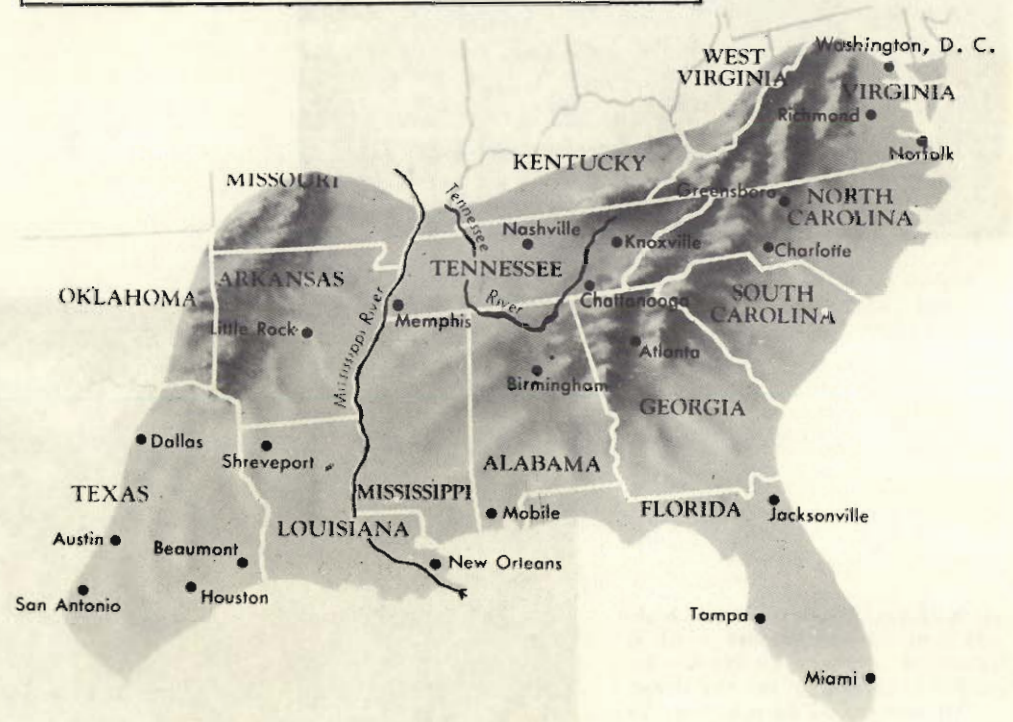


The Southeast



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.

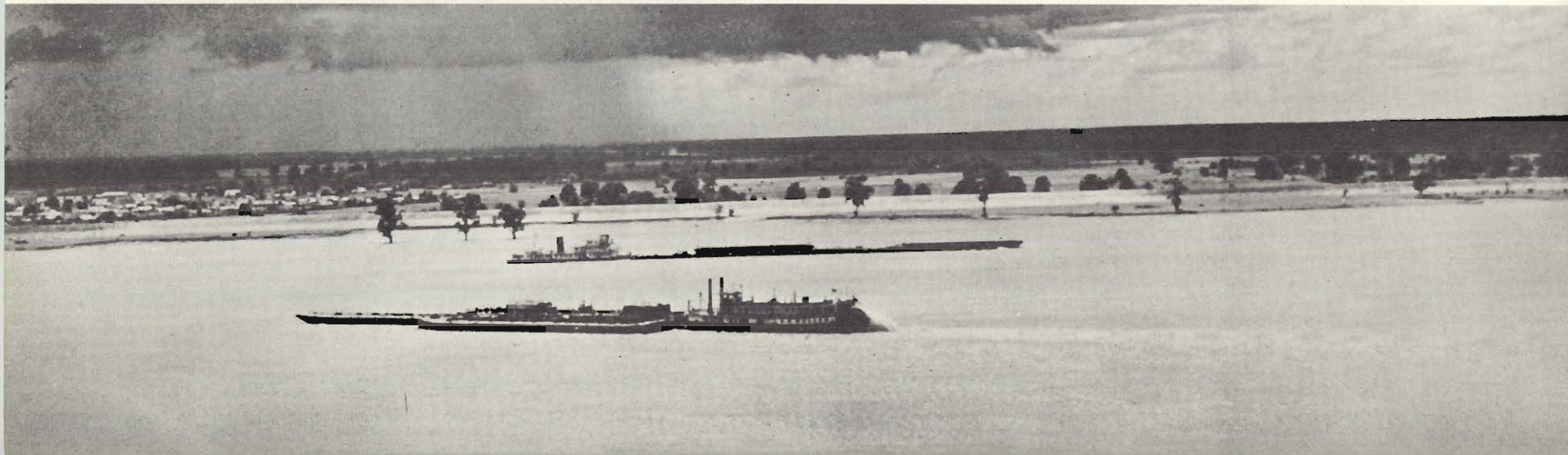
And to delight the human sense of poetry and wonder, the Southeast has many landscapes of special strangeness or beauty. For instance, there are low water-covered lands where cypress trees, shaped like bottles, rise out of dark, quiet waters into dark, tent-like masses of vines above. There is soil that 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.

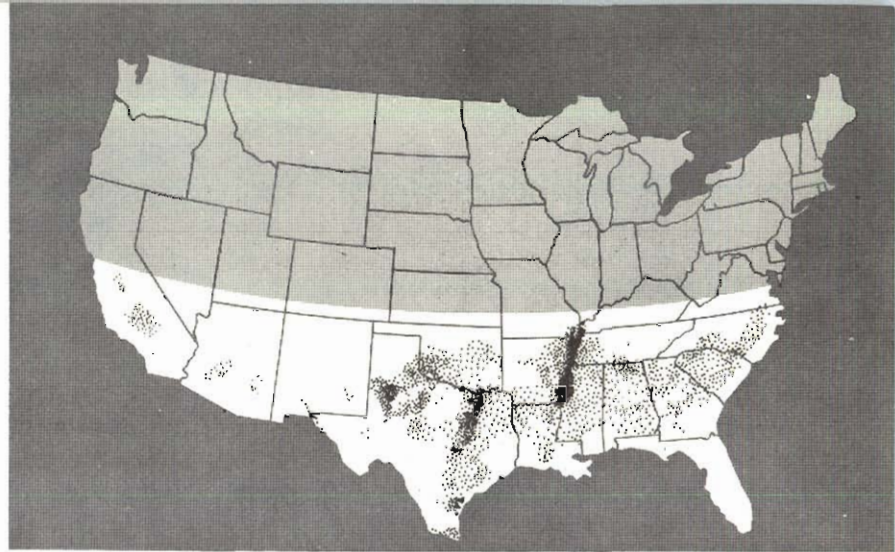


MINING THE SOIL

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 has always been the South's most important product.



