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TARR & McMURRY'S
GEOGRAPHIES

SUPPLEMENTARY
VOLUME



OHIO



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TARR AND McMURRY GEOGRAPHIES

SUPPLEMENTARY VOLUME

OHIO

BY

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HEAD OF THE SCIENCE DEPARTMENT OF THE CENTRAL
HIGH SCHOOL, COLUMBUS, OHIO

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CONTENTS

	PAGE
THE GEOLOGICAL STORY	1
PHYSIOGRAPHY AND DRAINAGE	4
The Divide	6
The Northern Slope	7
Lake Erie	12
The Ohio River	14
The Southern Slope	14
CLIMATE	21
PLANTS	23
ANIMALS	24
MAN	26
The Mound Builders	26
Indians	29
White Men	31
INDUSTRIES	37
Agriculture	37
Mining	41
Coal	41
Iron Ore	44
Quarrying	45
Clay Working	48
Oil and Gas	51
Iron Manufacturing	55
Other Industries	58
TRANSPORTATION	60

	PAGE
EDUCATION	64
GOVERNMENT	69
CITIES AND TOWNS	72
Columbus	72
Cleveland	75
Cincinnati	80
Toledo	84
Dayton	85
Other Cities and Towns	86
REVIEW QUESTIONS	91
TABLES OF STATISTICS	94
BOOKS OF REFERENCE	98

ILLUSTRATIONS

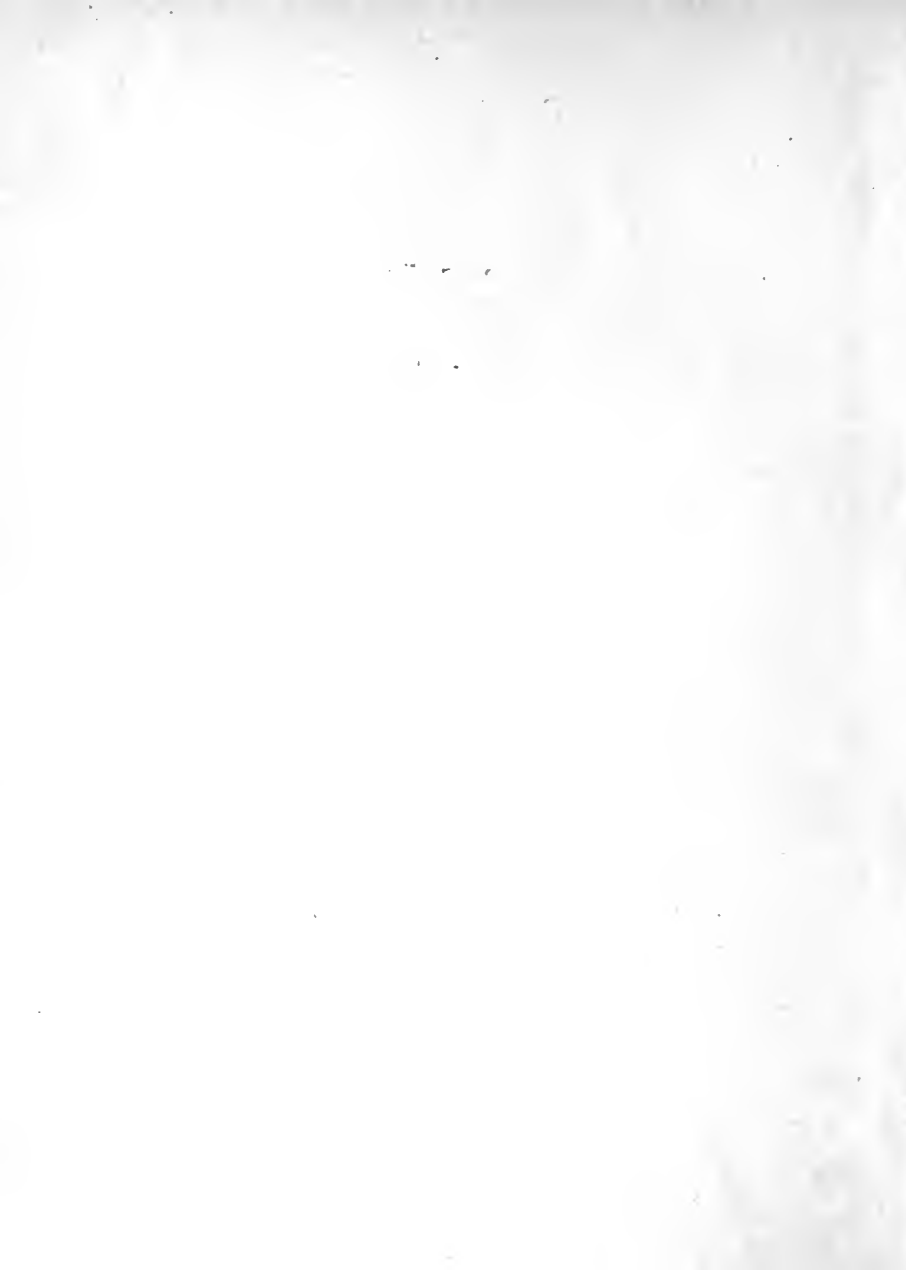
FIGURE	PAGE
1. Map of Ohio	<i>Facing</i> 1
2. Glacial Grooves in Limestone Rock on Kelley's Island	4
3. A Hill underlain by Rock	5
4. Summit Lake near Akron	7
5. Cuyahoga Falls	8
6. Section across the Cuyahoga Valley. (Diagram)	9
7. In the Maumee Basin	10
8. A Lumber Camp in Wood County	11
9. The Steep, Rugged Shore, Lake Erie	12
10. The Low, Sandy Shore, Lake Erie	13
11. Gibraltar, at the Opening of Put-in-Bay	14
12. The Ohio River	15
13. Section across a Valley made by Erosion. (Diagram)	16
14. The Licking River	17
15. Looking across the Kokosing Valley from Gambier	18
16. In the Upper Part of the Miami Basin	20
17. A Buckeye Tree	23
18. An Eagle's Nest	25
19. A Round-topped Mound in Ross County	27
20. The Great Serpent Mound in Adams County. (Diagram)	28
21. Inscription Rock	30
22. The Surveys of the Public Lands of Ohio. (Map)	33
23. Ohio in its Relation to its Neighbor States. (Map)	36
24. A Rolling Surface in Central Ohio	37
25. A Farm Home in Central Ohio	39
26. Rural Delivery	40
27. The Dairy Department at the State University	41
28. Section across an Eroded Valley in the Coal Measures	42
29. Towboat with Fleet of Empty Barges going up the River	43
30. A Street in a Mining Town in Athens County	44
31. Limekilns at Springfield	46

FIGURE	PAGE
32. A Quarry in Berea	47
33. Grindstones made of Berea Sandstone	48
34. The Largest Pottery in the United States	50
35. The Rookwood Pottery	51
36. A Brickyard in Columbus	52
37. Oil Field near Bowling Green	53
38. Oil Tanks near Bowling Green	54
39. A Blast Furnace	56
40. Raw Materials produced in Lake Region. (Map)	57
41. Iron Ore Docks at Conneaut	58
42. A Stream which furnishes Power for Mills and Factories	60
43. The Union Station in Columbus	63
44. A Lake Steamer	64
45. An Ohio River Steamboat	65
46. A Country Schoolhouse in Knox County	66
47. The Steele High School in Dayton	67
48. Orton Hall, the Geological Building at the Ohio State University	68
49. Domestic Science at the State University	69
50. Old Kenyon	70
51. Map of City of Columbus	<i>Facing</i> 72
52. The Fourth Street Market in Columbus	72
53. The State Capitol, showing the New Supreme Court Building	73
54. At the Corner of Broad and High Streets in Columbus	74
55. Map of City of Cleveland	<i>Facing</i> 75
56. The Lake Front, Cleveland	75
57. The Public Square, Cleveland	77
58. A Glimpse in the Forest City	79
59. Map of City of Cincinnati	<i>Facing</i> 80
60. A Street Car being drawn up the Mt. Adams Incline	81
61. The Art School and the Art Museum	82
62. A Bridge over the Ohio at Cincinnati	83
63. A Grain Elevator on the Maumee at Toledo	84
64. A Few of the Buildings of the National Soldiers' Home	85
65. The Home of President McKinley at Canton	87
66. Marietta, the Oldest Town in Ohio	91





FIG. 1.



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MAP QUESTIONS. — In what part of the United States is Ohio? Describe the northern boundary. The southern. The eastern. The western. What natural harbors on the lake shore? Name some of the islands. What is the longitude of Columbus? What is the difference in time between Columbus and London? What is the latitude of Columbus? On a globe trace this parallel around the world. What important cities are on or near it? In what zone is Ohio? By using the scale of miles, determine the distance across the state from east to west. How far is it from Cleveland to Cincinnati?

Trace a line across the map that will separate the rivers flowing north from those flowing south. What is this line called? To what river system do the rivers of the north belong? The rivers of the south? Draw a map of Ohio, and put in the rivers. Locate six of the principal cities. Locate your own county, and put in the county seat. Describe the location of your county. In what river basin is it?

The Geological Story. — Do you remember the story of how North America was made? In that story you are told that ages ago there was but a chain of islands in what is now eastern North America, a number of other islands in the far west, and between was a broad, open sea. In that far-away time Ohio was under this sea, near to the eastern islands.

The bottom of the sea was not very stable; but, like places along the coast to-day, it kept rising and sinking, the part near the shore being sometimes above water,

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sometimes below. The shores of this inland sea were like our present shores; in some places rugged and broken, in others low and flat. Along the shore and in the shallow water grew many plants and many strange sea animals. Then the bottom of the sea, at some distance from its eastern shore, came up above the water, forming an island, and this island is now southwestern Ohio and adjoining parts of Indiana and Kentucky. The sea bottom continued to rise till there was only a narrow strip of water on its eastern side. This strip in time came to be a swamp, and here the plants grew that were afterward changed into coal.

This great coal swamp covered what is now southeastern Ohio, parts of Pennsylvania, West Virginia, and Kentucky. When the swamp was above the water the coal plants grew in it; when below the water, the sediment from the land was deposited over it. The rising and sinking of the sea bottom continued till there were eighteen of these plant layers, varying greatly in thickness, between which were layers of sand, shells, and clay. At last the sea bottom was slowly raised above the water, forming the Appalachian Mountains in the east, and an extensive low plateau in the west. The plant fragments of the old swamp were slowly changed into coal, and the loose sands, shell beds, and clays into sandstone, limestone, and shale. As soon as the land was thus uplifted, the air and water began to act upon it, wearing it down, carrying it away, and carving out deep valleys.

After a long while, for reasons not known to us, the climate became very cold; the snow that fell in the winter did not all melt away during the summer, but began to accumulate, and in time the great glacier was formed

that covered northern North America. Where is there such an ice sheet now? What can you tell about it? As it travelled across Canada and the Great Lakes, it carried with it thousands of tons of rock and soil; much of this material was deposited along the front of the glacier, where the ice was always melting away. Thus were formed many series of low, rounded hills made of sand, gravel, and clay, the *terminal moraines*, as they are called.

How long the glacier lasted no one knows, but it must have been a long time, if we may judge by the amount of rock fragments or *drift* which it brought down and deposited. Then the ice began to melt away from the state. The streams flowing south became swollen, and carried away great quantities of sand, gravel, and clay, much of which was dropped on the sides or in the beds of the streams. Thus the valleys were built up. There was so much water that the Ohio could not carry it all away, and a lake was formed, reaching from the neighborhood of EAST LIVERPOOL to below CINCINNATI. At last the ice was all gone from over the state, and the great valley to the north was filled with water, forming Lake Erie, which was at first much larger than it is at present. What would be the effects upon the streams, hills, and valleys, if a great sheet of ice should now come down over the state?

Effects of the Glacier. — The appearance of the part of Ohio that had been covered by the glacier was entirely changed. The hills were worn down, and the valleys were partly or completely filled up; new hills of drift were made; many of the rivers had to find new paths, and begin again to wear valleys; the rock surfaces were scratched and grooved. These scratched surfaces may

still be seen in many parts of the state, but are especially well shown on the shores of Lake Erie and on the islands (Fig. 2). The soil was completely changed, the new soil being in many cases better than the local soil, but in some cases not so good. The beds of sand, clay, and gravel that the glacier brought have been of great value



FIG. 2.

Glacial grooves in limestone rock on Kelley's Island.

in the development of the state. Give uses for each of these materials.

Physiography and Drainage.—Ohio is a part of the great Allegheny Plateau region, which extends from New York south and west, through Pennsylvania, Ohio, West Virginia, and Kentucky, to Tennessee. It is a plain with an average height of about 850 feet. There are no true mountains in the state, but there are many hills, and some of these reach such a height that they are locally

called mountains; for example, the hills between the basins of the Scioto and Miami, which have a height of from 1200 to 1300 feet above sea level.

There are two causes for the hills of Ohio: the first is the erosion of the old plateau through long periods of



FIG. 3.

A hill underlain by rock. Notice the position of the rock layers. Notice, also, the depth of the soil. What is soil?

time; the second, the deposition of great piles of drift by the glacier. The hills of the first class are often steep and high, are underlain by rock (Fig. 3), and are covered usually with a soil which is formed by the decay of the rock; if in the glaciated region, they may be covered with drift. Examples of these are the hills along the Hocking Valley, or the valley of the Muskingum. The

second class are made of gravel and clay, are never very high nor steep, but are usually rounded on the top, and have gently sloping sides. Such hills may be seen almost any place in central or western Ohio.

A series of hills, most of them made of drift, with an average elevation of but a few hundred feet above the surrounding country, extends from Ashtabula County, in a south and west direction across the state, to Mercer County, dividing the plain into two slopes, a short, rather abrupt slope to the north, a long, gentle slope to the south. The waters of the northern slope are carried by many short streams to Lake Erie, the southern streams carry the water to the Ohio.

SUGGESTIONS. — Draw a map of Ohio, and put in all the streams of importance. Trace the great divide. With dotted lines trace the divides between the different smaller streams. On this map write the characteristic features of each river basin as the basin is studied.

The divide which separates the streams flowing north from those flowing south is broad and flat, and has an average elevation of about 500 feet above Lake Erie. The highest point is not more than 1000 feet above the lake. Lake Erie is 565 feet above the level of the sea.

Owing to an uneven distribution of the drift on the crest of the divide, there are many small depressions which are filled with water, forming charming little lakes. They are rarely more than a square mile in area, many of them but a few acres (Fig. 4); some have been filled up with the waste from the hillsides, and have become swamps. They act as reservoirs for the surrounding region, their waters supplying small streams, or, sinking into the ground and reappearing farther down on the

sides of the hills, as springs of clear, pure water; these springs add much to the value of the farm land. Many of these little lakes are seen in the neighborhood of AKRON and CANTON.

Some of the towns along the divide are CELINA, KENTON, MARION, BUCYRUS, CRESTLINE, CANTON, and AKRON. Most of the land is good rolling farm land.

North of the divide, the land sloping toward Lake Erie was once covered by the glacier, and most of it by the



FIG. 4.

Summit Lake on the divide, the source of Akron's water supply. One of the state canals passes through the lake.

waters of the larger Lake Erie. The glacier smoothed down the hills and filled up the valleys, some of which had a depth of two hundred or more feet, and over all laid down a thick cover of drift, usually quite level, but sometimes arranged in long ridges. When the ice had melted away and the region was covered by the waters of the lake, another layer, this time a fine clay sediment, was deposited over the drift, giving a peculiar character to the soil of this region. Around the lake, banks and ridges, real beaches, of sand were formed, just as they are

to-day being formed along parts of the shore of Lake Erie. This also gives a peculiar character to the soil.

In the eastern part of the state the divide is so far north that some of the streams which flow to the south have their rise almost within sight of the lake. The streams that flow directly north to the lake, are short and



FIG. 5.
Cuyahoga Falls.

rapid; some, however, are turned aside by the drift ridges already mentioned, and run for some distance back of these ridges, until, finding a way through, they turn to the north and enter the lake. To illustrate this, trace the course of the Cuyahoga River and the Grand River. These streams have narrow valleys, swift currents, and many falls and rapids.

In Erie County, east of the Sandusky River, is a large spring, called the "Blue Hole," which is the outlet for an underground stream of good size, which from this point on to the lake flows on the surface.

The Sandusky River is navigable as far as FREMONT. Most of the basin is level; the upper part, which includes the Sandusky Plains, has a deep, rich soil, and was once a grass-covered prairie.



FIG. 7.

In the Maumee Basin, in Wood County.

The Maumee, formed by the junction of the St. Joseph's and the St. Mary's, is the largest river in northern Ohio. Williams County and a part of Defiance County are the only parts of its basin which were not once covered by the waters of the lake, and in these counties there is a different soil. The old lake beaches and low glacial ridges form the only relief on an otherwise flat, monotonous surface (Fig. 7). Four of these beaches, or "sand ridges" as

they are called, can be traced across the country, running practically parallel with the present shore of Lake Erie. They have fixed the direction of the streams that are tributary to the Maumee.

When the waters of the larger lake withdrew, many



FIG. 8.

A lumber camp in Wood County.

hollows in the former lake bed were left filled with water; these in time became marshes. A large part of the Maumee basin, as well as the land to the southeast of it, has been known as the "Black Swamp" region. Until quite recent times this was covered with a thick forest, which is fast disappearing (Fig. 8); and the miles of ditch

that have been dug, at a cost of millions of dollars, have changed the swampy forest land to one of the best farm regions in the state. There are many fine artesian wells all through this part of the state.

Name the principal towns in the Maumee basin. Why is TOLEDO a great lumber market?

It was on the banks of the Maumee, near PERRYSBURG, that the battle of Fallen Timbers was fought in 1794, in which General Anthony Wayne defeated the combined forces of the Indians under Little Turtle and Brandt, and compelled them to sign the treaty of Greenville, which gave security to life and property in the Northwest Territory.

Lake Erie is a part of the St. Lawrence River system, and borders Ohio for 230 miles. In comparison with the other Great Lakes, it is very shallow, Lake Superior having a depth of over 900 feet, Lake Michigan over 800

feet, while Lake Erie is but a little over 200 feet in the deepest place, and at the western end, between the islands, it has a depth of but 40 feet.



