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GEOGRAPHY OF WEST VIRGINIA

By J. F. Marsh

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HISTORY

Before the coming of the white man, many Indian tribes-the Delaware, Shawnee, Mingo, and others-hunted in the deep forests of what is now West Virginia. The hostile Indians added to the other difficulties met by the early settlers in making a home in the wilderness. The power of the Red Man in the region was broken in the battle of Point Pleasant, 1774, when the armies of Virginia defeated Chief Cornstalk and his hosts.

La Salle explored the Ohio River in 1669, and John Lederer brought his followers to the top of the Blue Ridge near Harpers Ferry

in 1670. These and other explorers brought back good reports of the region bevond the Allegheny Mountains.

In the meantime many early settlements were made. Morgan Morgan settled at Bunker Hill, Berkeley County, in 1726, and some Germans came to Shepherdstown the next year. The Van Meters, Hites, and others came to the valley of the South Branch of the Potomac, 1735; Stephen Sewell and Jacob Marlin to Marlinton by 1740, followed by planters sent to that region by the Greenbrier Land Company. Other early settlements were on Tygart River by David Tygart, 1754; at Morgan-

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town by Thomas Decker, 1758; at Wheeling by the Zanes, 1769; in the Kanawha valley, including Charleston, about 1790. By 1800 the population of what is now West Virginia was about 80,000.

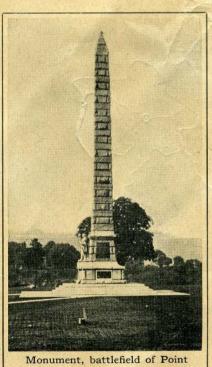
Most of the early settlers were occupied in clearing the forests for farms and in building homes. Other industries of the early period were salt manufacture, flour milling, tanning, timbering, mining, and smelting iron ore. The Baltimore and Ohio Railroad, which was built from 1832 to 1852, greatly influenced the early history of the state.

The mountain barrier which cut off easy connection with Old Virginia, the westward flow of the rivers, and the fact that many of the settlers came from the North caused the majority of West

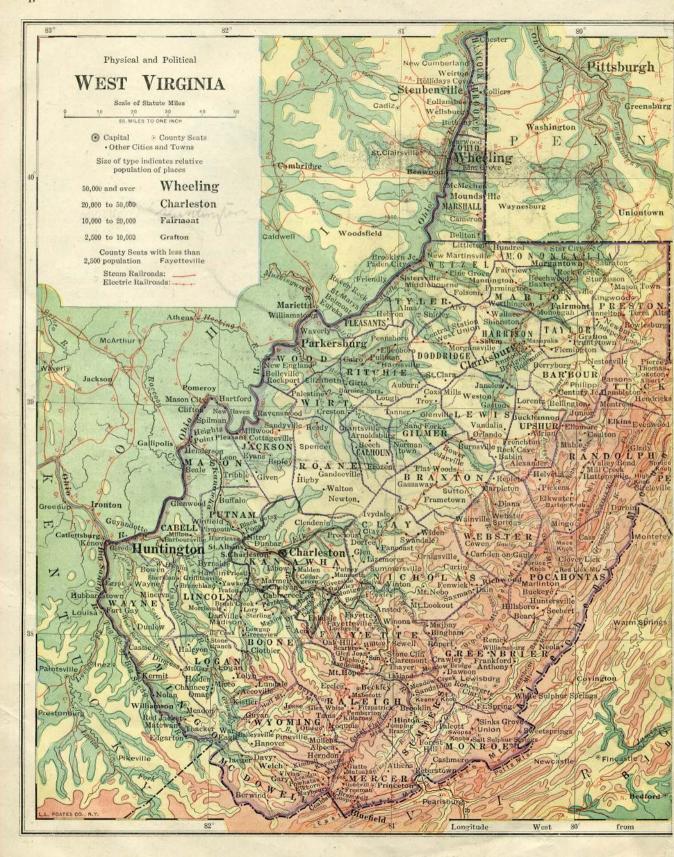
Virginians to oppose secession from the Union. Conventions for considering the question of forming a new state were held at Wheeling in 1861. The first constitution was adopted in 1862, and Lincoln issued the proclamation declaring West Virginia a state of the Union on June 20, 1863. The state furnished more than 30,000 soldiers to the Union Army and about one third that number to the Confederate Army.

