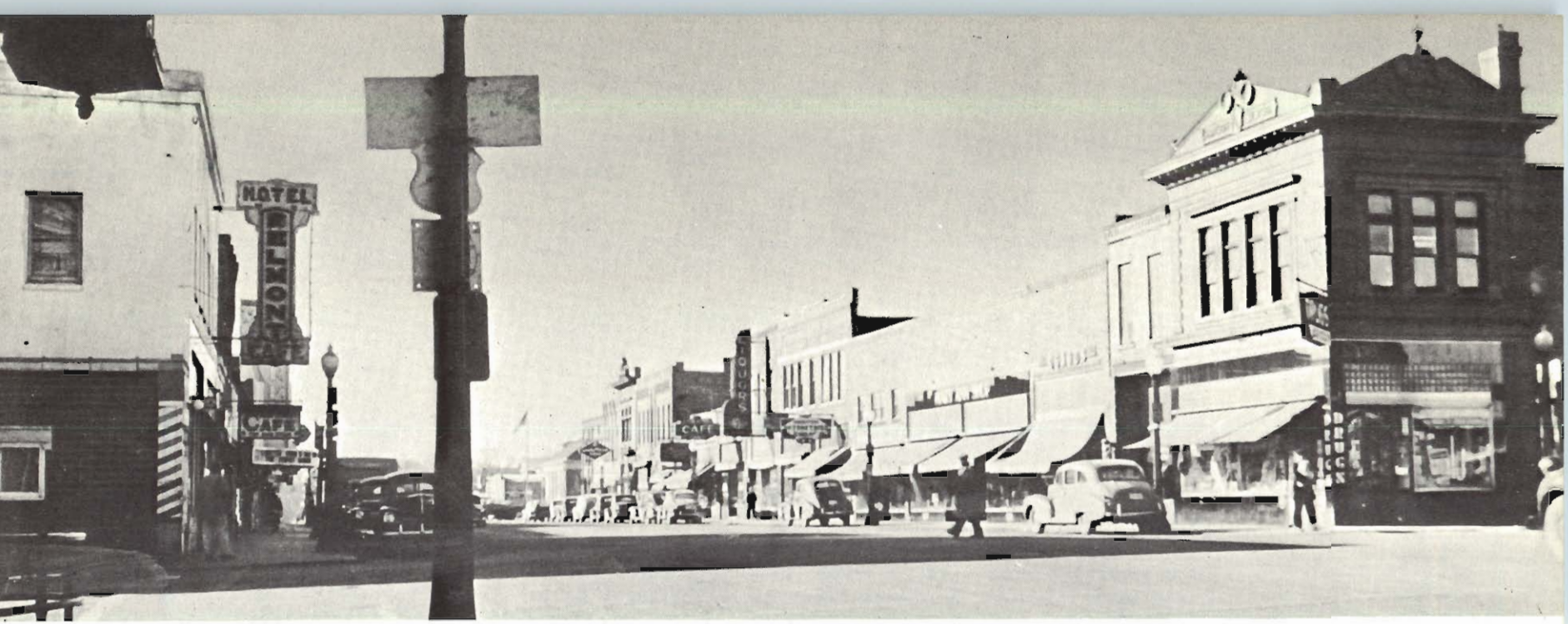
As with other grains, different kinds of maize have been developed for different soil and climate conditions. Some have been developed for various purposes. For instance, some contain twice as much oil as ordinary maize; others are rich in certain minerals. Hybrid crops grow to regular, even heights. This makes it possible for farmers to use machines that harvest the ears of grain from the side of the stalk where they grow.

Producing hybrid maize requires a great deal of patience. It must be done by hand, during 12 or more years of mating within the parent line of types and introducing other types. As the last step, two good plants are combined. This last step must be repeated for each year's seed, or the hybrid may not come true to type.

This process is difficult and complex, but it is simple compared to the job of discovering that new kinds of maize could be developed, or the job of discovering how to develop them. With other grains, the farmer or experimenter can be sure that all or nearly all the plants will be like the parents. But maize is different. American plant scientists began working on the problem of controlling maize qualities very early in the 20th century. Many men spent many years of trial and error before scientists could master the theory and practice of growing the new maize.

Like farmers everywhere, American farmers do not like to throw away anything that experience has taught them. They do not like to risk an untried new idea, even if it sounds like a good idea. To the eye, hybrid maize does not look as good as the prize ears of ordinary maize that farmers were so proud of growing. So, even after the first hybrids were developed, farmers were unwilling to use them. The maize developers had to spend 20 years more proving the value of hybrid maize before a few farmers were convinced that it was worth risking. After that, the revolution in the Maize Belt happened fast, because many farmers could actually know of a daring neighbor's success with the new seed. But the revolution is only now taking place in some parts of the country.

Farms in the Central Basin are large, averaging over 240 acres in size. Often they are out of sight of their neighbors.



In this area, most of the towns are trading centers for nearby farms, serving as community centers for the rural population.

FARM AND VILLAGE

A visitor to the United States would see many thousands of farms and many hundreds of small and large country towns. But he could search far and wide over the Central Basin without finding a farm village like the country villages which are often found in Europe and Asia. In those parts of the world, a village is a collection of homes, close together, occupied by some of the people who work on the surrounding land. In all the United States, there are few such villages.

Instead, each family of farmers lives separately on its own fields, often beyond the sight of any neighbors. The farmers and their families do not travel away from a village or town to do their work. Instead, they travel into town to attend church, to buy supplies, to go to meetings or dances. In most places, special, very large passenger automobiles stop for the farm children every day and take them into town to attend school.

This lack of farm villages seems strange at first, and hard to understand. We know that most of the early settlers in America came from farm villages in Europe. Indeed, when the Atlantic Coast was settled in the early 17th century, both the colonial officials and the settlers themselves expected that most of their settlements would be villages.

In New England, this plan worked out much as expected. For 200 years there, farmers typically lived in a group

All over the U.S., excellent roads make it easy for farm families to go to town for supplies, church services, and school.

of houses around a central green where the cattle of the whole villages grazed. The farmer's crop lands extended outward around the village.

Farther south, in the State of Virginia, however, farmers scattered up and down the creeks and rivers, with great distances between the separate families. These settlers were planting a New World crop, tobacco, which required fresh land every few years. For this reason, these tobacco farmers moved westward, as separate families, whenever their crop required new land. After several generations, families reached the low hills at the edge of the Appalachian Mountains and the long, rich valleys which were enclosed by the mountains. They then changed their farming from tobacco to grain and domestic animals. With their new crops, these families had no further need to move. Now they could remain where they were; now they could group themselves into villages if they wished. But by this time, they had learned to value the independence of the separate farm. Even when the cabin was humble, even though the work was hard, each family could feel that it had its own little farm on which the owner could do as he wished; and the families liked that feeling.

Much of the same kind of thing had been happening in other eastern states, but for different reasons. In the western reaches of the States of Maryland and New York wealthy land-owners held great blocks of wild land. Frontier farmers traveled to these lands to clear and farm them without any clear legal right to do so. Naturally these frontier farmers did not wish to call attention to themselves by establishing villages. Many other families in the States of New Jersey, Pennsylvania, and New

York lived on separate farms because their home countries or their religious beliefs were different from the home countries and beliefs of their neighbors.

Anyway, the families who moved out to settle in other parts of the United States were not people who preferred villages. Those who moved were the most independent and self-sufficient families. These were the families who first pushed westward to the Appalachian Mountains, then southward along the mountain valleys, then into the great Central Basin, and finally westward beyond the Rocky Mountains. These were the people who formed the pattern of the way of life brought on by the separate farm.

Until the days of good roads and automobiles, farming in the United States was often a lonely life, and it was always hard work. To be successful, the farmer and his wife had to have all kinds of skills. Whenever a problem arose, they had to deal with it themselves. Of course, neighbors helped each other with big jobs like building barns, but in day-to-day work the farmer had to make his own repairs and was often his own inventor. In a way, this made the farmers less conservative about methods. They tended to depend on their own ideas and experiences, more than on community tradition.

People in other countries feel emotionally attached to their villages. Americans became emotionally attached to the independent family farm. And since the early days of the United States, the people have supported this pattern of country life through their public policy. For many years, beginning in 1862, the government gave away free farm lands. To take full possession of such a farm, the settler and his family had to build a house on the land and live there for five years; then the land became theirs.

Between 1890 and the early 1930's, there was an increase in the number of farmers renting their land (instead of owning it). When this fact was realized, it caused great alarm. Therefore, recently, the national and state governments have helped farmers with loans in times of drought or crop failure, so that they will not lose their land. Some farmers have difficulty raising enough crops to support themselves, even in good times, because of poor land, poor methods, or lack of extra money for improvements. Such farmers are most in danger of losing their land. During the last 30 years, more than a million needy farmers have been helped by loans from the national government. The government requires the farmers to use this money in ways that will improve the farms,

Saturday is shopping day for most farm families.


Farmers consider new equipment with great care.


Recreation is another aspect of visits to town.

increase yields, and raise the family's living standards. Among tenant farmers (farmers who do not own their own land) many have been helped to buy land of their own.

As a result of this combination of tradition and policy, there are not many great farms which are owned by people who do not live on them. In the United States, less than one farm in a hundred is operated by a hired manager. Less than one-fifth of all farm labor is done by full-time hired workers or by harvest laborers who move about from farm to farm as the crops become ripe. The proportion of work by hired laborers is slowly but steadily declining. There is also a steady decline in the number of farm families who do not own land.

The frontier settlers took into the Central Basin many different ways of farming, from many different nations. First, there were the methods which were brought from England, but these methods were soon influenced by many customs from other nations. The Swedes introduced the log cabin, which became the typical dwelling of the frontier wherever there were trees. Good types of farm animals, and skills in dairy farming, came with the Dutch. Scots and Irish brought potato cultivation, for this New World crop was first widely planted in Europe. Germans created what was to become the typical American barn. This process of borrowing continues even today. Two pasture plants, lespedeza and kudzu, have been brought to the United States from Asia. The soybean, also from Asia, has recently become one of the chief crops in the Maize Belt. Italians and Japanese have influenced fruit and vegetable growing. Scandinavians have introduced their methods of dairying and cheese-making in the great northern dairy region of the Central Basin.

Until rather recently, most of the farmers in the Central Basin did "general farming." In the United States, this meant that the family produced as much of its own food and equipment as possible, and sold whatever remained, to buy things it could not raise or make.

Today, however, nearly all the farm families in the Central Basin do "commercial farming." This means that the family uses most of its energy, land, and equipment to raise products for sale. The farmer chooses to plant the crop that will grow best on his farm. He carefully figures the costs of enriching the soil, sprays, seeds, and equipment. He considers the effect of a crop on the soil, and the labor required for raising it. He balances this against the amount of money that he can get from the crop. He and his family do not try to raise products for their own use if the cost (in land, energy, and equipment) would be more than the gain. This change from "general farming" to "commercial farming" represent another kind of agricultural revolution.

The average size of farms in the United States has increased from 148 acres (59 hectares) in 1920 to 302 acres (121 hectares). The main reason for this increase is that a farmer can use more land now, because of machines and larger-scale growing of crops or farm animals. A century ago, two-thirds of the people of the United States were on farms. But today, the average farmer grows enough food for himself and twenty-three other Americans. In addition, he grows for export farm products for three people.

This is Montana, near the headwaters of the Missouri River. In this land of extremes — of intense heat and cold, almost constant wind, mountain peaks, and vast space — the unpredictable Missouri exerts a powerful force on the lives of all the people. The nation's longest river, the Missouri is also the most destructive, as it winds almost 2,500 miles from its source in Montana to its mouth above St. Louis. Most of the water that flows through its basin comes from the melting snows high in the Rocky Mountains. The enormous Missouri basin comprises one-sixth of the area of the United States — and yet it holds only one-twentieth of the nation's people.

A farmer surveys desolation created by the flooding Missouri. Below, Fort Peck Dam in Montana, one of more than 100 projects now planned to control the Missouri and put its water to human use.

THE WILD MISSOURI

The great Missouri River curves through the heart of the whole western half of the Central Basin. The Missouri is the chief branch of the Mississippi River, and does more harm than any other river in the United States. When the first travelers reached a point near the present city of St. Louis, they were amazed to meet a mighty stream of dirty water pouring down from the west. Father Marquette, a French priest who was leading the group, wrote: "I have seen nothing more frightful. A mass of large trees . . . real floating islands, came rushing . . . (so) that we could not, without great danger, expose ourselves to pass across." That was the Missouri River in flood in 1673. And that is the Missouri River in flood today.

The Missouri rises high among the snows of the Rocky Mountains. Before it reaches the Central Basin, it runs for 1,000 miles (1,600 kilometers) through a region where there are long droughts and sudden, extremely heavy rains. The Missouri is really two rivers; one of water and one of little bits of soil which are washed off the land. The people who live along the Missouri's banks say that it is "too thin to plow and too thick to drink."

Time after time, the muddy waters of the Missouri have flooded, spreading ruin in the States of Nebraska, Iowa, Kansas, and Missouri. The most recent floods have been in 1947, 1951, and 1952. The 1951 flood left 200,000 persons homeless. It killed 41 persons, put two million acres (800,000 hectares) of farmland under water, and destroyed more property than any previous flood in U.S. history.

In 1945, the United States Government began a great project to help the people in the Missouri basin. The project was named the Pick-Sloan plan, because those were the names of its engineers.

Already, many man-made lakes, dams, boat traffic channels, and earth walls have been constructed. But the job is so big that the work which has been done so far seems only to have made the river angry when it is in full flood. This is the biggest basin construction project in the nation's history. It will not be finished for many years. When it is completed, the river will "walk down" 2,000 miles (3,200 kilometers) through more than 100 huge lakes.

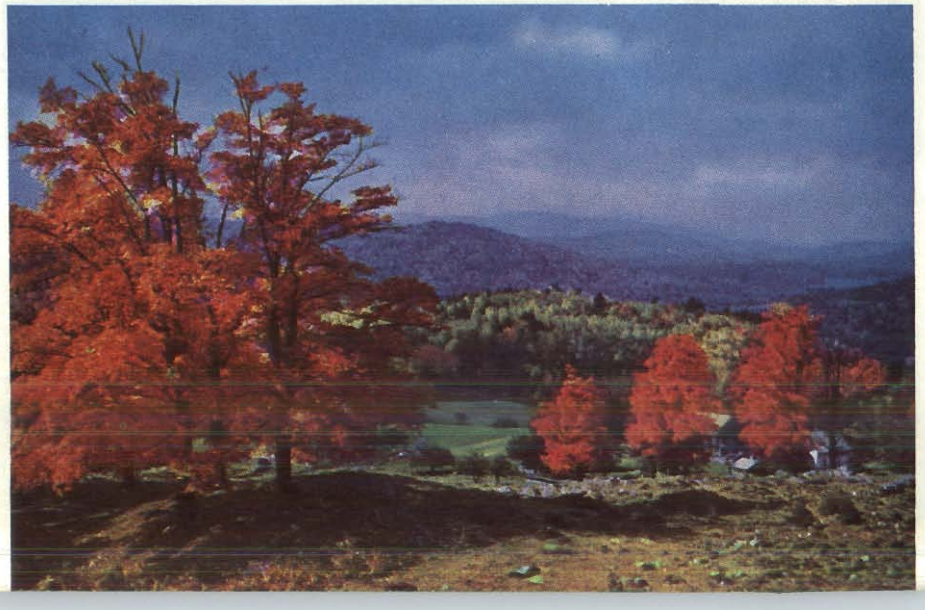
People who know the Missouri cannot fully believe that it can ever be really tamed. But people know that, somehow, the mighty river must be tamed. As one Iowa farmer says, "You can't live on a river that takes your future away."

The most characteristic autumn scene in the Central Basin, repeated mile after mile from Ohio to Nebraska, is cornfields filled with tidy rows of golden-brown corn shocks. Corn grows fast—sometimes several inches in a single night—and by late summer the stalks may be ten or fifteen feet high. In recent years, corn yields have increased enormously, largely through the use of better seed.

For 100 years, men have been reclaiming land that was once desert. Yet where it remains, the desert is a place of dramatic beauty.

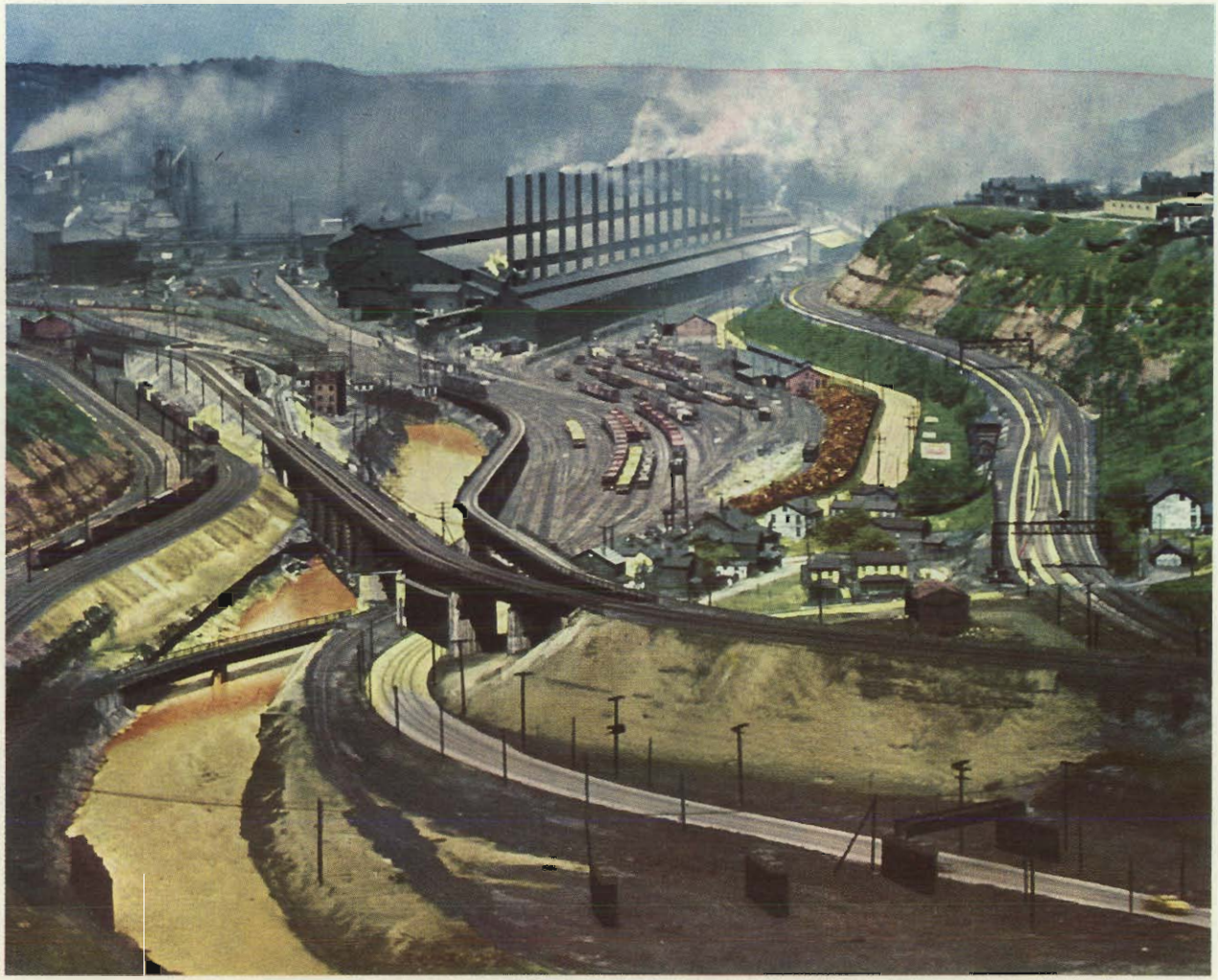
On the prairies, far from the moderating influence of the oceans, winters bring fierce storms and numbing cold to the farmers.

In the fall, New England's hills are a blaze of color. Maples, oaks, and birch trees burst forth with flame-colored autumn leaves.



Clear air and brilliant summer sunshine bring forth striking color contrasts in the Rockies. This is a mountain meadow in Colorado.

The canyon through which the Columbia River flows was cut into a lava plateau by a continental glacier during the last ice age.



Transportation facilities have been of paramount importance in the growth of Pittsburgh's heavy industry. Like many of the steel mills in this region, these are served by both railroads and river transport.

The Hudson River, as seen from the New Jersey shore, is a scene of almost constant activity. Ocean liners from all over the world berth at piers in New York harbor. In the background is Manhattan's famous skyline.

South of Los Angeles, a coast highway runs through scenery which is typical of southern California. Beyond the shoreline of the city shown in this picture, oil derricks may be seen on the horizon. The heart of more than forty business and residential communities in this region is **Los Angeles, one of the largest metropolitan areas in the world.** People from many sections of the United States vacation at Pacific beaches like this.