FIG. 9.
The steep, rugged shore.

The lake shore is regular, having but two large natural

harbors, Sandusky and Maumee bays; all the other harbors are artificial. There are two types of lake shore:

first, the steep, rugged rock cliffs, which are being constantly beaten upon and worn down (Fig. 9), and which may be seen at Marblehead, across the bay from Sandusky, and on any of the islands; and, second, the low, sandy shore, where the waves that roll in bring large quantities of sand, which is being deposited, thus building up the shore (Fig. 10). The low sandy shore may



FIG. 10.

The low, sandy shore.

be seen at Cedar Point, at the opening of Sandusky Bay, which is noted for its fine bathing, and at other points along the lake.

At the western end of the lake are a number of islands (Fig. 11); these are masses of limestone which project from fifteen to eighteen feet above the water. A good soil and a good climate fit them for agriculture, and gardening and fruit raising are important industries there. The delightful climate and the fine boating and bathing are attractions which during the summer draw thousands of people from all parts of

the state. While many of these visitors go to the islands for but one day, many more spend the summer there. Summer hotels, cottages, club houses, and summer homes are numerous, and caring for the summer visitors is one of the chief occupations of the people.

On Put-in-Bay there are several large caves in the limestone rock. How are caves formed?

The name *Put-in-Bay* has been given to the large bay in South Bass Island, and it is also applied to the island, because it is said Commodore Oliver Perry "put in" to the bay after the battle of



FIG. 11.

Gibraltar, at the opening of Put-in-Bay.

Lake Erie in which the American fleet gained a victory over the English boats and took them all captive. In what war was this? What was the famous message sent to General Harrison? Johnson's Island, at the mouth of Sandusky Bay, was used as a military prison during the Civil War, and many Confederate officers were confined there.

The greater part of Ohio is south of the divide on the long slope which is drained by the tributaries of the Ohio River. These streams have a fall throughout their whole course of from a few inches to five feet in a mile; while

those on the northern slope have a fall of from twelve to seventeen feet in a mile.

Name the principal streams flowing south. Which is the longest? Which drains the largest basin?

The glacier passed over the northern and western part of this section, but not over the eastern part, and this causes a marked difference in the surface and in the soil.

The Ohio River (Fig. 12) is a large stream flowing for 446 miles through a narrow valley on the boundary of the



FIG. 12.
The Ohio River.

state. The valley, which has been cut out of the plateau, is in no place on the Ohio boundary more than two miles wide, and it reaches that width in but few places. The hills which form the sides of the valley are from 300 to 600 feet in height, are quite steep, and are covered with forests. Here and there among the trees may be seen the opening of a clay bank, a quarry, or a coal mine. The river is winding, and the narrow flood plain is sometimes on one side, sometimes on the other. The bottom

land and most of the islands are good farm land, but suffer greatly from the spring and autumn floods.

The river is navigable for small craft throughout the year, for large boats during the seasons of high water, and for coal fleets only at the time of very high water (Fig. 29). Work is now being done by the United States government to improve the river, and so to aid transportation. Name the cities and towns along the river. A great many manufactories, such as potteries, blast furnaces, steel plants, and rolling mills, are seen on both sides of the river.

Why is the Ohio called the American Rhine? Compare the Rhine and the Ohio as to length. The Ohio River may be said to belong to Kentucky and West Virginia, since the southern boundary of our state is the line of lowest water. Who was Blannerhasset? What two presidents were born in Ohio river towns? President William Henry Harrison is buried on the side of a hill overlooking the Ohio at Great Bend, below Cincinnati.

The eastern part of the southern slope of Ohio, the part which was not covered by the glacier, has many high hills

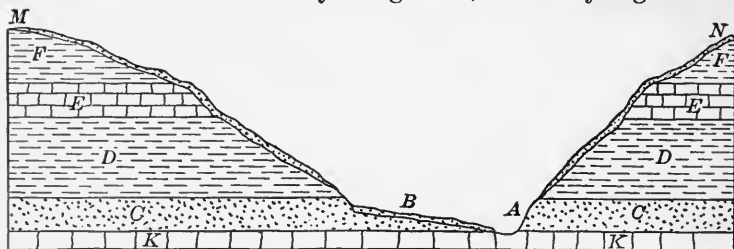


FIG. 13.

An ideal section across a valley made by the erosion of a stream. *A* is the present bed of the stream, *B* is the narrow flood plain, *M* and *N* represent the original surface of the plateau. Which of the rock layers offer most resistance to erosion and weathering, — the sandstone *C*, the limestone *E*, or the shale *D*?

with deep valleys between. The rocks in the sides of the hills are found to be in horizontal beds, and the layers on either side of the valley correspond (Fig. 13). From this we know that, during the many years that this land has been above the ocean, the streams that have been flow-



FIG. 14.

The Licking River. Compare this with Fig. 13. What has become of the material which formerly filled this valley?

ing across it have been wearing it down and carrying the material away until the valleys have been made. The high lands between are the remnants of the old plateau. In time what may happen to these hills? In Fig. 14 is shown the Licking River, which is making for itself a valley through the rocks. On which side is it cutting? Where is it beginning to make a flood plain?

The Muskingum, which is formed by the junction of the Walhonding and the Tuscarawas, drains a larger area than any other river entirely within the state. The northern part of the basin is broad, the tributary streams coming in from every direction; in the lower part of the course there are no tributaries of importance and the basin is narrow. The Muskingum is navigable for steamboats

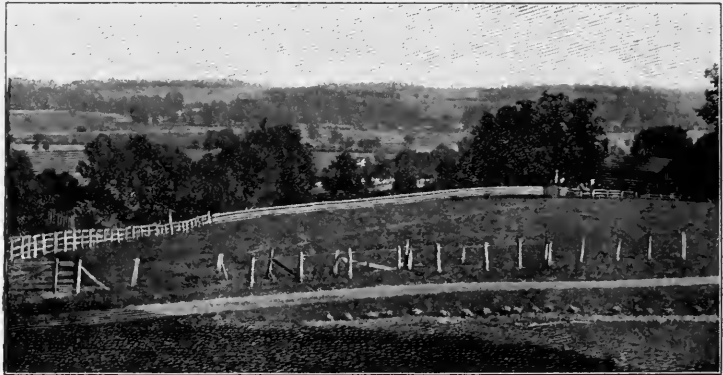


FIG. 15.

Looking across the Kokosing Valley from Gambier. In the upper part of the Muskingum basin.

for a distance of eighty miles above its mouth. To help navigation the government has built a series of dams, canals, and locks which make it possible for boats to pass over or around the shoals and rapids. The dams also furnish valuable water-power which is used for various manufactories.

In the broad upper part of the Muskingum basin there is much fine rolling farm land (Fig. 15); in the middle and eastern part are important coal mining districts; the

lower narrow part of the basin is very hilly, except along the river, where there is a narrow flood plain, which is good farm land. Name the cities in the Muskingum Valley.

The Hocking is a small, rapid stream draining a very hilly area; the hills along the upper course, called the "Hocking Hills," are locally quite famous for their beauty. The Hocking Valley is the most important coal mining region in the state, and also contains an important gas field at SUGAR GROVE, and an oil and gas field at CORNING.

The Scioto River drains a long narrow strip through the central part of the state; it has several tributaries, whose water-power is used in sawmills, paper mills, tanneries, and grist-mills. The upper part of the basin is good rolling farm land; in the middle and lower part are fine bottom lands, which produce large crops of corn and other grains. These bottom lands are made of the material carried down by the river when the glacier was melting away; the river in part of its course is running in a narrow trench, and the farm land is on a terrace made of drift on either side. The larger towns are built on the terrace (Fig. 6). To the south the hills are higher and are nearer to the river, and at PORTSMOUTH, where the Scioto enters the Ohio, the valley is very narrow, and the hills are from four to five hundred feet high. This valley was a favorite dwelling-place of the Mound Builders, many of their most famous earthworks being built along the river. Name the cities in the Scioto Valley.

The region along the divide between the Scioto and the Miami is hilly, the hills in the south being named mountains, as Long Lick Mountain and Bald Mountain;

some of the upland in this section is flat and poorly drained, the result being considerable swamp land. Along the northern part of the divide, near BELLEFONTAINE, in Logan County, is the highest land in the state, one hill being 1540 feet above sea level. The lowest land in the state is also in the basin of the Big Miami, the mouth of the river being but 432 feet above sea level, or 133 feet

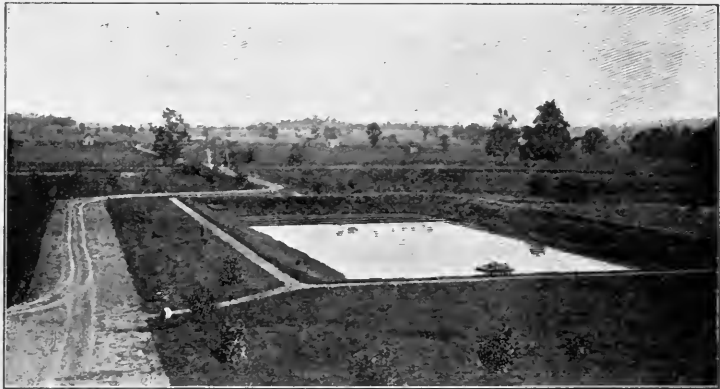


FIG. 16.

In the upper part of the Miami basin. In the foreground is seen the reservoir of the Springfield water works.

lower than the surface of Lake Erie. The fall in the Big Miami is from three to six feet in a mile. It is estimated that at least three hundred mills use the water-power from the two Miamis and their tributaries.

The upper part of the basin of the Big Miami (Fig. 16) is rolling farm land; it is underlain by a limestone which is near to the surface, and there are many quarries where stone is obtained for building purposes, and also for burning to make lime. The lower part of the basin has a deep,

rich, black soil, which has been derived, in part at least, from the underlying limestone, and it is said to be one of the best farm regions in the world. The Miami and Erie Canal follows the river for many miles, and it also furnishes water-power for paper mills, grist mills, and other manufactories.

Name the cities and towns in the Big Miami basin. Name three in the Little Miami basin. Model the map of Ohio in sand; show the divide between the Mississippi system and the St. Lawrence, the principal river basins, and the divides between. Locate the principal cities and see if you can tell why they are situated as they are.

Climate.—In what zone do you live? Give your latitude and longitude. From what direction does the wind usually blow? Keep a record for a month showing the direction of the wind, the number of rainy days, and the temperature. What is meant by the “prevailing westerlies”?

Ohio is in the path of the prevailing westerly winds. Will these winds be wet or dry after blowing across the United States? If we depended upon the prevailing wind to bring us rain we would have a dry climate; we are, however, also in the path of the great whirls or eddies of air which are constantly disturbing the regular flow of the westerly winds. These great whirls come usually from the northwest, and when the wind blows out from the centre in every direction, we have fine clear weather; when the wind blows in toward a centre, as you have seen it do in the little whirlwinds in a dusty road, then we have cloudy, rainy weather. The areas in which the air is moving in toward a centre are known as cyclonic storms. When one of these cyclonic storms moves slowly along over Ohio the winds blow in from every direction; the winds from the south and southeast are warm and

bring moisture from the sea. This moisture, as the air cools, is condensed and falls as rain. It is because of the passage of the storm and clear weather areas that we have such variable weather from day to day.

The average rainfall for a year in Ohio is 37 inches. The northeastern part of the state averages 34 inches, while in and around Toledo the average is but 28.5 inches. The central part of the state averages 38 inches, and the southwestern part has 39.6 inches. There is sufficient rainfall for agriculture in all portions of the state, but crops requiring the most moisture are produced in greater abundance where more moisture falls. Grass grows well with light rainfall, and, therefore, a larger per cent of the land is in pasture in the northern than in the southern part of the state.

The temperature of the state is subject to extremes, the summers are hot, the winters are cold. In 1900 the highest temperature reported was 103° in the shade, the lowest 20° below zero, making an absolute range of temperature of 123°. In the central part of the state the average temperature is between 50° and 52°, in the southern part between 54° and 57°. Lake Erie modifies the climate of the counties along its border, causing them to be cooler in summer and warmer in winter than the counties farther south; the effect of this is seen in the many orchards and vineyards which are found along the lake border. The warmer counties in the south produce a great many berries and some other fruits, and also much tobacco.

The climate of the state, as a whole, is suitable for raising grain; wheat and corn are two of the most important products.

What do you know about the Weather Bureau service? Is there a station in your town? If so, procure some of the maps and familiarize yourself with them. Which of our industries are especially benefited by the service of the Weather Bureau?

Plants.—Originally Ohio was almost entirely covered with a dense forest. The trees were those common to the

temperate zone:

walnut, butternut, cherry, hard and soft maple, elm, sycamore, oak, beech, ash, chestnut, buckeye, and hickory. The lowlands of the state are mostly cleared, but there is still a patch of woodland on nearly every farm. From the hills the large timber has been cut away, but a thick growth of young timber often partly

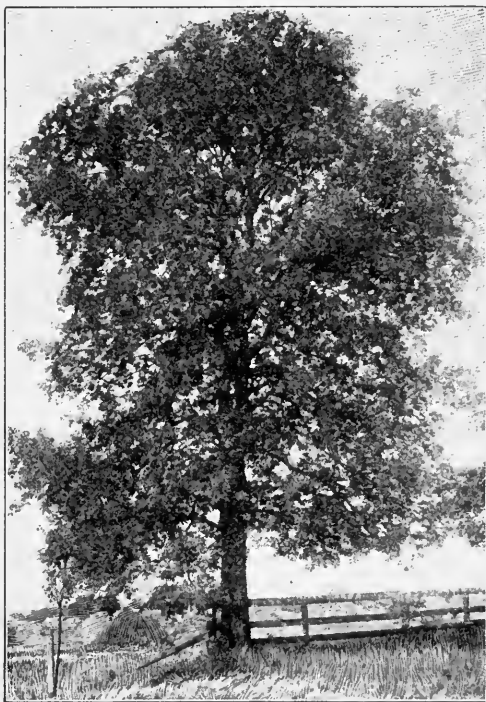


FIG. 17.
A buckeye tree.

covers them. An effort is being made in some parts of the state to replace the trees that have been cut down, and

many trees have been set out on the hills and on waste ground. What is the effect on the climate of removing the timber? Are there any laws in Ohio for the protection of the forests?

The buckeye (Fig. 17), from which the state derives its nickname, is peculiar to this part of the United States, being found only in Ohio and adjoining states.

The term "Buckeye State" came into general use in the campaign of 1840, when William Henry Harrison, of Ohio, was the candidate for the presidency. A cabin, made of buckeye logs took a very prominent part in the campaign, and in a popular song it was said to be ". . . a token and a sign of the bonnie 'Buckeye State.' "

Some of the fruits native to Ohio are the blackberry, raspberry, elderberry, wild plum, cranberry, and the pawpaw. Of the cultivated fruits, apples and peaches grow in all parts of the state; peaches and berries are raised in abundance in the southern counties, while grapes and pears are especially abundant in the counties along the lake and on the islands. Why?

Some of the commonest wild flowers are buttercups, violets, anemones, spring beauties, trilliums, and the Indian turnip. On the hills are found arbutus, orchids, columbine, laurel, and the gorgeous wild honeysuckle. In autumn along every roadside and in the fence corners grow goldenrod and purple asters. Many varieties of ferns grow in all parts of the state. Make a list of the forest trees that grow in your neighborhood; of the fruits; of the wild flowers. What scenery most appeals to you? Describe it.

Animals.—The large wild animals which were here when the first settlers came have entirely disappeared.

Bears were common, buffalo and deer furnished most of the meat for the pioneer's table, and wolves were so numerous that the government offered a bounty for their scalps in order to rid the country of them. Wild turkeys and wild pigeons, which were very abundant, have also disappeared. Foxes, opossums, skunks, and raccoons are still found where there is woodland, and rabbits and squirrels are quite plentiful in all parts of the state.

Many birds spend the summer in this latitude: song-birds, such as the song sparrow and the meadow lark; game birds, as the dove and the quail; birds of prey, as the owl, the hawk, and the eagle. Eagles are still found on the borders of the lake and on the islands. They build their nests in the tops of the tallest trees (Fig. 18), the nest shown being over one hundred feet above the ground; it is built of twigs and branches, and is five or six feet in diameter.

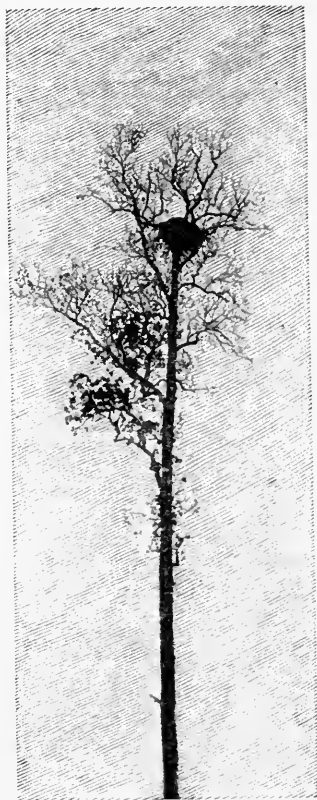


FIG. 18.
An eagle's nest.

There are many varieties of fish in Ohio, both in the lake and in the streams. Fishing is an important industry

on the shores of Lake Erie. Some of the most important food fish in the lake are whitefish, bass, lake trout, and pickerel; in the streams, perch, catfish, and sunfish. The United States government maintains a fish hatchery on Put-in-Bay Island, and the state also has a hatchery in Sandusky. From both of these young fish are obtained which are used to stock Lake Erie and the lakes and streams of the state.

Make a list of the wild animals that are found in your county. Of the birds that stay all the year, of those here during the summer. What has the government done to protect the birds? Why is this necessary? Are there any other wild animals protected by law? Are the fish protected? Make a list of the fish caught in your streams.

Man. — *Mound Builders.* — The first inhabitants of Ohio of whom we have any definite knowledge left many evidences to show us that they had been here, but there is little to tell us whence they came or whither they went. In every part of the state, sometimes on the tops of hills, sometimes in the valleys, are found peculiar earthworks, walls, enclosures, forts, and many round-topped mounds (Fig. 19). The great abundance of these round-topped mounds of earth has caused the men who built them to be called the "Mound Builders."