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



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.

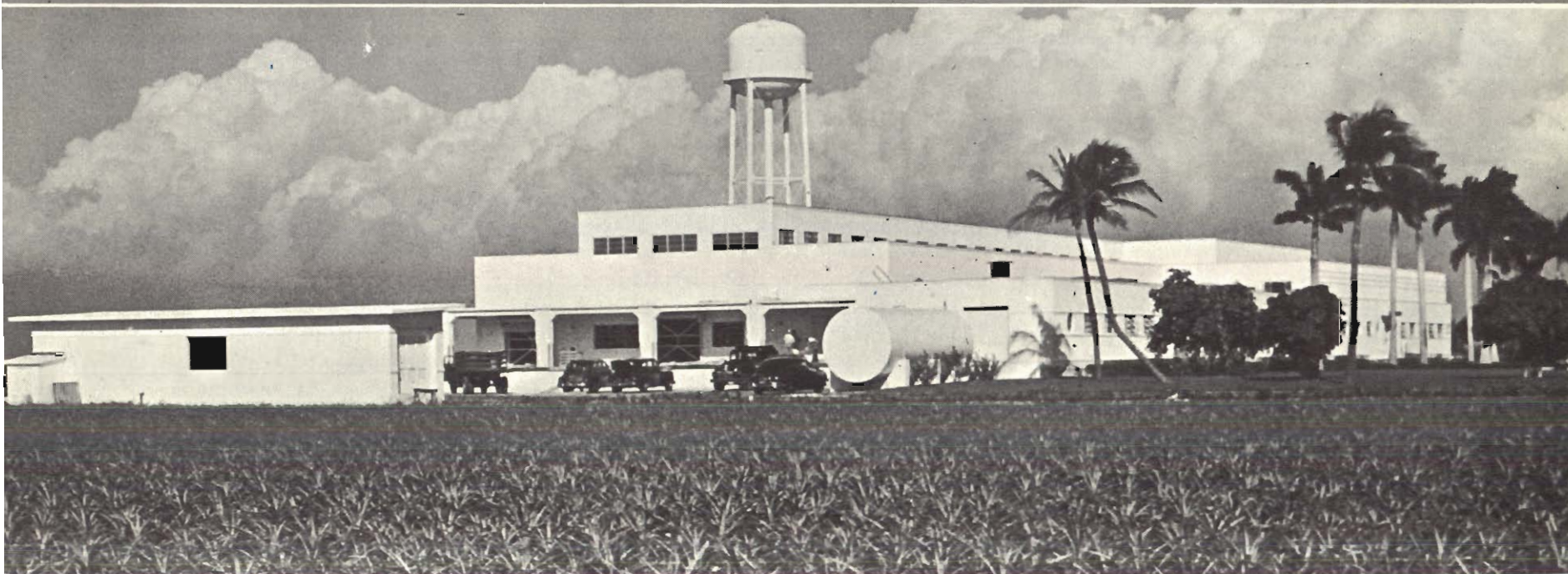
There is little use in laying blame for the situation into which the South had fallen. But if blame is to be laid, the whole United States must share it. The people of the South could not possibly have developed their resources properly, because they were too poor in money and energy to make experiments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

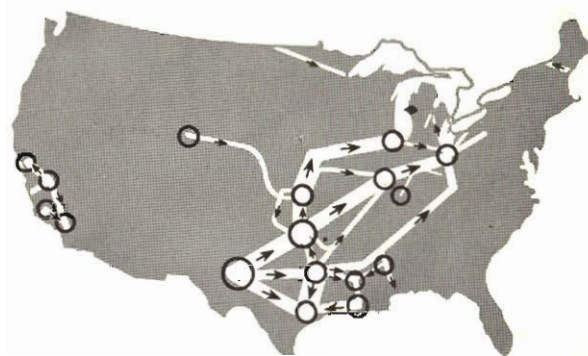
The new resource is *industrial power*.

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.