The Southeast

METROPOLITAN AREAS	POPULATION (1960 Census)	METROPOLITAN AREAS*	POPULATION (1960 Census)
Washington	2,001,897	Nashville	399,743
Houston	1,243,158	Knoxville	368,080
Dallas	1,083,601	Fort Lauderdale	333,946
Atlanta	1,017,188	Orlando	318,487
Miami	935,047	Mobile	314,301
New Orleans	868,480	Beaumont-Port Arthur	306,016
Tampa-St. Petersburg	772,453	Shreveport	281,481
San Antonio	687,151	Chattanooga	283,169
Birmingham	634,864	Columbia	260,828
Memphis	627,019		
Norfolk	578,507		
Jacksonville	455,411		
Richmond	408,494		

*Twenty-two other metropolitan areas in this region have more than 150,000 people.

METROPOLITAN AREAS

Nearly all the metropolitan areas of the Southeast developed as centers for handling the raw farm and forest products of the surrounding countryside. Thus Memphis, Dallas, New Orleans, and Mobile were great cotton shipping points; Little Rock, a center for making cotton by-products such as cottonseed oil and cake; Richmond, a leading center of the tobacco industry; Jacksonville, a point for shipment of lumber, resins and citrus fruits. But all the metropolitan areas of the Southeast are now important manufacturing centers also. In the chart above they are listed in order of their relative size.

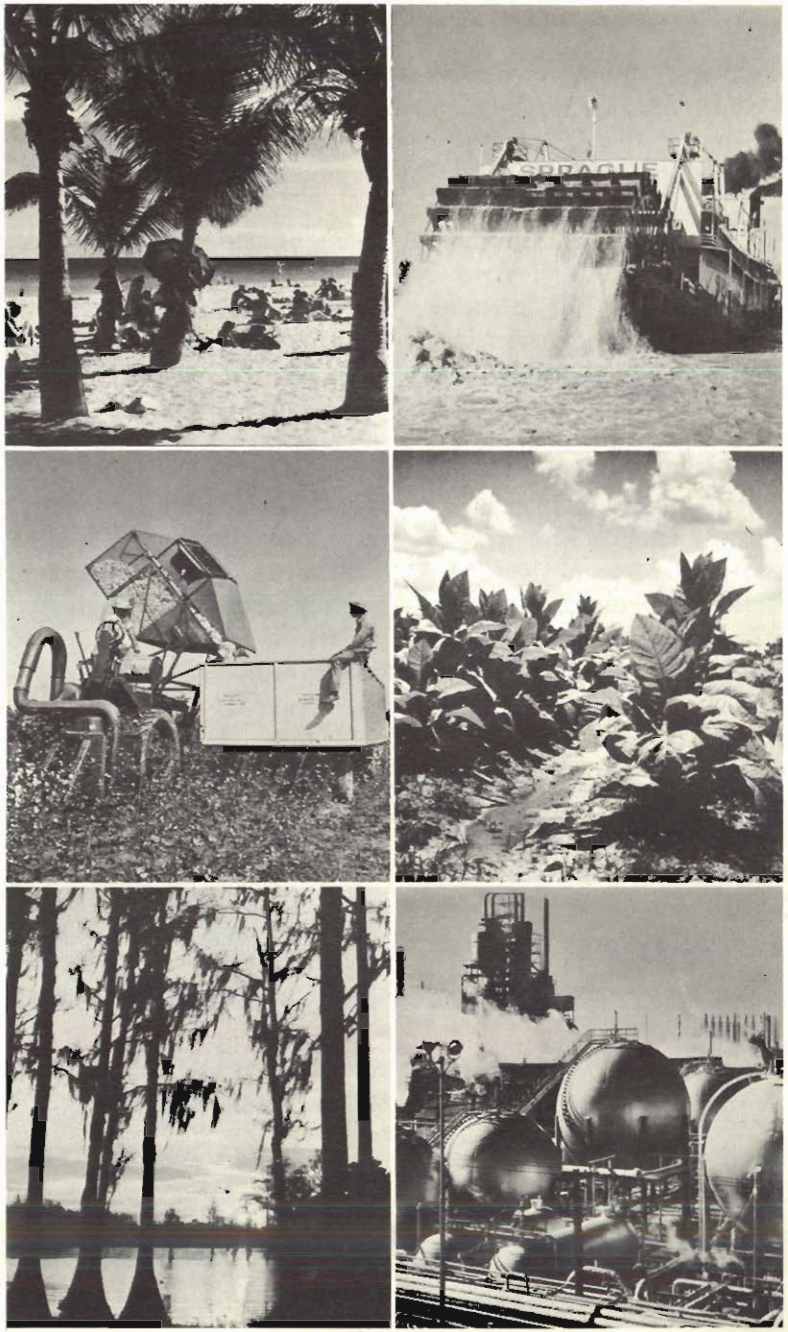
LAND OF CHANGES

This southeastern region is changing more rapidly than any other part of the United States—not because the land is new, but because the land is old, over-used land that is now being given new life.

In 1889, a famous southern editor and public speaker told a little story about his region. Southerners still quote his story to explain the problem of the Southeast, and to show what they are doing about the problem. The editor's story told of the funeral of one of his neighbors, a poor man. "They cut through solid marble to make his grave," the editor said, "and yet the little marble stone they put above him to mark his grave was from the State of Vermont. They buried him in the heart of a pine forest, and yet his pine coffin came from the State of Ohio. They buried him beside an iron mine, and yet the nails in his coffin and the iron in the shovel came from Pittsburgh. They buried him in a coat from New York and shoes from Chicago and a shirt from Cincinnati. The South didn't supply anything for that funeral except the body and the hole in the ground."

A modern writer from the South has expressed the problem this way: "We have added too little human skill to our raw materials."

As his comment and the editor's story both suggest, geography itself has been kind to the Southeast. The region is blessed with plentiful rainfall and a mild climate. On most of its farmlands, crops can be grown without frost for at least six months of the year. The Mississippi River and its southern branches run through the heart of this region, and other rivers are found near its coast. Crops grow easily in its soil, which is brown on the coastal plain, red on the low hillsides, and black in east Texas. The mountains contribute coal, water power, and rich



Florida beach • Mississippi riverboat • Cotton-picker • Tobacco field • Moss-covered cypress • Texas oil tanks

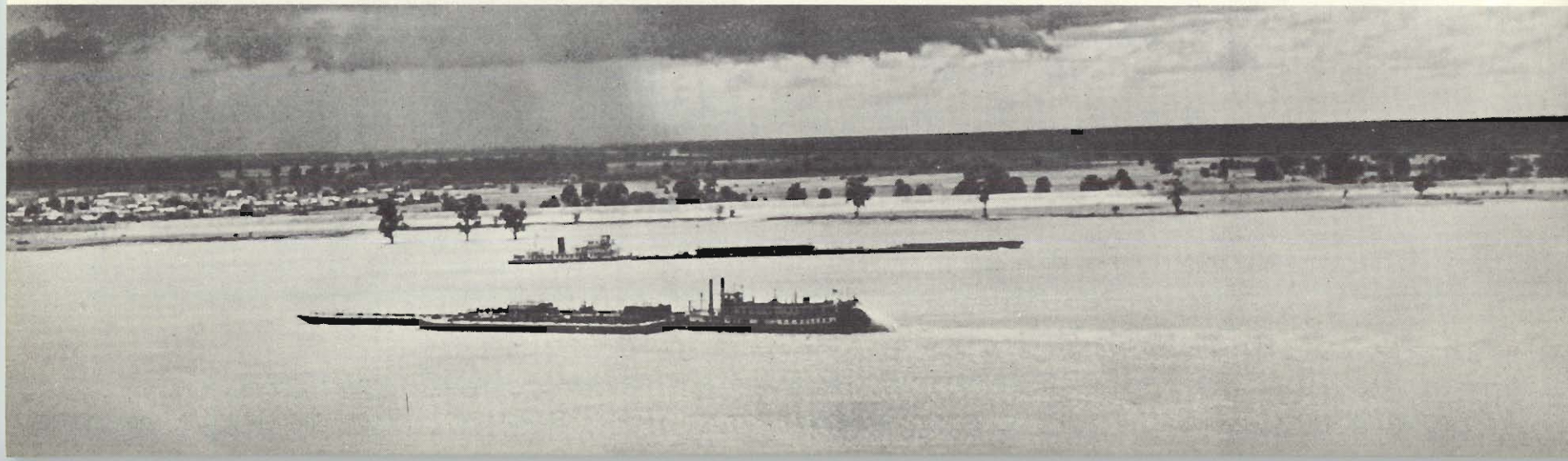
valleys. Much of the great tongue of land which is the State of Florida is a garden for warm climate fruits. Some of the nation's largest oil fields lie in the States of Louisiana and Texas. The region is naturally rich in fisheries, forests, and minerals.

And to delight the human sense of poetry and wonder, the Southeast has many landscapes of special strangeness or beauty. For instance, there are low water-covered lands where cypress trees, shaped like bottles, rise out of dark, quiet waters into dark, tent-like masses of vines above. There is soil that looks like broad expanses of red silk, decorated with long curving rows of pink and white flowers—the flowers of the cotton plant. There are quiet little valleys hidden between great green hills; or sunny, sandy islands where all the world seems to be one endless stretch of sand, water, sky, and wind. One can understand why so many American writers have been interested in southern scenes, and why people in every part of the U.S. like to sing the songs of the South.

The people of the South, too (white and Negro), have proved themselves to be enterprising. People from the Southeast settled a great part of the American West. Many southerners make places for themselves in the industries and professions of the North, as well as in their native regions. Travelers who return to the Southeast today, after many years' absence, are astonished at improvements that they see. They find new roads, bridges, and factories; new schools, hospitals, and community centers. "I had never seen a farm region so full of new barns," one traveler wrote.

The Southeast has needed these improvements very much. Even today, the average income and the average standard of living are lower in the Southeast than in any other region of the nation. Each year, it loses a part of its natural population gain because many people leave to find greater opportunity in the North or West. We have already spoken of the importance of the machine in developing the United States. The Southeast, as a whole, still uses machine power less than other regions do. And the value of agricultural or industrial goods produced by each worker is less. Clearly, in this region, something went wrong in the partnership of man and geography.

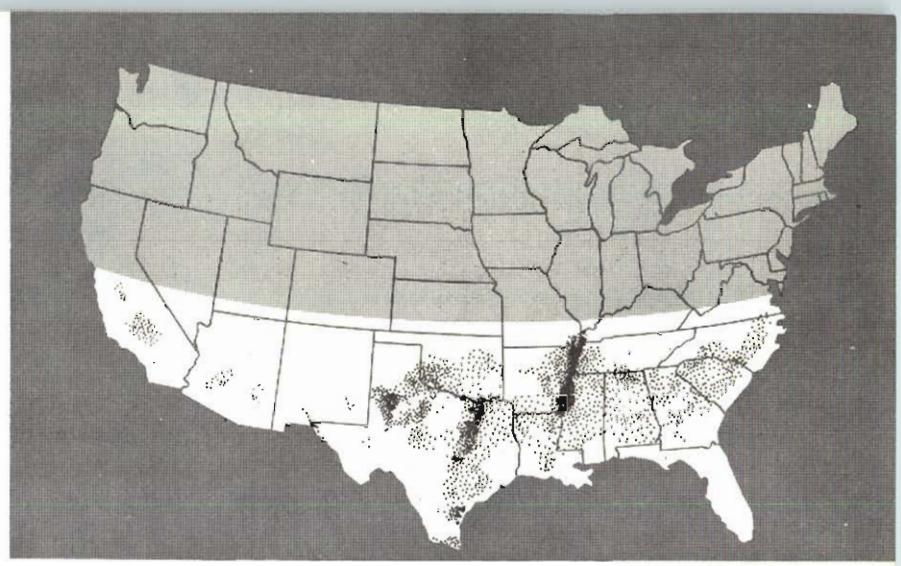
Throughout the history of the United States, the great Mississippi River has been one of its most important shipping arteries.



MINING THE SOIL

Before the United States declared its freedom from England in 1776, the colonies (both north and south) were not encouraged to make things. The colonists were expected to supply raw materials to the mother country. As we have seen, geography did not fit the Northeast very well for this pattern; the northern states changed the pattern when they became independent. But the South, with its rich soil and ideal climate, was finding wealth in growing tobacco, rice, and dye plants. Then, in 1793, great new possibilities for the use of cotton appeared with the invention of the cotton gin, a machine to separate the cotton fiber from the seeds. Cotton needs about six months to grow and ripen. Here was a crop that the warm South could grow supremely well. It was also a crop which the whole world seemed to want. Land was cheap, and many farmers put all their energies into growing this single crop, as much of it as possible. Farming of that kind, before the days of farm machines, required a large labor force. At first this labor was supplied by the degrading slave trade from Africa in which human beings were captured, sold and forced to work without pay. The slave trade ended in 1808. After that, the natural population increase of slaves provided workers for the cotton fields.

The slavery system was a curse to the slaves, and it was also a curse to the people who owned slaves. After many years of this single-crop agriculture, the soil became poor. When the rain came beating down on the cultivated earth between the rows of cotton, it washed away precious topsoil. The farmer who raised only one crop and used slaves always needed cash. He needed to maintain his labor force and he needed to buy all the things he did not grow or make, but the mining of the soil used up his money. When his land ceased to grow cotton well, he had to abandon the used soil and move



Cotton acreage in the U. S. Each dot represents 10,000 acres.

Cotton has always been the South's most important product.

westward if he could afford to. After the fresh land had all been taken, he had to buy expensive soil enrichers. If he could not do this, he gradually grew poorer as the land grew poorer.

The farmer needed money, but almost the only way for him to get money was to continue growing cotton—or, farther north, tobacco. Both these crops mined the soil of its riches and made the soil poor. For the southern farmers had to produce for export; this was their only important market. The region did not have a population of well-paid workers who could buy what was produced there. The North had a population of prosperous farmers living on small farms, but the South did not. Most of the southern farmers lived on small farms, but these small farmers gradually became poor by competing with the slave labor that did the work on the few big farms. And the small farmers became poorer still by wearing out their own soil. Thus the cotton farmers, big and small, faced an impossible problem. As the soil became poorer, cotton planting continued to move westward, to the states of Texas and Oklahoma, until it was stopped by lack of rainfall.

During the tragic years of 1861 to 1865, the United States put her men and her resources into the conflict between northern and southern states. When the war ended in defeat for the southern states, the South had lost a quarter of its adult men and almost all its capital. The slaves were freed, but the economic pattern was not really changed, for them or for the other southern people. The people could only turn again to the resources they knew best. This was their land and their knowledge of its most salable crops. And so the mining of the soil continued, until, in some places, the land was producing only a fourth of what fresh land had given. Even the poorer crops required as much labor as ever; while the farms of the North and the West were using machines, the South continued to be too poor to buy machinery, and continued to use cheap human labor.

New difficulties, too, were troubling the region. The farmer could no longer even be sure of cash for the cotton he grew, because the price of cotton on the world market changed violently from year to year. Sometimes the farmer lost money on his year's labor. A new enemy with six legs (an insect called the cotton boll weevil) marched into Texas from Mexico in 1862, and spoiled the growing crop. Chemistry products could not stop it. Slowly the army of insects marched eastward. By 1921, it had reached the Atlantic Coast, leaving ruin and despair behind. At last, the damage was partly controlled by planting types of cotton that ripen before the insect can grow big enough to destroy the crop.

There is little use in laying blame for the situation into which the South had fallen. But if blame is to be laid, the whole United States must share it. The people of the South could not possibly have developed their resources properly, because they were too poor in money and energy to make experiments and improvements.

Luckily, the old errors—the misuse and misunderstanding of geography—are being corrected in the South today. It is a hard job to repair the destruction of so many years. Because the rest of the United States helped to cause this destruction, the rest of the United States is today helping to mend it. But the biggest part of the job is being done by southerners themselves. They have had to begin mending the most basic of all their resources, the land. More than the new factories or new schools, the change that most impresses travelers to the South today is the improvement in the land itself. Now there are young forests, and fat cattle in green pastures, where not long ago the land was poor and bare.

Mechanical cotton-pickers which can do the work of forty men are freeing farm workers for jobs in new southern industries.

Industry joins agriculture in the Southeast. This modern plant processes pineapple grown in fields right outside the factory.

Strip rotation of cotton and small grain is followed by an annual planting of lespedeza on this farm in South Carolina.

CHANGING WAYS

In a little town of southern Alabama there is a monument honoring the cotton boll weevil! The people of that area erected the monument because the boll weevil destroyed their cotton crop so completely that in the year 1910 it forced them to stop growing cotton. They turned instead to dairying and to raising ground nuts and melons. What they had thought was a misfortune became good fortune, for their new farming was better suited to their land and brought them a better living.

In another place in Alabama, three brothers in 1934 acquired a lumber mill that had already cut down most of the surrounding forest. The remaining trees were enough to keep the mill busy only eight years longer. But the brothers had new ideas. Today the mill is cutting more wood that it ever did in the old days, and the supply may continue forever, because the forest has become a carefully managed "tree farm." The brothers have grown new trees to replace the old ones. They have also helped

their farmer neighbors by showing them how to grow trees, as a steady crop, on land that could no longer grow cotton.

Mississippi, the most thoroughly agricultural state of the Southeast, began about 1940 a program to increase manufacturing. The state now tells its citizens to "Balance Agriculture with Industry." By 1951, the plan had helped create thousands of new industrial jobs in Mississippi.

These examples give a glimpse of three sides of the movement that is saving the South. Southerners call this movement "diversifying." First of all, they are bringing their agriculture into balance, with crops that put new life into the soil, and with many types of plants and animals which are suited to the many features of their landscape.

Second, southerners are adding to the basic wealth of the region by using and cultivating their resources, instead of letting them lie idle or destroying them.

And, third, they are bringing their whole economy into balance by adding industry to farming.

At first this movement of "diversification" was slow. It happened by chance, as in the Alabama town that had to stop living on cotton. But, in 20 years, it has become a very broad movement, purposely planned by individual farmers and manufacturers, and purposely encouraged by communities, states, and the national government.

The change in farming has started in many different ways in different parts of the South. Usually it has begun with one farmer. This one daring farmer decides to try out a new crop, or a new way of plowing. Or he changes from raising plants to raising farm animals. He may have heard of these things from a government agricultural agent, or perhaps he read about them in a magazine for farmers. Usually his neighbors think he is making a great mistake. But when they have seen that his experiment is successful, they have adopted his idea.

Remaking a farm is always hard work for the farmer, but he is given approval in many ways, and is helped to avoid mistakes. The government has a program to save the soil. Under this plan, the farmers in a district vote to decide whether or not they wish to adopt a soil building plan for their district. If they vote to adopt such a plan, agricultural experts help them plan how to use their fields for crops, and show them how to rebuild the soil. In some parts of the South, farmers cannot afford to buy the equipment or the new seeds or animals which they need to improve their way of farming. So the states and national government have arranged ways of lending money to farmers for such needs.

In some places, one of the biggest problems is that the farmers do not own the land on which they work. They are tenant farmers. Tenants usually do not care for land as well as farmers who own their own soil and can give it to their children when they die. So, in many places, tenant farmers who want to buy land are given loans which they can repay out of the extra money they earn from well managed farms. As soon as the change had really started, many details helped it along. Two pasture crops from Asia, lespedeza and kudzu, were found to be ideal for southern pastures. Very rapidly they have helped make the South a leading region for farm animals. New hard roads have been built to the farms, so that travel is possible in all weather. New processes have been developed for freezing foods. Consequently, many farmers can now profitably grow vegetables for city markets. Wise businessmen in the South understood that new ways bring new needs, and they built up such enterprises as fleets of motor

Contour-planted orange groves in Florida.

Kudzu vines from Asia improve livestock.

Petroleum refining, a major southern industry.

freight trucks, or packing plants for poultry or domestic birds or cheese factories. Lack of such enterprises had long made the South dependent upon the cotton economy. Cotton is still the principal crop of the South, but cotton growing is changing, too. Machines for picking cotton, which can do the work of 40 men, have begun to take the place of low-paid labor. Usually, throughout the history of the industrial revolution, such use of machines has taken jobs away from people, creating problems of unemployment. The machines for picking cotton are being introduced gradually. In this way, the workers whom they replace can be given jobs in industry or other occupations when they are no longer needed in the cotton fields. Poor fields are now being used for other crops or for pasture. And the farms which still raise cotton are yielding better crops, because the farmers use chemical products to enrich the soil and do other things to improve it.

Until 1940, most southern factories did simple jobs, compared with factories in the North. They turned raw material into partly finished products. For example, they made cotton into cotton yarn or rough sheeting, and they shipped the partly finished goods North to be made into finished cloth or clothing. Or they took already finished machine parts, from northern factories, and assembled them into machines that would be sold in the South.

Birmingham, Alabama, for instance, has long had a large steel industry, because Birmingham is a place where iron ore, coal, and limestone, a rock used to make the iron more pure, are all found close together. But Birmingham's machinery came from the North, and it made few finished steel products. Instead, it shipped out the metal. The South shipped out partly refined aluminum ore instead of aluminum products. Aluminum is a bright, soft metal that is easily worked and does not rust. It shipped out wood instead of furniture, and turpentine, the distilled juice of pine trees used in paints, instead of paints.

This, too, is changing swiftly. Better farming has brought farm machinery and factories to the South, for making tools. Higher wages and richer farms in the whole region have brought clothing factories and shoe factories and plants for making many kinds of goods used in houses. New houses, schools, barns and buildings for storing machines have created a need for factories that make window frames and doors, pipes and fur-

naces, and dozens of other things that go into modern buildings.