These earthworks, of various sizes and shapes, are found in all parts of the Mississippi Valley, but are especially abundant in the Ohio Valley, ten thousand being found in Ohio alone. The most extensive works are the enclosures, which are of two kinds: first, those made on the lowlands, as those along Lake Erie, and in the fertile valleys of the Miamis, the Muskingum, and the Scioto; and, second, the hilltop enclosures which are found on the highest hills in the same regions. The lowland enclosures

sometimes contain an area as great as twenty acres; this is enclosed by a wall higher than a man's head, and on the inside of the wall is a ditch. Numerous openings in the wall were undoubtedly gateways. What use was made of these enclosures is not known. Some of the most extensive of them are found in the Scioto Valley above and



FIG. 19.

A round-topped mound in Ross County.

below Chillicothe. The enclosures on the tops of hills, from which one could see long distances in every direction, are made of earth or earth and stone, and are supposed to have been used as retreats in time of danger. The largest of these fortifications is Fort Ancient, in Warren County, on an eminence overlooking the Miami River.

A peculiar form of mound is that representing some animal. The greatest work of this kind in Ohio, and one of the largest in the world, is the Great Serpent Mound in Adams County (Fig. 20). The land on which this

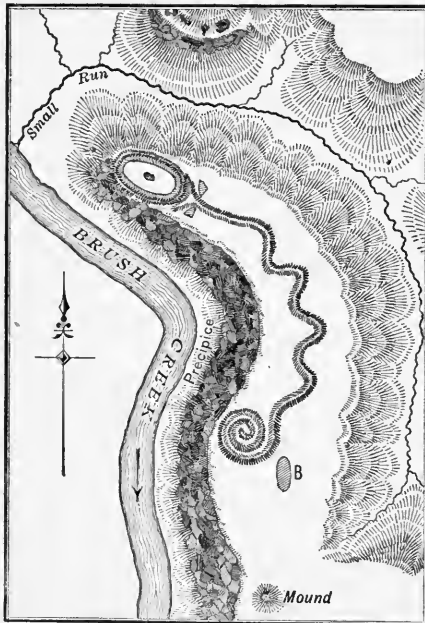


FIG. 20.

The Great Serpent Mound, in Adams County.

all over the state; there are five hundred of these in Ross County alone. Some of them were used as burial places, and in these are found skeletons, together with flint arrow points, stone hatchets, and stone pipes. Other mounds are on commanding places, and were used, it is thought, as signal stations. Still others (and these are of

this mound is built has recently been presented to the State Historical Society to be preserved as a park. It is on high land, the head, body, and tail extending over a quarter of a mile. The end of the tail is curled. These *effigy* mounds, as they are called, may have been used for some religious purpose.

By far the most numerous of the earthworks are the dome-or-cone-shaped mounds (Fig. 19), which are scattered

the greatest interest and importance) were used as places of worship; clay altars are found in some of them, and the clay has been burned till it is like brick. On these altars numerous objects have been discovered, some of which must have been brought from long distances. On one altar there were ornaments of copper, mica, bone, and shell, teeth of the shark and alligator, meteoric iron pounded into ornamental shapes, and great numbers of pearls. Which of these objects show that these people were either travellers or traders?

The Mound Builders must have been an agricultural people, as such great numbers could not have lived on so small an area if they had not produced their own food. What became of them no one knows. Are there any mounds in your neighborhood? Write a description of one you have seen.

Indians.— There were many tribes of Indians here when the first settlers came, some of the more important being the Delawares, Shawanees, Miamis, Wyandots, and remnants of the Eries. Their villages were in clearings along the streams, and here the women raised fields of beans and corn, while the men spent their time in hunting and fishing, or in warring against their neighbors. They became experts in the use of the rifle, but still used the tomahawk and scalping-knife. Some of the tribes had skill in picture writing, as is shown by "Inscription Rock" on Kelley's Island (Fig. 21). Translated, this is said to be the story of the conquering of the Erie or Cat Nation in 1665 by the tribes of the Iroquois, and was written by the Eries.

The Indians of the Northwest Territory never could be made to understand why their land belonged to the French

by "right of discovery," or to the English because of a charter given by a distant king. By a treaty made with the English the Indians were to have the land bounded on the north by Lake Erie, and on the south by the Ohio; the frontiersmen, however, would not keep this treaty. In almost every encounter the object of the Indians was to drive the white men beyond the river. These facts



FIG. 21.
Inscription Rock.

must be borne in mind when we read of the Indians attacking the settlements or lonely cabins, killing the inhabitants, or carrying them into captivity.

There were many struggles between the Indians and the whites, and the Indians were often victorious. General Harmar, and afterward General St. Clair, met with terrible defeats, and the people were greatly discouraged. Congress was appealed to, and President Washington sent

General Anthony Wayne to take charge of the troops. He asked to be given only American-born soldiers, and to be allowed time enough to make preparation. He spent two years in studying the ways of the Indians and in drilling and hardening his men; then he met the combined forces of Little Turtle and Brandt on the Maumee River near PERRYSBURG, and defeated them. This battle, which is called the battle of Fallen Timbers, was fought in 1795, and it so weakened the Indians that for a number of years they gave no trouble. In the War of 1812 a last effort was made by the Indians under Tecumseh, but this also was a failure. Numbers of Indians continued to live in peace with their white neighbors until about 1840, when the last of them were removed to reservations beyond the Mississippi.

White Men.—Probably the first white men to visit Ohio were the French, in about 1668 or 1669. They had held Canada since 1608, when Champlain founded Quebec, and it was now thought best to explore the interior and take possession in the name of the French king. The work was undertaken by the brave La Salle. It is thought that he crossed Ohio from the lake to the Ohio River, and after travelling some distance down the river he returned to Canada for supplies. In old French records there is an account of the discovery at this time of a great river called by the Indians "Ohio," which, as translated by the French, means "The Beautiful River."

La Salle made several voyages into the interior, and finally, in 1682, he floated down the Mississippi to its mouth, and took possession of the land in the name of his king and called it *Louisiana*. In time a line of forts was established which extended from Canada across the

lake country to the mouth of the Mississippi River. Ohio was included in this territory, and was under the dominion of the French king for about eighty years. Locate this region on a map of North America, and see if you can tell why the Ohio River was of special importance to the French.

The English began to come over the mountains about 1700. There were many conflicts between them and the French for the control of the Ohio River and the surrounding country. The Indians took sides with the one or the other as best suited their own purposes. Read in your histories the account of the struggle for the possession of the land at the junction of the Monongahela and Allegheny rivers. What city is now situated there? By the Treaty of Paris, signed in 1763, the land west of the mountains was given to the English.

In your histories review the French and Indian War. What was its cause? What were the results?

At the close of the Revolution there was not an established settlement of white men in Ohio. Many stories were told of the land beyond the mountains; of the large, beautiful river with its many tributaries; of the valleys with a deep, rich soil; and of the deer, buffalo, and other game which lived in the open woodland or fed on the prairies. Plans began to be made to go out and take possession of this new territory.

Connecticut, Virginia, and other colonies had claimed the land, but it was all ceded to Congress except certain reservations made by the two colonies named (see Fig. 22). Congress had surveys made, and large grants of land were offered to the men who had fought in the Revolution.

General Rufus Putnam heard great praise of the land from the surveyors who surveyed the Seven Ranges (Fig. 22), and he, with other officers and soldiers, decided to plant a colony there. A company, known as the Ohio Company, was organized in 1787, and a large tract of land was obtained

west of the Seven Ranges, at the mouth of the Muskingum. Two parties, one from Massachusetts and the other from Connecticut, were soon ready, and, in February of 1788, they were on the upper branch of the Ohio, building flat-boats with which to con-

tinue their journey. One of these boats was named the *Mayflower*. Why? On April 7, 1788, they reached the mouth of the Muskingum. Fort Harmar was on the west side of the stream, so the settlement was started on the east side. Work was at once begun, felling trees and laying out the town; the first building was the log fort,

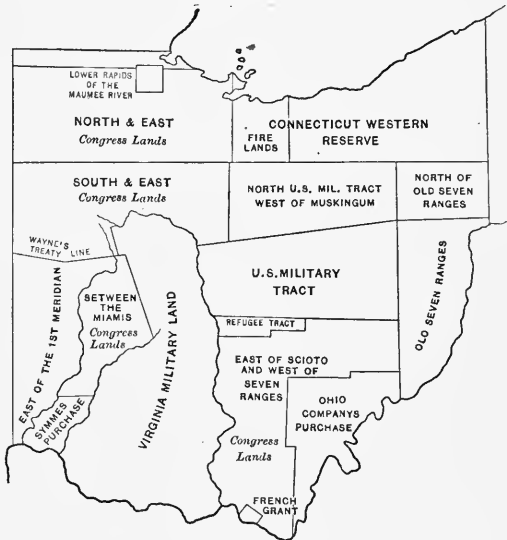


FIG. 22.

The surveys of the public lands of Ohio. One thirty-sixth, or 704,000 acres of the land, was reserved for school purposes.

which was built on the site of an old fortification of the Mound Builders. The town was called MARIETTA (Fig. 67), in honor of Marie Antoinette, the queen of France. The Fourth of July was celebrated for the first time in the West in a way befitting the occasion; the soldiers of Fort Harmar joined with the citizens in a procession, after which all assembled to listen to the words of eloquence of one of their number; this was followed by a great feast, at which game from the forest and fish from the river were served to all.

A little later the newly appointed governor, General St. Clair, came from the East, and the Northwest Territory took its place as a part of the nation. It was governed much as Alaska is to-day. Many boats came down the river, carrying families who brought with them all their possessions, and who had come to make this their home. Late the next fall, a large party from New Jersey in charge of Judge Symmes came to take possession of the land between the Miamis.

Three settlements were to be made: Miami City, where the Big Miami empties into the Ohio; Columbia, at the mouth of the Little Miami; and Losantiville, opposite the mouth of the Licking; the fort for the protection of the settlements was to be at Miami City. When the colony for Miami City arrived, the river was high and the sites of Columbia and Miami City were under water, while Losantiville, which was on higher ground, was unaffected. The fort was, therefore, built at Losantiville, and the people gathered around it. The next year the little settlement was visited by Governor St. Clair and he re-named it, calling it CINCINNATI.

The settlers soon began to take possession of the bottom land along the tributary streams; CHILLICOTHE, in the Virginia Military District, was founded by a party from

Virginia in 1796. DAYTON, in the Miami Valley, was founded by a colony from CINCINNATI in the same year. The first permanent settlement in the northern part of the state was made in the same year by a party from Connecticut. The settlement was at the mouth of the Cuyahoga River, and was named, in honor of one of the founders, CLEVELAND.

What do you know about the troubles with the Indians? Find out something about each of the following great Indian chiefs: Tecumseh, Logan, Brandt, and Pontiac. What became of the tribes who formerly lived here? Make a list of the names of rivers, counties, and towns that are of Indian origin.

In 1802 Ohio was made a state; a constitution was framed, and the first General Assembly under this constitution was held in March, 1803, at CHILlicothe. In 1816 the capital was established at COLUMBUS.

As the settlements increased in number and in size, the great need was better means of communication with the markets in the East. When this was accomplished by means of the National Road (Fig. 1) and the Erie Canal, growth was very rapid. Improved roads and the state canals also did much to better the condition of the people in all parts of the state, but especially those in the interior.

Ohio was on the direct line of emigration to the West (Fig. 23), and many of the best of the moving hosts were detained within the borders of the state. To the people of New England, New Jersey, Kentucky, and Virginia, who were already here, were added many more from New York, Pennsylvania, and states farther south. In later years many persons of foreign birth have come to our cities, until now thirteen per cent of our population is foreign born.

Gradually the canals gave way to the railroads. The first railroad in Ohio was built in 1831 (see page 62), and the work of building is still going on. See if you can account for the fact that so many of the trunk lines pass through the state. What effect has this had in the development of the state?



FIG. 23.

Ohio in its relation to its neighbor states.

The history of Ohio in the time of the Civil War is a part of the history of the whole country, and should be studied in the history of the United States.

What were some of the events of the war that affected our state because of its geographical position? What is meant by the "Underground Railway"? Relate the story of "Morgan's Raid." Name the great leaders in the war who came from Ohio. Name some of the statesmen. Who were Ohio's "War Governors"?

Within a year after the close of the war, most of the soldiers had returned to their work in the offices, factories, mines, or on the farms. The history of Ohio since the war is largely a story of development. There has been progress in many lines, but especially in the development and multiplication of the many industries of the state.

INDUSTRIES

Agriculture. — With a gently rolling surface, broken by river valleys, a fertile soil, a sufficient rainfall, and a tem-

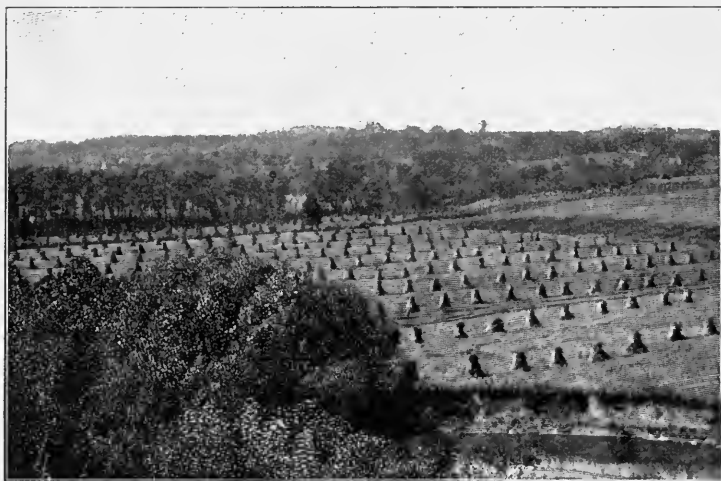


FIG. 24.

A rolling surface in central Ohio.

perate climate, Ohio will always rank as one of the foremost agricultural states. Good home markets and the best means of transportation to the near-by eastern trade centres have also done much to encourage agriculture.

The valleys of the Miamis (Fig. 16), the Scioto, and the Muskingum (Fig. 15) and their tributary valleys have a deep, rich soil which produces large crops of corn, wheat, clover, and hay. The soil in the north and northwest (Fig. 7) is adapted to grazing, and therefore dairying and sheep raising are among the chief occupations of the people, but grains and fruits are also produced in large quantities. Pears, peaches, and grapes are the principal fruits; more grapes are produced than are required for the markets, and these are made into wine.

In the part of the state covered by the glacier, the rolling land between the river basins has a good soil and produces oats, corn, and wheat; there is also much grass land, furnishing pasturage for great numbers of sheep and cattle and a smaller number of horses. The hill country in the south and southeast has not as good soil as the other parts of the state, and is not so well adapted to agriculture. Fruits, such as berries and peaches, and tobacco are important products of the southern counties. Market gardening, fruit raising, and dairying are profitable industries in the vicinity of the manufacturing towns and the large cities.

The average farm in central Ohio contains from 100 to 150 acres. It is not all given to one crop, as are the wheat farms of Dakota, or the corn farms of Kansas and Nebraska; here 30 to 40 acres are often given to wheat, 20 to 30 are planted with corn, about the same with timothy and clover, while 20 or more are still covered with timber, the trees furnishing the supply of fuel, while the land affords some pasture. A smaller acreage is devoted to oats, pasture, potatoes, and fruits. Each farmer usually owns from six to eight head of horses, fifteen to twenty cattle, a flock of a hundred or more sheep, a few pigs, and a great many turkeys and chickens. The five or six milch cows furnish the family with milk and butter, and enough

butter is sold to supply the table with groceries. The farmhouses are comfortable houses of wood or brick, the barns are large, and are surrounded by granaries, cattle-sheds, wagon and machine houses, and other necessary buildings (Fig. 25).

The spring and summer seasons are given to planting, cultivating the crops, and harvesting them ; the autumn and winter, to caring for



FIG. 25.

A farm home in central Ohio.

the stock, cutting the year's supply of fuel, and splitting the rails for the fences. The rail fences are being quite rapidly replaced by wire fencing; give reasons for this. In the fall such of the live stock as has been fattened for the purpose is killed and the meat cured, enough being put away to last through the coming year. Potatoes and apples, with such vegetables as turnips, beets, cabbage, and celery, are stored in the cellar for use during the winter. Add to these stores the flour and the meal made from wheat and corn raised

on the farm, also a constant supply of milk, butter, and eggs, and it will be seen that the farmer produces on his own farm most of the necessary food-stuffs for his family.

The methods of farming have greatly improved. With a hoe a man could cultivate but a small field of corn; with a two-horse cultivator his power to do work has greatly



FIG. 26.
Rural delivery.

increased. The wheat, once sown broadcast, cut with a cradle, and threshed with a flail, is now sown with a drill, cut with a self-binding machine, and threshed by steam. This improved machinery allows more leisure time, and the farmer has time to read the agricultural journals, the daily paper, and the best magazines. In many districts the daily paper is brought by the rural delivery postman

(Fig. 26). The rural delivery is a great boon to the farmer. No matter how busy the season, he is assured of his daily paper, which gives him the market reports, and keeps him in touch with the busy world. Also the electric car lines are now coming his way, and telephones are increasing in number.

Most of the farmers are Americans by birth and have at least a common school education. The country school



FIG. 27.

The dairy department at the State University.

(Fig. 46) is now supplemented by the district high school and the state university. The agricultural course in the State University at Columbus offers special advantages to the farmers for the study of soils and of stock, and for studying the most improved methods of farming, gardening, and making butter and cheese (Fig. 27).

Mining. Coal.—Tell what you have learned of the formation of coal. What kinds of coal are there? What are its most important uses? In what part of the state is it mined? What can you tell of the geology of that section? How were the hills made?

The coal veins in Ohio were discovered early because of their exposure on the sides of the hills (Fig. 28). Some of

the veins are but a few inches in thickness, others have a thickness of from ten to twelve feet. The small veins do not pay to mine for the market, but where one outcrops on a man's farm it furnishes him with necessary fuel. A vein of from eighteen inches to two and a half feet thick pays to mine if the coal is of a good quality. The tunnels in such mines are too low for horses, and large dogs are sometimes used to haul out the coal. Such mines are called "dog mines."