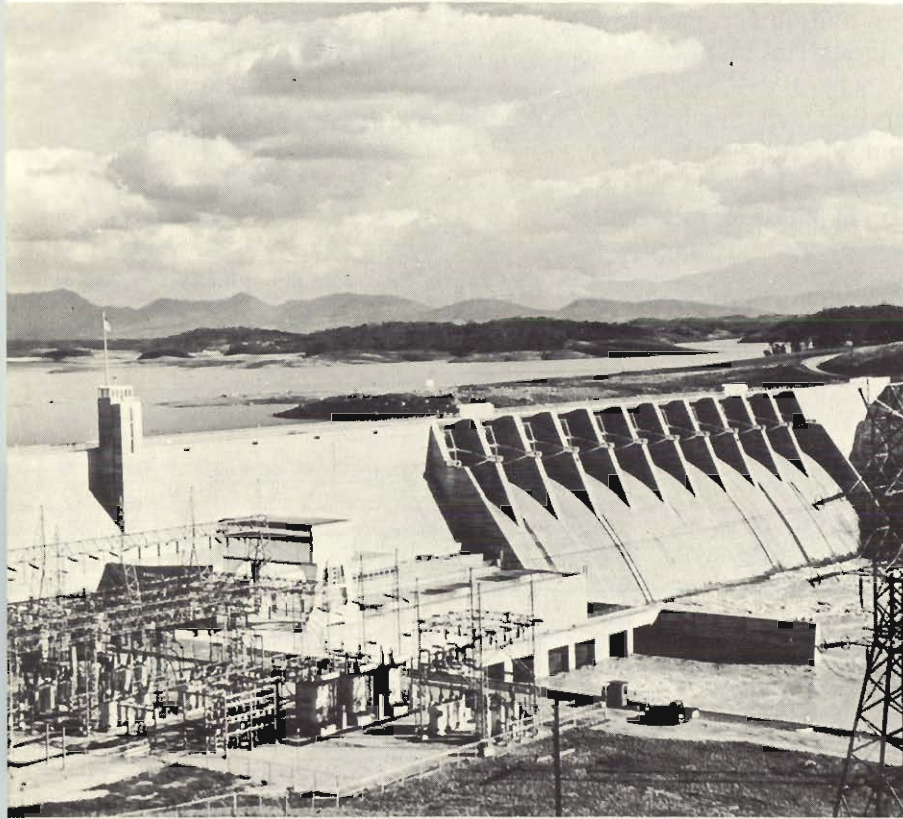
THE POWER OF THE RIVER

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



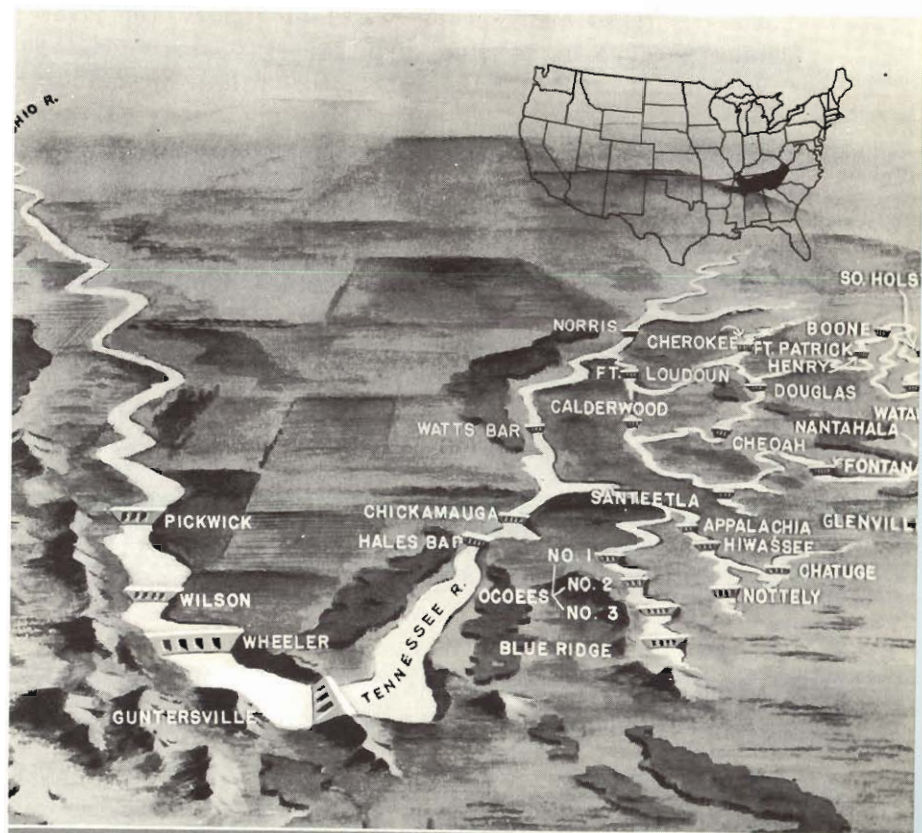
Douglas Dam, on French Broad River in Tennessee, is one of thirty dams in the Tennessee Valley system. Begun in 1933, this series of dams now controls the waters of the Tennessee River and its five principal tributaries. Waters which used to wreck the valley in time of flood are now put to work making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

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.

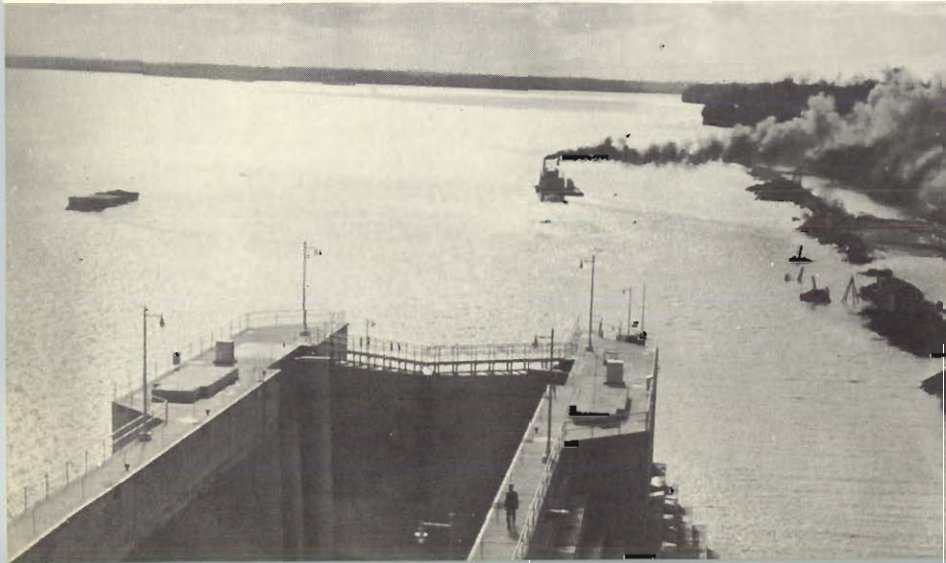
Power and safety are important, but they are not the only measures of the "economic and social improvement"

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.

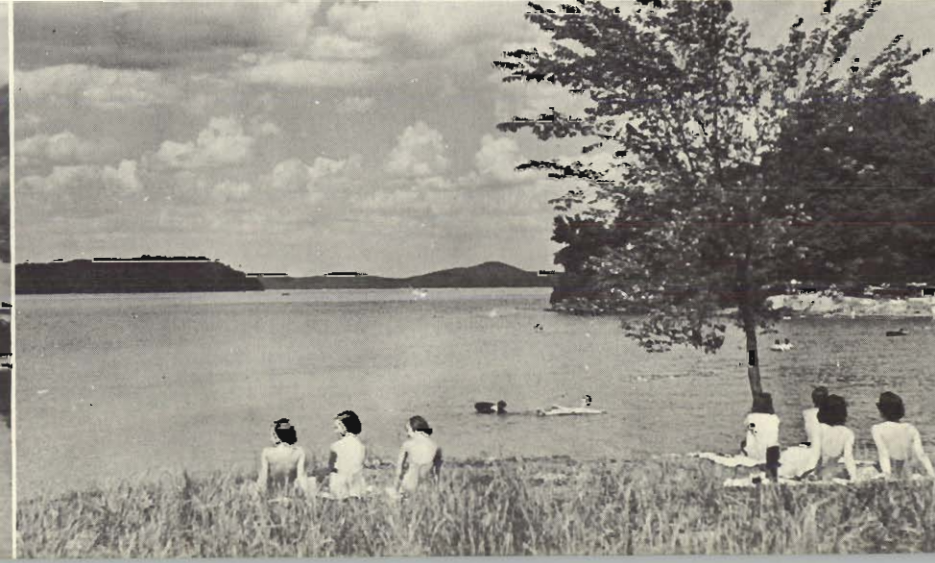
Communities in the region have annual "improvement contests." Members of the community compete in sports, in cooking and management of their houses, and in ways of making the home and community attractive.

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.