By 1950, there were 2,000,000 more industrial workers in the South than there had been in 1940. Each year the number increases. Not all the industries have grown up because the South has become a better market, however. There are also other reasons. Industry depends on the proper use of basic geographical resources, in the South as in the North.

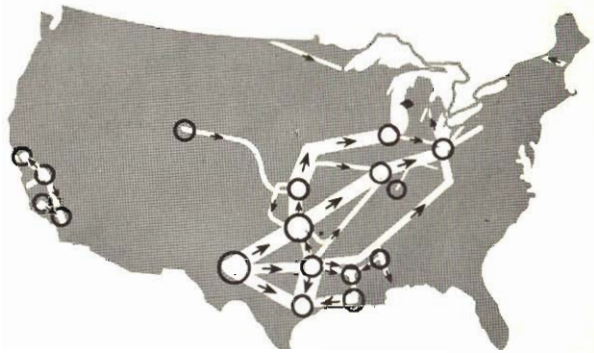
The South always did have raw materials, transportation, population. What new resource, therefore, is suddenly bringing basic industries to the South?

The new resource is *industrial power*.

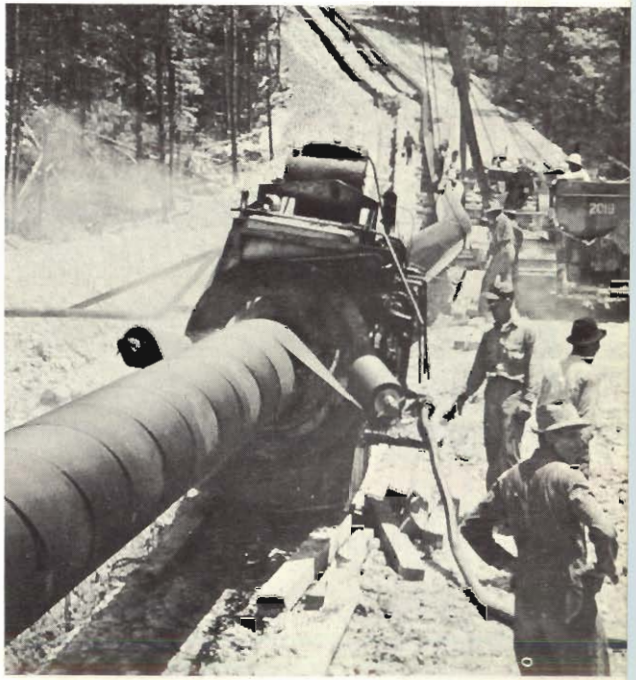
Industrial power, the energy that turns machines, is being developed, at last, for human use. For example, natural gas, which is collected in pockets within the earth, is a great resource for industrial power, but it must be transported after it is taken from the ground. Today the South has built new lines of pipe under ground which carry this resource from the gas and oil fields to mines and mill sites. Most important of all, water power that was once wasted is now being used for cheap electricity. This electricity supplies power for machines in homes and on farms, and in the great new industrial plants of the region.

One industry which has done much to improve the economy of the South within the past 30 years is the very important, constantly expanding oil industry.

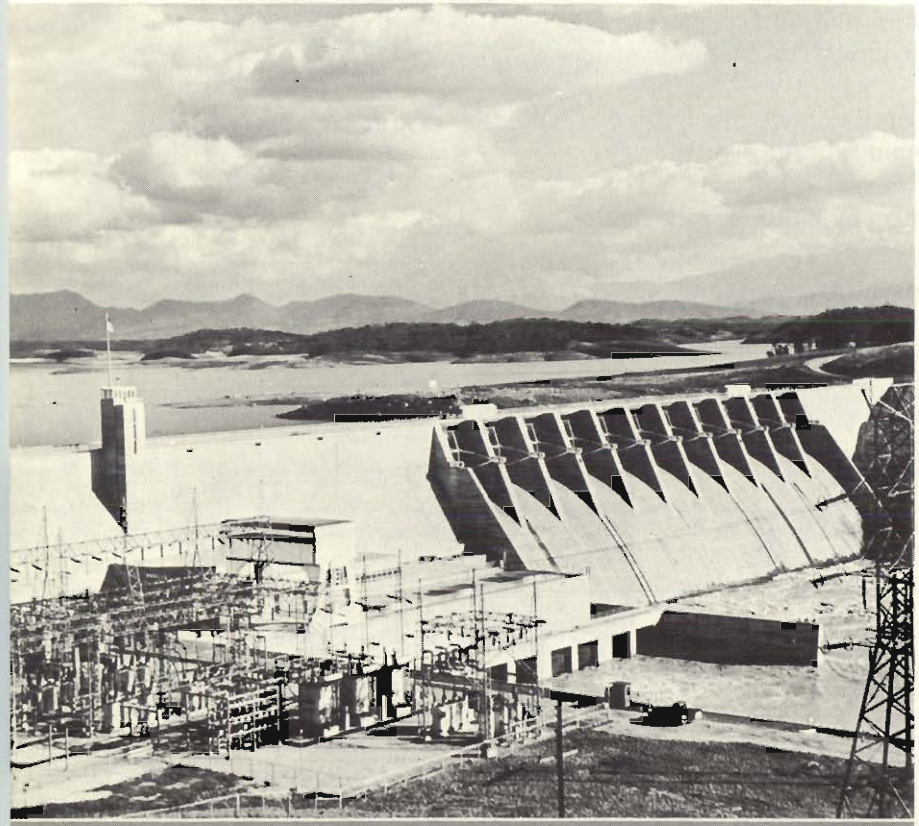
In earlier times, almost all the crude oil in the South used to be piped to refineries, plants which made it into gasoline, oil and other products, in the Middle West and the East. Then the South brought back what it needed of gasoline and oils. Today, however, crude oil refining and the manufacture of equipment for crude oil production are huge industries in the southern oil fields. This has helped create cities in that area. Glance again at the map on page 66. Dallas, Houston, San Antonio, and Beaumont are all great oil cities which grew up in the midst of great oil fields. The map at the right shows the major pipelines which connect fields with refineries, ports, and consumers. Some of the pipelines are more than 1,000 miles (1,600 kilometers long). They are made so that they can carry several different products made from crude oil, one after the other, through the same pipe, without mixing them.



This map shows flow of major pipelines in the U. S.



Pipelines carry gas and liquid fuels across the country to homes and factories. This pipeline will transport natural gas from Texas to West Virginia.



Douglas Dam, on French Broad River in Tennessee, is one of thirty dams in the Tennessee Valley system. Begun in 1933, this series of dams now controls the waters of the Tennessee River and its five principal tributaries. Waters which used to wreck the valley in time of flood are now put to work making electricity. In addition, Douglas Dam's flood storage waters form a lake 43 miles long, which is used for navigation and for recreation.

THE POWER OF THE RIVER

What is a river? Usually we think of a river in different ways, depending on what interests us most at the time. It is a thing of beauty; a way to travel; a drain; a sudden, savage killer; a supply of water; a home for fish; a source of energy; or simply a familiar landmark.

Clearly, a river is many different things, some good, some bad. And, as with all things in nature, no single quality of the river is really separate from its other qualities. Yet people have usually failed to notice this fact when they developed their rivers.

In 1933, the United States began a new kind of experiment with a river and its valley. The river was the Tennessee, part of the Mississippi drainage system. For many years, this river gave little to its people. Instead, it carried away soil, and swept away lives, crops, and homes in its frequent floods. In many places it was not deep enough for river boats. The farmers in its basin were deeply in debt and poorly fed. Disease rates were high. Average income and average farm production per person were only two-fifths as high as the average throughout the nation. The few cities were not prosperous. The few power dams in the river were idle much of the time. Experts who studied the region said it was the nation's principal problem.

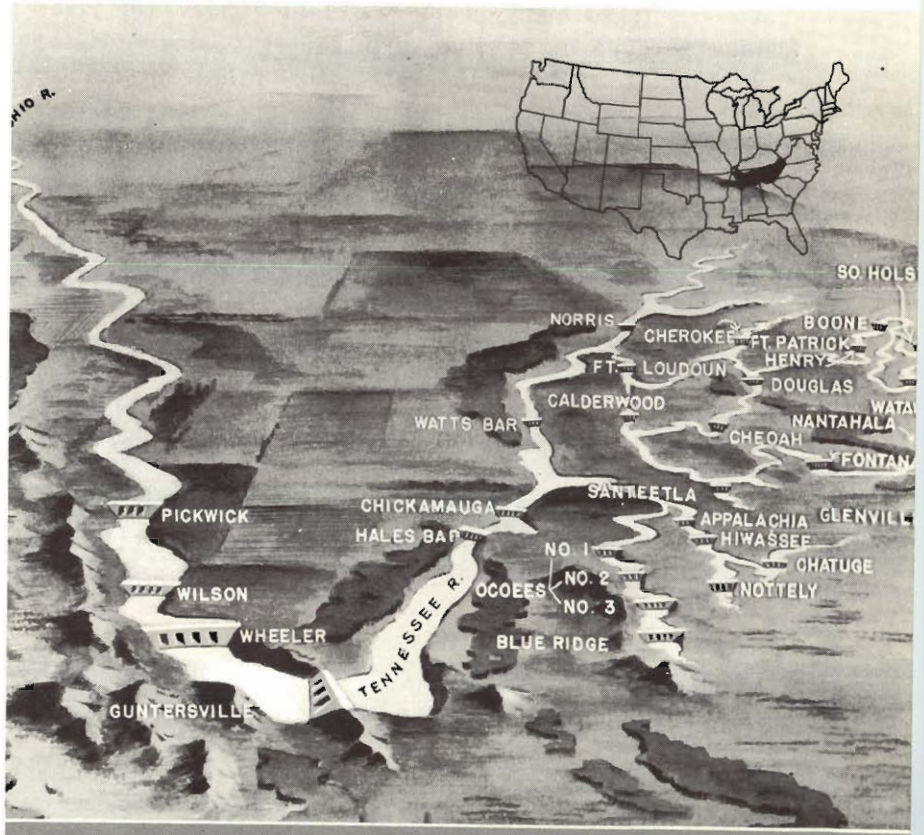
But why should basins be built for controlling floods, if these flood control basins would soon be choked with silt that was brought down from the hills? Why should electric power be developed if the people of the valley were too poor to use that power? Why should the river be made deeper for boats if there was little for the boats to carry? Through the United States Congress, the people voted to call upon the wealth and effort of the entire nation in order to solve these problems. The development of the Tennessee River basin became a national project. It was supported by taxes of all the people. And the new

idea behind the Tennessee Valley Act—an idea which had never been tried before—was a plan to develop the entire basin as a whole, to deal with all its problems at the same time.

So the law assigned six great tasks to the Tennessee Valley Authority, which was known as the TVA. These tasks were: (1) to control floods; (2) to improve river shipping; (3) to develop electric power; (4) to improve the use of the land along the shores of the river; (5) to grow new forests in any part of the basin where forests were needed; and (6) to improve the economic and social conditions of the people living in the basin.

Today the Tennessee River looks like a series of long, clear lakes. Thirty-one major dams control the waters of the main stream and its five principal branches. (The last dam was completed in 1953, just 20 years after the work first started.) By 1959, freight traffic up and down the "lakes" had reached some 2,000 million ton-miles (2,912 million metric ton kilometers) a year. (In 1933, on the old river, the figure had been 33 million ton-miles [48,048 thousand metric-ton kilometers] less than one-sixtieth of the freight traffic in 1959.) Freight traffic had increased 60 times (almost 6,000 percent).

Today, when mountain streams are raging, messages flash from dam to dam. A message arrives at the control room of the Hiwassee Dam: "Hold back all the water of the Hiwassee River. Keep it out of the Tennessee!" To Cherokee Dam on the Holston River, the message is: "Hold back the Holston!" To Chickamauga Dam on the Tennessee River itself, "Release water to make space for waters from above." Behind these orders there is a regular system of reporting rainfall and the flow of streams, from all over the huge river basin. Hundreds of people who live in distant parts of the basin take responsibility for controlling their river. Farmers' wives, woodsmen,



The Tennessee River and its tributaries drain an enormous area lying within parts of seven southern states. It is the tenth largest river system in the U. S. Before the Tennessee Valley Authority (TVA) was created in 1933, this area was one of the nation's chief economic problems. TVA has sought to develop flood control, navigation, and electric power; promote proper use of marginal lands; reforest where necessary; and improve social and economic conditions.

and storekeepers take a few minutes from their daily tasks to measure the rainfall, and to telephone their reports. With so many people watching it now, the river cannot produce its terrible surprises.

Instead of wrecking the valley, the waters are put to work, making electricity. The river is piled up high behind the dams in time of flood, and is kept at a low level for safety before flood seasons.

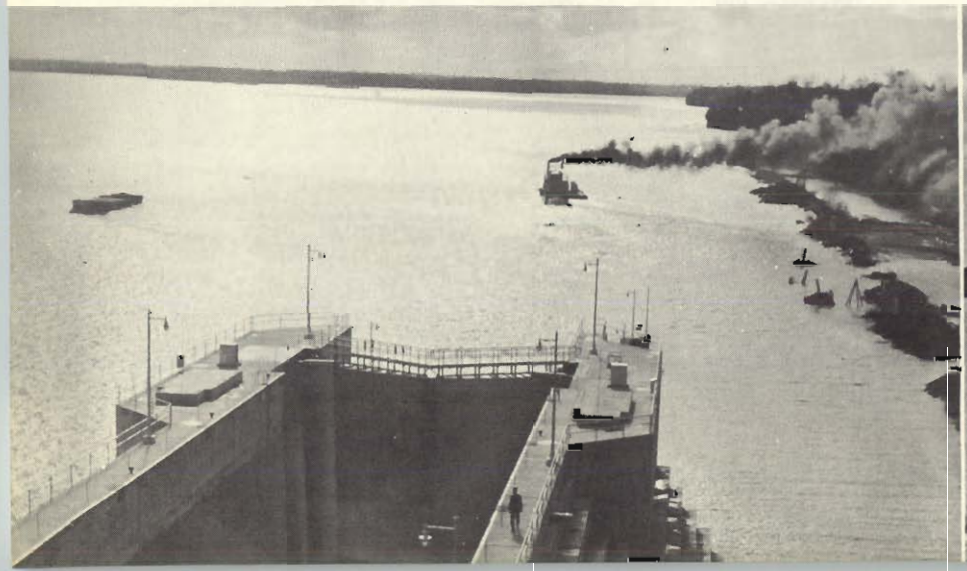
By 1959 the TVA was producing more than 60 thousand million kilowatt-hours of electricity each year. A kilowatt-hour is equal to about 13½ hours of human energy. In other words, the valley has gained a servant that gives as much as *810 thousand million hours of human energy each year*. Before 1933, only three out of every 100 farms in the Tennessee basin had electricity. Today, 95 out of every 100 farms have electricity. Electricity cools the milk in the farm dairy, it operates the warming device that protects the very young chickens, it pumps water from the well, it washes the clothing. And it has built up a huge variety of new industries throughout the central South.

Power and safety are important, but they are not the only measures of the "economic and social improvement" that the TVA was ordered to create. There have been many related changes. The engineers found that controlling the water also meant controlling the mosquitoes which carried malaria. During the past 10 years, not a single case of malaria has been found in the Tennessee basin. Much of the land along the river has been turned into parks. There is swimming and boating, and each year people take millions of pounds (kilograms) of fish from the clear waters. Forests and new ways of farming are controlling the washing away of the soil and are increasing the ability to produce. Whole communities have doubled their production of food. Some farms have increased production three times, and at the same time have restored their soil.

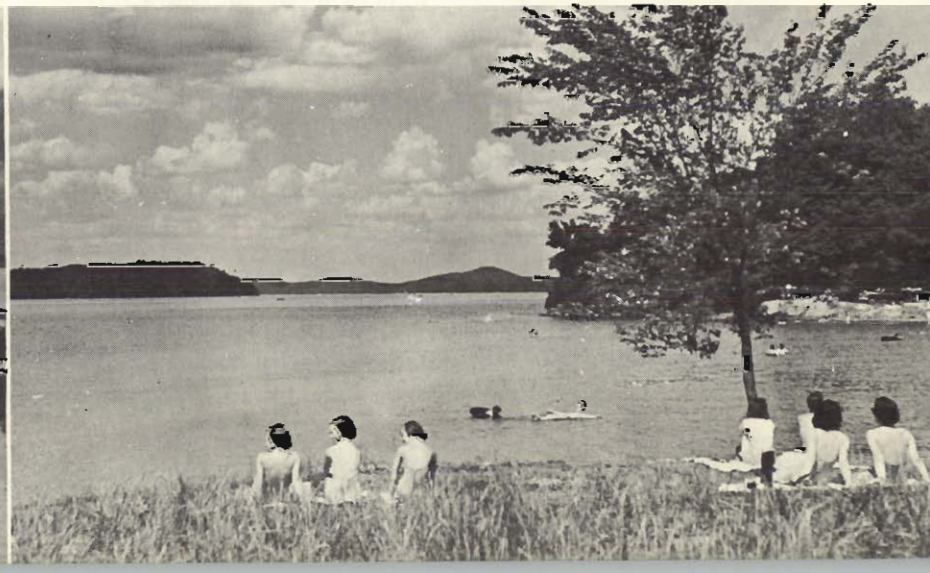
Communities in the region have annual "improvement contests." Members of the community compete in sports, in cooking and management of their houses, and in ways of making the home and community attractive.

One might think that keeping up all these enterprises would require an enormous staff of TVA workers from the national government. On the contrary, the TVA employs only about 16,000 persons. Most of the work

Locks make TVA waters navigable along a 650-mile channel.



Dams form scenic lakes for use by vacationers and sightseers.



is done by the people who live in the region. The TVA sells electricity to associations of farmers, which are called cooperatives because they work together, and to town and city governments. The cooperatives and local governments then sell and distribute the electricity to consumers.

"Demonstration farms," so called because they are used to teach and show methods of farming, in the region test and teach new methods of agriculture. But these demonstration farms are simply the places of ordinary farmers who volunteered to follow the advice of agriculture experts and then to explain their methods to any interested neighbors. The program has spread to 38 states, and nearly 72,000 farm families have taken part in it. To start the program, volunteers were first given free soil enrichers. Now there is no need to offer them free soil enrichers; better crops are reward enough. Improvements in parks, health, and education are now being continued by the regular community and state governments. With more time free from work, people can carry out community and home improvements in whatever way seems best suited to their particular area.

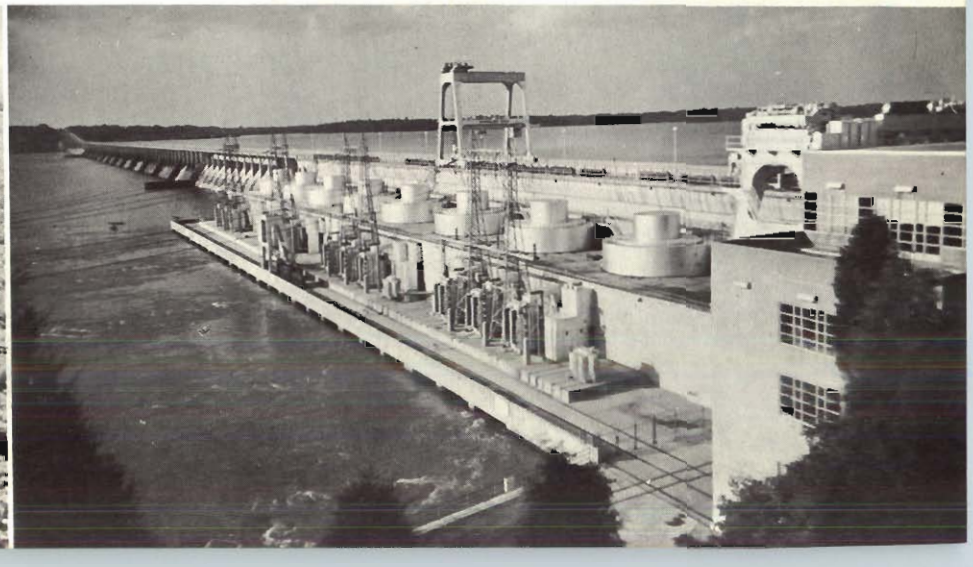
The Tennessee basin is still behind the national average in its income and farm production. So many problems cannot be solved in a few years. But now the region is building on improvements which have already been made, and each year the gain is greater than the year before.

There is a place called Ducktown in the basin where copper ore was discovered a generation ago, and a smelter, a plant where metals are melted out of ores, was built. The forests for seven miles around were cut and burned for fuel. The fumes from the smelter destroyed all of the plants which remained, and the soil became poisonous to plant life. Heavy rains tore holes in the land. Today, the fumes from the Ducktown smelter are harmless; the sulphur from the fumes is captured to make a useful product of chemistry. But the land around the smelter cannot be repaired so quickly.

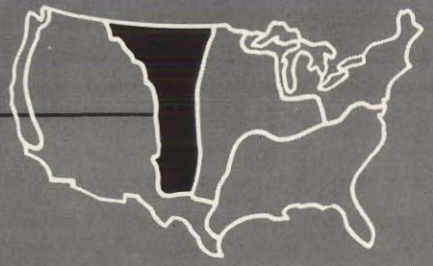
Until time and care can improve the land, Ducktown will remain a desolate place. For many years, people will look at it, and understand something that is just as true of poor cropland and poisoned streams, though the lesson is harder to see there. They will understand the terrible price of developing one resource by robbing all other resources.