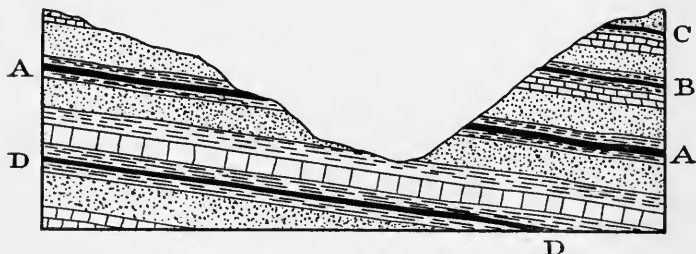


FIG. 28.

An ideal section across an eroded valley in the coal measures. *A*, *B*, *C* and *D* represent coal seams. Which of these seams can be mined by drift mining? By shaft mining?

Veins with a thickness of from three to twelve feet furnish most of the coal of commerce. If the coal outcrops on a hillside, the mine is run into the hill, and this is called "drift mining" (Fig. 28); if, on the other hand, the coal seam is deep down in the ground, a shaft must be sunk, and this is "shaft mining." Most of the mines in Ohio are drift mines, but there are a number of shaft mines in Jackson, Stark, Meigs, and some other counties. The deepest shaft is less than three hundred feet. The greatest coal seam in the state is in the Hocking Valley; it is about twelve feet in thickness, and is mined by a

drift mine. The most improved mine machinery is used in these mines.

All of our coal is soft or bituminous ; it is used for fuel, for making coke, for reducing iron ore, and for making artificial gas. Railroads, which carry the coal to market, run out from the mining region in every direction. Great quantities of coal are also shipped on the Ohio



FIG. 29.

Towboat with fleet of empty barges going up the river.

River ; towboats, with fleets of barges, go down the river at the time of high water, carrying from five hundred thousand to seven hundred thousand bushels of coal in one fleet (Fig. 29). Give reasons for shipping by the river. What advantage is it to the coal trade to have the Great Lakes on the north ?

There are over 1200 mines in Ohio ; new ones are still being opened, and old ones are being abandoned ;

114 were abandoned in 1896. Thirty thousand men are engaged in mining, while others still are employed in getting the coal to market. Most of the miners are of foreign birth. They live in small towns near the mouth of the mine; the houses in which they live (Fig. 30) are often owned by the company which employs them, and the stores at which they trade are also often owned



FIG. 30.

A street in a mining town in Athens County.

by the company. Some of the towns in the mining region are NELSONVILLE, SHAWNEE, JACKSON, BELLAIRE, and STEUBENVILLE.

Iron Ore. — In the first half of the last century, mining of iron ore was an important industry in Ohio. The area where iron occurs is the same as the coal area. Strata from a few inches to several feet in thickness, bearing iron ore, occur in the rock strata of the coal measures.

The iron ore, like the coal, was found outcropping on the hillsides, and was mined by drifting or by "stripping," that is, removing the cover of soil and rock, and then taking out the ore. Most of the ore that is near enough to the surface to pay for mining has been used. Small quantities of native ore are mixed with the imported ores and smelted in a few furnaces (see page 55).

Quarrying. — The rock which underlies the soil in Ohio is limestone, shale, and sandstone. There is no granite in the state, except the large granite boulders which were brought here by the glacier.

The stone is valuable for many purposes, and where it is near the surface there are quarries in which many men are employed. Limestone is found in the west, southwest, and northwest, sandstone and some limestone in the rest of the state, and shales are found in all parts of the state.

Limestone was formed under the water, and is made of the remains of animals that lived in the sea which covered Ohio years ago; many of these remains or fossils, such as corals and shells, may be seen in almost any block of limestone. The limestone and all the other rocks of Ohio are stratified, that is, arranged in layers, the strata varying in thickness from a fraction of an inch to a dozen or more feet (Figs. 3 and 14). This stratification is of great assistance in quarrying.

The large blocks are used for foundations and other building purposes; the capitol at COLUMBUS and many of the public buildings and churches in the large towns are made of limestone. In SANDUSKY the stone is so near the surface that some of the cellars were blasted out of the solid rock; many of the houses are made of stone taken from quarries in or near the town.

Some of the limestones when burned make excellent lime, and there are many kilns at SPRINGFIELD, COLUMBUS, MARBLEHEAD, KELLEY'S ISLAND, and other towns in the western part of the state (Fig. 31). The purest of the limestone is used in the blast furnaces to help in the reduction of iron ore. Larger quantities are being used

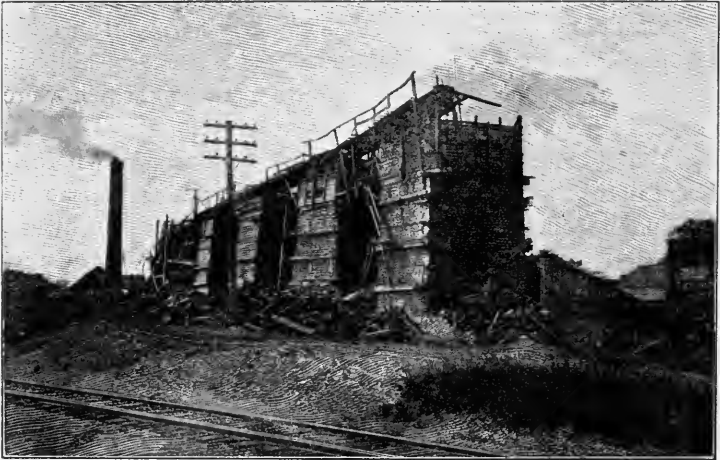


FIG. 31.
Limekilns at Springfield.

each year for making cement, which is used for sidewalks, piers, docks, and for many other purposes.

Shale or *claystone* is very abundant all over the state. It is a soft rock, and is deposited in such thin layers that it cannot be used for the ordinary purposes for which other stone is used. Its most important use is in making drain tile and paving brick; for this purpose it must first be ground very fine, when it becomes plastic like clay, and it is then mixed and moulded as clay is.

Sandstone is found east of a line drawn from Erie County in the north to Adams County in the south. There are many uses for sandstone; when the strata are thick and the stone comes out in large blocks, it is used for all kinds of building purposes.

In Lorain and Cuyahoga counties are some of the best sandstone quarries in the United States. The stone is called "Berea Grit," from BERE^A, where there is a very important quarry (Fig. 32). The stone in this quarry is from 65 to 75 feet in thickness, and has

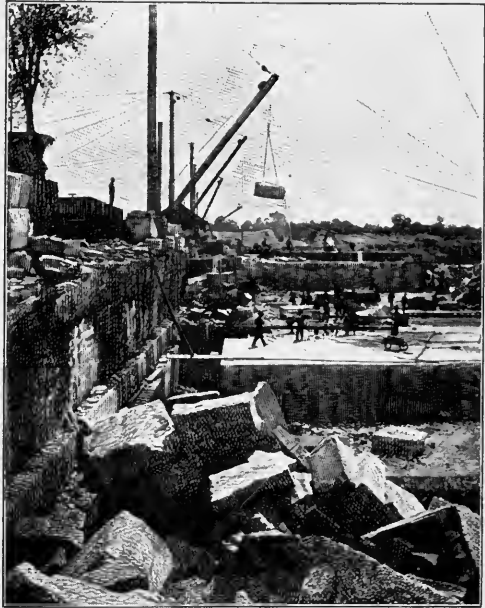


FIG. 32.

A quarry in Berea. The stone is cut out with saws.

been quarried to a depth of 40 feet; it has been used in making some of the finest public buildings in NEW YORK, BALTIMORE, PHILADELPHIA, CHICAGO, and BOSTON, and in some of the large cities of Canada. The Canadian Parliament House is made of Berea stone.

The thinner strata of sandstone, if taken out in large

slabs, are used for flagging and for paving blocks. Near WARREN is a flagstone quarry. If the stone has a fine, even grain it is used for grindstones and whetstones. Suitable stone for both these purposes is also found at BEREA, and the largest grindstone factory in the world



FIG. 33.

Grindstones made of Berea sandstone.

is situated there (Fig. 33). Grindstones from this factory are shipped to all parts of the civilized world. Some of those in the picture were being made to send to Russia.

Some of the purest sandstone is ground up, and put with limestone and soda to form glass. Near NEWARK there is a fine glass sand.

Some of the places where sandstone is produced in quantities large enough for shipping are: BEREA, AMHERST, AKRON, and MASSILON, in the north, ZANESVILLE and LANCASTER, in the interior, and on the Ohio River, BUENAVISTA, STEUBENVILLE and PORTSMOUTH. Cuyahoga County is the most important quarry district in the United States.

Clay Working.—What is clay? What is the peculiar property which gives it value? For what is it used? Does it make good farm land?

Clay occurs in the greatest abundance in all parts of Ohio, and each year its value is becoming more apparent.

In some places it is obtained on the surface from the drift; in other places it is so deeply covered that it has to be mined.

The first building material used in the state was obtained from the timber which had to be cut down to make the land ready for farming. When in time something better than the log cabin was desired, bricks began to be made from the clay. Many old brick farmhouses are seen in central Ohio, for which the bricks were made in an adjoining field. As the towns grew, brickmaking became a more important industry, and as the timber disappears it becomes every day of greater importance.

Crocks, jugs, and jars were necessary articles in every pioneer household, and they were expensive when brought over the mountains in wagons; so potteries for their manufacture were established. Along the Ohio River a clay was found which was suitable for making a coarse ware called "yellow ware," and a pottery to manufacture it was started at EAST LIVERPOOL. For a long time there were but one or two kilns; then other and better ware began to be made, and the industry spread to the neighboring towns along the river, and grew very rapidly. Clay suitable for the new ware was not found in Ohio, but the workmen were here, the coal for burning the kilns was here, and the means of transportation were good, so that the industry became firmly established. There are now hundreds of kilns in the towns along the Ohio, and EAST LIVERPOOL is the centre of the dish manufacturing business in the United States. The largest pottery (Fig. 34) in the country is located there. The heavy white ware used in hotels and a finer decorated table ware are some of the principal products.

Numerous other uses are found for the clays: fire clay is made into bricks to line furnaces, chimneys, and kilns; other clays are used for tile for roofs, floors, and mantels. Pressed brick, paving brick, hollow ware, door-knobs, marbles, pipes, and ornamental pottery are some of the products that have not been mentioned.

The most noted ornamental pottery in the United States is the Rookwood pottery, which is made in CINCIN-

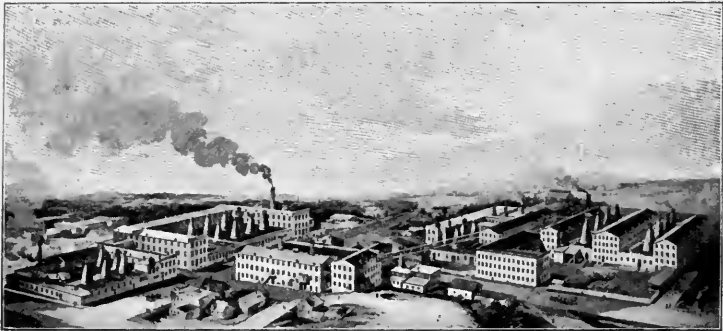


FIG. 34.

The largest pottery in the United States.

NATI (Fig. 35). It is valued for its fine coloring, beautiful decoration, and, above all, for its fine glaze. A number of skilled artists are employed to decorate the ware.

The great abundance of the clays and shales, and the many uses to which they can be put, have led men to believe that long after the coal has all been mined clay will continue to be one of the most important products of the state. A school for studying the clays and their manufacture has been established at the State University at

Columbus. Visit a brickyard or a pottery, and write a description of what you see there (Fig. 36).

Oil and Gas. — Besides the coal which furnishes fuel for factories, furnaces, and mills, we have in Ohio natural gas and petroleum. Natural gas is said to be the most perfect fuel so far discovered. How it was formed we



FIG. 35.

The Rookwood Pottery.

are not able to tell, but it comes from deep down in the earth, where it is stored up in a porous rock, over which is a non-porous rock, like shale, which acts as a cover to keep the gas in. Take a piece of sandstone, and put it in water or in oil, and see whether it absorbs any of the liquid.

Men cannot tell from the surface where oil or gas will be found, but a region must be tested by putting down wells.

In drilling the wells the drill first goes down through the soil, then through the solid rock for from one hundred to two thousand feet. What part of a mile is this? Veins of water are often struck, and the water comes up into the well; if from a great depth, it will be strong with salt and



FIG. 36.

A brickyard in Columbus.

other minerals. When the drill gets down to the gas rock the gas may come up with such force that the drill is blown out of the well. In other wells it comes in such small quantities that the well is "shot"; that is, an explosive is lowered into the well, and then exploded. This may cause the well to flow more freely, but in some cases

nothing comes out but salt water. In some wells there is no gas, but oil may be obtained by pumping. One large engine can be made to pump a number of wells that are near together (Fig. 37).

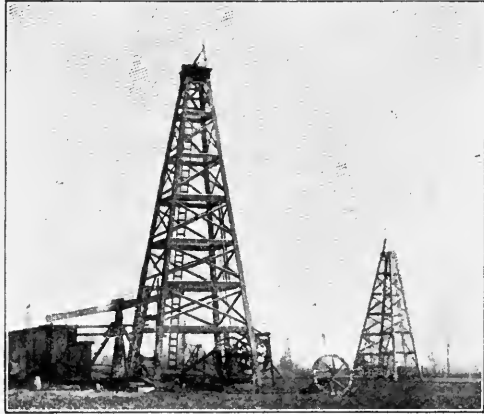


FIG. 37.

Oil field near Bowling Green.

Gas was first discovered in Ohio in paying quantities at FINDLAY in 1884. Thinking the supply was unlimited, it was offered free for a number of years to any factories which would locate there and use it as a fuel.

Glass works, potteries, chain and nail works, and other industries soon took advantage of the offer. The gas was allowed to burn along the roads in large jets both day and night. Many wells were sunk around FINDLAY and BOWLING GREEN, and pipes carried the gas to TOLEDO and other cities. In a short time the amount of gas began to decrease, and in some wells stopped flowing altogether. Then it became evident that the supply was limited, and must be carefully guarded. In a few years the gas was all gone, but the wells still produce oil when they are pumped.

The history of the gas wells in all sections seems to be the same. First comes gas, which in time diminishes, and is then accompanied by oil; then the oil grows less, and the well produces but a few barrels a day when pumped, and finally the amount of oil is so small that the well is abandoned.

The most important gas field at present in the state is in Fairfield and Licking counties. The gas from SUGAR GROVE, near LANCASTER, is piped to COLUMBUS, LANCASTER, and other towns and cities in the vicinity. Gas is also obtained at CORNING, CAMBRIDGE, and SOUTH OLIVE.

Nearly all the counties in northwestern Ohio produce either oil or gas. The region around LIMA produces the

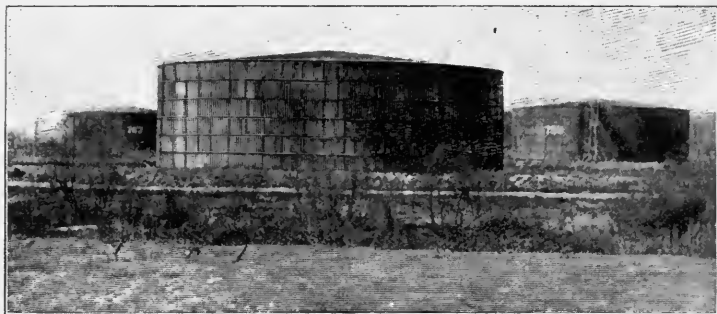


FIG. 38.

Oil tanks near Bowling Green.

most oil. The first well was drilled here in 1885. The average depth of the wells is about twelve hundred feet. The daily production from these wells (1901) is about forty-five thousand barrels. Some of the oil from this section is refined at Toledo, Lima, and Cleveland; but great quantities of it are transported to Chicago and to the Atlantic seaboard by means of pipe lines, and refined there. Many large tanks for storing the crude oil are seen in LIMA, TOLEDO, BOWLING GREEN, and FINDLAY (Fig. 38).

When the oil comes from the wells it is thick, and has a dark color. In the process of refining many substances are obtained; for example, benzine, gasolene, kerosene, machine oil, vaseline, a material from which chewing gum is made, and paraffin.

There is another important oil field in the southeastern part of Ohio, — in Athens, Perry, Morgan, Harrison, and adjoining counties. Some of the wells are less than a hundred feet in depth; others have a depth of over two thousand feet. CADIZ, SCIO, MACKSBURG, and CORNING are some of the chief oil towns. MARIETTA is a distributing centre for the oil in the Ohio River region.

Most of the oil wells and the refineries are controlled by the Standard Oil Company, one of the greatest trusts in the world, which has its headquarters in Cleveland. Oil from Ohio is shipped to all parts of this country, and also to foreign lands. Which European country produces large quantities of oil? Which of the Western states have oil and gas fields?

Iron Manufacturing. — Ohio is the second state in the Union in the manufacture of iron and steel goods, Pennsylvania being the first. The iron ore now used is not a product of the state, and we owe this important industry to our coal, and to our position on the trade route of the Great Lakes, rather than to our natural resources of iron ore (page 44).

Iron is obtained from iron ore by reducing the ore in a blast furnace (Fig. 39). Into the blast furnace, which is a high iron cylinder lined with fire-brick, are put iron ore, coke, and limestone; these are carried to the top of the furnace in small cars by an elevator or "hoist." When the furnace is filled a blast of hot air is sent through it from other large cylinders called "stoves." The material of the coke and limestone unite with the impurities in the ore, and the iron is set free, and runs down to the bottom of the furnace, where about

every four hours it is let out into sand moulds. The bars from these moulds are called "pigs" of iron. To make steel, the pig-iron is melted and put into a large vessel called a "converter"; certain chemicals are added, a blast of hot air is blown through it for about fifteen minutes, and chemical changes take place which change the pig-iron into steel. The steel is then poured out into large moulds, and these "ingots," as the blocks of steel are called, are ready to be made into steel rails, bridge iron, sheet steel, wire, and nails, which are a few of the more important products from the steel plants.