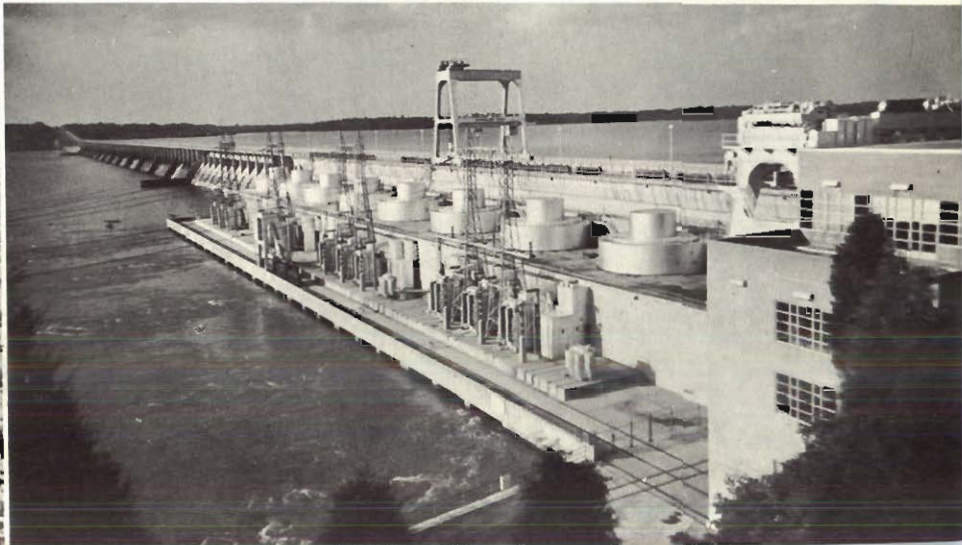
There is a place called Ducktown in the basin where copper ore was discovered a generation ago, and a smelter, a plant where metals are melted out of ores, was built. The forests for seven miles around were cut and burned for fuel. The fumes from the smelter destroyed all of the plants which remained, 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.

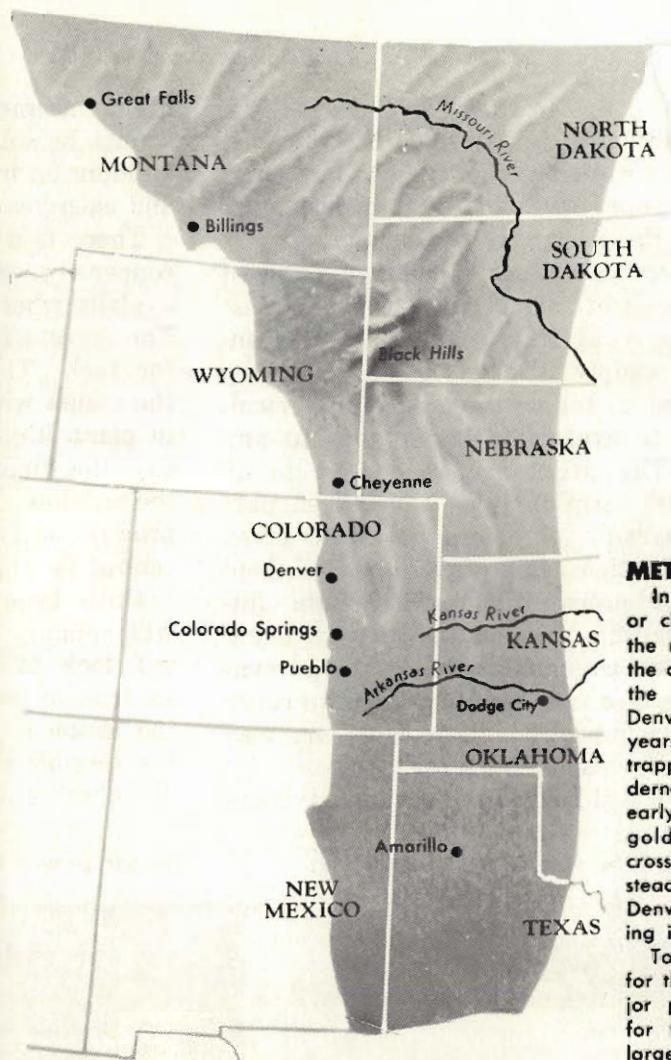
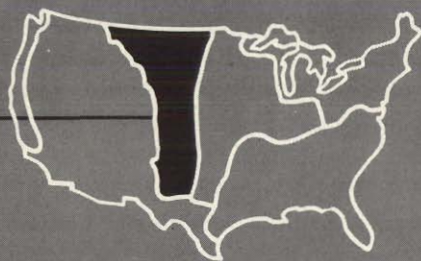
Seedlings for reforestation are grown in special TVA nurseries.



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



The Great Plains



METROPOLITAN AREAS

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.

METROPOLITAN POPULATION AREAS* (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.

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) rain-fall 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 capital, 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 un-

derstand 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.



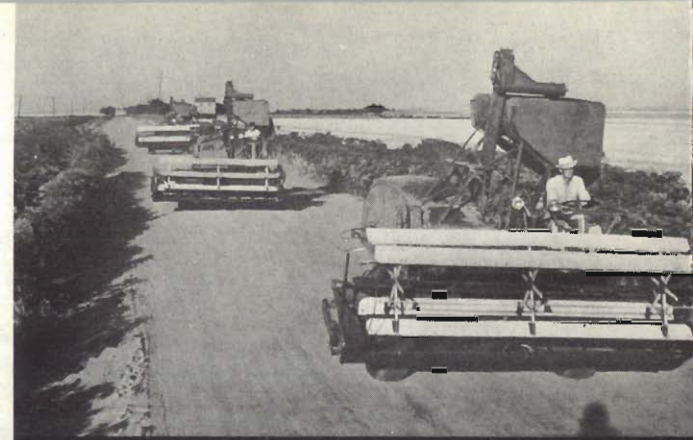
The combine cuts the heads from wheat stalks, shakes out the grains of wheat, and puts the straw back on the ground to protect the soil. It does this while it moves along, faster than a man can walk.

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.

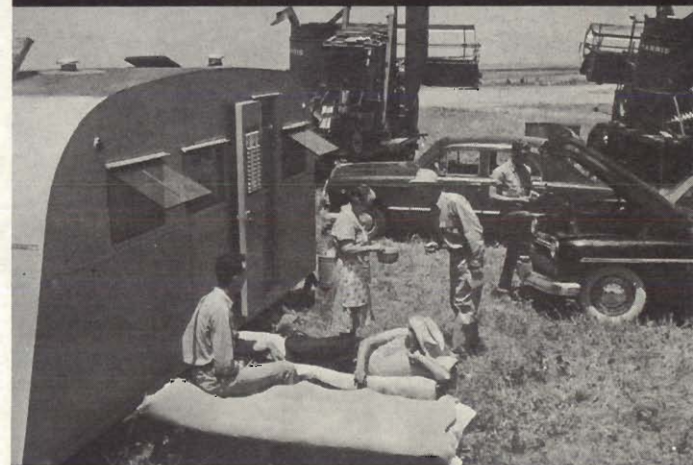
There is further hope for the future in the resources which lie beneath the soil. Below some parts of the plains, there are enormous supplies of minerals and crude oil. Industry is starting to move into the region that was once "The Great Desert." The people are beginning to understand the Great Plains,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

roads 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.