Seedlings for reforestation are grown in special TVA nurseries.

Electric power for homes, farms, and factories is created at dams.



The Great Plains



METROPOLITAN AREAS*	POPULATION (1960 Census)
Denver	929,383
Lubbock	156,271
Amarillo	149,493
Colorado Springs	143,742
Wichita Falls	129,638
Abilene	120,377
Pueblo	118,707

* Six other cities have over 50,000 population.

METROPOLITAN AREAS

In the vast plains there are few towns or cities, and only one of them deserves the name of "Metropolitan Area." This is the city of Denver, on the western edge of the plains, where the mountains begin. Denver is a young city: merely a hundred years old. The first men to settle here were trappers and traders who roamed the wilderness for fur-bearing animals and guided early settlers on their way west. When gold was discovered, thousands who crossed the plains settled in Denver. Instead of gold, they found silver here, and Denver became the center of the silver mining industry.

Today, Denver is a manufacturing center for the entire Great Plains, where the major products of the area are processed for the western markets. Denver is the largest meat-packing center west of Chicago. It is also a city of music and art festivals: the cultural heart of the region.

Other towns of the plains are small and far apart. They are spacious, with wide, straight streets. Beyond their back yards, there is nothing but the plains, as far as the eye can see. For many towns in this region, the future holds great promise. The "cowtown" aspect is giving way to industrialization. Cotton ginning, oil refining, storage and shipping of natural gas, and other industries are new dominant factors in their economic life.

LAND OF TRAGEDY AND PROMISE

In 1911 a member of the U.S. Department of Agriculture described the Great Plains as a territory whose history was filled with tragedy, and whose future held possibilities for greatness. The same words might describe the Great Plains today. The tragedy has continued; the promise of greatness has not yet been fulfilled. The Great Plains begin with the 20-inch (51 centimeter) rainfall line which runs north and south, almost through the center of the United States. The traveler gradually becomes aware of the difference in the atmosphere, as he crosses the belt immediately to the east and west of this imaginary line.

This is a land of extreme heat and extreme cold. It is a land where water is worth more than property. It is almost flat, rising very slightly for 400 miles (640 kilometers) until it suddenly meets the mountains to the west.

For two or three years, there may be enough rain in this Great Plains region. Then there is a year when no rain falls, when the streams from the mountains dry up and are filled with sand. The wind blows constantly. The weather is very hot from July to September, but in the winter the snow covers houses and barns. Often the weather destroys a year's work in a single day.

For many generations the map-makers called this vast, flat, lonely land "The Great American Desert." The first travelers across the plains were men who went into the mountains to hunt the fur-bearing animals. They were called "Mountain Men." When they went back to the

Wheat combine and oil well, Montana • Texas Cowboys • Snow-covered plains • Sheep in Utah • State capitol, North Dakota

east, along with their fur they took tales of the mountains and plains. Soon, summer after summer, wagons full of settlers traveled across the region, until their wheels had cut tracks in the earth. But these pioneers who moved westward did not settle in the Great Plains. There seemed to be no reason for stopping here. For many years this area was feared and disliked as a dangerous wasteland. Only the Indians knew how to exist here, without trees and without land that was right for farming. The Indians rode horses whose ancestors had escaped from Spanish who traveled here three centuries earlier. They used the Great Plains for hunting bison, a large cow-like animal belonging to the buffalo family. There were millions of bison in those days. The Indians made their tents and clothes from the skin of the buffalo. They ate the meat, and they made their tools from the bones.

In 1868, the railroads stretched forth into the plains. The hunters and men who built the railroads brought death to the buffalo. In a few tragic years, millions of buffalo were killed; and without the buffalo the Indian was forced to abandon the plains. The cowboy and the white man's cattle came to the Plains instead.

The big cities of the East needed leather and meat, and the cattlemen began driving their great herds over the plains to the railroad towns for shipment. Two or three generations after the first wagon trains had hurried across the Great Plains, there was no more free land of good quality for farming. The eastern prairies were already settled, and the Pacific Valleys were well populated. Gradually, some settlers arrived in the Great Plains region to make farms on the hard, dry soil.

These were the first of the "homesteaders." A homesteader was a farmer who received 160 acres (64 hectares) of free land from the national government in exchange for living on the land and cultivating it for five years. When the first homesteaders arrived, they found that Indians, cattlemen, and cowboys controlled the plains. The Indians and the cattlemen were not pleased to see the homesteader. They did not like his fences and plowed fields. For years there was violent conflict between homesteaders, cattlemen, and Indians. But two inventions which reached this region in the 1870's assured the farmer's victory. The first of these was barbed wire, which provided material for fences in a region where wood and stone were not available. The other invention was the windmill, which saved the farmer's life during dry periods by pulling up water from below the ground, for his vegetables and farm animals.

The windmill saved the farmer's vegetable garden, but it could not save the rest of his land from destruction. The farmer did not realize it, but he was wasting his land by "square farming"—plowing his fields along the straight lines that marked the edges of his property. Wind swept over the square patches of plowed ground, and hard rains which fell heavily but not often, washed the topsoil into the rivers. In the best years, half the crop succeeded. In the worst years, all crops failed.

A whole new system of farming was needed here, but this fact was not recognized until a terrible tragedy showed people all over the nation that the Great Plains area needed help and change.

The plowed furrows of a wheat field dramatize the vastness of a Montana plain. The Great Plains area begins with the 20-inch rainfall line. Because of this, it is a region where water is worth more than property. It is a country of violent climates, of constant winds, frequent blizzards, and recurrent droughts. It is also a place where men are working to undo the damage created by poor farm practices.

THE SEA OF WHEAT

On the morning of May 11, 1934, the people of Boston, Massachusetts, stopped in the streets to look up at the dirty, yellow sky. Across the continent, for 1,800 miles (2,880 kilometers) thick dust hid the sun. Millions of tons (metric tons) of fine soil were being blown into the Atlantic Ocean by the unceasing winds of the Great Plains. This was the beginning of the great drought that brought ruin to one-sixth of the nation's land.

The upper layer of soil of the plains was blowing away. Wells and streams were dry. Dust filled the houses and stopped machinery. It even stopped the windmills. Crops died in the fields. Cattle and sheep died of thirst. And tens of thousands of people abandoned their homes and moved off the plains.

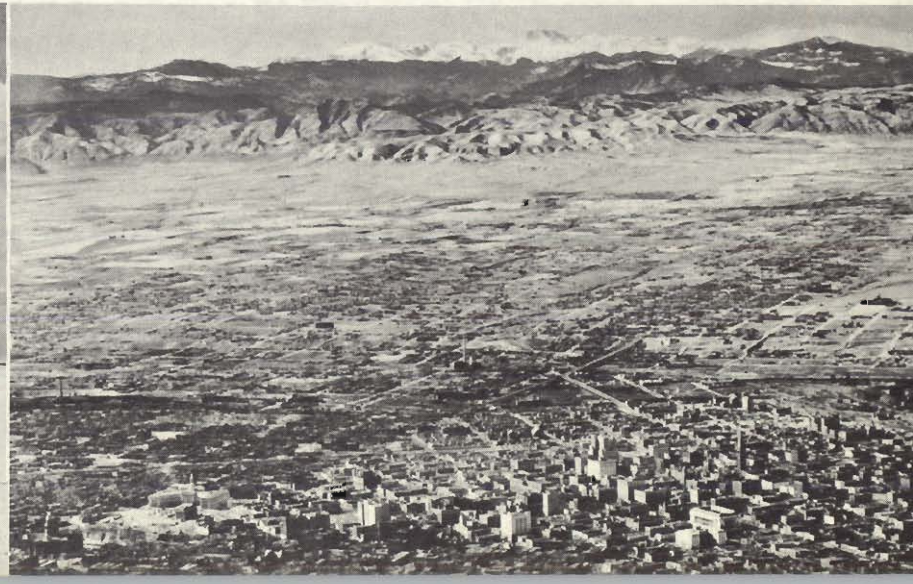
Less than a century after the first plowing of the ground, the land was ruined. It was tragically clear that the people had failed to take proper care of the land. Farmers had misused the land because they did not understand it. How, now, could the grass be saved? How could the land be made to support as many families as possible? And how could the dry, grassless land be made to produce? Until the end of the 19th century, the American settler had simply moved to a new piece of land when his old land stopped producing well. But now no more land was available. The frontier was gone. The region needed a new kind of pioneer—men to rebuild the soil that their ancestors had destroyed.

The people who first dared to settle on the Great Plains were chiefly from northern and northwestern Europe. They were accustomed to difficult climates and hard living. These toughest of farmers and their descendants refused to be defeated by the terrible years of drought and crop failure. They were determined to stay on the Great Plains, and to succeed.

The dust storms made all Americans notice the terrible destruction of land on the Great Plains. Farmers, scien-

Temperatures as low as —45°F. have been recorded on the plains.

Denver lies at the foot of the Rockies, a mile above sea level.



tists, and government officials began to work together to give back to the soil its ability to grow crops.

Only one group of pioneers seemed to be successful on the plains. They were a colony of Mennonites, a strict religious sect, from the Crimea in Europe, who had brought with them their own wheat seed. This wheat had come from a similar soil and climate. It was planted in the autumn, to ripen in the following spring or summer, and so it was called winter wheat. The hard winter wheat grew better than any of the soft spring wheat which had come from regions with more rainfall. "Turkey red" wheat (so-called because of its color and its Turkish origin) was the first suitable crop for the Great Plains. It was the ancestor of the strong hybrid of spring and winter wheats, which grows successfully today.

The Great Plains now produce a larger wheat crop than the most hopeful pioneer could have imagined. But this is because today's new pioneer farmer has learned to rotate his crops, to plant alfalfa or other legumes that put nitrogen back into his soil. County agents and soil experts have taught him to work across the slope of the land as he plows so that the ridges and hollows would catch and hold the heavy rains and keep the water from washing the soil away.

Experts have also taught him to terrace his land, and to plant grass along the natural courses where the water drains away. Ponds and dams keep the precious water on the land. The farmer is helping nature rebuild the topsoil that holds the rain, resists the wind, and gives life to all kinds of plants.

New methods of production have also helped increase the farmer's yield. On the southern plains, the farmer begins in May to harvest the hard winter wheat which was planted during the previous autumn. As the summer advances, one can see thousands of combines (machines which both cut and separate the grain from the straw).

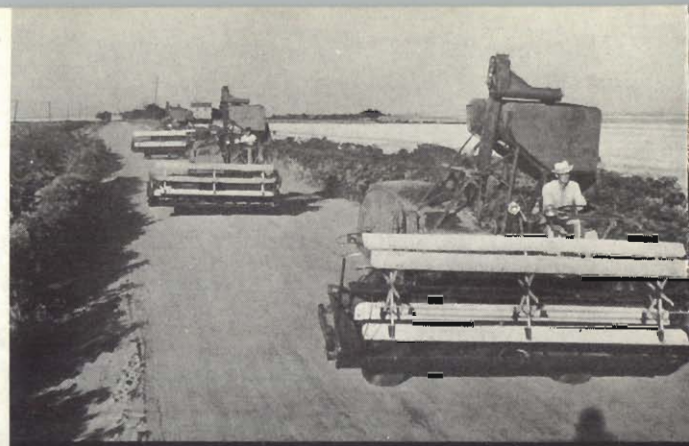
Wheat harvesting begins in May on the southern plains. Combines make giant wheat farms possible, do the work of many men.

The combine cuts the heads from wheat stalks, shakes out the grains of wheat, and puts the straw back on the ground to protect the soil. It does this while it moves along, faster than a man can walk.

With modern equipment, one farmer can manage his own fields of 500 or more acres, (200 or more hectares), without help; but most farmers rent combines to do this work. The giant machines and their crew start at the southern edge of the Great Plains each spring, and travel northward to the Canadian border as they harvest the golden wheat. Weather is always a risk: a storm may crush the stalks in a few minutes. For this reason, harvest crews sometimes work all day and most of the night, to bring the wheat into huge elevators, enormously tall bins into which the grain is lifted, for storing grain. These grain-storage elevators are seen along the railroad tracks at about 10-mile (16-kilometer) intervals.

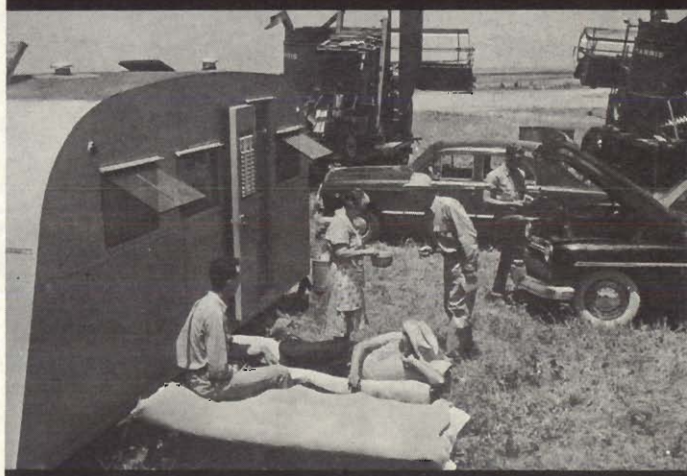
Today much of the land in the Great Plains produces well. Agriculture is not yet fully developed there, but experts believe that scientific farming will increase the products of the soil about 30 percent by 1980.

There is further hope for the future in the resources which lie beneath the soil. Below some parts of the plains, there are enormous supplies of minerals and crude oil. Industry is starting to move into the region that was once "The Great Desert." The people are beginning to understand the Great Plains, and the land is beginning to fulfill its promise.



Combine crews move north as the wheat ripens.

Millions of acres are harvested with great speed.



A combine crew relaxes after a day's hard work.

CATTLE COUNTRY

The story of the Great Plains is the story of men in a hurry. Most men who passed through this region were hurrying from the Central Basin to the Pacific Coast Valleys. But some who came to the plains saw countless bison and cattle on the vast pasture-land, and they dreamed of a time when this supply of food and leather might be shipped to the eastern cities. Because of these men, the Great Plains became America's cattle country.

The thousands of wild cattle on the rich prairie grass were descended from six young cows and a bull that had come to Mexico with the Spanish in 1521. By 1870, thousands of cattle were there for the taking. A man needed only horses, some supplies, and a few helpers to gather in the wild animals. Soon meat packing houses were established in Chicago, and railroads were pushed south and west toward the plains. The railroads were still hundreds of miles (kilometers) from the southern plains, but enterprising cattlemen started the great cattle drives that were to become famous in stories about cowboys.

The fierce cattle with long horns were scattered over hundreds of miles (kilometers) of plains country. They had to be rounded up by cowboys who knew how to ride, and ride hard. Then the cowboys began to drive them in herds across the plains. The cowboys occasionally met bands of thieves, fierce storms, and flooded river crossings. They had to face angry farmers whose fields were crushed by the herds, and Indians who demanded payment from cattlemen crossing their lands. The cowboys had to be men of strength and courage. The drive was long and slow: the animals had to stop where there was sufficient grass to eat, and a watering place for camp had to be found in advance. A herd might travel 15 miles (24 kilometers) during a day, and at night the nervous cattle had to be calmed. To keep them quiet, cowboys rode circling about the herd throughout the night, singing to the animals. This was part of the cowboy's work; and his sad, slow songs have become a part of American folk-art.

For the cowboys, the greatest danger was that the herd might suddenly become frightened and rush away. The noise of thunder, the sight of a grass fire, or the sudden movement of a frightened animal could start the herd into motion. Then it would rush forth, crushing anything which stood in its way.

Within a few years, herds of heavy cattle moving eastward had made deep trails. At the end of the trails there were towns like Dodge City, called cowtowns because their trade was closely tied to handling, buying

Every fall, the cowboys herd cattle into corrals.

The animals are then inoculated against disease.

Cattle go into sorting pens en route to market.

and selling cattle. Here cowboys celebrated and spent their pay. The rough, noisy life of these cowtowns is often described in stories and films about the "Wild West."

The herds increased, and the cattlemen's interest turned to the northern plains. When the herds of bison and the Indians left, a vast ocean of grass became open for feeding cattle on grass. A man in Chicago discovered a way of shipping fresh meat over long distances by ice-cooled (later machine-cooled) railroad cars, and cattle-raising extended over the entire Plains. But there were troubles and terrors. Thieves stole the cattle and horses. The Indians made a last desperate attempt to keep their land; and settlers who wanted to put fences around their land for farms often fought the cattlemen. Hot summers dried up the grass and the watering places. Grass fires started quickly. Then, in the winter of 1887, a great storm, called the Great Blizzard, struck, with wind, ice, and snow. After the storm, millions of cattle on the open ranges were scattered for miles, dead or dying. In some places the snow had been blown into drifts 100 feet (30 meters) deep, burying houses, cattle, and men.

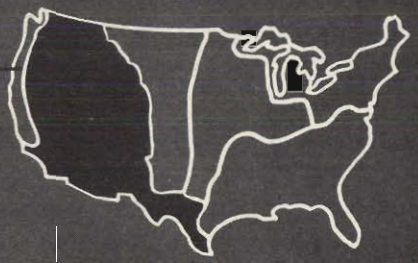
After two months, the terrible ice and snow melted, flooding rivers and adding new terror to the old. The Great Blizzard ended the power of the cattlemen; they could no longer resist the opposition of the settlers. The time of the open range was over.

Today, a new and wiser cattle industry occupies the Great Plains. Many cattlemen have formed cooperative associations, which divide the land among the members and decide how many sheep or cattle should graze on each piece of land. The association make rules for the use of the land, according to the advice of experts and scientists who have studied the special problems of each area. Many problems remain, but the cattlemen are restoring the pastures, just as farmers are restoring the soil. Cooperative associations, individual cattle raisers, and government experts work together at experiment stations, growing various types of grass under various range conditions. The ranchers are learning what their land needs. Slowly but surely they are giving it new life.

Science and cooperation are also improving the cattle. After many years of experiment, owners of one of the largest ranches in America have succeeded in crossing Brahma cattle from India with the heavy American cattle. The Indian Brahma is able to endure the heat of the plains, and the American cattle are excellent for beef.

In the fall, cowboys round up cattle which have been feeding on range grass, and herd them into ranch corrals for sorting

The Mountains And Deserts



METROPOLITAN AREAS	POPULATION (1960 Census)
Los Angeles	6,742,696
San Diego	1,033,011
San Bernardino	809,782
Phoenix	663,510
Salt Lake City	383,035
El Paso	314,070
Spokane	278,333
Tucson	265,660
Albuquerque	262,199
Austin	212,136

CITIES*	POPULATION
Ogden	110,744
Las Vegas	64,405
Reno	51,470
Yakima	43,284

*Of More than 40,000 people

METROPOLITAN AREAS

This wide region of craggy peaks and sheltered valleys supports fewer people than any other comparable section in the United States. Parts of Oregon contain less than two people to each square mile, (fewer than one to each square kilometer) compared to 596 to the square mile (229 to the square kilometer) in Massachusetts.

Men group in mining camps, in the small trading centers of irrigated valleys, or along the bays and inlets of the coast. Between them lie hundreds of miles of precipitous peaks, deep canyons, and broad deserts.