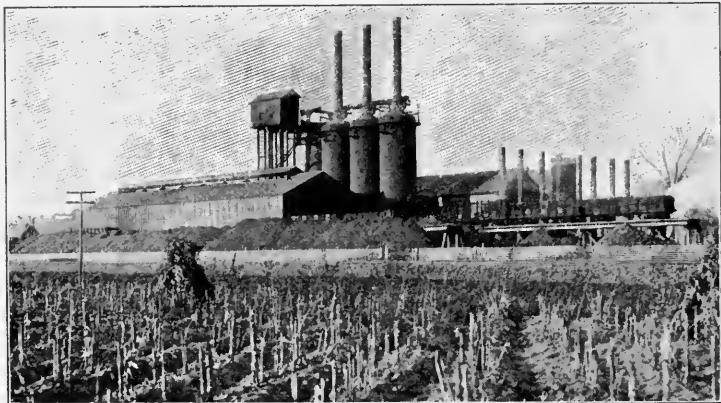


FIG. 39.
A blast furnace.

What materials necessary for the reduction of the iron ore are found in Ohio?

Ohio still has some iron ore, but the discovery of the rich ore beds around Lake Superior made ours of little value (Fig. 40). The ore beds in Missouri are also greater in extent than ours, and the ore is richer in iron. Trace the route from the Superior region to the coal fields; also from Missouri to the coal fields (Fig. 23). Why not ship the coal to the iron ore?

The ore that came by the lakes was unloaded at our lake ports to be reshipped to the coal fields. CLEVELAND

was an important coal market, and when the iron ore was brought there it followed that furnaces were built where the two came together. The same thing is true in a smaller way of the other lake

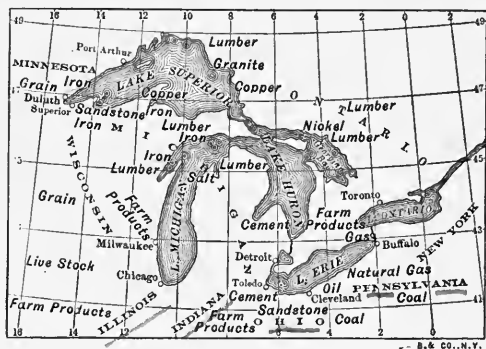


FIG. 40.

Some of the raw materials which are readily brought to the lake ports by boat.

ports, and a great many iron works are therefore found in the towns along the lake, and also in the region between the lake and the coal fields.

Not only are there reducing furnaces and steel plants, but there are factories and founderies which make use of the pig-iron and steel. CLEVELAND has become one of the largest cities in the United States and the largest in Ohio. Other towns largely interested in ironwork are CONNEAUT (Fig. 41), ASHTABULA, LORAIN, SANDUSKY, and TOLEDO; the towns in counties nearer the coal fields are YOUNGSTOWN, AKRON, CANTON, MASSILON, and many others. All of these cities have increased in size and in wealth with the growth of the iron industry. Large boats, which are built expressly for that purpose, are used in shipping the ore. These boats are loaded and unloaded almost entirely by machinery.

Southern Ohio had been the most important part of the state in the production of iron until the advent of the new ore from Lake Superior; then the southern industry received a check. There were iron workers there, however, and coal and limestone were near, while the Ohio River offered means of cheap transportation; consequently it was not long until new and larger furnaces were built, and iron



FIG. 41.

Iron ore docks at Conneaut. Much of the ore that goes to Pittsburg is received here.

manufacturing is now one of the most important industries along the river. Some of the river towns engaged in iron work are STEUBENVILLE, BELLAIRE, IRONTON, PORTSMOUTH and CINCINNATI. CINCINNATI is the greatest market for pig-iron in the United States.

Other Industries. — Besides the great industries that have been mentioned, which give employment to the majority of our people, there are many others of importance.

Where agriculture is the principal industry, a large

amount of farm machinery will be needed ; with the iron and the wood at hand, it follows that the work will be done at home. Ploughs, harrows, reapers, threshing machines, windmills, wheelbarrows, farm wagons, buggies, and garden tools are among the products from these factories.

COLUMBUS is one of the most important centres in the world for the manufacture of carriages and wagons. Columbus buggies are sent to all parts of the world.

CLEVELAND has large boat-building interests, building most of the boats used on the lakes. In the making of merchant boats it stands first in the United States. Boats are also being built here for use on the Atlantic Ocean.

Many boats for use on the Ohio and Mississippi rivers are built in the towns on the Ohio. Street cars are made in DAYTON, and railroad cars in TOLEDO and COLUMBUS. Doors, sash, furniture, wagon-beds, and other articles made of wood are produced in the towns in the northwestern part of the state. Why there ?

Paper made of straw or of wood fibre is manufactured in many towns where the canals or the streams furnish water-power. Grist-mills and sawmills also use the power furnished by the streams (Fig. 42). Boots, shoes, and gloves, and leather for harness are becoming very important products. Flour, oatmeal, canned goods, and packed meats are some of the food products. There are large breweries in CINCINNATI, COLUMBUS, and CLEVELAND. Wine is made on the islands and in towns along the lake. Window glass, table ware, bottles, and cans are made in TOLEDO, LANCASTER, NEWARK, COLUMBUS, and BOWLING GREEN; TOLEDO has the most important glass factory in the state.

Salt is produced in the southern part of the state, matches are manufactured in AKRON and BARBERTON, hard and soft rubber goods in AKRON, automobiles in CLYDE, and bicycles in a number of towns in the state.



FIG. 42.

A stream which furnishes power for mills and factories. Cuyahoga Falls.

What manufacturing industries are there in your county? Try to find a reason for their location. What manufactured products must we import? What food products?

Transportation. — One of Ohio's greatest men has said, "Next in advantage to having the thing to sell is to have the convenience to carry it to the buyer." In this, as in natural resources, Ohio is greatly favored. The most important route in early days was the Ohio River, and rafts and flatboats were the quickest means of transportation.

The difficulty of going up the river with loaded boats caused the people to look for a market down the river, and this was found at New Orleans and intervening towns. Usually the boat was sold and the seller found his way back to his home on foot or on horseback.

Congress had promised to make a road from the Ohio country to the ocean, and in 1806 the commissioners appointed chose a route from Indiana across Ohio through Wheeling and Cumberland. This is the National Road, still one of the best roads in the state. Find it on the map. Through what cities does it pass? What part of the state was especially benefited by it? This was the first road to a market for the central part of the state. On it might have been seen herds of cattle, flocks of sheep, and droves of swine which were being driven to the Eastern markets. Heavy wagons with six horses made regular trips over the mountains. Over the mountains came also a steady stream of white-covered wagons in which was the pioneer with his family and all of his household goods, going West to find a home on the fertile prairies.

In 1811 the first steamboat was launched on the Ohio, and after that boats could go both up and down the river. Many of the people had never heard of a steamboat, and the great speed with which this boat travelled led some to imagine that a comet which had been attracting much attention had fallen into the water.

Lake Erie was of no great importance as a trade route until the opening of the Erie Canal in New York, then the prosperity of northern Ohio was assured. A connection between the two important water routes of Ohio, Lake Erie and the Ohio River, was now needed, and an appeal was made to the General Assembly. Two canal

routes were selected, one from CINCINNATI to TOLEDO, the other from CLEVELAND by way of the Scioto River to PORTSMOUTH. Trace these two canals. Why do they follow the rivers? The day chosen on which to begin work on the canals was kept as a holiday, and celebrations were held all over the state. This was in 1825, and in eight years the canals were opened, but they were not finished until ten years later. Which one of our presidents was once a driver on one of these canals?

While the canals were still unfinished, the first railroad of Ohio was built; it ran from Toledo to Adrian, Michigan, a distance of thirty-three miles, and the first power used was horse-power. The rails were strips of wood on which were spiked iron bands. When steam was used and the time required to make the journey was reduced to three and a half hours, the speed was considered remarkable. How long does it take a fast train now to run that distance? In 1844 a railroad was completed between Dayton and Sandusky, and the day of travelling by the stage-coach and the canal-boat was past.

The states west of Ohio were developing rapidly, and to reach the West and Northwest from many places in the East, the railroads had to pass through Ohio, so that the great trunk lines were built across the state. Why is Ohio called "The Gateway to the West"? To get the coal to market, railroads had to be built from the mining regions, and these roads run across the state in every direction. Now there is not a county in Ohio that has not at least one railroad. Twenty-six lines run into Cincinnati. The land and other property belonging to the railroad companies represent millions of dollars (Fig. 43).

Lake traffic was injured for a time by the railroads, but

with the development of the ore mining around Lake Superior, and of the lumbering business and farming in the Northwest, the lake ports became again places of the first importance in trade. Fine passenger boats go back and forth around the lakes all through the summer season (Fig. 44), and a daily line of boats connects Cleveland



FIG. 43.

The Union Station at Columbus. This is one of the finest railway stations in the United States.

with Toledo and the islands. Transportation by the Ohio is also of great importance, but it is greatly interfered with in dry seasons. Boats (Fig. 45) carrying both passengers and freight run three times a week from Cincinnati to Pittsburg except in times of very low water. Thousands of tons of coal and great quantities of lumber come down the river in the times of high water (Fig. 29). Iron ore

from Missouri, and pig-iron, steel, and manufactured iron products get to the markets by way of the Ohio.

Electric car lines now run out from all the large cities in many directions, and lines are now being laid which will connect the capital with all the large cities in the state. These will be of especial benefit to the farmers, and will serve to bring all the people into closer relations.

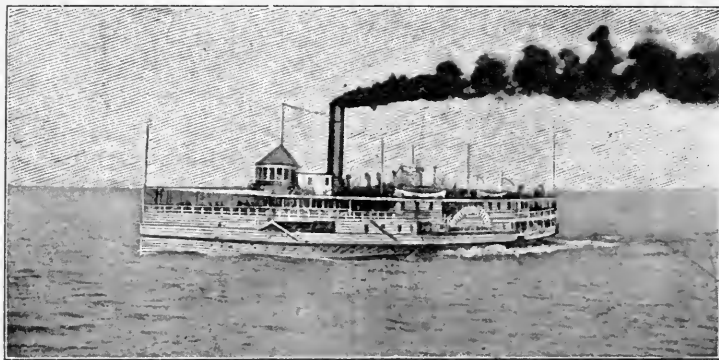


FIG. 44.
A lake steamer.

The Miami and Erie Canal is being repaired with the intention of using on it canal-boats drawn by an electric motor.

What means of transportation are there in your county? What is the condition of the country roads? Whose business is it to take care of them?

Education. — Provision was made to educate the future citizens of Ohio before there was a permanent settlement in the state. The Ordinance of 1787, which outlined the government of the Northwest Territory, said, "Schools

and the means of education shall forever be encouraged," and a certain portion of the public land was set aside for free schools ; and provision was made not alone for the common schools, but also for academies and a university. The schools were not free at first, as there was no public money, and there was so much free land that the school lands could not be sold or leased ; it was not until 1838

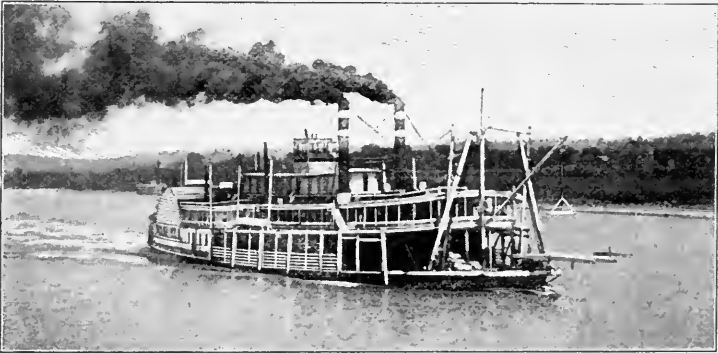


FIG. 45.

An Ohio River steamboat.

that enough money was raised by taxation and by disposing of the school lands to make the schools free to all.

After a long time all the school lands were sold, not always to the best advantage, and the money loaned to the state at six per cent interest ; this is called the state's irreducible debt. In this way a permanent school fund was established. The interest from this fund, with state and local taxes and certain fines, furnishes the money for the support of the public schools.

A free education is now within the reach of every boy

and girl in Ohio. In every city and town and in all parts of the country there are schoolhouses in which schools are in session for from six to ten months of the year.

The country schoolhouse (Fig. 46) is usually built where two roads cross near the centre of the district. It is a one-story building with but one room, and on top is a large bell which can be heard all over the neighborhood. It has comfortable seats and desks, and good blackboards, charts, and maps. Pupils of all ages are in the one



FIG. 46.

A country schoolhouse in Knox County.

room, and are taught by one teacher. In the best schools, besides the common branches, pupils are taught history, algebra, and something of the sciences. By the provision of the Boxwell Law, pupils from the district schools who pass an examination given by the county examiners are entitled to attend any high school in the county, the tuition to be paid by the local directors.

In towns and cities the school buildings are well constructed of brick or stone, the schools are carefully graded, and many teachers are employed. In every town of a thousand or more people there is a high school, and in the larger cities there are several high school buildings which are in different parts of the city for the better accom-

modation of those who attend (Fig. 47). CLEVELAND, TOLEDO, DAYTON, AKRON, and YOUNGSTOWN have introduced manual training. CLEVELAND and TOLEDO have manual training high schools.

Following the high schools, and still a part of the public school system, is the Ohio State University. It is situated

in COLUMBUS, on a tract of land containing over three hundred acres, part of which is still farm land. It has a beautiful campus and many fine, well-equipped buildings (Fig. 48). Besides the regular college courses there are colleges of Agriculture (Fig. 27), Domestic Science

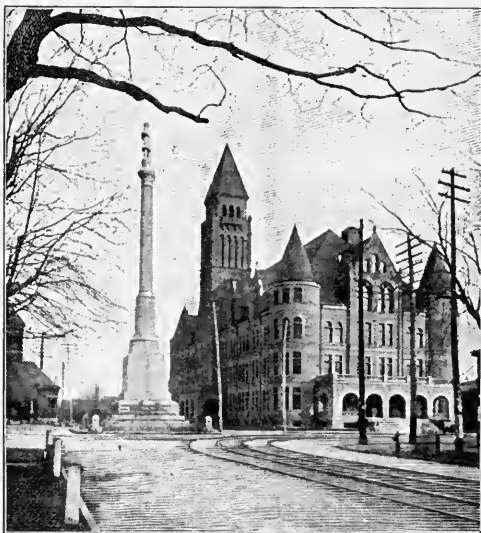


FIG. 47.

The Steele High School in Dayton.

(Fig. 49), Engineering, Pharmacy, and Law.

There are also many private schools and colleges. Some of these are Western Reserve University and Case School of Applied Sciences in CLEVELAND, Oberlin College in OBERLIN, Ohio Wesleyan University in DELAWARE, Dennison University in GRANVILLE, Kenyon College in GAMBIER, one of the oldest colleges in the state (Fig. 50), Lima College in LIMA, Cincinnati University, Wittenberg

in SPRINGFIELD, Miami University at OXFORD, and many others. The Ohio University at ATHENS and Miami University at OXFORD, as well as the Ohio State University at COLUMBUS, are state institutions. There are schools of medicine and of law in COLUMBUS, CLEVELAND, and CINCINNATI. Wilberforce College at XENIA is a school where negro youth may receive an industrial as

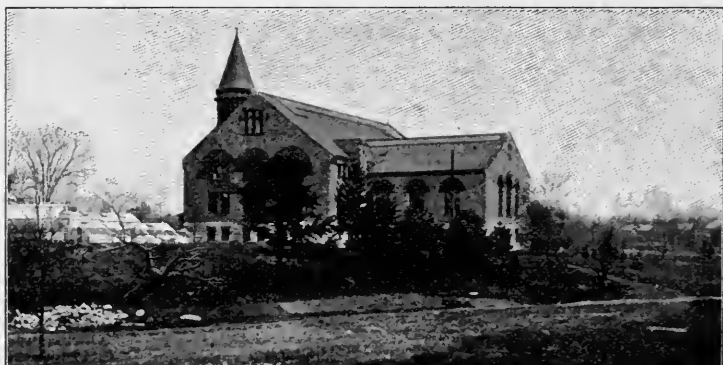


FIG. 48.

Orton Hall, the geological building at the Ohio State University.

well as an academic education. It is in part under the care of the state. State schools for the blind, deaf and dumb, and the feeble-minded, are located in COLUMBUS.

The Ordinance of 1787 says, "Schools and *the means of education* shall forever be established." One of the greatest "*means of education*" after the schools is the public library, and the number of these is increasing every year. Besides the public libraries in nearly all the towns, we now have the *Travelling Library*; this is a part of the State Library in the Capitol, and consists of fifteen thou-

sand volumes. If a board of education or a number of citizens from any part of the state desire books from this library, they may be obtained through the state librarian. Thirty-five books may be drawn at one time, and may be kept a period of three months, the only cost being the cost of transportation.

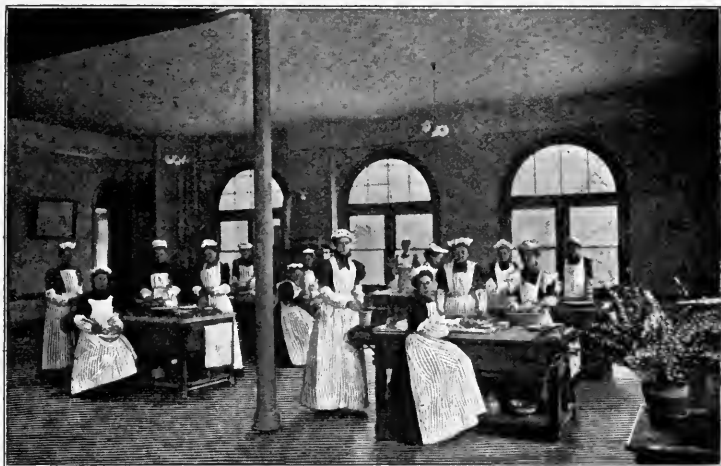


FIG. 49.

Domestic Science at the State University.

Is there an academy or a college in your county? Are there any public libraries? Have the people in your town taken advantage of the Travelling Library?

Government.— Ohio, like all the other states of the United States, has its own constitution and has charge of all matters which concern the state alone.