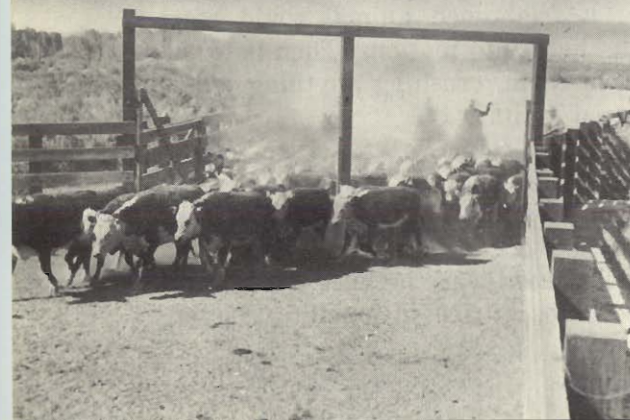
Within a few years, herds of heavy cattle moving eastward had made deep trails. At the end of the trails there were towns like Dodge City, called cowtowns because their trade was closely tied to handling, buying



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 associations 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

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

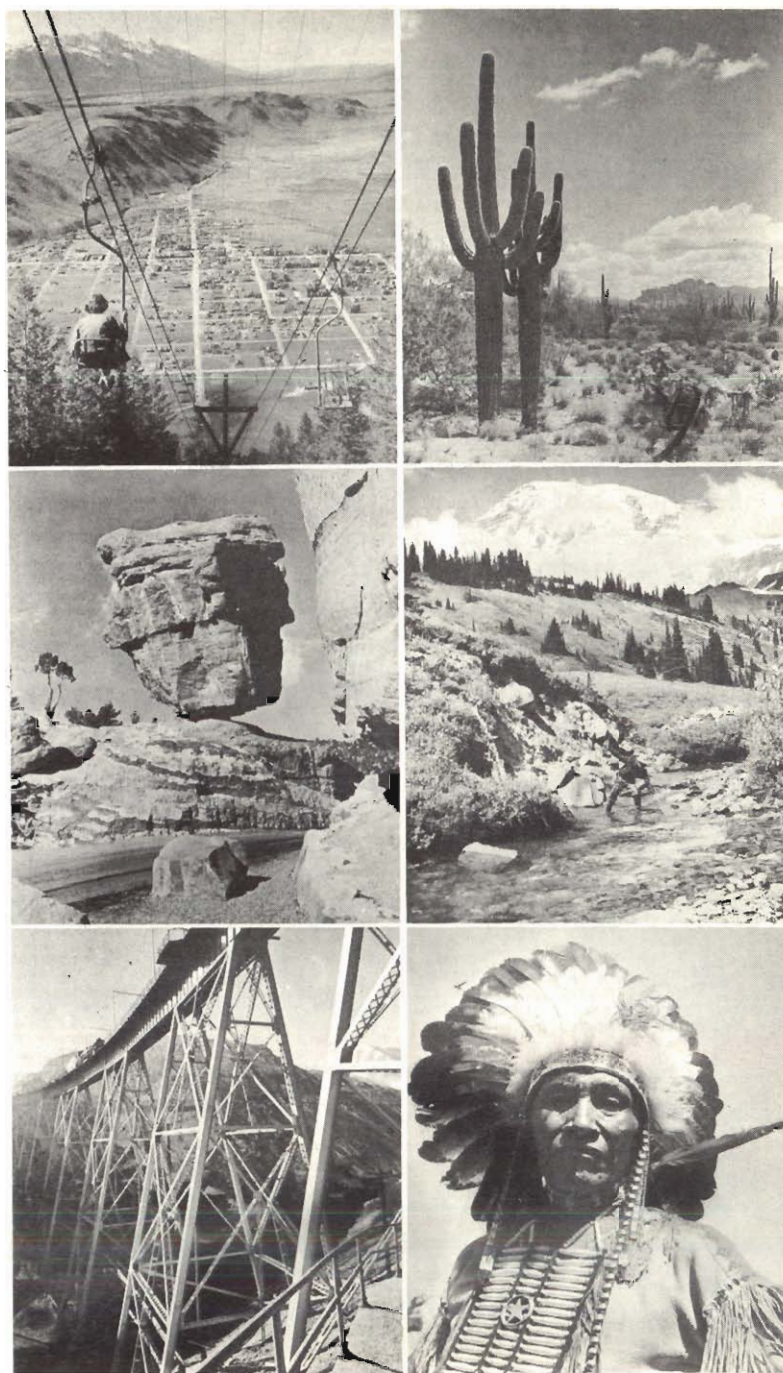
the country. Los Angeles is the heart of the vast collection of semi-suburban communities along the coast. Within the memory of many residents, this city has expanded until it is now the world's largest metropolitan area (452.2 square miles or 1176 square kilometers), harboring forty-odd separate communities. 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

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.

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

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.



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 individ-

uals 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.