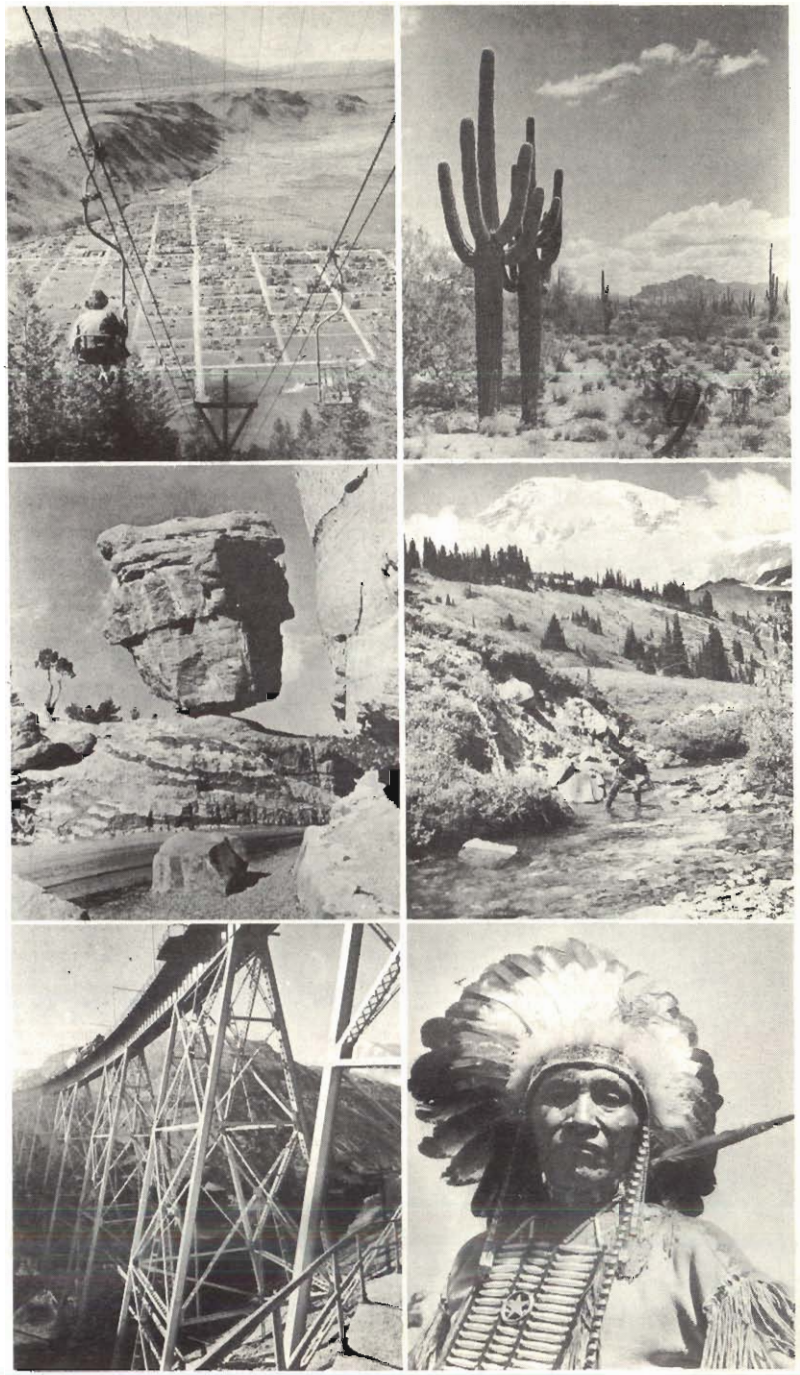
Only on the Pacific are there large cities, towns, and suburbs where people live as close together as they do in the eastern parts of the country. Los Angeles is the heart of the vast collection of semi-suburban communities along the coast. Within the memory of many residents, this city has expanded until it is now the world's largest metropolitan area (452.2 square miles or 1176 square kilometers), harboring forty-odd separate communities. These include the motion picture center of Hollywood, and the fertile San Fernando Valley, with the great citrus belt which has a 265-day growing season. Significantly enough, Los Angeles and its suburbs are dependent on the giant aqueducts which bring water 233 miles (373 kilometers) from Owens Valley and 392 miles (627 kilometers) from the Colorado River.

THE ROCKIES

Like the Great Plains, the vast Mountain and Desert region was a land which people hurried through on their way west. Seeking land and gold, the settler at first found neither until he reached the Pacific slopes. But then gold was found at Pikes Peak and in a few other parts of the Rocky Mountains. Clearly, there was gold in the Rockies. Men hurried back to this region, faster than they had hurried through it. Civilization began to reach into the mountains.

The majestic Rocky Mountains stretch all the way from Mexico to the Arctic. Like the Alps, they are high, sharp, rough, and uneven. Compared to the Appalachians in the east, the Rockies are young. Their faces of bare rock are capped with snow, even to the south. In the high valleys there are remains of glaciers, or rivers of ice which fill mountain valleys. Below them one finds clear, icy lakes which the glaciers made.

More than 100 million years ago, the earth was violently folded and compressed where the Rockies now stand. Melted rock was forced up, carrying with it gold, copper, lead, silver, and other metals. The tremendous movements



Ski-lift, Wyoming • Arizona desert • Balancing Rock, Colorado • Fishing near Mt. Rainier • Bridge in Rockies • Sioux Indian

of the earth continued; and the mountains rose and fell and rose again. The Sierras pushed upward. Lava poured over the land in great floods, to build the Columbia Plateau, and the Colorado River began to cut the Grand Canyon. As the mountains rose for the last time, the Coast Ranges broke into pieces, leaving great cracks. Huge blocks of the earth still shift occasionally along these cracks, causing earthquakes.

The whole tremendous broken system of the Rockies includes 39 named ranges. In addition, there are flooded mountains whose tips form islands off the Pacific Coast.

The first white men to visit the mountains were Spanish travelers, moving across the southern ranges to the Pacific. Stories of gold brought them here, but they did not stay in the mountains. No one stayed in the mountains—not even the mountain men who hunted in the northern ranges. Until a century ago, the Rockies seemed almost impossible to cross; but the chance of finding gold makes men do improbable things. After 1848, when gold was found in the river beds of California, great numbers of people crossed the mountains and deserts, over trails that the mountain men had discovered. Today, eight railroads and a dozen highways go winding over the mountains, following routes that were made nearly a century ago.

In the days when gold was king and thousands of men lived in camps in the wilderness, agriculture began in the Rockies. Farmers raised food to sell to the miners and to settlers on their way west. Most of the farmers

Looking west from Colorado Springs, the Rockies' "Front Range" looms at the edge of the plains. Foreground is semi-desert.

were Mormons—or Latter Day Saints, as they called themselves. These were members of a religious group who had worked hard against great difficulties on the trail before establishing their own community. They were seeking some hidden valley in the mountains, some land that no one else would want. When Brigham Young, their leader, saw the waters of the Great Salt Lake shining in the sun, he knew this was the right place.

The ancient waters that brought soil to these valleys had no way of reaching the sea, so they spread out in shallow lakes. As the water slowly evaporated, minerals remained in the beds of the lakes. Great Salt Lake, for example, contains an estimated 6½ thousand million tons (5.9 thousand million metric tons) of salt. Another lake holds millions of tons (metric tons) of soda. The lakes change size and shape with the rainfall, and sometimes they dry up when the weather is very dry. Once, in 1887, one of these lakes dried up completely, and the farmers who lived near the lake gathered a rich crop before the water again appeared.

In this land of little water, farming was very difficult. It would have been impossible without careful planning and working together. Fearing no task, they built more than 100 towns and countless gardens in this region which other men had considered worthless. Water, carefully brought by canals, made their land produce, and showed other communities how to bring life to the Mountain and Desert soil.

In the background are various stages of forest growth, ending with snow-capped Pike's Peak, on which trees will not grow.

Lowest point in the U.S., Death Valley is a 140-mile-long desert.

Irrigation water has brought life to much of the California desert.

THE DESERT COMES TO LIFE

For the past 100 years, the immense stretch of barren American desert has been becoming smaller. Three generations ago, the wasteland extended from the Mississippi Valley in the east almost to the Pacific Coast. But men learned that the prairies could grow maize and that the grass lands could feed cattle and sheep or yield wheat. As they continued to cultivate the desert, the size of the desert area decreased.

Today, there are still 60 to 70 thousand square miles (156,000 to 186,000 square kilometers) of desert. In the 600 miles (960 kilometers) between Salt Lake City and Reno, Nevada, there is nothing but dead lakes, dry rivers, snakes and small animal life, enormous mineral wealth, and the inhuman beauty of the desert. No community action like the Mormon efforts could water this central desert. Parts of this region can support cattle, but most of the American desert remains a desert. It is an empire in size, but scarcely more than a town in population.

Here in the vast triangle of land between the Sierra Nevadas in the west and the Rockies in the east, the climate is very dry and hot. Even fairly large rivers from the mountains dry up so rapidly that they die before reaching the end of the desert. The sun shines nine-tenths of the year, and the temperature is 115 to 120 degrees (Fahrenheit) (46 to 48 degrees centigrade) in the shade. But twice a year it rains, even here. In midsummer and

midwinter, the great heat of the desert makes the air very hot. The hot air expands and rises so high that clouds form and rain falls. Then, for a few weeks, the desert is a brilliant mass of color. Brown, yellow, and red change to purple and blue in the soft light of sunset and dawn. Coarse grasses and plants spring up quickly and small bushes and flowers bloom suddenly and magnificently in the great heat. Then their seed ripens, and soon they become brown and dry. With so few roots to hold it down, the desert shifts constantly. The wind and rain slowly change the shapes of the mountains, creating strange forms that resemble towers, peaks, rounded hills, and sawteeth.

Close to the western edge of this region, there is a particularly lonely stretch of desert. It was named Death Valley by pioneers who tried to cross it in their rush to the gold fields. For 140 miles, (225 kilometers) scarcely a bush can be seen in this ancient lake bed 280 feet (85 meters) below sea-level—the bottom of the United States.

But even in the vast, silent desert there are rich oases—prosperous towns which were built where men found sufficient water. The Colorado, the Gila, and other, smaller rivers have made the desert bloom along their shores, just as the Nile River supported great empires in the Sahara Desert. Centuries ago, American Indians used these western rivers to water their fields. Ruins of their old canals still extend for miles (kilometers) throughout the desert.

Observing these canals, early settlers thought that bringing water to this land would be easy. They had seen that the mountains held plenty of snow and rain. If the mountain rivers could be put to work, they thought, the valleys would produce again.

In the lifeless desert between the mouth of the Colorado River and the Salton Sea, farmers began to change the course of river water. For years, the river had wandered as it pleased across the broad, low lands near its mouth, sometimes turning south to the Gulf of California, sometimes curving northward into the Salton Sea. Now the farmers made the river flow down the gently sloping surface of the low lands. As a result, the farmers had one year with enormous crops. But they had not thought about the awful power of raging flood water. In 1905 the wild Colorado River cut through an outlet and rushed across the fields, forming a lake that became 45 miles (72 kilometers) long. Before the river could be controlled again, this lake had covered fields, houses, and railroad tracks with its bitter, salty water.

Each year the Colorado threatened to flood when snow melted in the high mountains at its source. In summer it choked watering ditches with mud. Finally, the people of the Imperial Valley realized their mistake. They had to control the entire course of the river, not just the lower end of the river. A huge dam had to be built to hold the river where its floods began—not where they ended.

In 1936, Hoover Dam was completed, taming the red waters of the Colorado. The dam is more than seven hundred feet (213 meters) high.

Over 4,000 feet long, Grand Coulee Dam is the largest concrete structure in the Western Hemisphere. It dams the Columbia River, source of the nation's largest reclamation project. Electricity from the dam's power plant is important to the Pacific Northwest, since these states have little coal or oil for fuel.

It produces enough electricity to drive the industrial machines of all southern California, and to light the houses of that entire region. It permits a steady flow of clean water to 750,000 acres (300,000 hectares) of dry land. Releasing the waters of the Colorado slowly, it prevents the raging floods that formerly threatened property and human life each spring. And now the Imperial Valley produces a great many types and large quantities of hot climate fruits, which are shipped to all parts of the country.

The success of Hoover Dam encouraged other similar projects throughout the country. In order to build Hoover Dam, the farmers, construction companies, city tax payers, state and national governments had all put aside their special interests for the good of all. They had learned to understand their geography, and they had worked together on a common problem. In the Imperial Valley they discovered that dry land can become a garden. They had learned that land can be rebuilt. Perhaps, in future generations, the American desert will disappear entirely, and

more thousands of square miles will come to life, to feed the hungry people of the world.

In 1952, a million acres (400,000 hectares) of dry wasteland in the State of Washington were brought back to life with the flow of water from Lake Roosevelt, behind Grand Coulee Dam. This dam, the largest concrete structure in the western half of the globe, controls the Columbia River. For many years, helpless farmers stood on their dry plateau and watched the river roar past them, 600 feet (180 meters) below. But the editor of a local newspaper realized what had to be done. He began to write articles that made the whole nation interested in this region and its problems. Twenty-five years later, the construction of the Grand Coulee Dam was begun. And when the whole project was completed, 20,000 people gathered in an outdoor prayer service to give thanks for the rebirth of their area—an area as large as the state of Rhode Island, the smallest state in the United States.

At the extreme south of the great Mountain and Desert region, a Texas farmer has shown what free individuals can do with their land. There, in Brownsville, a farmer named John Shary had seen how the Indians dug ditches to water their small farms. In the 1920's, he decided to bring water to his land scientifically. His 300 acres (120 hectares) of trees grew fruit so successfully that land suddenly became very valuable everywhere in his valley. And everywhere in the valley, people began to grow fruit. Soon the supply of fruit threatened to become greater than the demand. A young chemist, however, developed a method of preserving the juices in cans, not possible before because the juices were so acid they would eat away the cans, and saved the industry. Someone else discovered new uses for the outside skin of fruit, and for the liquid which was taken from the skins. Today, thousands of cattle, hogs, and domestic birds live very well on fields which are made green by the river. The area around Brownsville has become one of the nation's richest agricultural regions. It is also an industrial area rich in oil and natural gas reserves, and it is a vacation center for people all over Texas.

Semi-arid lands in California have been made productive by means of irrigation. One such area is the fertile San Bernardino Valley near Los Angeles.

TREASURE IN THE ROCKS

Early in 1848 a sawmill worker found a few yellow flakes in a stream in California. After a short period of doubt, people realized that he had found gold; and the news spread rapidly across the continent and across the seas. In one of the greatest mass movements of history, many thousands of people came to California from all over the world, to seek their fortunes in the rocks. Largely because of the gold rush the whole continent was settled within just one century, although some men had said this process would require 2,000 years.

The sawmill worker's few yellow flakes came from a region called the Mother Lode. This was a region 120 miles (192 kilometers) long and a mile (1.6 kilometers) wide, a region rich in gold. But after about 10 years, there seemed to be no more gold in the Mother Lode. Then pioneers went back to the Rockies, where they had seen yellow mountain streams and heard the stories of gold and diamonds. By 1860 hundreds of lonely, courageous men were searching along the mountain sides for loose mineral specimens which might come from rich deposits. And they sifted small stones from the beds of mountain streams, hunting for gold.

Thus, all over the United States, many kinds of mineral deposits were discovered. Men found that the Black Hills of South Dakota were rich with tin ores. A group of miners looking for gold near Butte, Montana, found far greater wealth in silver, lead, and copper. However, ores must not only be found, they must be dug out of the ground and they must be processed. Soon enterprising men built mills for crushing the ores, and furnaces to melt them down. In 1893, when the Northern Pacific Railroad reached Butte, the mining industry was established. Today, in 58 active mines, there are passages 1,200 to 4,000 feet (360 to 1,200 meters) underground. Open-pit mines, new to the area, cut into the earth's surface.

Even now, mining is a dangerous and risky business. Some mines are high on mountain sides, and the ore must be carried down mountain trails. Sometimes a rich deposit cannot be mined because the cost of transporting the ore would be greater than the value of the metal. A promising mine may yield only a small part of the cost which is required to dig it.

Scattered through all the old mining districts, there are abandoned towns. These were formerly rich, wild cities whose mines produced unbelievable amounts of wealth, and then were suddenly exhausted. With no further reason for existing, the towns were then abandoned to die. One such town is Rhyolite near Death Valley. Rhyolite was born, became rich, and died—all during a period of four years. Its railroad station was once the grandest in Nevada, but the station stands now without even rails leading to it. In 1859, Virginia City, Nevada, was a busy town where 10,000 men hunted for treasure in the rocks. For 16 years, the mountains near Virginia City yielded huge fortunes in gold and silver. And then, almost overnight, the story was ended. The settlement died, like other famous towns—Tombstone, Goldfield, Cripple Creek, and Central City. After a few years, there was no more ore to be found, or the costs increased, or there was no more profit. Mining men and their families moved away, leaving the empty buildings to remind later travelers that people

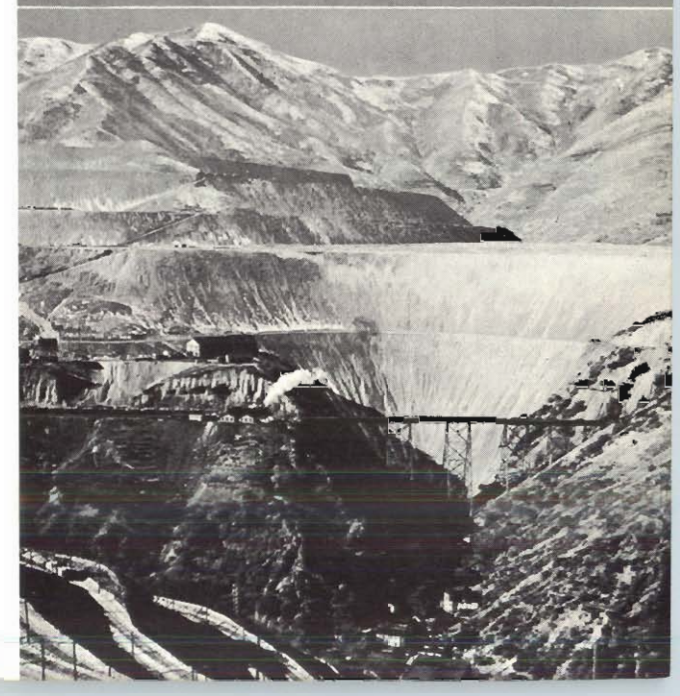
had once lived and worked in this town.

Most of the Rocky Mountain gold is gone today. Some other minerals also vanished much too quickly. Here, as in the forests and on the plains, thoughtless men robbed the earth of its riches. The soil can gradually be restored, and trees can be planted on bare hillsides. But the mineral wealth of the earth cannot be created again. Wise mining methods and careful use will be needed until science finds substitutes for the minerals which industry requires.

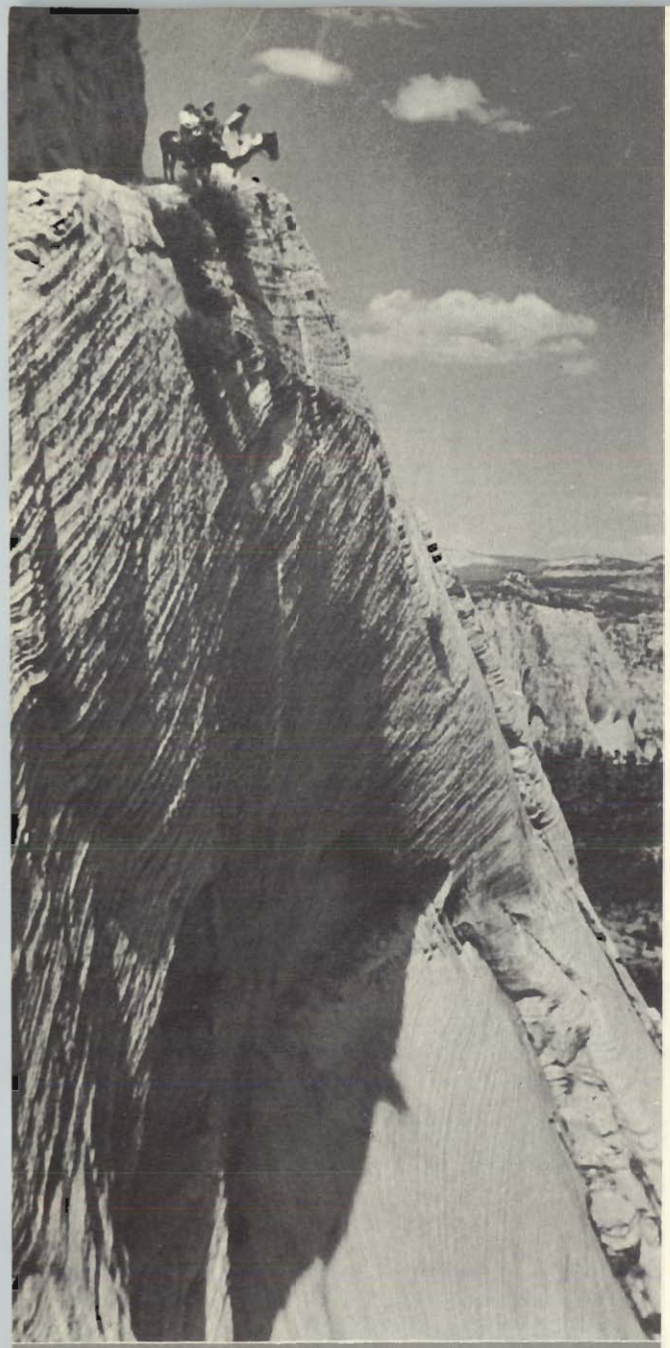
Today, the greatest copper mining center is Bingham, Utah, in one of the Great Basin ranges. A few years ago Bingham ore would have been considered worthless because it contains very little copper. But better methods of operation have made Bingham ore valuable, just as better methods of wheat raising have made the Great Plains produce. Giant steps were cut into the rocky face of the mountain. More than 30 such steps rise, one above the other, above the floor of an immense pit. Great electric machines load ore onto long trains which slide downhill to a smelter on the shores of the Great Salt Lake. These methods are so much better that the mining of the ore costs only a few cents per (metric) ton. And the enormous supply will last for many years.

By a new process, different minerals can now be separated by chemistry. Since many ores contain four or five different substances in small quantities, mineral deposits which were formerly worthless can now be used. As a result, much ore which was thrown away in the early days of mining now yields a rich harvest.

Modern industry demands more and more of the nation's mineral wealth. Each new electric plant needs miles (kilometers) of copper wire. Machines require iron, lead, and other materials. Coal, oil, and natural gas must drive the machines. Fortunately, many resources still lie below the American continent, and mineral hunters constantly explore every possible region for undiscovered sources. At the same time, scientists work to produce new mixtures of metals and fuels which will demand only raw materials which are plentiful. The minerals which men find today are being wisely and carefully used, so that they can benefit future generations.



Two new mining methods are illustrated here. (Top) A pneumatic drill bores into oil shale rock. This ore may yield fuel to supplement U.S. coal and oil reserves. (Below) The open pit copper mine at Bingham, Utah.