The first constitution was framed in 1802. In 1851 this constitution was amended and greatly changed; it was

then submitted to the people, who voted upon it, and it was adopted. This is the constitution under which we now live.

According to the constitution the state government consists of three branches, the legislative, the executive, and the judicial. The county and township governments have two branches, the executive and the judicial. The village and city governments have three branches, which are the same as the branches of the state government.

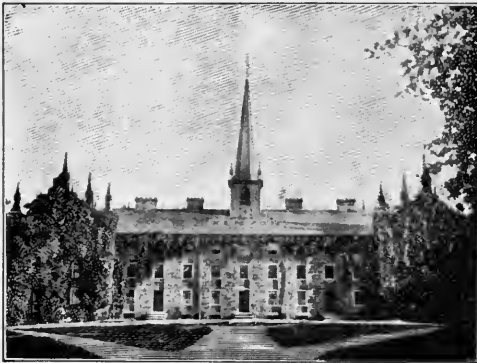


FIG. 50.

Old Kenyon, one of the buildings at Kenyon College.

The *legislative*, or law-making, branch of the state government is called the *General Assembly*. It has two departments, the Senate and the House of Representatives. A bill to become a law in Ohio

must pass both houses, and then be signed by the presidents of both the Senate and the House. The governor of Ohio has not the power to veto a bill. The General Assembly elects the United States senators. How many United States senators are there from each state?

The *executive* branch of the government sees that laws are properly administered. The chief executive officers of the state are the governor, the lieutenant governor, the secretary of state, the auditor of state, the treasurer of state, the state commissioner of common schools, and the

attorney general. All of these officials are elected by the people.

The office of the *judicial* department is to interpret the law, and in case the law is not obeyed to punish the offender. There are many courts. The lowest is the court of the justice of the peace, the highest is the Supreme Court, which is in session once a year in the Capitol in Columbus.

Each county has charge of its own local affairs. The chief officials, such as the commissioners, the auditor, the sheriff, the probate judge, and others, are elected by the people.

Each county is divided into townships, the number of these in the different counties ranging from twelve to twenty. Each township has charge of such affairs as repairing the roads, caring for the schools, and levying certain taxes. The chief administrative officers are the trustees, the chief judicial officer is the justice of the peace.

Villages and cities have charge of local affairs, not only administering the law and trying offenders, but they also have legislative power, making the laws that are necessary for the best government of the corporation. The lawmaking power is vested in the council; the administrative power, in the mayor and his cabinet; and the special judicial power, in the villages, in the mayor's court, in the cities, in the police court.

QUESTIONS AND SUGGESTIONS. — Who are the United States senators from Ohio? How are they elected? Who is the congressman from your district? How is he elected? For how long a time? Find out the names of the governor and other executive officers. What is the duty of each? Who is the state senator from your dis-

trict? The representative? Name the county officials and give the duty of each. If you live in a village or city name the municipal officers. Take as a subject for debate: Resolved, that the governor of Ohio should have the veto power.

CITIES AND TOWNS

Columbus.—Locate the capital of Ohio. COLUMBUS is the fourth city in size in Ohio, having in 1900,

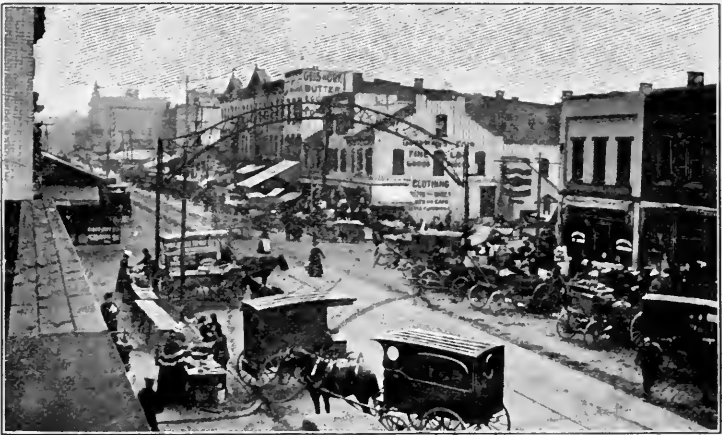


FIG. 52.

The Fourth Street Market.

125,560 people. The location of the city, almost in the centre of the state, has caused it to be an important railroad centre, not only for the local roads, but also for the great lines that extend from east to west across the continent. Its many manufactories and wholesale houses cause it to be a centre of trade for a large district adjoining. Electric car lines are now being built which will connect it still more closely with all parts of the state.

COLUMBUS AND VICINITY.

Railroads thus: ————
 Street Car Lines thus: - - - - -
 Canals thus:
 Scale of Miles,
 0 1/2 1 2
 2 MILES TO 1 INCH.

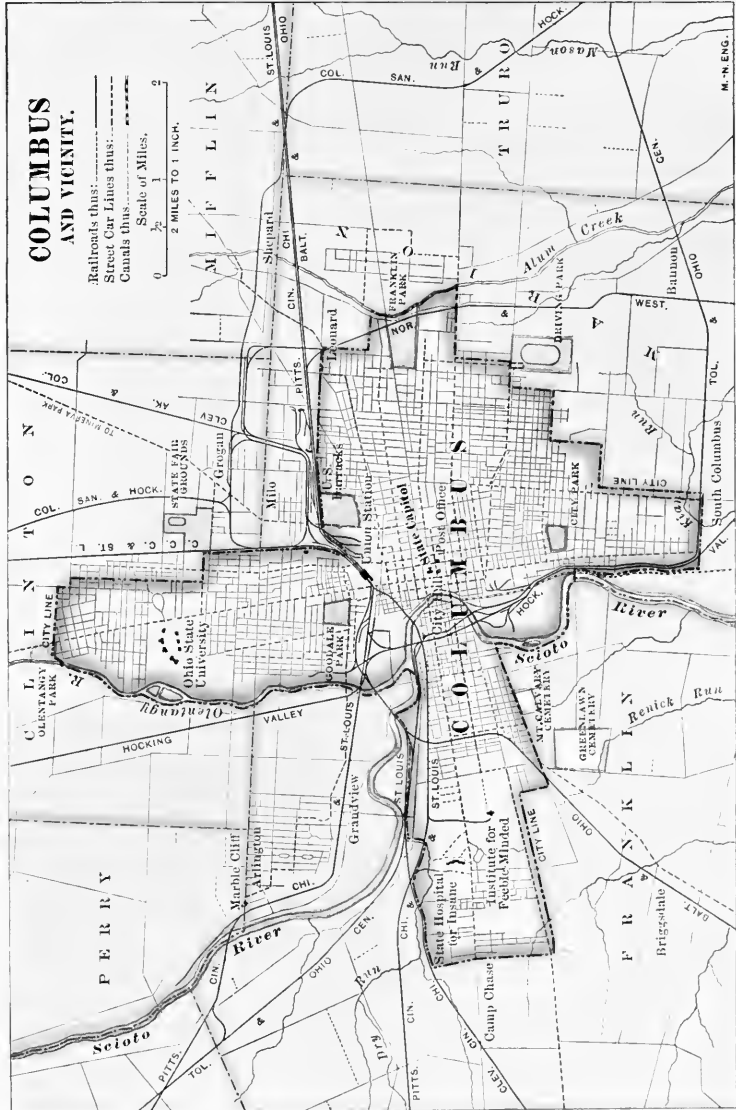


FIG. 51.

Many of the state institutions are here; the State University, the schools for the blind, the deaf and dumb, and the feeble-minded, the hospital for the insane, and the penitentiary.

COLUMBUS has many industries, some of the more important being the manufacture of buggies and wagons, pig-iron and steel, shoes, leather, malt liquors, cigars, bicycles, and many kinds of machinery.

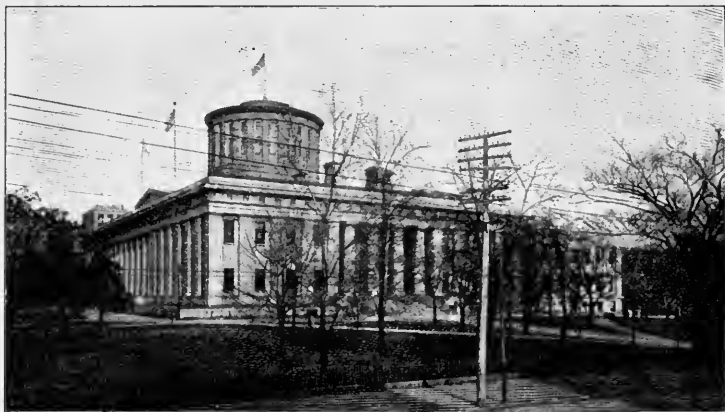


FIG. 53.

The State Capitol, showing the new Supreme Court building in the rear.

COLUMBUS is also an educational centre; besides the State University, the public schools, and other state educational institutions, there are two medical schools, the Capital City University, and several business colleges and private schools. Besides the city library and the large Public School Library, there are the libraries belonging to the state in the Capitol and in the Library at the University. These are all free to the public.

COLUMBUS, it is said, was born a capital. When Ohio was made a state, in 1802, the seat of government was established for a certain number of years at CHILlicothe, but no state buildings were to be built there. All felt that the capital should be near the centre of the state, and a committee was appointed to select a location. Nothing definite was done for some time; then a company of men who owned



FIG. 54.

At the corner of Broad Street and High in Columbus.

the land "on the high bank of the Scioto," made the following proposition: they would lay out the town on their land, making broad streets, give ten acres for a public square on which to build the capitol, give another ten acres for a penitentiary, and construct these two buildings for a sum not to exceed \$50,000. This proposition was accepted. Work was begun at once, felling the trees, surveying the land, and laying out the town.

Town lots were sold to raise money with which to build the new buildings. The General Assembly met in the new capital the first time in 1816. The members came on horseback, and when the legislature adjourned, those living along the Scioto returned in rowboats. In 1826 an appropriation was made to remove the stumps from High Street. The present capitol (Fig. 53) was finished in 1857; in late years it has proved to be too small, and a very handsome addition

CLEVELAND AND VICINITY.

Railroads thus: ————
 Street Car Lines thus: - - - - -
 Canals thus: ~~~~~

Scale of Miles.
 0 1/2 1 2
 2 MILES TO 1 INCH.

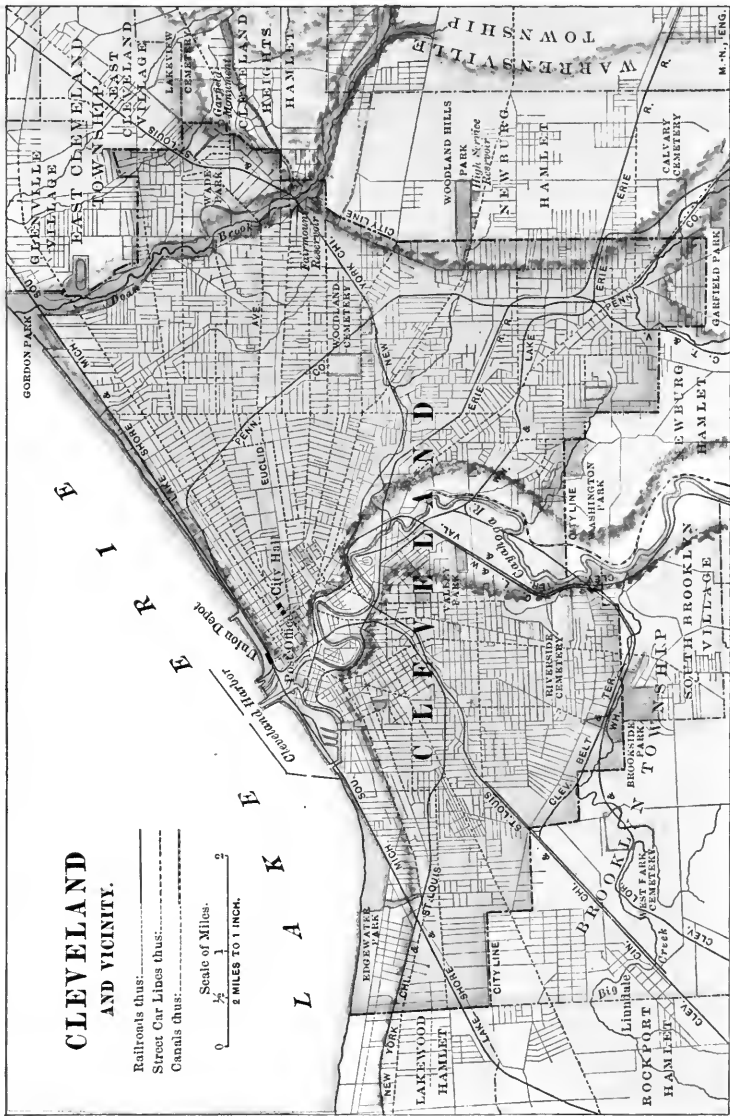


FIG. 55.

has just been built. In this are the Supreme Court rooms, and the offices of many of the state officials.

In less than a hundred years COLUMBUS has grown from a few log houses to be one of the wealthiest cities in the Union. It has fine wide streets, Broad Street being noted for its beauty, numerous parks, fine business blocks (Fig. 54), churches, and school buildings.

The General Assembly meets in COLUMBUS every two years.

Cleveland.—The largest city in Ohio is Cleveland. It is situated on Lake Erie, at the mouth of the Cuyahoga

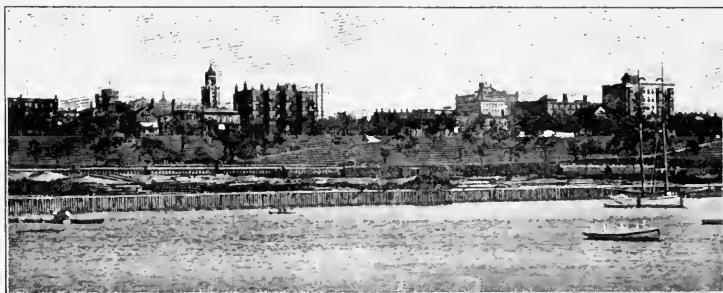


FIG. 56.

The lake front, Cleveland.

River, and is one of the most important ports on the Great Lakes. The city is built on three plains: the first is the narrow flood plain along the river, the second is a clay and gravel plateau, or terrace, from sixty to eighty feet above the level of the lake, and the third is the "heights" back of the plateau, which is from one hundred to two hundred feet higher than the plateau (Fig. 6). At the time when the lake was larger than it is now (see page 3),

“the heights” was the lake shore, while the plateau was under the waters of the lake. The Cuyahoga River has cut a channel for itself through the rocky heights, and in the softer material of the plateau has worn, not only a channel, but has made a narrow flood plain. Formerly the river, just before reaching the lake, turned west, and, after running a short distance parallel with the lake shore, turned again and entered the lake. A new channel, which runs due north, has been cut for it, and this wide, deep channel, protected by breakwaters, forms the harbor. The old river channel is lined with ore docks and yards for ship-building.

The low land along the river, called the “flats,” is covered with docks, warehouses, lumber yards, and factories. On the plateau, or terrace, is the public square, the business part of the city, and also much of the residence portion, as Euclid Avenue and neighboring streets (Fig. 57). The heights, such as Euclid Heights, Mayfield, and Cedar Heights, are fast becoming the most beautiful residence part of the city.

CLEVELAND is in the part of Ohio known as the *Western Reserve*, and was first settled in 1796. The Western or Connecticut Reserve is the land that was held back by Connecticut at the time when the states ceded to Congress the land which they claimed west of the mountains. It extends from the forty-first parallel north to Lake Erie, and from the Pennsylvania line west 120 miles (Fig. 22). The land east of the Cuyahoga River was sold in 1795 to the Connecticut Land Company, which was composed of some of the wealthiest citizens of Connecticut. A party sent out to survey the land was in charge of Moses Cleveland, a member of the company, and when the town was laid out it was named, in his honor, CLEVELAND, afterward changed to CLEVELAND. On the west side of the river a trading post had long been established, as this was considered a place of importance, lying as it does on the direct line between the two posts, Pittsburg and Detroit.

The little settlement grew very slowly, and it was not till the Erie Canal was built that it showed decided signs of progress. It then became a distributing centre for the merchandise and other commodities brought by the canal. Stage lines were already built connecting CLEVELAND with Pittsburg, COLUMBUS, and other towns.



FIG. 57.

The public square, Cleveland.

The building of the state canals, two of which terminated in CLEVELAND, was of great importance to the growing town, and it became one of the leading grain markets on the lakes. The lake route was now of great importance; fine steamers were plying back and forth on the lakes, carrying large quantities of merchandise as well as great numbers of passengers. CLEVELAND was a regular stopping place for the boats, and for thirty years held a place of first importance in the

state. Then came the period of railroad building, and the lake traffic began to decline. CLEVELAND, with the other lake ports, felt the change.

In 1851 something occurred which seemed of no importance at the time, but which, in the history of both the city and the state, has proved to be of the greatest importance. A boat coming from Lake Superior brought with it a few barrels of iron ore, which were landed at CLEVELAND. This was the beginning of a new era. Coal mining was being carried on in the Mahoning Valley and in other sections to the south, and CLEVELAND was one of the markets; more iron ore was brought to be sent to the coal region, and the ore and the coal met in CLEVELAND. Local railroads were soon built to the mining region, and large quantities of coal were shipped out. Iron manufacturing became an important industry. The same railroads that brought the coal could carry back some of the ore, and iron manufacturing began all along the railroads; and CLEVELAND became a receiving station for the ore, and a shipping place for the manufactured product.

It is estimated that sixty per cent of all the ore shipped from the Superior region now comes to CLEVELAND. Of the boats that bring it, eighty per cent are owned by the people of CLEVELAND. The ore is not only reduced and the pig-iron changed to steel, but these products are manufactured into machinery, steel rails, iron for boat-building, bridge iron, boilers, wire, nails, nuts, bolts and screws, sewing machines, hardware, and many other iron products.

CLEVELAND is the most important builder of merchant boats in the United States. Besides building most of the lake boats, it is now building boats to be used on the Atlantic Ocean. The numerous industries that followed

the iron industry brought many people to CLEVELAND, and in 1890 it had become the second city in size in Ohio, while in 1900 it had become the largest city in the state and the seventh in size in the United States.