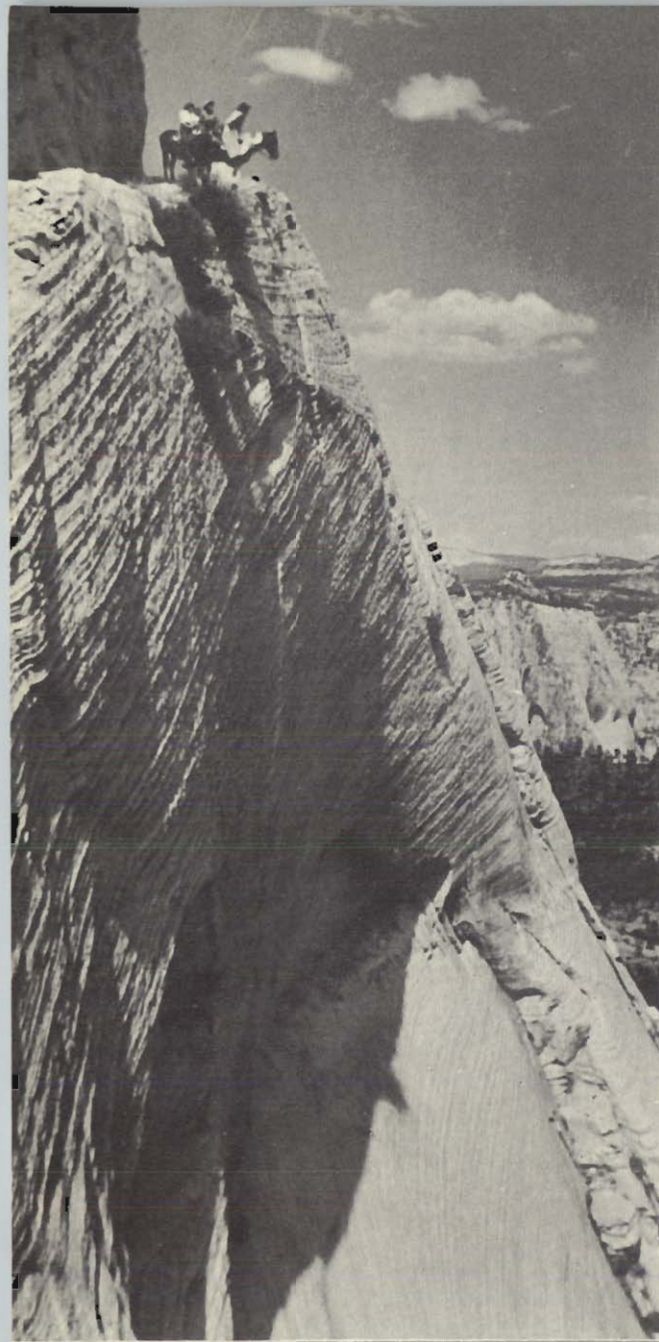
By a new process, different minerals can now be separated by chemistry. Since many ores contain four or five different substances in small quantities, mineral deposits which were formerly worthless can now be used. As a result, much ore which was thrown away in the early days of mining now yields a rich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

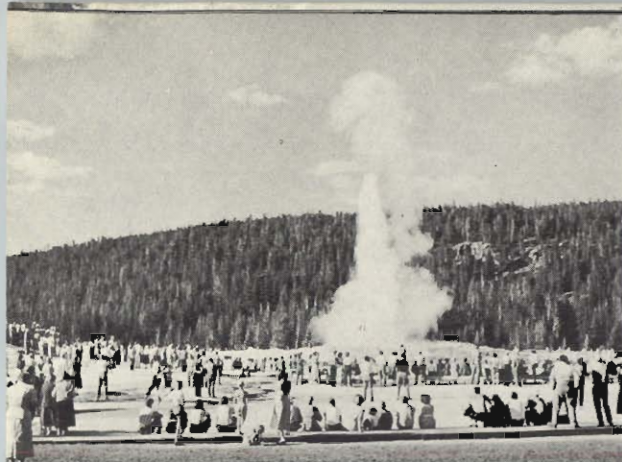
aside as a great national park for all people to enjoy. His suggestion was received with great enthusiasm by his companions, and also by the national government. Two years later the Yellowstone National Park came into being. Today 3,472 square miles (9,027 square kilometers) of this magnificent wild 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, un hunted and unafraid.

Some parks are famous for their scenery; others have special significance for students of earth structure or ancient cultures. For example,

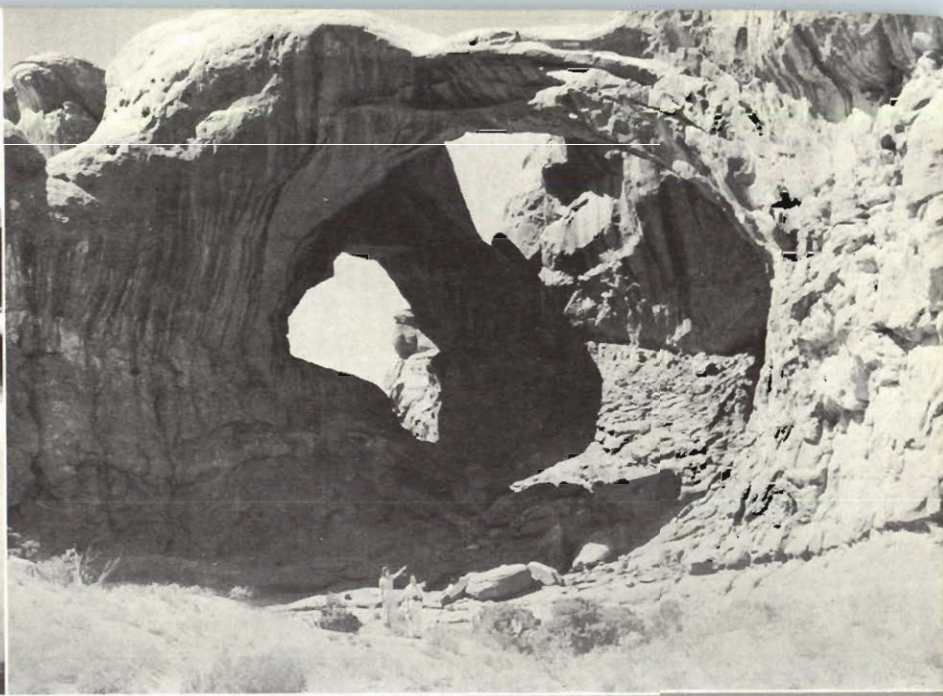
Mesa Verde National Park is a tableland about 15 miles (24 kilometers) long and eight miles (13 kilometers) wide, rising 2,000 feet (600 meters) out of the valley below. It contains the cliff-dwellings of some of America's earliest known Indian tribes. Rocky Mountain National Park tells the story of 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.