High on the rim of Zion Canyon, riders survey the majestic scenery of Zion National Park, in Utah.

THE TEMPLES OF NATURE

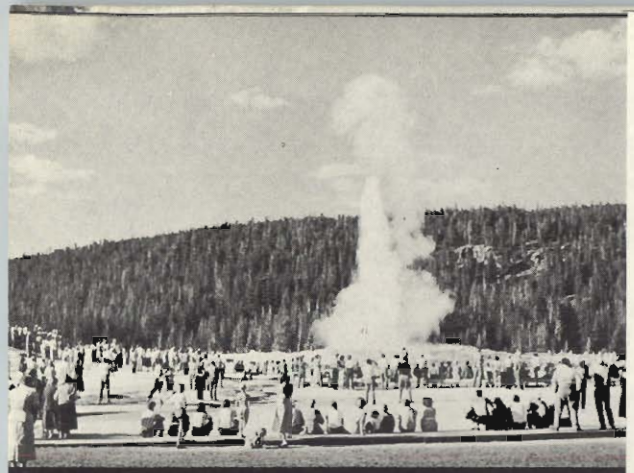
When the first miners and hunters returned from the Rocky Mountains, they brought home such tales of natural beauty that a group of scientists decided to test the truth of these stories. These doubting scientists who visited the Rockies in 1870 wrote reports that sounded more like poetry than like science. They described a mountain made entirely of black glass; glaciers, or rivers of ice, that were blue-white; magnificent deep canyons; towering white waterfalls; and great caves far beneath the earth.

One night, as the scientists rested around their campfire, they discussed ways of preserving these magnificent natural scenes. Some wanted to divide the region among themselves; but one member disagreed. He believed that no one should own such beauty—the whole area should be set aside as a great national park for all people to enjoy. His suggestion was received with great enthusiasm by his companions, and also by the national government. Two years later the Yellowstone National Park came into being. Today 3,472 square miles (9,027 square kilometers) of this magnificent wild country are preserved for millions of visitors to enjoy.

Since 1872 the system of national parks has grown steadily. Twenty-nine areas are now set aside as national parks. State and local governments have set aside smaller regions.

The land in the national parks belongs to the Federal Government, which bought the areas from various other nations, states, or from individuals. The government protects the plants and animals which live in

The Colorado River took 1,500,000 years to form Grand Canyon.



"Old Faithful," hot water geyser at Yellowstone.

Visitors' cabins are available at National Parks.

Park Rangers give informative talks to visitors.

each national park area. No rancher, miner, hunter, or logger may use its meadows, trees, or wild-life, except under strong controls.

The parks are in charge of a specially created branch of the Federal Government, the National Park Service. The rangers who work for the park service protect the areas, and they also guide visitors through the parks, helping people learn about nature while enjoying the natural monuments, scenery, wild animals, and plants.

Within the parks there are camping grounds for visitors who have brought their own tents and there are cabins, and hotels. Each year more than 68 million people visit the national parks.

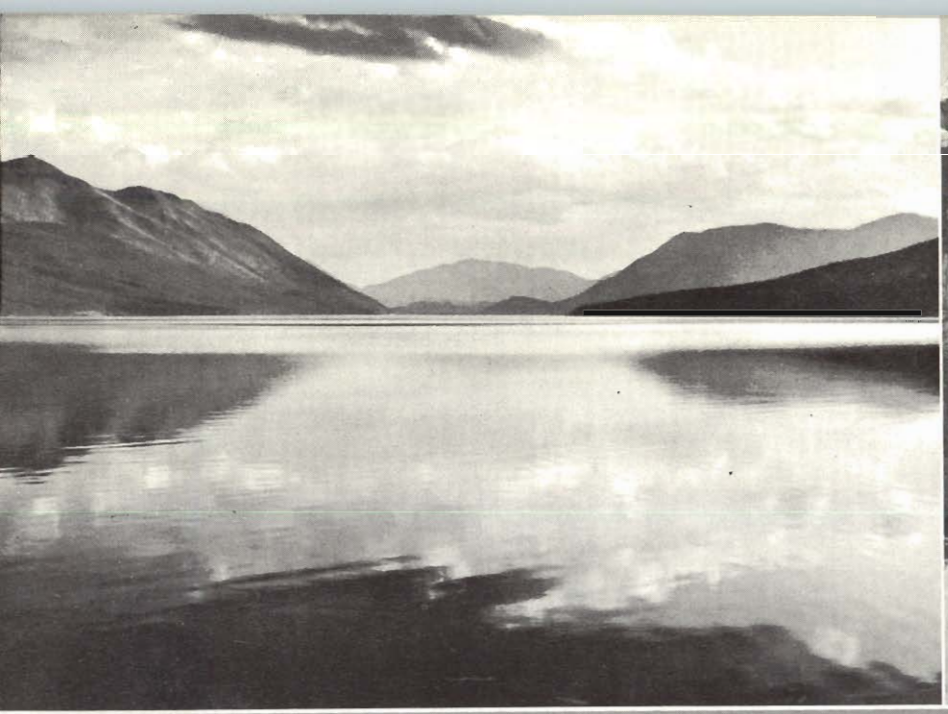
The parks offer more than recreation. In the national parks people can learn about nature, coming in contact with its plant and animal life.

Yellowstone Park is still the favorite of tourists. Excellent highways lead into the park; comfortable, inexpensive lodgings are available to everyone. Experienced instructors serve as guides; animals wander about, unhunted and unafraid.

Some parks are famous for their scenery; others have special significance for students of earth structure or ancient cultures. For example, Mesa Verde National Park is a tableland about 15 miles (24 kilometers) long and eight miles (13 kilometers) wide, rising 2,000 feet (600 meters) out of the valley below. It contains the cliff-dwellings of some of America's earliest known Indian tribes. Rocky Mountain National Park tells the story of the mountains themselves. There, one can see remains of older mountains, canyons, forests, and glaciers. Yosemite National Park is famous for its beauty; Yosemite's waterfalls leap 2,400 feet, (720 meters) and its valleys have walls which are 3,000 (900 meters) feet high.

But perhaps no scene can equal the Grand Canyon of the Colorado River. There, for a million and a half years, the great river has been cutting through the mountain rocks. (See the picture on page 101.) The most impressive parts of the canyon lie within the 105-square-mile (273 square kilometers) Grand Canyon National Park.

More than any other section of the United States, the Mountains and Deserts are still the country of immense open space. This land once barred the way of weary travelers; now it has become a land for winter and summer vacations, a land of magic and wonder.



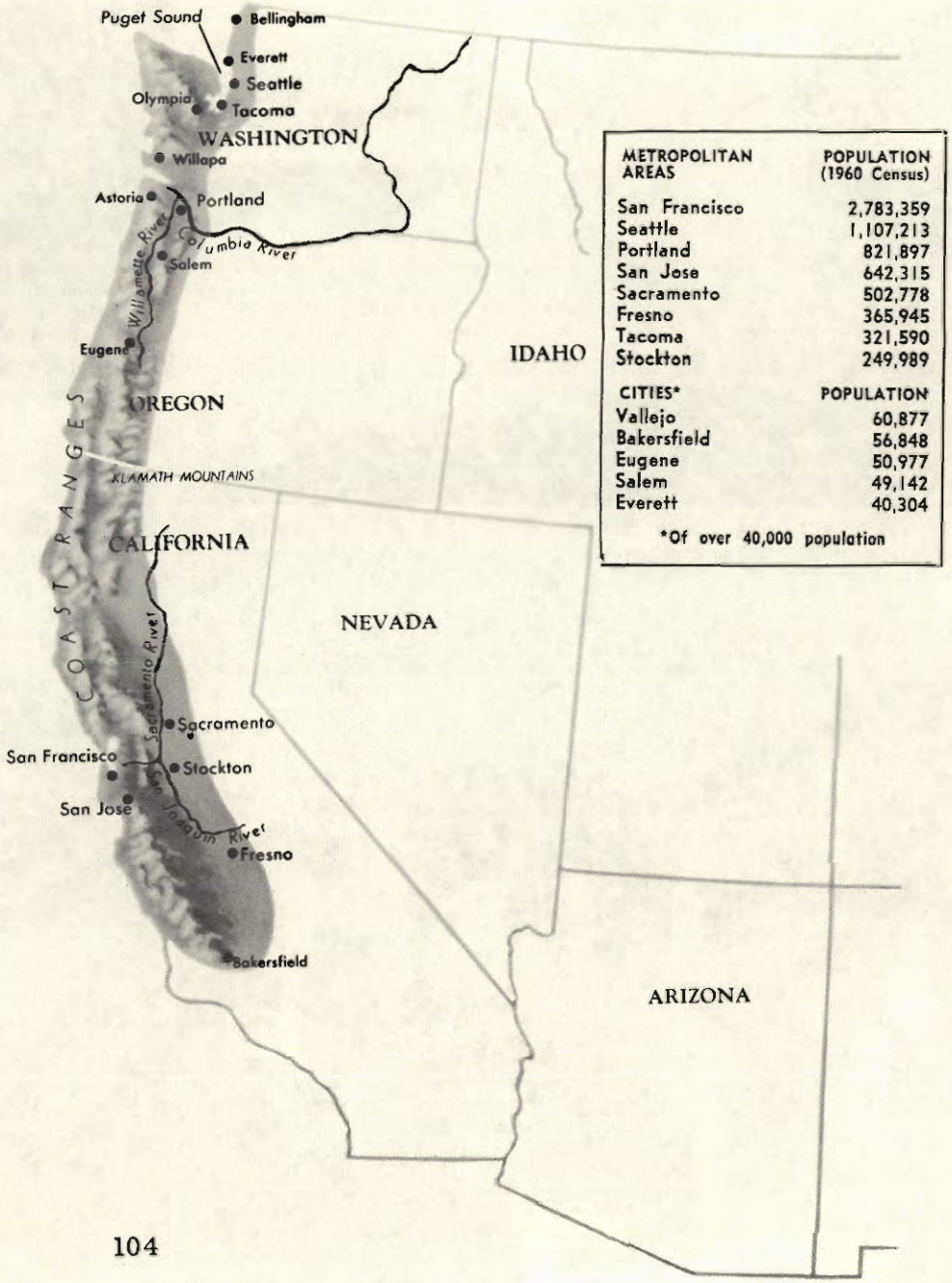
This is Lake McDonald, in Glacier National Park, Montana.

These curious natural stone arches are in the State of Utah.

Prehistoric cliff dwellings are in Mesa Verde National Park.

Yosemite National Park in California is a famous scenic wonder.

The West Coast Valleys



METROPOLITAN AREAS	POPULATION (1960 Census)
San Francisco	2,783,359
Seattle	1,107,213
Portland	821,897
San Jose	642,315
Sacramento	502,778
Fresno	365,945
Tacoma	321,590
Stockton	249,989

CITIES*	POPULATION
Vallejo	60,877
Bakersfield	56,848
Eugene	50,977
Salem	49,142
Everett	40,304

*Of over 40,000 population

THE END OF THE TRAIL

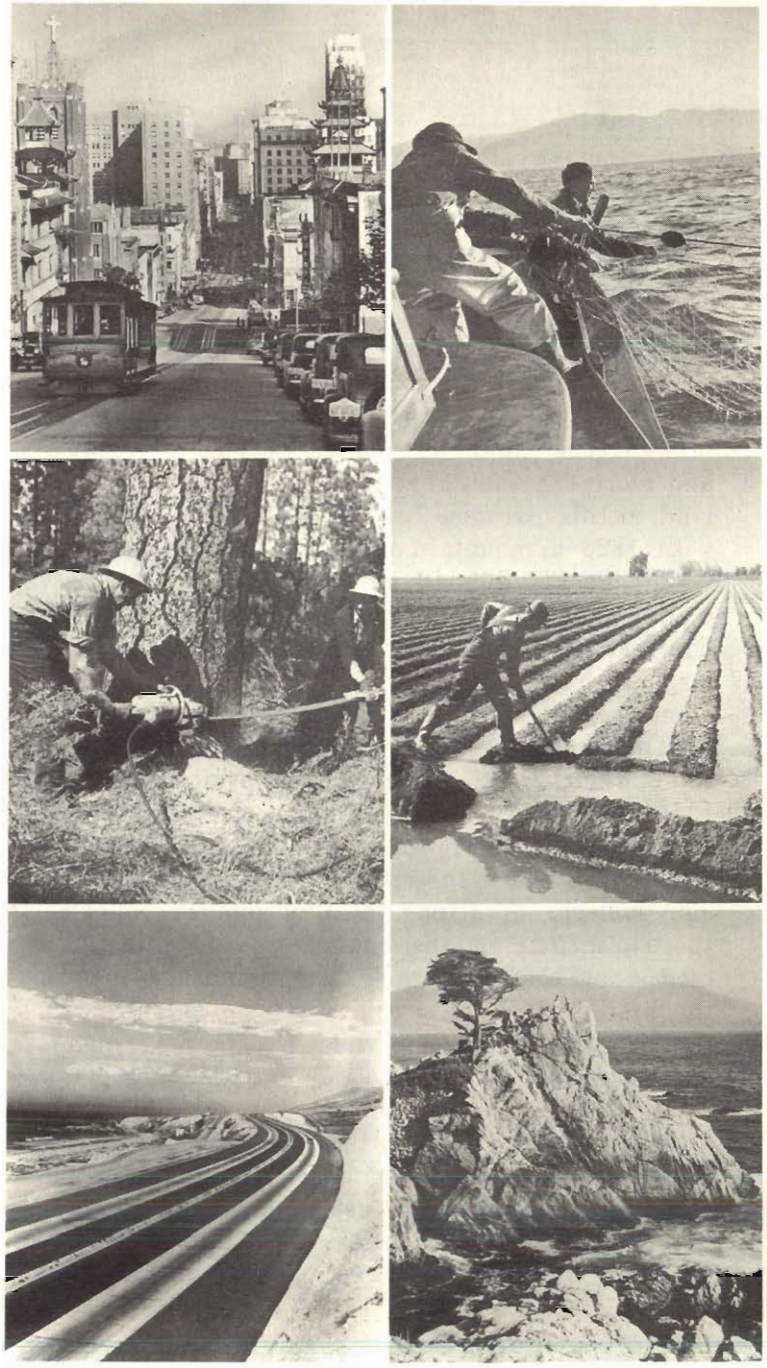
When Americans began to move to the Far West, the entire Pacific Coast attracted them. The great westward movement began before any gold discoveries in the region. Even during the period of the gold rush (1850-1860) five settlers journeyed to the northwest for every four who went to California.

Why did they come, these men, women, and children from the east? Why did they endure the frightful trials of the plains, the mountains, the deserts? Why did they want so much to move west?

More than anything else, these Americans came because they wanted more space, free land, a freer life, and perhaps riches, too. To all, old and young, the frontier offered the great chance—the great opportunity. These people wanted something new; they wanted a country that offered challenge because it was not yet shaped or built. Those who journeyed to the Pacific Coast found fertile land at the end of the trail. The end of this westward passage made the United States a continental nation.

The leader of the first group of settlers from the east wrote: ". . . to our great delight we beheld a great valley. . . . The valley of the river was very fertile, and the young tender grass covered it like a field of wheat in May." The chain of valleys along the Pacific is still a joyful sight to travelers. This strip of land, 200 miles (320 kilometers) wide, provides a living for 14,500,000 people today. (The Mountain and Desert region is four times as large, with only about one-third as many people.) In every season of the year, the gardens in this 200-mile (320 kilometers) wide strip send fresh fruits and vegetables to the entire nation. Fish, lumber, grain, and processed foods are sent from here to the nations across both oceans.

Long before the first settlers reached the far west, sea captains and merchants from New England had sailed



San Francisco • Salmon seining • Logging, Washington • Irrigation, California • Pacific Highway • California coast

along the western coast and built trading posts. The Pacific Coast was the gate to the Orient, and Americans of vision soon recognized its possibilities. The Pacific Coast was very far from the rest of the nation, however—several months' voyage by sea. To reach it from Boston or New York, one had to sail all the way around Cape Horn at the extreme southern tip of South America. But traders who dared to take the long hard trip grew rich. They brought back tales of rich green valleys, giant forests, and more fish than anyone had ever seen. A route over land to this paradise had to be found.

In 1826 a mountain man led the first party through "South Pass"—the only gap in the Rockies where wagons, cattle, women, and children could cross. But there was no great movement westward over land until 1843. Then large numbers of pioneers began to cross the country along the Oregon Trail, which had been laid out by traders and missionaries. The trail began at Independence, on the Missouri River. It cut across prairies and the Great Plains. Then, rising suddenly, it curved about through mountains for 400 miles (640 kilometers) until the travelers could follow the rivers which descended to the Pacific valleys. A strong, healthy pioneer could complete the trip in four months, but many less fortunate travelers died along the trail: their graves marked the way. In the first year of the great movement, 1,000 persons left the Mississippi and Ohio valleys. The next spring, 1,400 started toward the west; and in 1845, nearly 3,000 set forth on the Oregon Trail.

The trail ended beyond the rain-catching Cascades and Sierra Nevadas, in the valleys between these mountains and the lower, gentler Coast Ranges. (See the map on page 10.) The Klamath Mountains divide the chain of valleys into a northern and southern part, forming the crossbar of a great letter "H." The southern valley—more than 500 miles (800 kilometers) long—is called the Great Central Valley. It is drained by the Sacramento and San Joaquin Rivers, which empty into San Francisco Bay. The northern valley—Willamette Valley—is drained by the Willamette River, which flows north into the great Columbia River.

The Willamette Valley is a gentle, prosperous region of farms, towns, groves, and fields which are green all year. The farms are family farms. Willamette farmers grow wheat, oats, and special grasses for feed and hay; they raise dairy cows, hogs, and chickens. Today a trainload of fresh fruit can cross the United States in just a few days. The first settlers needed four or five months to travel the same distance.

Even in the rich Willamette Valley, however, life was not always easy. In the spring, the heavy rains flooded rivers and fields. In the summer, the high ocean tides spilled salt water into the river beds. In 1936 the people of the region began a flood control project, and now five dams check the Willamette River. The dams keep the water flowing evenly, turning its energy into electric power for farm machines, sawmills, fish packing plants, and other industries. Two other dams are being built, and four more are to be started. Like New England, the Willamette Valley was settled by industrious, independent people. In a way, it is the New England of the West. But nature has been more generous there than in the New Englanders' stony land.

The end of the trail — looking out over the Pacific Ocean

Portland, on the Columbia River, a major shipper of the North Pacific. Snowy Mt. Hood, in the background, offers winter sports.

CITIES OF THE PACIFIC

The natural harbors of New England are America's door to Europe; the shores of Puget Sound open the way to the Orient. Thousands of years ago, a great river of ice moved south from the Canadian mountains and dug out the valley floor of Puget Sound. Sea floods poured in when the ice melted. They created a blue-green inland sea, which was guarded east and west by snow-capped mountains. Between these ocean-filled valleys there are wooded fingers of land and islands, with hundreds of water-ways and natural harbors for boats. South of Puget Sound, tall cones of mountains which once shot out melted rock and ashes rise 8,000 feet (2,400 meters) into the air from great mountain plateaus.

Many manufacturing and fishing towns lie along the forested hills and lowlands beside the bays and little harbors of the Northwest Coast. At cities like Seattle, Portland, Everett, Tacoma, Bellingham, and Olympia, goods from the Orient and the south Pacific are unloaded. From these same ports, ships leave with fruit, grain, fish, condensed milk in cans, timber, or machines for other nations all over the world. The waters of Puget Sound, itself, are crowded with small fleets of fishing boats, and with

Seattle has an even climate. Its average temperature is 52° F.

San Francisco is the largest land-locked harbor in the world.

houses on boats along the shore.

About 860 miles (1,375 kilometers) south of Seattle, San Francisco lies at the tip of a tongue of land broken by the narrow channel of the Golden Gate. Through this channel the tides of the Pacific pour into a great bay. San Francisco has long been a center of commerce, finance, shipping and culture for more than 2 million people in the bay area and inland.

Asians from the west and successive waves of Europeans from the east have made San Francisco a city of many peoples and many tongues.

Freight from a hundred ports is unloaded at San Francisco. Long lines of railroad cars are loaded here with the rich fruit of the Central Valley. Great streams of motor traffic cross the Golden Gate Bridge, a mile (1.6 kilometers) long, to the north shore.

Half a century ago, this major city of the west was in ruins. In 1906 a great earthquake shook the city to its foundations, and a great fire destroyed the city. But within three years, 20,000 new buildings were constructed; and after seven years a new city was rising out of the ashes of the old.

FOOD FROM THE SEA

Every spring and summer, millions of salmon, a large fish which returns from the sea to fresh water streams to breed, swim from the Pacific Ocean into the mouths of northwestern rivers, and then swim steadily upstream. Passing through swift waters, around great rocks, and leaping waterfalls, each fish finally reaches the original stream or lake where it started life, several years before. The salmon then dig out shallow nests in the riverbed, where they lay their eggs. Then, exhausted by their journey, the parent salmon die. They have finished the task that nature has given them. Several months or even years later (depending on the species of salmon), the young fish start their trip to the ocean. They live in the salt water from two to seven years, until they are ready to swim upstream and deposit their eggs.