CLEVELAND has many important industries besides iron-working. More oil is refined here than in any other city



FIG. 58.

A glimpse in the Forest City.

in the world. There are woollen mills, and factories where clothing is made. Paints, varnishes, and chemical supplies are made here. Electric light carbons and all sorts of electrical supplies are important products.

CLEVELAND has wide, beautiful streets and many parks, as Wade Park, Gordon Park, and others. The many fine trees that grow, not only in the parks, but in all parts of the city, have given CLEVELAND the nickname of "The

Forest City" (Fig. 58). The city is not compactly built; there are few large residence blocks and tenement houses. The working man and the rich man both have homes with dooryards.

The public schools of CLEVELAND are counted among the best in the West. Manual training is an important part of the public school education. Other educational institutions are the Western Reserve University, the Case School of Applied Sciences, and several schools of medicine.

President Garfield's tomb is in one of Cleveland's beautiful cemeteries.

Cincinnati. — On the map locate Cincinnati, and describe its location. Can you give any reason why a great city should have grown up here? What cities are there across the river?

CINCINNATI, the "Queen City of the West," with its fine public buildings, many parks, and beautiful suburbs scattered all through the hills, is one of the finest cities in the West, as well as one of the largest. It is second in size in Ohio, and eighth in the United States.

The business part of the city is on a low plain which borders the river, and is not many feet above it. This plain, which extends back along Mill Creek, is almost encircled by hills, which are from two hundred to three hundred feet above the river. The city extends for fifteen miles up and down the river. With the extension of the street car lines the people began to build their homes back in the hills, away from the heat and the dust of the main city. To get to the top of the hills, which are very steep, a number of inclines have been built; on these are large trucks on to which the street cars are run, and then both are slowly drawn to the top of the hill (Fig. 60).

CINCINNATI AND VICINITY.

Railroads thus: ———
 Street Car Lines thus: - - - - -
 Canals thus: ~~~~~
 Scale of Miles.
 0 1 2
 2 MILES TO 1 INCH.

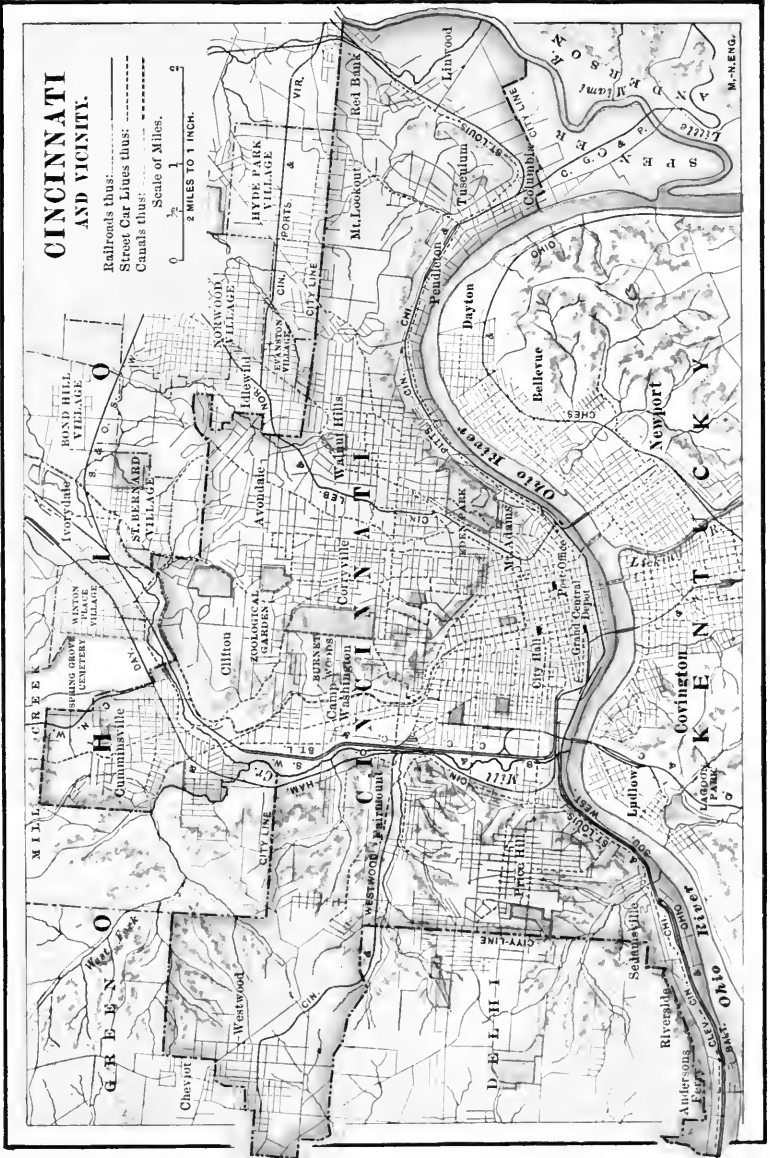


FIG. 59.



Eden Park and Burnet Woods are two of the fine parks of the city in which are still growing stately forest trees which were once a part of the original forest. In a commanding position overlooking the Ohio in Eden Park are the Art Museum and the Art School (Fig. 61).



FIG. 60.

A street car being drawn up the Mt. Adams incline.

CINCINNATI is the meeting-place for two lines of boats, the one running to Pittsburg and other towns to the east, the other running to Louisville, Memphis, New Orleans, and other towns to the west and south. Twenty-six lines of railways connect the city with all parts of the country ;

one of the great lines to the south, the Cincinnati Southern, was built and is still owned by the city. By means of the southern railways as well as the steamboat lines CINCINNATI is open to trade not only with the southern states, but also with the countries bordering the Gulf and the Carribbean Sea, and with South America. It has,

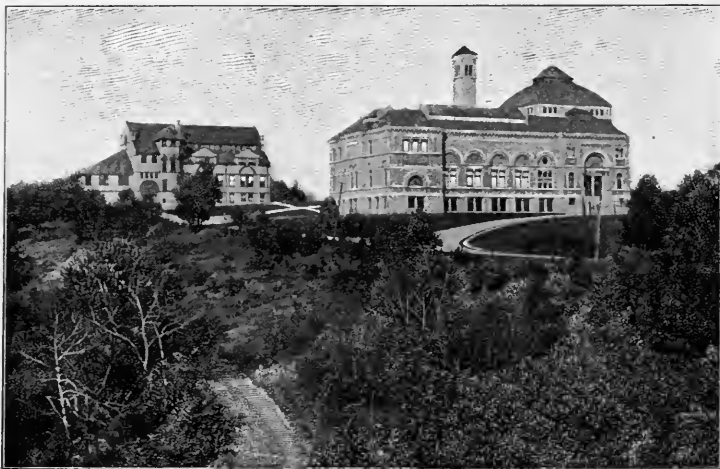


FIG. 61.

The Art School and the Art Museum.

therefore, a large market for its leather, furniture, shoes, liquors, carriages, clothing, paper, and machinery. Why is CINCINNATI called "The Gateway to the South"?

The Miami and Erie Canal terminates in CINCINNATI, and was a very important feature in an early day. It is now being repaired with the expectation of establishing a line of electric canal-boats between the lake and the river. Electric lines give easy communication with all the sur-

rounding towns and with the capital. A number of fine bridges connect it with Covington and Newport in Kentucky (Fig. 62).

Cincinnati is an important manufacturing city; its tanneries, wagon and carriage factories, machine shops, factories where furniture and clothing are made, and its breweries and distilleries are among the largest in the

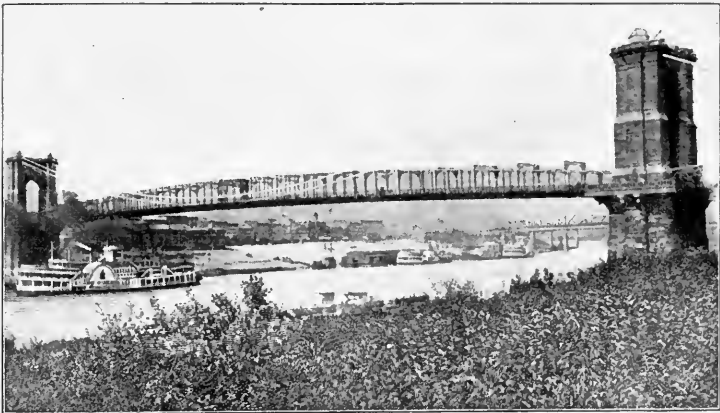


FIG. 62.

A bridge over the Ohio at Cincinnati.

United States. Other important products are meats, drugs, hardware, soap, paint, ink, tobacco, and cigars.

Rookwood pottery, which is the most noted of all the American decorative potteries, is made in Cincinnati (Fig. 35).

But the Queen City is more than a manufacturing and commercial town; it is one of the leading cities in music and art in the West. Musical festivals are held biennially in Music Hall, in which is employed the finest talent to be

obtained in the world. The Art Museum (Fig. 61) contains a great amount of valuable material, and the children of the public schools are given the opportunity to visit it with their teachers.

The public school system covers not only the course in the high school, but a course in the Cincinnati University. There are also public libraries, and schools of medicine and law.

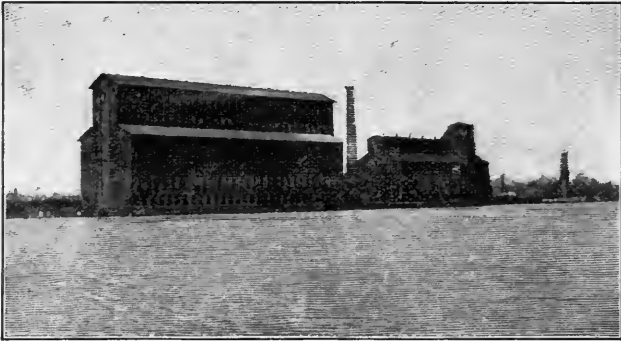


FIG. 63.

A grain elevator on the Maumee River at Toledo.

TOLEDO is the third city in size in Ohio. It is situated on either side of the Maumee River, some distance down from its entrance to Maumee Bay. It has a fine harbor, with nineteen miles of docks. It is a receiving station for iron ore from the Superior region, lumber from Michigan, and coal, grain, and other products from Indiana and Ohio.

It is an important lumber market as well as a manufacturing centre for wooden articles, such as cars, carriage beds, wheels, sash, doors and blinds, furniture, and picture

frames. Other important industries are refining oil, making glass, fishing, and manufacturing pig-iron, steel, and machinery.

It is the terminus of the Miami and Erie Canal, also of the Wabash and Erie Canal. It is the pioneer railway town in Ohio, and has many important railroads. Toledo exports grain, coal, wool, live stock, fish, lime, glass, cement, and many other manufactured articles.

DAYTON, the fifth city in size in Ohio, is a beautiful city



FIG. 64.

A few of the buildings of the National Soldiers' Home.

with well-paved streets and many fine residences. Situated on the Miami at a point where several tributary streams join it, Dayton is the natural market for the fine farm region which surrounds it. In early days these streams were the paths over which farm produce came to market; and in later times the railways have found it convenient to follow the valleys, and this has made the city an important railroad centre.

Cash registers, locks, cigars, cigar boxes, paper, leather, furniture, and clothing are some of the manufactured

articles. A fine system of public schools (Fig. 47) is aided by one of the best public museums and libraries in the state. The central branch of the National Soldiers' Home is located here (Fig. 64), and is visited yearly by hundreds of people.

SANDUSKY, on Sandusky Bay, has the finest and largest natural harbor on the lake. The ground back of the bay rises gradually, giving the city the benefit of the lake breeze, as well as a fine view of the lake. In and around the city are many limestone quarries, and many of the public buildings and dwelling houses are made of stone, which gives the city a very handsome appearance. Grapes and pears are produced in abundance in the surrounding country. SANDUSKY is an important lumber market, and manufacturing articles from wood is one of the principal industries; some of the products are boxes, barrels, window sash, and doors. Fishing is an important industry. The state fish hatchery is located in SANDUSKY. Large quantities of ice are shipped from SANDUSKY to CINCINNATI and other towns and cities in the interior.

MILAN, in Erie County, is the birthplace of Thomas A. Edison.

AKRON is a busy manufacturing city, situated on the divide that separates the basin of the St. Lawrence from the basin of the Mississippi. There are a number of beautiful little lakes in the vicinity. One of these, Summit Lake (Fig. 4), is the source of AKRON'S water supply. The Ohio Canal and a canal connecting the lake and the Ohio near Pittsburg pass through the town. Some of the important industries are manufacturing sewer pipe and stoneware, harvesters, twine, rubber goods, and fire brick. Such food products as flour, crackers, and oat-

meal, are also made here. One-fifth of all the matches used in the United States are made in AKRON and adjoining villages.

CANTON is a manufacturing town, producing threshing machines, engines, wagons, ploughs and other machinery. One of the largest watchmaking factories in the country



FIG. 65.

The home of President McKinley at Canton.

is situated here. CANTON has many beautiful homes; one of these will always be remembered as the home of President McKinley (Fig. 65).

YOUNGSTOWN, in the Mahoning Valley, is the centre of a fine farming and sheep raising region, and holds a leading place in the coal and iron trade. It is the pioneer town in Ohio in the iron industry.

Like CLEVELAND and other cities and towns on the lake, LORAIN is interested in ironwork. It is situated at the mouth of the Black River and has a good harbor. Boat building has long been an important industry. The growth of Lorain in the last ten years has been very rapid. Why?

ASHTABULA, at the mouth of the Ashtabula River, has a good harbor, and is an important shipping station for coal and a receiving station for iron ore. There are also iron furnaces and steel plants here.

One of the leading towns in the marketing and refining of oil is LIMA, the county seat of Allen County. It is the headquarters of the Pipe Line Company, which controls about three-fourths of the oil produced in that section. The crude oil is transported by pipes to Chicago in the West and to the coast in the East. Oil is also refined in LIMA, and the various by-products from the crude oil are manufactured here. LIMA is an important railroad town and several roads have shops here.

PIQUA, a thriving manufacturing town, is on the Miami River and has fine water-power. Among the leading manufactured products are linseed oil, furniture, strawboard, and machinery.

DEFIANCE is at the junction of the Auglaize and the Maumee, and is named for Fort Defiance, built by General Anthony Wayne in his campaign against the Indians which was ended at the battle of Fallen Timbers (page 31). The region surrounding DEFIANCE was the heart of the Indian country. The representatives of various tribes came from long distances and from every direction to the great councils which were held here.

The manufacturing of wooden articles is one of the

principal occupations, some of the products being boxes, barrels, furniture, wagons and carriages, paper, hoops, and staves.

FINDLAY and BOWLING GREEN were in the centre of the first great gas field of Ohio (Figs. 37 and 38). Many factories were built in the towns at that time, which were afterward abandoned. The supply of gas is exhausted, but there is still oil in the field. The surrounding country is a good farming region, and the towns are improving steadily.

FREMONT is at the head of navigation on the Sandusky River. It was the home of President Hayes.

TIFFIN is the trade centre for a large agricultural district, and it is also a manufacturing town. Chief among the manufacturing industries are making agricultural machinery, bolts and screws, woollen goods, and glassware. TIFFIN is the seat of Heidelberg College.

MARION is an important railway centre, and a trading place for a fine farming and grazing region. It is also a market for the limestone and lime which are products of the quarries in the vicinity.

MASSILON has an important coal trade and is also a manufacturing town. Ironworking and making machinery are important industries.

MANSFIELD, MT. VERNON, and NEWARK are centres of important farming regions. At NEWARK are some of the best-preserved of the works of the Mound Builders. MANSFIELD was the home of John Sherman. ZANESVILLE, sometimes called the "clay city," is an important town in the manufacturing of decorative tile, fine pottery, glass, and different kinds of brick. It is at the head of navigation on the Muskingum River.

SIDNEY, KENTON, and TROY are trading places for large farming areas.

WASHINGTON COURT-HOUSE is one of the leading cattle markets in the state.

LANCASTER is the centre of the most important gas field in Ohio. It has a number of industries which make use of the natural gas. LANCASTER is the birthplace of General William Tecumseh Sherman.

CIRCLEVILLE is the market for a fine farm region, the Pickaway Plains. Some of its industries are making strawboard and straw paper, packing pork, and canning and drying corn.

SPRINGFIELD is an important railroad town, and a leading market for limestone and lime. It is the seat of Wittenberg College.

XENIA has large twine factories and powder mills. The Soldiers' and Sailors' Orphans' Home is in Xenia.

HAMILTON is a growing manufacturing town. It is situated on both sides of the Big Miami, and is the centre of a region called the "Garden of Ohio." Some of the products of the manufactories are canned goods, liquors both malt and distilled, farm machinery, engines, pumps, paper, furniture, and tile.

CHILlicothe is situated on a terrace, thirty or more feet above the Scioto River. It is an important grain market. CHILlicothe was the capital of Ohio from 1800 to 1816 (p. 74).

ATHENS is the seat of Ohio University, a state institution founded in 1804.

MARIETTA is the oldest town in Ohio (Fig. 66). The first inhabitants were from New England, and it still has the appearance of a New England town. Blennerhas-

sett's Island is twelve miles below Marietta, in the Ohio River. Some of the best known of the Mound Builders' works are at MARIETTA. Marietta College is located here.

POMEROY is a coal-mining town, and has large salt works.

PORTSMOUTH and IRONTON are both iron manufacturing towns.

STEUBENVILLE and BELLAIRE are important coal markets, and manufacture pottery, pig-iron, and steel.



FIG. 66.

Marietta, the oldest town in Ohio.

EAST LIVERPOOL is the centre of the pottery industry in the United States (Fig. 34).

SOMERSET, in Perry County, was the birthplace of General Philip H. Sheridan.

REVIEW QUESTIONS

I. LOCATION.—(1) On a map of the United States locate Ohio. (2) Near what mountain region is it? (3) In what great river basins? (4) Describe the boundary. (5) Keeping within the boun-

dary of the United States trace the shortest route from (a) New York City to Chicago. (b) From Boston to St. Louis. (c) From Philadelphia to Minneapolis. (d) From Duluth to Pittsburg. (6) What relation have these lines to Ohio? (7) Trace Mason and Dixon's line. (8) Is Ohio a Northern or Southern state? (9) An Eastern or a Western state? (10) Show what effect the position and boundary of the state have had on its development.