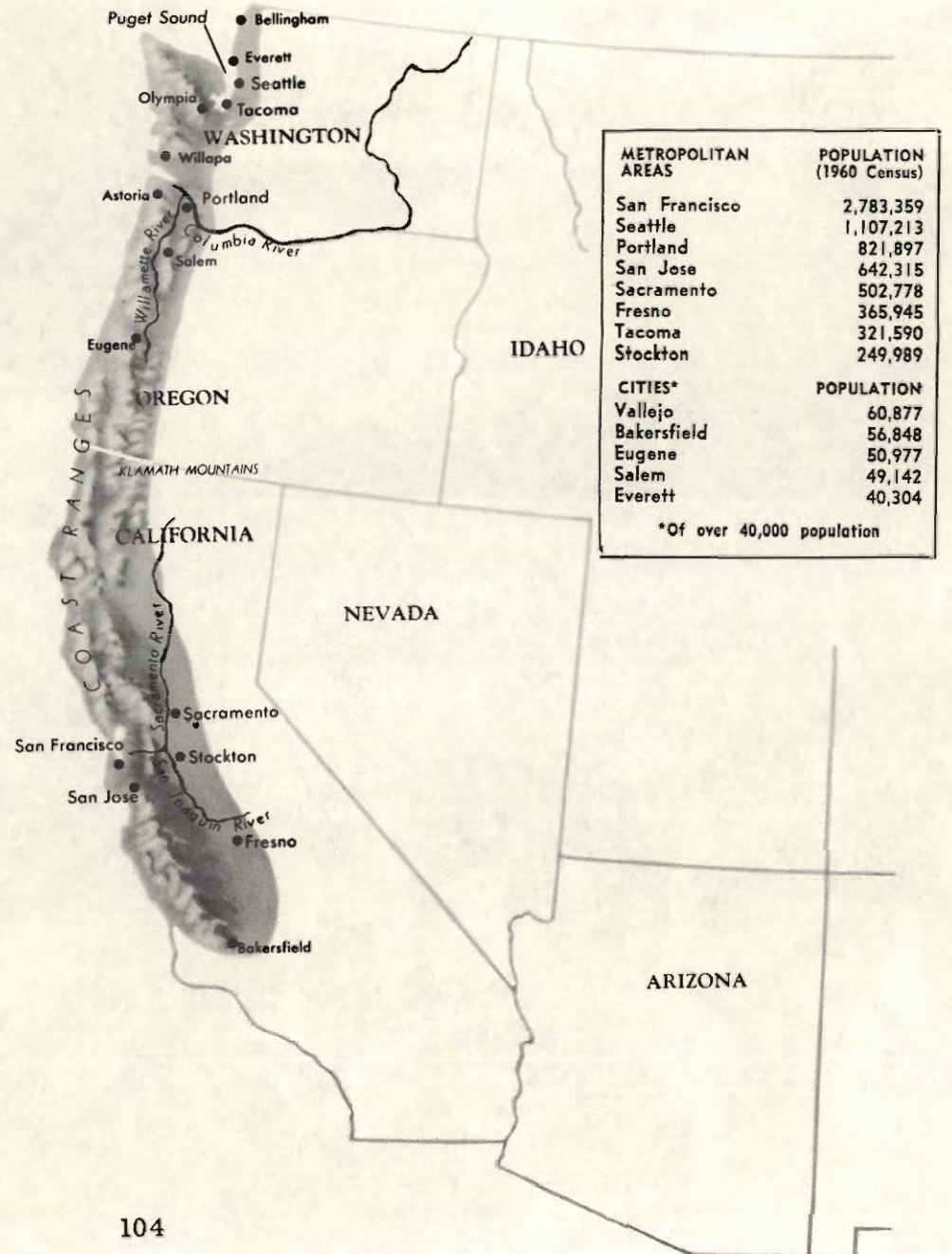
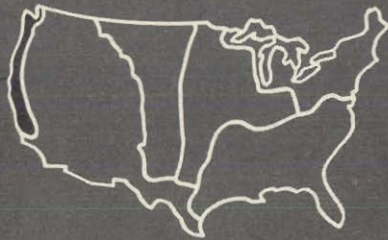
These curious natural stone arches are in the State of Utah.

Prehistoric cliff dwellings are in Mesa Verde National Park.



Yosemite National Park in California is a famous scenic wonder.

The West Coast Valleys



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.





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.

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.



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

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 farm-

ing, 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.

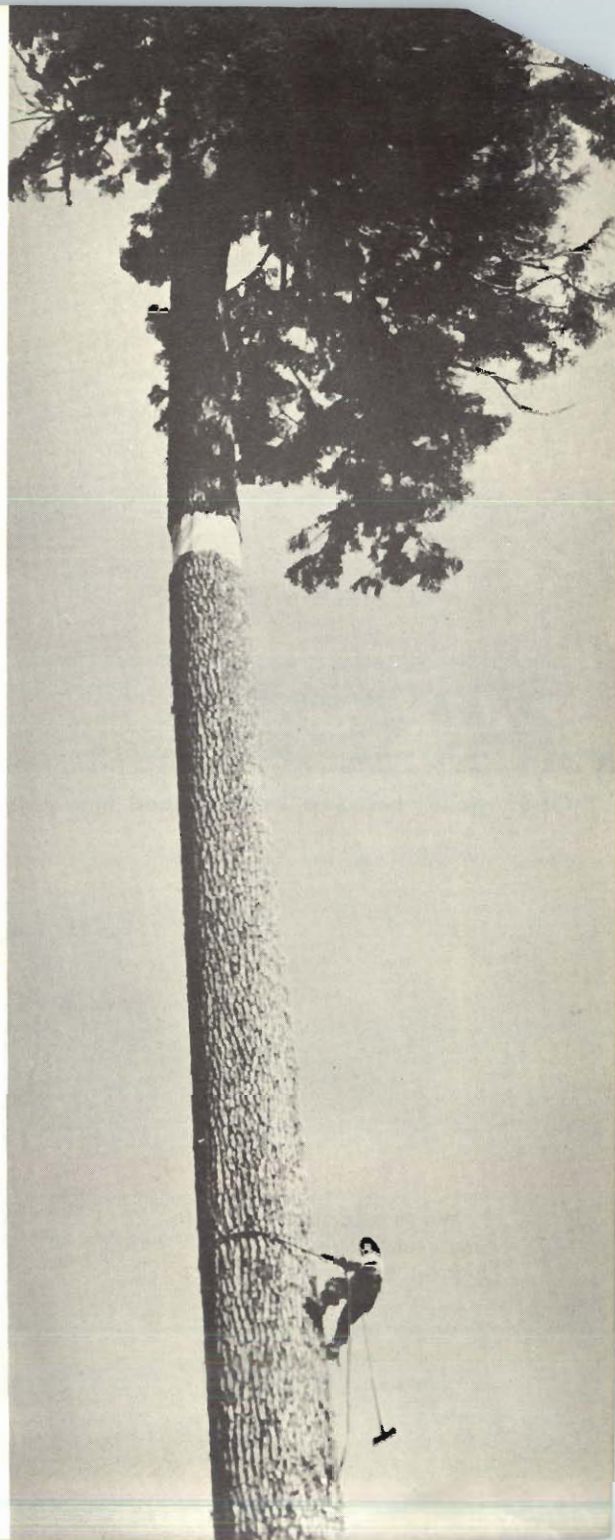
Citizens of the whole country became alarmed. As a result, in 1905, the government created the United States Forest Service, which protects the forests through careful management of lumbering. The Forest Service also works to prevent soil washing away, and it controls the use of streams. More than 18 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 (320,000 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.



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.

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.