This marvelous series of events helps man provide himself with a basic need—plentiful quantities of fish. When the adult salmon gather at the river mouths for the annual trip upstream, they are in the best possible condition. Nearly every harbor has its salmon fishing fleet. Various types of nets catch thousands of salmon at a time, to be sent to markets and packing plants.

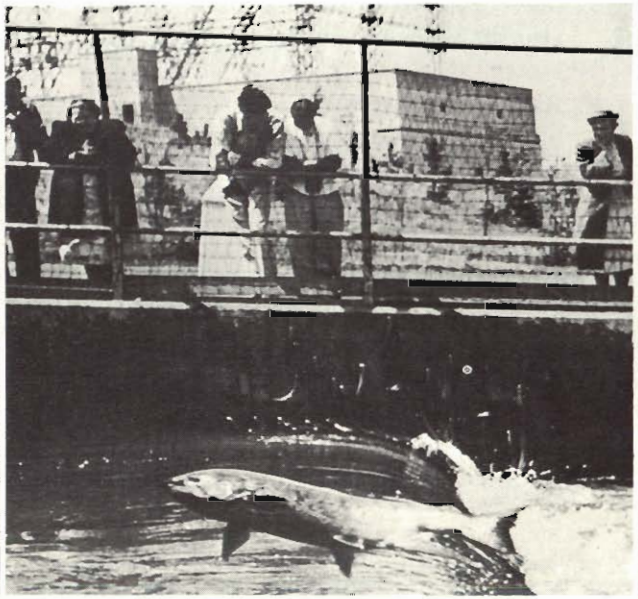
The town of Astoria, which was established by the crew of a trading ship at the mouth of the Columbia River in 1811, is one of the oldest fishing towns on the Pacific Coast. At first the vast numbers of salmon were neglected, because the traders were more interested in furs than in fish, and because there seemed to be no way to preserve the salmon. But in 1867, a generation after the first overland settlers arrived, the citizens of Astoria built the first Columbia River fish packing plant. Their experiment was a success; thousands of pounds of fish were permanently preserved, ready for storage or shipment. The industry remained small for many years, since there were few workers available for cutting and cleaning fish, and pressing them into tinned containers.

The Columbia River salmon catch is vital to this area.

Today the work is done by machines that clean and put into cans 60 salmon in a minute. Trainloads of salmon in cans then begin to travel across the country, often on the same day the fish were taken from the river.

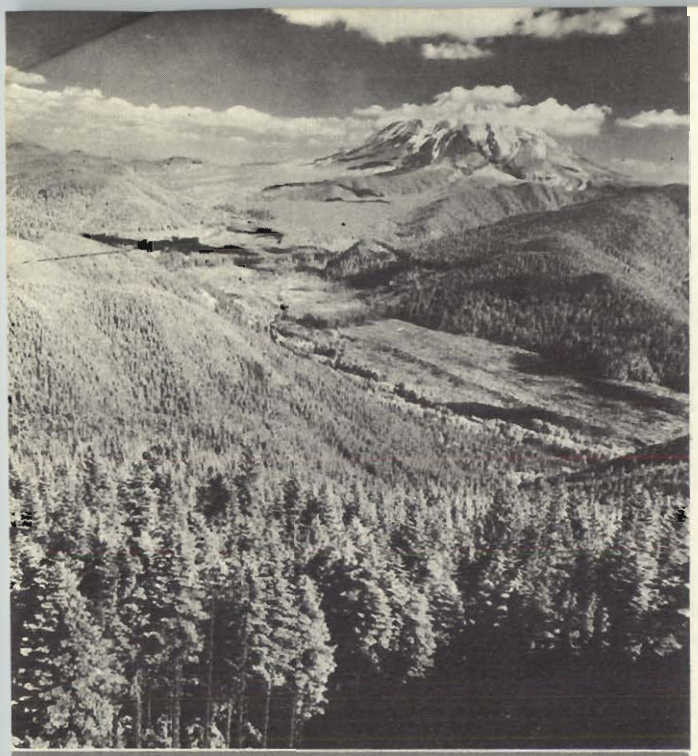
Puget Sound and the Columbia River once had the richest of all salmon waters. But the supply decreased because of nets and traps, the building of dams, and taking away water for crops. By the late 1930's, the supply of fish was seriously threatened. To preserve it, the people of Canada and the United States joined forces in establishing the International Pacific Salmon Fisheries Commission. They began to study the mysterious life of the salmon, and they built places to raise the young fish. They ruled that one fish must be set free for every one that was caught. Then, to help the fish swim upstream for depositing their eggs, they built special fish ladders up the smaller dams and rapids. The people of this region had learned something about nature: they had learned that, whenever man disturbs nature's delicate balance for his own benefit, he must restore that balance again. If this is not done, nature cannot continue to serve man. The cold waters of the northern Pacific and the still, shallow inlets are also rich in other fish and ocean life. Power boats drag long lines with hooks to catch the fish in the early morning fog. And during the season, people in the small towns around Willapa harbor get a harvest of shell fish. These started life in Japan, and were then carried to beds in the cold waters of the U.S. Pacific Coast.

Fish ladders make it possible for salmon to get over Bonneville Dam en route to their spawning grounds.



Traveling up a fish ladder, a salmon makes a graceful leap. Thousands of fish go upstream every year.

Near a fish ladder, biologists tag salmon to learn more about their unusual migratory habits.



Forests like these are the Northwest's greatest resource.

Modern lumber mills make maximum use of all timber.

THE GREAT FORESTS

On the western slopes of the United States, south of Puget Sound, warm, gentle rain falls almost constantly. On these mountain slopes, giant Douglas fir trees grow as they grow nowhere else in the world. Walking along beneath the ancient giants of the forest, a visitor hears the steady dripping of water on the leaves. But the water is not rain; the sky is hidden. The trees themselves drip constantly, because the air, heavy with water, is not able to take up more from the leaves and because some water also condenses from the air upon the surface of the leaves and drips off. For miles, pine and fir and other evergreen trees cover the western side of the Cascade Mountains. Farther south, in California, one finds the great redwood trees, the largest and oldest living things. Some are 3,000 years old—silent witnesses to human history.

Ever since men came to America, forests have provided fuel and shelter. Forests covered more than half the land that is now the United States. At first, trees had to be cut down to prepare the land for farming, and to provide food, shelter and fuel. The pioneer travelled in wooden boats, or in wooden wagons, which were drawn over wooden roads and bridges. He used wood for his house, his tools, and his furniture.

As America grew, the need for wood increased. By the time settlers reached the midwest, industry needed vast quantities of wood. Railroads stretched farther and farther westward, and lumber camps harvested what then seemed like limitless reserves of trees.

These men did not realize that a forest is more than a collection of trees. It is a complex universe of plant and animal life. Each tree must have sunlight, moist rich soil, and enough space for its roots. The forest sometimes provides food for cattle and sheep on the range. It protects the soil from erosion. By taking in rain water and by slowing the melting of snow in the spring, it lessens the danger of floods and it regulates the flow of streams which benefit people in the valleys below.

In the universe of a living forest, two opposing forces are constantly

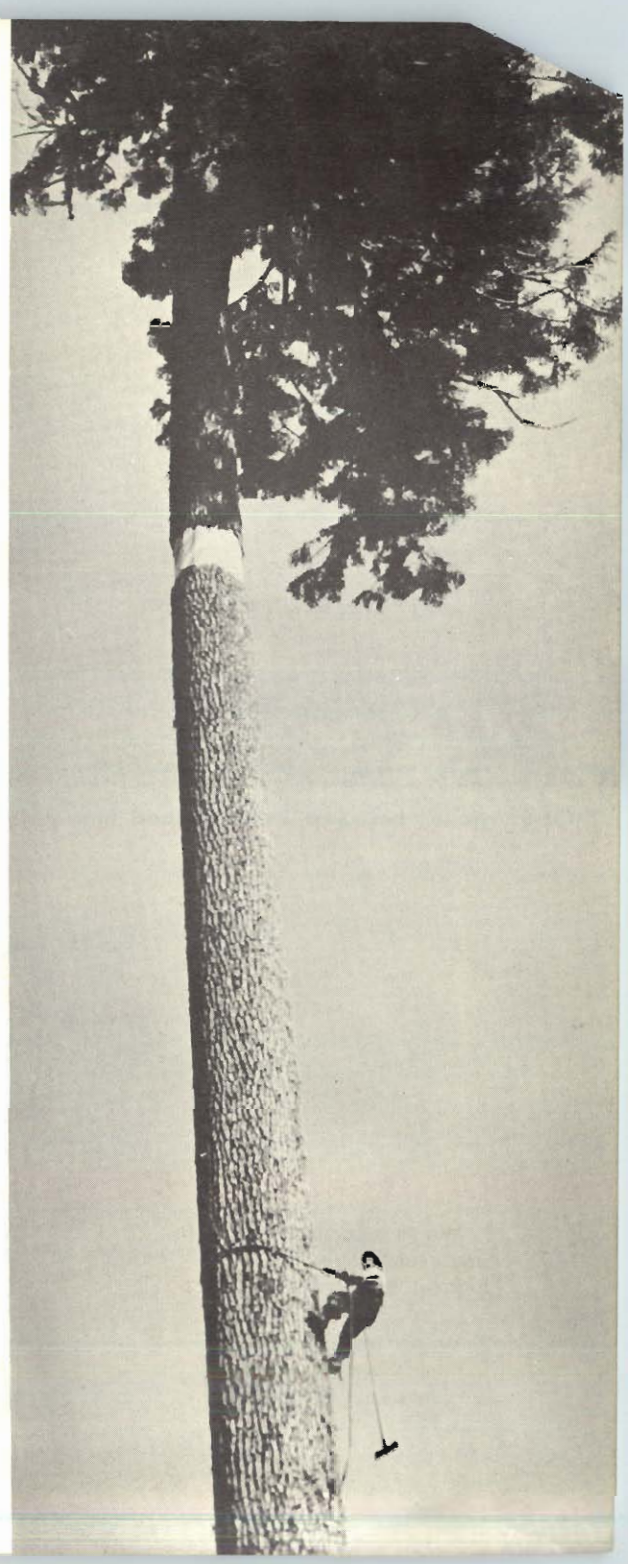
at work. These two forces are growth and decay. The growth of new trees balances destruction by insects, plant diseases, and occasional storms. But man's thoughtless cutting of timber disturbed this natural balance. Forests were cut down more rapidly than new trees could grow. And when the forests were destroyed, people saw the damage that had been caused. Fires broke out of control and wild life disappeared. Worst of all, the rich soil of the forest floor was washed away by unchecked rain water and by mountain streams that dug deeply into the earth.

Citizens of the whole country became alarmed. As a result, in 1905, the government created the United States Forest Service, which protects the forests through careful management of lumbering. The Forest Service also works to prevent soil washing away, and it controls the use of streams. More than 18 million acres (7.2 million hectares) of timberland are managed as national forests, so that everyone may benefit from wise use of the nation's timber, water, wild life, and other resources.

On 15,000 privately owned tracts of land, about 49 million (20 million hectares) acres of timber have been converted into "tree farms," where modern methods are used for growing high-quality trees. The "farms" range in size from three acres (one hectare) to 800,000 acres (320,0000 hectares).

About 60 percent of U.S. forest land is in farms and other small, privately owned areas. Some of these have not been well managed. Federal, State, and private agencies are working together to aid and help improve timber growth and better management on these lands. Each year, land owners and various agencies working together plant more than one and a half thousand million trees.

The old forests may never grow again as they once did. But some 489 million acres (195 million hectares)—about a fourth of the nation's land area—are forest lands. If they are wisely managed and protected, they will continue to be a source of public welfare and pleasure.



A lumberjack climbs a towering fir tree to cut off its top.

Citrus groves below a snow-capped mountain near Los Angeles.

THE INLAND EMPIRE

Thousands of years ago, between the Coast Ranges and the Sierra Nevadas, the Great Central Valley was formed. Today this great valley is one of the highest producing farm regions in the United States. Pears grow on the cool mountain slopes; vegetables, including beans, onions, as well as rice grow in the black soil near the river mouth; lettuce grows in the "valley of green gold;" and grapes for wine and raisins grow on the low, sunny hills. The sheltered groves yield peaches, olives, oranges, and lemons in addition to other fruits. Machine-cooled trucks and railroad cars carry these products to the entire nation in all seasons. Grain and cotton grow all year on the valley's 60,000 farms. Sheep and cattle feed in the valley's pastures.

Nature generously provided a rich soil and a mild climate. But, only a short generation ago, the protected valley produced scarcely enough food for its own people, because nature had failed to balance its gifts. In this great valley, rain and snow fall in the winter and spring, but the summer is dry. The valley's problem was that the water came at the wrong time, and also in the wrong places.

The Sacramento River flows down the center of the northern half of the valley. The San Joaquin flows through most of the southern half. These two streams meet in a low-lying region near the middle of the state of California, opposite San Francisco. The Sacramento Valley gets two-thirds of the water for one-third of the cropland. The San Joaquin, with a larger, drier area, gets only one-third of the water.

1. Water is carried from Sacramento River to San Joaquin River by canals.

2. Water from the San Joaquin River is used to irrigate southern valley.

For many years, men could not solve this problem. Year after year, the Sacramento River poured its unused wealth with destroying force into the sea. At the same time, more and more land at the San Joaquin end of the great valley died of thirst and became desert.

By 1931, the people of California saw the need for a valley-wide program of flood-control and water for crops for the entire area. A State Water Plan was created. This included dams, power plants, canals, power lines, and pumps to move the extra waters of the Sacramento River across hundreds of miles (kilometers) to the thirsty southern tip of the valley. The local government could not do the vast, daring job alone, so California appealed to the Federal Government for help. Congress agreed, and in 1935, it established the Central Valley Project.

The TVA had to rebuild what man had destroyed by not knowing of nature's balance. But the Central Valley Project had to do more; it had to create a natural balance. And the lives of more than a million people depended upon the success of this project.

The first part of the Central Valley Project was a rescue job. The waters of the northern rivers had to be held back in flood time, and released during the dry summers. Reshaping nature, engineers built three large dams. They also built 360 miles (575 kilometers) of canals, giant pumps, and water powered electric plants to produce the power for controlling and pumping the water. Shasta Dam, the biggest in the project, stores 4,500,000 acre-feet (55 hundred million cubic meters) of water in its lake. When they are needed, these waters are released. A canal carries Sacramento River water southward across the flat land near the mouth to a giant pumping plant. On its way, this water pushes back salt water tides which used to creep up the river bed from the sea.

In order to make water flow uphill for irrigating the southern valley, engineers built huge pumps which lift 4,600 cubic feet (129 cubic meters) of water every second. They pour the water into canals that slope gently southward. Friant Dam and more canals were built to change the course of the San Joaquin River into farms and groves which need its water. Instead of flowing north as the San Joaquin once did, two million gallons (7,600 cubic meters) of San Joaquin waters now travel south every minute. And where the insufficient waters of the San Joaquin once flowed, the waters of the Sacramento now serve the region—500 miles (800 kilometers) from the original source of the river.

Because of the new dams, pumping stations, and irrigation ditches, the Central Valley now enjoys a new life of rich groves and fields, and of industries which are run by new power. The project is not complete. More canals, pumps, lakes, and dams must be added. More land must be saved from the desert. But the families of the valley can be proud of their inland empire, where—a few years ago—they refused to admit defeat despite constant disappointment.

The people of the Central Valley now know that a free people can do more than merely use the resources of nature that are given to them. With knowledge, effort, and will, they can change these resources and make them work together to supply human needs. In doing so, they benefit not only themselves, but also future generations.

THE COAST VINELANDS

Hectares of vines stretch along the gentle, sunny slopes of the Coast Ranges, north and south of San Francisco. The rich soil and eternal sunshine give every possible assurance to crops in California's eight major wine-producing areas.

Spanish priests were the first to grow vines here. They brought their art and their seedlings with them from across the ocean. They did not sell their wine, but travelers who stopped at their churches praised its special flavor; and about 1824 settlers began to make wine to sell from the Spanish Mission grapes. Growers experimented with different kinds. They tried to improve the native grapes, which had a strong flavor; they also tried to import delicate European varieties for planting in California. Often the foreign vines would die in the new soil; sometimes the change of climate and conditions would give the grapes a different flavor.

For many years, the growers were unsuccessful. Then, in 1870, a disease of vine roots suddenly killed thousands of vines in Europe. The disease was traced to small insects on the roots of American vines which a European wine maker had introduced into his own fields for experimental growing. Then, they returned to America—this time in European vine cuttings. Like the vines of Europe, the California fields were almost destroyed by the disease.

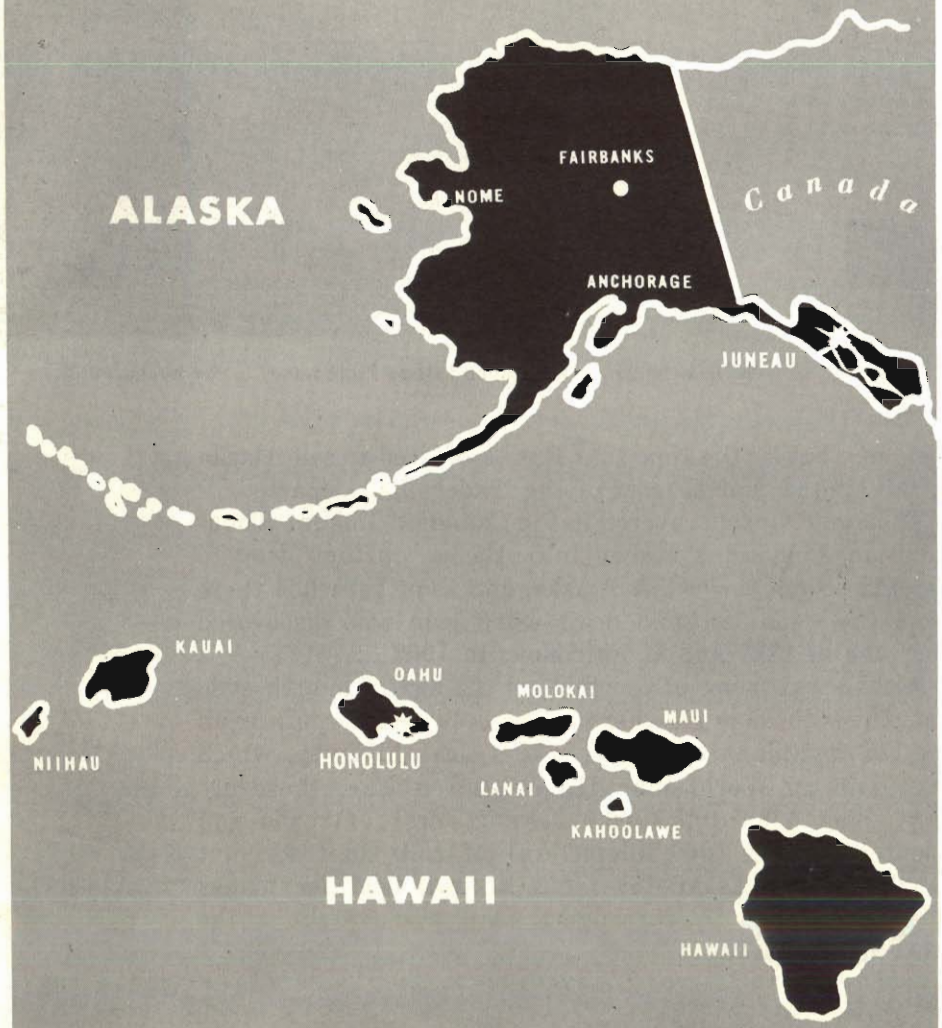
The strong native roots had resisted the disease before. Could they resist it again? In desperation, growers grafted European vines upon American roots. The success of the experiment saved the wine industry of both continents. Years of hard labor were necessary; all the vines had to be replaced completely. But ever since that time, winegrowers in France, California, and other regions have been grafting European grape cuttings upon American roots.

The vines of Santa Clara, San Joaquin, and other California valleys bear rich, plentiful fruit each year, yielding from six to ten tons an acre (2 to 3.6 metric tons of grapes an hectare). The fine red and white wines which they produce are the result of another great blessing of nature, skillfully used by people who were determined to succeed.

Neat rows of vines on the slopes of the Coast Ranges, California.

A worker inspects seedless grapes in the San Joaquin Valley.