II. PHYSIOGRAPHY AND DRAINAGE.—(1) What is the general character of the surface of Ohio? (2) What two great forces have changed and modified the surface? (3) What part of the state was covered by the glacier? (4) Give the most important effects of the glacier? (5) What important differences are there between the part of the state covered by the glacier, and the part not so covered? (6) Tell what you know about the divide between the rivers flowing to Lake Erie and those flowing to the Ohio. (7) Describe the northern slope and name the principal rivers. (8) Compare the southern slope with the northern, and name the important rivers on the southern slope. (9) What part of the state is best adapted to agriculture? Why? (10) Which of the rivers furnish water-power?

III. CLIMATE, PLANTS, AND ANIMALS.—(1) In what wind belt is Ohio? (2) From what direction do our storms usually come? (3) What is the average rainfall of the state? (4) Compare the temperatures in different parts of the state, and give reasons for the difference. (5) What effect does this difference have on agriculture? (6) Name the more important trees, shrubs, and wild flowers native to Ohio. (7) Do the same for the part of the state in which you live. (8) What is being done in the state to protect the forests? (9) Tell what you know of the wild animals that formerly lived in the state, and of those living there now. (10) What is the government doing to protect the wild animals? Why is this necessary?

IV. HISTORY.—(1) Tell what you know of the first inhabitants of Ohio. (2) Describe one of the earthworks you have seen. (3) Name some of the counties, towns, rivers, etc., that have Indian names. (4) Find out what you can about the following great Indian chiefs: Logan, Tecumseh, the Prophet, Brandt, and Little Turtle. (5) What is meant by the Northwest Territory? (6) Which of the colonies had claims on Ohio? (7) How were these claims satisfied? (8) From which states did the people come who founded the first set-

tlements in Ohio? (9) Give an account of the selection of a permanent capital for the state. (10) Give an account of some of the great writers, statesmen, and soldiers who have come from Ohio.

INDUSTRIES

V. FARMING, DAIRYING, FRUIT RAISING.—(1) What are the conditions that make Ohio primarily an agricultural state? (2) What are the different types of farm lands? (3) Where are the best farm lands in the state? Why are these lands the best? (4) What are the principal farm products? (5) In what parts of the state is fruit raising an important industry? (6) Where is dairying of special importance? (7) Where is market gardening an important industry? (8) What effect will it have on sheep raising to lower the tariff on wool? (9) Compare the present methods of farming with those in the past. (10) Compare Ohio with the other states in the production of sheep, wheat, horses, hay, and corn.

VI. MINING AND QUARRYING.—(1) Name the mineral products of Ohio. (2) Locate the mining district. (3) What kind of coal is produced in Ohio, and for what is it used? (4) Tell what you can about the formation and mining of coal. (5) What effect has the supply of coal in Ohio had upon the development of other industries in the state? (6) What are the building stones of Ohio, and in what parts of the state is each quarried? (7) What is the most important building stone, and where is it quarried? (8) For what else are limestone and sandstone used besides for building purposes? (9) What is lime? (10) Give some uses of cement.

VII. IRON MANUFACTURING.—(1) What place does Ohio occupy in the production of pig-iron and steel? (2) Give reasons for the great development of the industry in Ohio. (3) Locate the most important iron ore producing regions in the United States. (4) From which of these regions do we receive the greatest amount of ore? (5) Tell how it is shipped, and in what towns it is received. (6) In what towns and cities are pig-iron and steel produced? (7) What city is the greatest market for pig-iron? (8) Tell what you can of the reduction of iron from the ore. (9) Give the principal uses of steel. (10) Name some of the cities where farm machinery is made.

VIII. CLAY, OIL, AND GAS.—(1) What are the principal uses of clay? (2) In what parts of the state is clay found? (3) What are

the important clay products produced in Ohio? (4) Where are these articles produced? (5) What is said of the importance of the clays of Ohio? (6) Locate the principal oil fields of Ohio. (7) What is meant by "refining the oil," and what are the products from the refineries? (8) How is the oil transported to the refineries? (9) Where are the natural gas fields of Ohio? (10) What are some of the uses of natural gas?

IX. GOVERNMENT AND EDUCATION. — (1) What are the departments of government of a state? (2) Name the executive officers of the state, and give length of term of each officer. (3) Name the members of the General Assembly from your district. (4) Name the county officials in your county, and give the length of term of each. (5) What courts are held in your county, and who are the judges? (6) Who are the United States senators from Ohio, and how are they elected? (7) Who is the congressman from your district, and how is he elected? (8) What provision did the general government make for education in the Northwest Territory? (9) How is the money obtained which pays the expenses of the public schools? (10) What is the "Travelling Library"?

X. CITIES AND TOWNS IN OHIO. — (1) Name the capital city, and give the reason for its location. (2) What is the largest city, and give reasons for its rapid growth. (3) Give some of the causes that have made Cincinnati a great city. (4) Name and locate all the towns that have over ten thousand inhabitants. (5) Name the principal towns in the mining region. (6) Name the principal iron manufacturing towns. (7) Name the towns in the oil regions. (8) Name and locate the towns that are interested in clay working. (9) Name the towns where colleges or universities are located. (10) What is the oldest town in the state?

TABLES OF POPULATION, AREA, ETC.

POPULATION OF OHIO; 1800 TO 1900

Census Year	Population	Increase, Number	Per Cent	Census Year	Population	Increase, Number	Per Cent
1800	45,865			1860	2,339,511	359,132	18.1
1810	230,760	185,895	408.7	1870	2,665,260	325,749	18.9
1820	581,295	350,535	151.9	1880	3,198,062	532,802	20.0
1830	937,903	356,608	61.3	1890	3,672,316	474,254	14.8
1840	1,519,467	581,564	62.0	1900	4,157,545	485,229	13.2
1850	1,980,329	460,862	30.3				

POPULATION OF LARGEST TEN CITIES OF OHIO; 1850 TO 1900

Cities	1900	1890	1880	1870	1860	1850
Cleveland	381,768	261,358	160,146	92,829	43,417	17,034
Cincinnati	325,902	296,908	255,189	216,239	161,044	115,485
Toledo	131,822	81,434	50,137	31,584	13,768	3,829
Columbus	125,560	88,130	51,047	31,274	18,554	17,882
Dayton	85,333	61,220	38,678	30,473	20,081	10,977
Youngstown	44,885	33,220	15,435	8,075	2,739	
Akron	42,728	27,601	16,512	10,006	3,447	8,266
Springfield	38,253	31,895	20,730	12,652	7,002	5,108
Canton	30,667	26,189	12,258	8,660	4,041	2,603
Hamilton	23,914	17,565				

CITIES FROM 10,000 TO 25,000 POPULATION; CENSUS OF 1900

	1900	1890		1900	1890
Ashtabula	12,949	8,338	Massillon	18,157	14,270
Chillicothe	12,976	11,288	Newark	11,944	10,092
East Liverpool	16,485	10,956	Piqua	12,172	9,090
Findlay	17,613	18,553	Portsmouth	17,870	12,394
Ironton	11,868	10,939	Sandusky	19,664	18,471
Lima	21,723	15,981	Steuenville	14,349	13,394
Lorain	16,028	4,863	Tiffin	10,989	10,801
Mansfield	17,640	13,473	Zanesville	23,538	21,009
Marietta	13,348	8,273			
Marion	11,862	8,327			

TOWNS HAVING FROM 5,000 TO 10,000 POPULATION

	1900		1900
Alliance	8974	Middletown	9215
Bellaire	9912	Mt. Vernon	6633
Bellefontaine	6649	Nelsonville	5421
Bowling Green	5067		
Bucyrus	6560	New Philadelphia	6213
		Newburg	5909
Cambridge	8241	Niles	7468
Canal Dover	5422	Norwalk	7074
Cireleville	6991	Norwood	6480
Conneaut	7133		
Coshocton	6473	Painesville	5024
		St. Mary's	5359
Defiance	7579	Salem	7582
Delaware	7940	Sidney	5688
Elyria	8791	Troy	5881
Fostoria	7730		
Fremont	8439	Urbana	6808
		Van Wert	6422
Gallon	7282	Warren	8529
Glenville	5588	Washington Court-House	5751
Gallipolis	5432	Wellston	8045
Greenville	5501		
Kenton	6552	Wellsville	6146
		Wooster	6063
Lancaster	8991	Xenia	8696
Martins Ferry	7760		

TOWNS HAVING FROM 2000 TO 5000 POPULATION

	1900		1900
Ada	2576	Lisbon	3330
Ashland	4087	Lockland	2695
Athens	3066	Logan	3480
Barberton	4354	London	5511
Barnesville	3721	Madisonville	3140
Bellevue	4101	Manchester	2003
Berea	2510	Marysville	3043
Bridgeport	3963	Medina	2232
Bryan	3131	Miamisburg	3941
Carthage	2559	Middleport	2799
Celina	2815	Mingo Junction	2954
Chicago Junction	2348	Napoleon	3639
Clyde	2515	Newcomerstown	2659
Collinwood	3639	New Straitsville	2302
Crestline	3232	North Baltimore	3561
Cuyaboga Falls	3186	Oberlin	4082
Delphos	4517	Ottawa	2322
Dennison	3763	Paulding	2080
East Cleveland	2757	Pomeroy	4639
East Palestine	2493	Port Clinton	2450
Eaton	3155	Ravenna	4003
Elmwood Place	2532	Reading	3076
Fairport	2073	Ripley	2243
Franklin	2724	Rockport	2080
Geneva	2342	St. Bernard	3384
Girard	2630	Saltville	2353
Glouster	2155	Shawnee	2966
Greenfield	3979	Shelby	4685
Hicksville	2520	South Brooklyn	2343
Hillsboro	4535	Toronto	3526
Jackson	4672	Uhrichsville	4582
Kent	4541	Upper Sandusky	3355
Lakewood	3355	Wapakoneta	3915
Lebanon	2867	Wauseon	2148
Leetonia	2744	Wilmington	3613

THE COUNTIES OF OHIO

County	Organized	Area Sq. Mi.	Population 1900	County Seat
Adams	1797	415	26,328	West Union
Allen	1820	324	47,976	Lima
Ashland	1846	371	21,184	Ashland
Ashtabula	1807	537	51,448	Jefferson
Athens	1805	370	33,730	Athens
Auglaize	1848	299	31,192	Wapakoneta
Belmont	1801	461	60,875	St. Clairville
Brown	1817	417	28,237	Georgetown
Butler	1803	315	56,570	Hamilton
Carroll	1832	346	16,811	Carrollton
Champaign	1805	409	26,642	Urbana
Clarke	1817	312	58,939	Springfield
Clermont	1800	394	31,610	Batavia

County	Organized	Area Sq. Mi.	Population 1900	County Seat
Clinton	1810	311	24,202	Wilmington
Columbiana	1803	436	68,590	New Lisbon
Coshocton	1811	479	29,387	Coshocton
Crawford	1820	332	33,915	Bucyrus
Cuyahoga	1807	303	439,120	Cleveland
Darke	1809	436	42,532	Greenville
Defiance	1845	304	26,357	Defiance
Delaware	1808	366	26,401	Delaware
Erie	1838	177	37,650	Sandusky
Fairfield	1800	423	34,259	Lancaster
Fayette	1810	335	21,725	Washington Court-House
Franklin	1803	361	164,460	Columbus
Fulton	1850	321	22,501	Wauseon
Gallia	1803	346	27,918	Gallipolis
Geauga	1805	344	14,744	Chardon
Greene	1803	343	31,613	Xenia
Guernsey	1810	441	34,425	Cambridge
Hamilton	1790	400	409,479	Cincinnati
Hancock	1820	540	41,993	Findlay
Hardin	1820	440	31,157	Kenton
Harrison	1814	320	20,486	Caliz
Henry	1820	430	27,282	Napoleon
Highland	1805	470	30,982	Hillsboro
Hocking	1818	400	24,398	Logan
Holmes	1824	420	19,511	Millersburg
Huron	1815	450	32,330	Norwalk
Jackson	1816	410	34,248	Jackson
Jefferson	1797	440	44,357	Stuebenville
Knox	1808	540	27,768	Mt. Vernon
Lake	1840	215	21,680	Painesville
Lawrence	1816	440	39,534	Ironton
Licking	1808	680	47,070	Newark
Logan	1817	440	30,420	Bellefontaine
Lorain	1822	500	54,857	Elyria
Lucas	1835	440	153,559	Toledo
Madison	1810	470	20,590	London
Mahoning	1846	420	70,134	Youngstown
Marion	1824	430	26,678	Marion
Medina	1818	400	21,953	Medina
Meigs	1819	400	28,620	Pomeroy
Mercer	1820	470	28,021	Selma
Miami	1807	400	43,105	Troy
Monroe	1813	470	27,031	Woodsfield
Montgomery	1803	470	130,146	Dayton
Morgan	1818	400	17,905	McConnelsville
Morrow	1848	450	17,879	Mt. Gilead
Muskingum	1804	650	53,185	Zanesville
Noble	1851	400	19,466	Caldwell
Ottawa	1840	300	22,213	Port Clinton
Paulding	1820	420	27,528	Paulding
Perry	1817	410	31,841	New Lexington
Pickaway	1810	480	27,016	Circleville

County.	Organized	Area Sq. Mi.	Population 1900	County Seat
Pike	1815	470	18,172	Waverly
Portage	1807	490	29,246	Ravenna
Preble	1808	440	23,713	Eaton
Putnam	1820	510	32,525	Ottawa
Richland	1813	490	44,289	Mansfield
Ross	1789	650	40,940	Chillicothe
Sandusky	1820	440	34,311	Fremont
Scioto	1803	640	40,981	Portsmouth
Seneca	1820	540	41,163	Tiffin
Shelby	1819	420	24,025	Sidney
Stark	1808	580	94,747	Canton
Summit	1840	420	71,715	Akron
Trumbull	1800	650	46,591	Warren
Tuscarawas	1808	520	58,751	New Philadelphia
Union	1820	420	22,942	Marysville
Van Wert	1820	400	30,394	Van Wert
Vinton	1850	402	15,330	McArthur
Warren	1803	400	25,584	Lebanon
Washington	1788	650	48,245	Marietta
Wayne	1796	540	37,870	Wooster
Williams	1820	420	24,953	Bryan
Wood	1820	620	51,555	Bowling Green
Wyandot	1845	400	21,125	Upper Sandusky

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INDEX

NUMBERS REFER TO PAGES

- Agriculture, 37-41.
Animals, 24, 25, 26.
Area of counties, 96.
- Bowling Green, 53, 54, 59, 89.
Boxwell Law, 66.
" Buckeye State," 24.
Buckeye tree, a, 23.
- Canals, 35, 36, 61, 62, 64, 82.
Chillicothe, 74, 90.
 settlement of, 34.
Cincinnati, 50, 58, 62, 80-84.
 settlement of, 34.
Clay working, 48-51.
Cleveland, 9, 57, 59, 75-80.
 settlement of, 35.
Climate, 21, 22.
Coal, 2, 41, 42, 43.
Columbus, 59, 72-75.
 capital established at, 35.
 state capital at, 73, 74.
Cuyahoga Falls, 8.
Cuyahoga River, 8, 9, 60, 76.
- Dayton, 59, 85.
 high school building in, 67.
 National Soldiers' Home at, 86.
 settlement of, 35.
Divide, the, 6, 8, 14, 20.
Drainage, 4-21.
- East Liverpool, 91.
 potteries of, 49, 50.
Edison, Thomas A., 86.
Education, 64-69.
- Erie, Lake, 3, 6, 7, 11, 12, 26, 57.
 islands of, 4, 13, 14.
 shores of, 12, 13.
 transportation on, 61, 63, 64.
- Fallen Timbers, battle of, 12, 31, 88.
Findlay, 53, 89.
- Garfield, James A., 80.
Gas, 51-55.
 discovery of, 53.
 regions producing, 19, 55.
General Assembly, 35, 70, 74, 75.
Geological story, 1-4.
Glacier, 2, 3, 15.
 effects of, 3, 4, 5, 7.
Government, 69-71.
- Harrison, William Henry, 16, 24.
Hayes, Rutherford B., 89.
Hocking River, 5, 19, 42.
- Indians, 29-31, 35, 88.
Industries, 37-60.
Iron manufacturing, 55-58, 87.
Iron ore, mining of, 44, 45. -
 receiving docks for, 58.
 Lake Superior, 57, 78. -
 reduction of, 55, 56.
- Lima, 54, 88.
- Marietta, 55, 90, 91.
 settlement of, 34.
Maumee River, the, 10, 11, 12.
McKinley, William, 87.
Miami River, 19, 20, 21, 26, 38.

- Mining, 42, 45.
 coal, 42, 43, 44.
 iron ore, 44, 45.
 Mound Builders, 19, 26-29, 34.
 Muskingum River, 5, 18, 26, 33, 38.

 National Road, the, 35, 61.

 Ohio Company, the, 33.
 Ohio River, the, 3, 32.
 discovery of, 31.
 manufacturing towns on, 58.
 transportation on, 16, 43, 63, 65.
 valley of, 15, 16.
 Oil, 19, 51-55.
 Ordinance of 1787, 64, 68.

 Physiography, 4-21.
 Plants, 23, 24.
 Population of cities, 95.
 of counties, 96, 97, 98.
 of state, 94.
 of towns, 95, 96.
 Potteries, 49.
 East Liverpool, 49, 50.
 Potteries — *continued*.
 Rookwood, 50.
 Zanesville, 89.
 Public lands, map of, 33.
 Putnam, General Rufus, 33.

 Quarrying, 20, 45-48.

 Railroads, 62.
 first built, 36, 62.
 Reference, books of, 98.
 Review questions, 91-94.
 Rural delivery, 40.

 Scioto River, 19, 26, 27, 38, 74.

 Toledo, 12, 59, 84, 85.
 Transportation, 60-64, 80.
 Travelling Library, 68-69.

 University, Ohio State, 41, 50, 67, 68, 69.

 Wayne, General Anthony, 12, 31, 88.
 Western Reserve, 32, 33, 76.
 White men, 31-37.

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