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

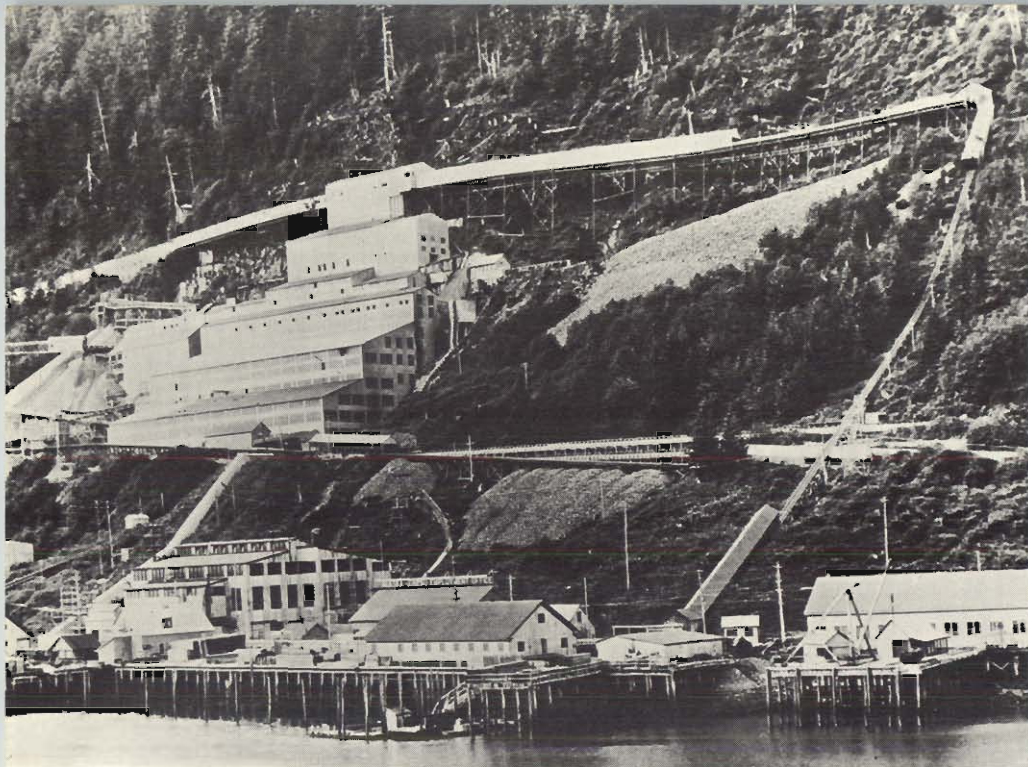
In 1959 Americans welcomed Alaska into the Union as the 49th state. Attitudes toward Alaska were different in 1867, when the peninsula was purchased from Russia. Then most Americans had little interest in "586,000 square miles (1,524,000 square kilometers) of icebergs and polar bears"—beyond Canada's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

tlements, 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 Hono-

lulu 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.

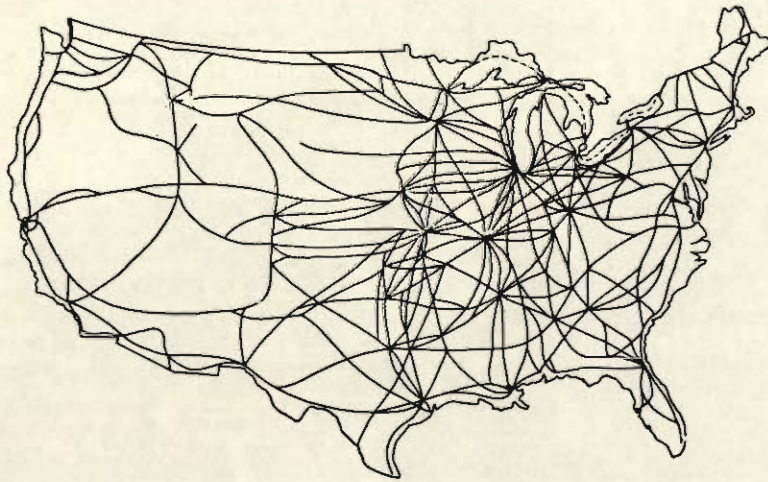
As in other, older civilizations, the first lines of settlement followed the rivers. Where there were no rivers, roads had to be built over land. The first of the big roads westward was the Cumberland Road, which ran for 600 miles (960 kilometers) from Cumberland, in the west of the state of Maryland,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

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”



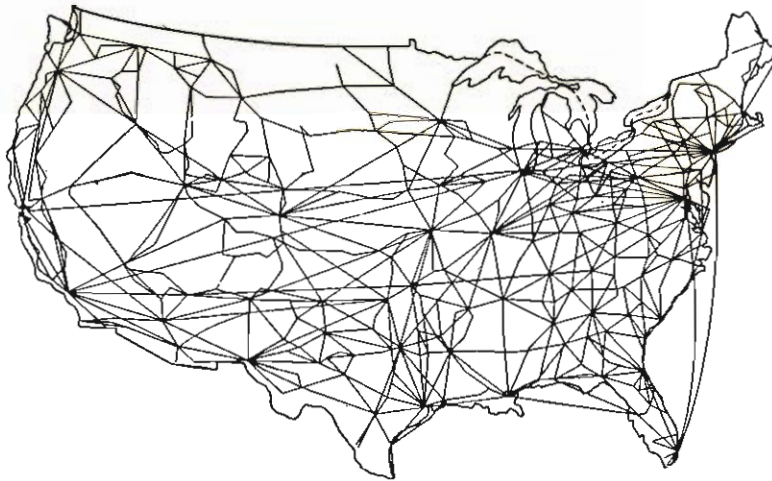
These lines show major and secondary highways.

—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



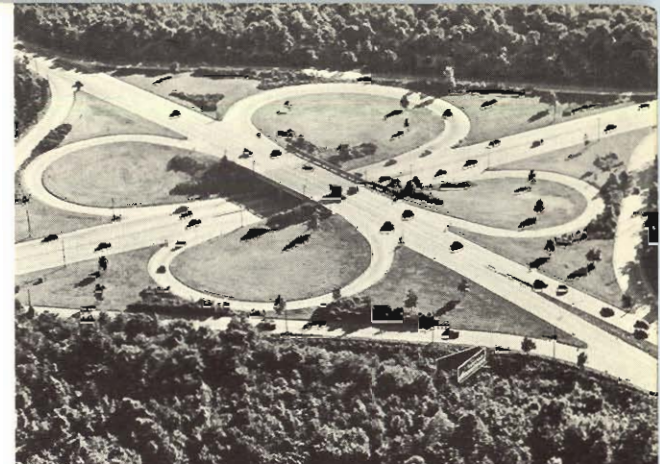
These are the major commercial airline routes.

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 Califor-

nia 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 col-

onies "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.



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 TVA—Tennessee Valley Authority
 OEM—Office of Emergency Management