The New States



ALASKA

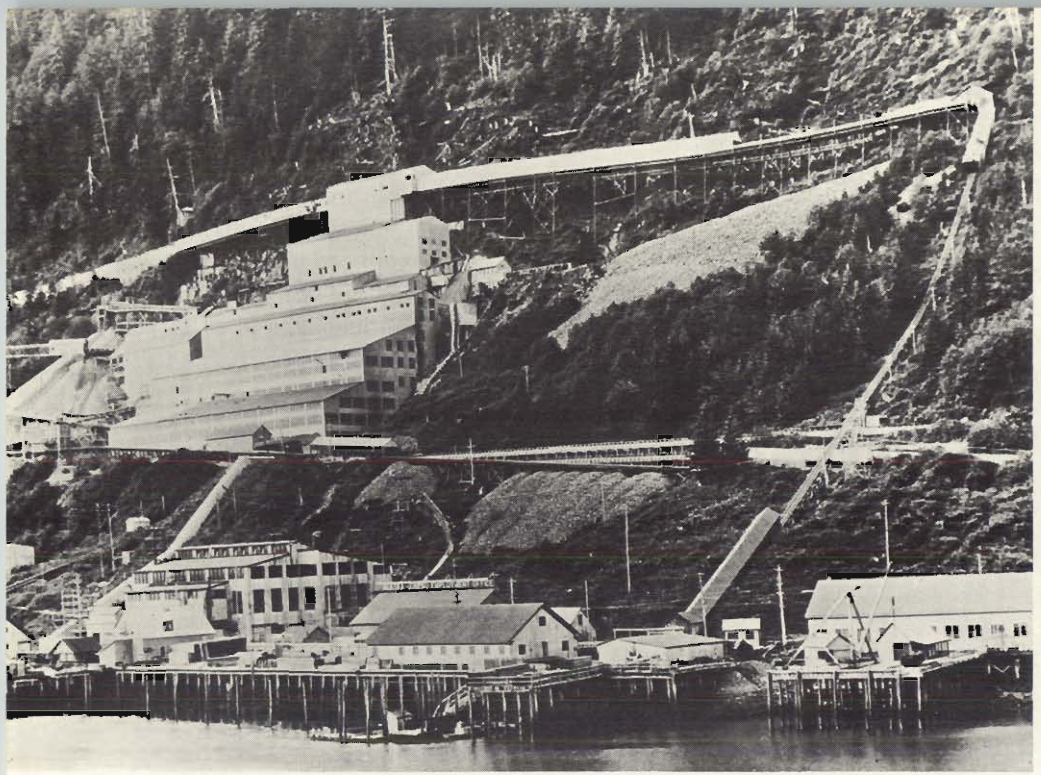
In 1959 Americans welcomed Alaska into the Union as the 49th state. Attitudes toward Alaska were different in 1867, when the peninsula was purchased from Russia. Then most Americans had little interest in "586,000 square miles (1,524,000 square kilometers) of icebergs and polar bears"—beyond Canada's western borders, far from the settled areas of the United States.

In those parts which lie above the Arctic Circle, Alaska still is a land of icebergs and polar bears. Ice masses lie buried in the earth, which is permanently frozen to a depth of several hundred feet (60 or more meters). From early May until early August, the midnight sun never sets on this flat, treeless region, but the sun cannot melt the icy soil more than two-thirds of a meter down.

Alaska is America's largest state, but only about 225,000 people live there. According to estimates, 2,000,000 acres (800,000 hectares) of its land area are fit for plowing, but only about 12,000 acres (4,800 hectares) are being cultivated.

The Japan Current of the Pacific warms Alaska, and the Arctic chills it. The temperature may drop as low as –47 Fahrenheit (–43.5 degrees centigrade) in some places, and may rise to 86 (30 degrees centigrade) degrees in other parts of the state. In a year, more than 450 inches (11.4 meters) of snow may fall in the north, while some 85 inches (2.16 meters) of rainfall may descend upon the capital city of Juneau in the south.

Nature has divided the huge tongue of land into three distinct regions. Alaska, which lies between about 71° and 56° north latitude, stretches southward from the Arctic Ocean to the Pacific Ocean. Of the three regions, Arctic Alaska reaches from the Arctic Ocean to the rough mountains of Brooks Range. Central Alaska lies between Brooks Range and Alaska Range, where Mt. McKinley rises 20,300 feet (6,187 meters)—the highest peak in North America. From the western face of the Alaska Range, another block of territory slopes down toward the



Alaska is rich in minerals; gold mine in operation near Juneau.

Waikiki Beach, with Diamond Head Promontory in the background.

Bering Sea and Russia. At the pointed end of this territory, the island chain of the Aleutians extends far to the southwest. Another finger of land, known as the "Panhandle of Alaska," thrusts to the southeast, into Canada's Province of British Columbia. The broad stretch of water between these two fingers is the Gulf of Alaska, the northern end of the Pacific.

Arctic Alaska has been the home of the Eskimos for countless centuries. It is believed that the Eskimos moved there from Mongolia or Siberia. A short route for their passage would have been Bering Strait, which is named for Vitus Bering, the Danish sea captain who discovered Alaska on his voyage for Russia in 1741. The Eskimos, the Aleuts of southwestern Alaska, and the American Indians of southeastern Alaska, are the state's earliest known inhabitants. Russian fur traders established settlements, but by the time that Russia offered to sell Alaska to the United States, most of the traders had departed.

Then gold was discovered in the Canadian Yukon. Thousands of Americans rushed into Alaska, on their way to Canada. Some never left Alaska, and some returned there from the Canadian gold fields when gold was discovered at Nome in 1889 and at Fairbanks in 1902.

Alaska was never completely cut off again, though even today it is hard to get there. The only motor route from the U.S. mainland to Alaska is the Alcan highway, which was built in World War II. Within Alaska, there are only about 5,000 miles (8,000 kilometers) of roads and about 600 miles (960 kilometers) of railroad track, but nearly every Alaskan town has its own field for planes to land. Planes fly passengers, mail, and freight to the most distant villages.

The gold rush that changed life so suddenly for Alaska was soon ended. Many stories about mining camps have become part of American literature, but the gold from Alaskan earth contributed less to economic progress than the fish in Alaskan waters. The fish which are caught in a single year range in value from $80 million to $90 million. Fur-bearing animals are plentiful in the forests and streams, and valuable fur seals inhabit Alaskan waters. Since 1911, Canada, Japan, the U.S.S.R., and the United States have jointly agreed to control the hunting of seals. The seal herd has been rebuilt to its former size of about 1.5 million.

After fishing, Alaska's chief industry is lumber and the production of wood pulp. There are also large deposits of coal, copper, gold, and other important minerals.

When Alaska changed from a territory to a state, its citizens acquired more than 100 million acres (40 million hectares) of former Federal land within its boundaries. Any oil deposits which may be found under the coastal waters will also belong to the new state.

As citizens of a state, Alaskans now can vote for the President of the United States. They can elect two senators and one representative in the United States Congress. The governor of Alaska now is elected instead of being appointed by the President, and the state law-making body is free to make any laws which are not contrary to the Constitution of the United States.

HAWAII

A famous American author, Mark Twain, once called Hawaii "the loveliest fleet of islands that lies anchored in any ocean."

In the fifth or sixth century, daring Polynesian voyagers sailed to Hawaii across thousands of miles (kilometers) of the Pacific in their double canoes. They are believed to have been the islands' first inhabitants. British Captain James Cook accidentally rediscovered Hawaii in 1778, and traders and priests and ministers soon followed.

Today, about 630,000 people inhabit the island chain's land area of 6,423 square miles (16,700 square kilometers). By origin, they are most closely related to the countries of Asia and the Pacific—chiefly Japan, the Philippines, China, and Korea. Only about one-sixth of the inhabitants originated in Europe or America. Politically, Hawaiians have been related to the United States since 1900. In that year, as a result of their request for American citizenship, their former kingdom became an organized territory of the United States. In 1959, the territory was admitted to the Union as the fiftieth state.

About 2,000 miles (3,200 kilometers) of ocean separate Hawaii from California, its closest sister state.

The twenty islands of Hawaii—like a chain of beads some 1,600 miles (2,560 kilometers) long—lie upon the Pacific, southeast to north west. They belong to the hot climate, but the climate is rather less hot because of the ocean currents that pass their shores, and because of the winds that blow across the land from the northeast. The temperature usually remains close to the annual average of 75 degrees Fahrenheit (24 degrees centigrade).

On the larger islands, volcanic mountains from which flow melted rock, rise from the sea. Along the gently sloping land areas to the southeast, there are beaches of yellow, white and black sands.

The largest island, Hawaii, lies at the southeastern end of the chain and is almost twice as large as all

the other islands combined. Five volcanoes gave the island its form. Of the two active volcanoes, Mauna Loa is the world's largest. It towers above the scenic Hawaiian National Park, which stretches from the 14,000-foot (4,200 meters) high mountain peak across the sea to neighboring Maui. Hot climate plants, sandy desert, waterfalls, craters, and caves make the 300-square-mile (780-square-kilometer) park a tourist attraction.

The best known of all the islands is the third largest, Oahu. Oahu, a diamond-shaped plot of earth no more than 40 miles (64 kilometers) long and 26 miles (42 kilometers) wide, is the center of Hawaiian life. Honolulu, capital and largest city, spreads out over 85 square miles (220 square kilometers) of land at the foot of the volcanic Koolau mountain range. It is home to more than half of all Hawaiians. Seven miles (11 kilometers) away lies Pearl Harbor, where the United States Pacific Fleet is based. Waikiki Beach, enjoyed by Hawaii's kings in ancient times and by world visitors today, extends along the shore from Honolulu to Diamond Head, a dead volcano.

Honolulu's harbor is a port of call for more than a thousand ships a year, and the international airport, with more than 245,000 flights a year, is the busiest in the Pacific. About 225,000 people a year visit the islands and provide more than $85 million of Hawaii's annual income.

Each island has its distinctive character. On green Kauai, probably the oldest island, is Mt. Waialeale, dead volcano and rainiest place on earth. For 37 years, rainfall there averaged 470 inches (11.9 meters) a year.

Molokai was once dry, but now water from canals has turned it into a flourishing cattle-raising and farming area. Here Father Damien, a Belgian priest, ministered to the Kalaupapa leper colony. Lanai, once thinly blanketed with dry, brown grass, now grows pineapples. Perhaps more pure-blooded Hawaiians live on Niihau's 72 square miles (187 square kilometers) than in any other part of the island chain. Kahoolawe, the westernmost of the major islands, is barren and waterless.

The smaller westerly islands have been converted into the Hawaiian Islands Bird Reservation, to protect some types found nowhere else in the world.

The rich volcanic soil of the islands has been made to flourish through scientific agriculture and man-made waterways. Hawaii's farm workers are among the highest paid in the world. Although there are no fuel resources and few useful minerals except sulphur, there are many industries. Honolulu alone makes more than 160 different kinds of products.

The first official ties between Hawaii and the United States were created through trade in sugar. In 1876, the United States granted tax-free entry to Hawaiian sugar and thereby helped its cultivation. Today, 27 sugar companies cultivate more than 220,000 acres (88,000 hectares) of sugar cane on four of the islands.

Pineapple, the second most important crop, is grown on five islands. Pineapple fields cover more than 76,000 acres (30,400 hectares). Other important agricultural crops include coffee, fruit, and vegetables.

The Nation United

The Statue of Liberty, in New York harbor.

THE FORCES OF UNITY

In many ways, it is difficult to believe that the United States is all one country. As we have seen, there is no one scene which alone represents America. The dark northern pine and the slender palm of the South, the green meadow and the wind-swept rock, the lonely farmhouse and the city of a million homes—all these are America. The black-haired fruit picker who speaks Spanish; the blond wheat-farmer whose grandfather came from Norway; the Italian truck-farmer; the coal miner whose parents came from Poland; the merchant who takes part in the Chinese New Year's ceremony—all these are Americans.

Every human being who has ever lived in the United States has been one who journeyed there or the descendant of such a settler. The American Indian left his home in Asia thousands of years ago to begin life in a new land. Since 1492, when the first European saw the American continent, people from every country of the world have made their homes in America. Yet, this vast land —stretching from the Atlantic Ocean into the Pacific and up into the Arctic—is one country, whose people speak the same language, are part of the same general cultural pattern, and are subject to the same laws.

We have seen how the United States is divided into great regions which have different ways of living and working. Each of these regions has its own characteristics and problems. And each has its own groups of people, whose parentage and traditions make them different from any of the others. Fortunately, the American people were able to create a political and social system in which all of these regions and groups were not only contained, but fully represented.

How this was done is the story of men, working together, to form one nation out of many parts.

America's children, the heritage of many nations.

THE CONQUEST OF DISTANCE

In 1848, pioneers who crossed the continent in their covered wagons made the trip in 109 days—if they were fortunate and strong. Today a New York family can drive by automobile to San Francisco in a week, or make the trip in three days by train, or fly there in five hours. Transportation has conquered the vastness of the land, and made neighbors of the people living thousands of miles (kilometers) apart.

As in other, older civilizations, the first lines of settlement followed the rivers. Where there were no rivers, roads had to be built over land. The first of the big roads westward was the Cumberland Road, which ran for 600 miles (960 kilometers) from Cumberland, in the west of the state of Maryland, over the mountains to the states of Ohio and Illinois.

More than rivers or highways, the railroads brought people together, and made one country out of the huge continent. In 1830, there were only 23 miles (37 kilometers) of railroad tracks in the United States, and by 1850, there was not yet a mile (kilometer) of track west of the Mississippi River. But as enterprising men built railroads across the eastern states, the great river routes were joined to the coast cities. And wherever railroad lines met or joined, a new town quickly sprang into life.

By 1863, two railroad companies proposed to connect the Atlantic and Pacific coasts by a railroad all the way across the continent. Advancing eastward from California, the Central Pacific pushed forward across the desert wastes; while the Union Pacific moved slowly westward over the mountain table lands. Finally, in 1869, the tracks of the two railroads met, and a golden spike was driven into the railroad ties to celebrate the completion of this first railroad which crossed the continent—the first real

A highway network converges in New York City.

This map shows principal railroad lines in the U.S.

These lines show major and secondary highways.

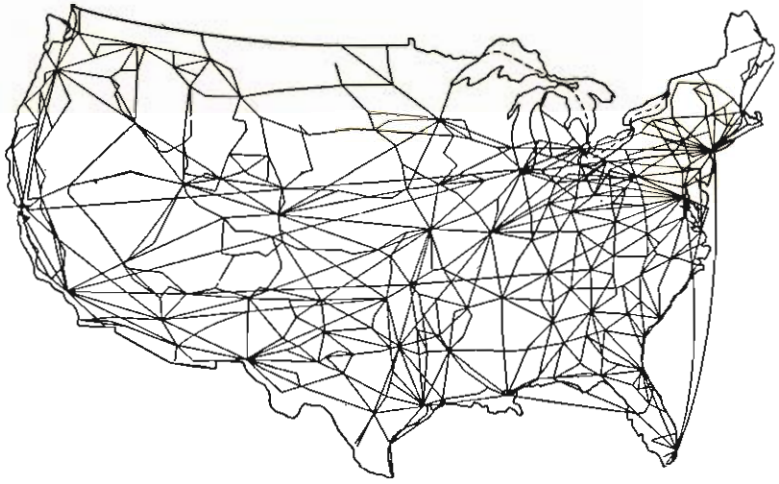
tie between east and west.

From this time on, a tighter and tighter net of railroads connected the growing towns and villages. The map at the left shows only the major routes in the United States. Over these rails, fresh berries from California are brought to a New York cafe, and the newest products to enrich the soil from a Tennessee factory are sent to fields in the Pacific northwest. Within a few days—sometimes within hours—goods are brought from one part of the country to another.

Although the railroads brought towns and cities together, they could not go everywhere. People often were far from communities, especially in the Great Plains or in the newly settled southwest. The "iron horse" or steam engine accomplished much; but the "horseless carriage"—the automobile—did still more.

In many parts of America, distances are so great that automobiles are necessities, not luxuries. Families need automobiles. As we have seen, most American farmers do not live in villages. Some live miles (kilometers) from their nearest neighbor, and hundreds of miles (kilometers) from a town. Large-scale farming is common in many parts of the United States today, but it did not become profitable until there were trucks and farm machines. Trucks carry the farmers' grain to storage bins, milk to plants where it is processed, and vegetables to market. Trucks and cars go wherever there is a road, and America's 3.5 million miles (5.6 million kilometers) of roads bring every field and barn into the circle of civilization.

The family automobile has helped to bring people of the United States two other things—two things which can seldom exist at the same time—community life and privilege to be by themselves. In the early days of industry, people who worked in factories lived close together, within walking distance of their jobs. As industries grew, more and more people had to live together in crowded conditions. But when men built longer and better roads, and when automobiles and other means of rapid transportation became available to almost everyone, people did not have to live near their jobs. New housing districts grew up outside the big cities. Increasingly, cities became places of work only. Every morning millions of Americans drive their automobiles to work, sometimes a distance of 50 miles (80 kilometers). At night they drive home to houses



These are the major commercial airline routes.

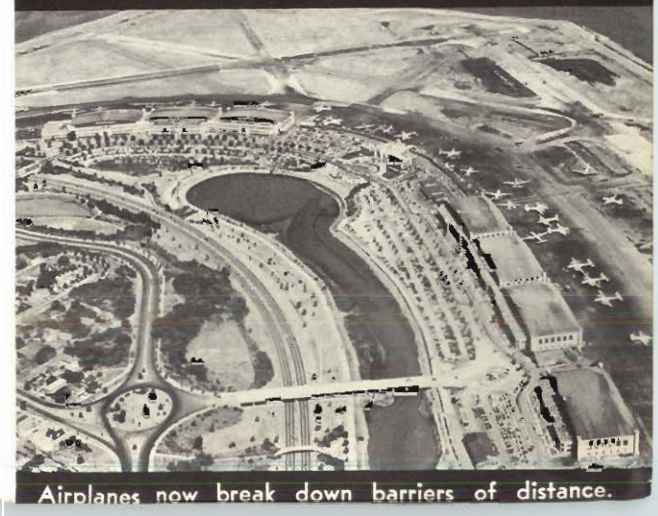
and apartments outside the cities, surrounded by trees and lawns.

Automobiles have helped make this possible. In addition, automobiles and other methods of fast transportation are changing American industry. Factories are being built far from cities, in undeveloped areas. Because the means of transportation are available, it is not hard to bring people—as well as materials—to the places where they are needed. This possibility of moving people was largely responsible for the remarkable growth of the Pacific Coast, during and after World War II. As industries built new factories in the Far West, Americans from all over the country moved west to take advantage of new jobs and new opportunities in this area. Between 1940 and 1950, the population of the States of Washington, Oregon, and California increased by 4,753,265. For California alone, this was an increase of 53 percent over 1940. In this same 10-year period, while the population of the United States as a whole increased by 14½ percent, the State of Arizona showed a gain of over 50 percent.

If we look at the map at the top, we can see how the airplane, too, is bringing the people of the United States closer together. Only 50 years after the Wright brothers made the first successful airplane flight, the United States has more than 260,000 miles (416,000 kilometers) of regular flight routes. Men and goods can now travel to every part of the country in less time than ever before. Men have conquered the distances which lie between them. But distance is not the only thing which keeps men apart.

A highway intersection outside New York City.

Railroads were important in unifying the nation.



Airplanes now break down barriers of distance.

WORKING TOGETHER

Distance in the United States could never have been conquered if Americans had not learned to work together. The greatest barriers are not canyons or mountains, but fences and borders. Neither roads nor machines can remove these man-made obstacles. But trust and understanding can.

In the great loneliness of America in the 18th century, each man had to depend upon himself and his own efforts. He made his own tools, his own shelter, and grew or hunted his own food. But then, as now, no man was self-sufficient. Men had to help each other because they could not survive alone.

The first European settlers needed the guidance of friendly Indians, who knew the climate, and knew which crops would grow in the strange soil. The pioneers needed each other. As they traveled across the trackless plains, they learned to form their wagons into a circle at night for protection against enemy Indian attacks. In this, and countless other ways, Americans learned to work together. They learned that one helps a neighbor today because he may need that neighbor's help tomorrow.

After the 13 colonies had won their independence from England, they became 13 states, loosely tied together. Each state was like a little nation. Each state was jealous of its power to make decisions which affected its own people. A few men of vision realized that these independent states could prosper only if they were united. They realized that the problems of states were the same as the problems of individuals. Each man who came to the shores of America had left his home and his country because he wanted something which he could not have there. Some wanted freedom to worship God their own way. Others wanted to follow a new profession and to break the chains of fixed social classes. Still others wanted to own land and to enjoy the fruits of their labor. Faced with the troubles of the frontier, these men gave up total independence to achieve what each man wanted to achieve.

And so, long before the first railroad track was laid, a piece of paper bound the people of the United States together in a common purpose. This piece of paper is the Constitution of the United States. Written by the representatives of the original colonies "in order to form a more perfect union," it became the supreme law of the land in 1789, when it was approved by a majority of the states.

The Government of the United States rests, quite simply, on this voluntary association of 50 states in a common federal union. Through their elected representatives in local, state, and national governments, the people of the United States can work together for the common good. They have seen how much can be accomplished through unity. And they know that no problem is too difficult if all the people work together toward its solution.

In this book we have only looked quickly at the United States. We have seen only a part of the land. We have only glanced at the people, their problems, and their accomplishments.

To look at the U.S.A., or at any country, is not to understand it. The shape of the land tells only part of the story.

But the partnership of men and the land and the climate in the United States is an indication of what free men have done—and can do—to make their resources work for them.

Capital of the United States — Washington, in the District of Columbia

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Abbreviations:

USIA(IPS)—United States Information Agency (International Press Service)
SO(NJ)—Standard Oil Co. (New Jersey)
CSCo.—Cities Service Company
FSA—Federal Security Agency
USID—U.S. Department of Interior
NYPL—New York Public Library
INP—International Press Photos
FPG—Free Lance Photographers Guild
USDA—U.S. Department of Agriculture
Bur Rec—U.S. Department of Interior, Bureau of Reclamation
SCS—U.S. Department of Agriculture, Soil Conservation Service
TVA—Tenessee Valley Authority
OEM—Office of Emergency Management