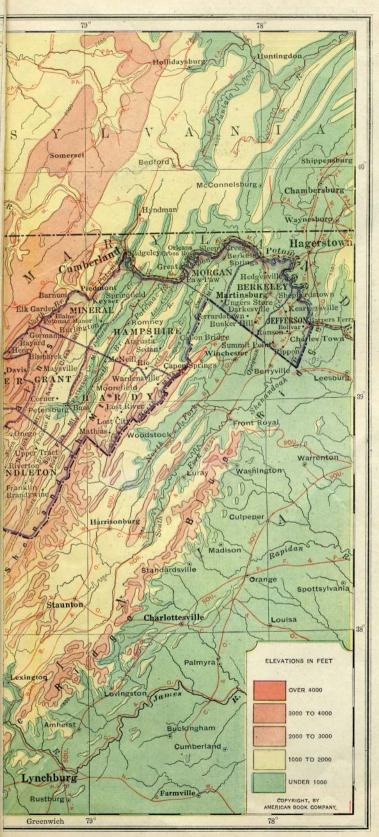
Many state institutions were founded soon after the state was formed, the West Virginia University being established in 1868. The state had a rapid industrial development.

West Virginia has produced many strong leaders. A few of them are: Francis H. Pierpont, governor during the Civil War; Nathan Goff, Secretary of the Navy under President Haves and later a Federal judge and



Pleasant





MAP STUDY

1. Look at the map carefully, noticing the peculiar shape of the state. 2. Why did some man say, "West Virginia looks like a frog sliding down the western slope of the Allegheny Mountains"? 3. What is meant by the following quotation: "West Virginia is the most northern of the southern states, the most southern of the northern states, the most eastern of the western states, and the most western of the eastern states"? 4. Draw lines east and west touching the northern and southern tips of the state, and other lines north and south touching the points farthest east and west. 5. Extend the lines and find the relation of their latitude and longitude to Pittsburgh, Richmond, Washington, and Cincinnati. 6. Find the extreme length and width of the state, using ruler and scale of

7. What parts of the boundary are straight lines? Why? 8. What is the Mason and Dixon Line? 9. What rivers form parts of the boundary? 10. Place a string on that part of the Ohio River bordering on the state, following carefully all the bends. Use a large wall map if possible. 11. Measure the string, and by the scale of miles find the length of the western border.

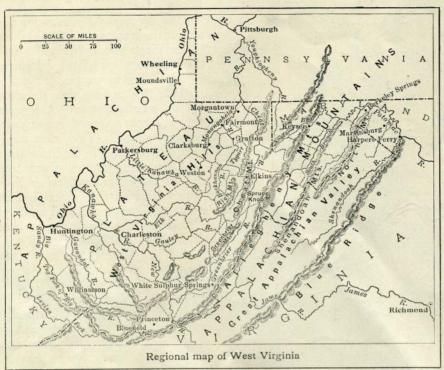
12. What is the area of West Virginia?

13. Make a list of five states about the same size as West Virginia; four about twice as large; one about ten times as large.

14. Look at the map and select what looks like the largest county; the smallest county; and an average-sized county. 15. Look at the table on page xxiv to learn how well you estimated. 16. Name the counties of the Panhandles. 17. Where is your own county? 18. What is its area? 19. How far is it in a straight line from your home to Charleston? To Wheeling? To Huntington? To Bluefield? To Martinsburg? To New York? To Washington? To Chicago? To San Francisco? Use ruler and scale of miles.

20. To what group of states does West Virginia belong? (See page 116.) 21. In what part of this group is it located? 22. Why was it placed in this group?

23. With no map in sight, draw rapidly an outline map of the state showing five rivers and ten cities. 24. Compare your map with the correct map, and practice until you can draw on paper or blackboard a map that shows the general location of important features.



United States senator; Stephen B. Elkins, Secretary of War under President Harrison and later United States senator; William L. Wilson, a leader in Congress and Postmaster General under President Cleveland; and John W. Davis, ambassador to England under President Wilson.

The state took an active part in the World War, furnishing 45,648 men for our fighting forces.

POSITION AND SIZE

Position.-West Virginia, as will be seen by

reference to the map on page 98, occupies the northwestern part of the South Atlantic States. By latitude and longitude it is bounded as follows: on the north by 40° 45′ north latitude, on the south by 37° 10′ north latitude, on the east by 77° 45′ west longitude from Greenwich, on the west by longitude 82° 40′.

The boundary, a total of 1170 miles in length, is very irregular. The western shore of the Ohio River forms the boundary on the west; the Big Sandy and Tug Fork on the southwest; and

the Mason and Dixon Line, a part on the north; while the mountains on the east had much to do in determining that boundary when the state was formed. The eight counties that lie in the basin of the Potomac River and along the Baltimore and Ohio Railroad compose the Eastern Panhandle; and four small counties between the Ohio River and Pennsylvania make up the Northern Panhandle.

Size.—The area of the state is 24,170 square miles. Some comparisons in size will be interesting: West Virginia

is as large as the combined areas of Rhode Island, Delaware, New Jersey, Connecticut, and Massachusetts; it is one half the size of New York, and one eleventh the size of Texas. West Virginia ranks fortieth in size among the forty-eight states of the Union.

SURFACE

The Mountains.—" Mountaineers" is the name commonly applied to the people of West



Junction of the Potomac and Shenandoah rivers, where West Virginia meets Maryland and Virginia



The highest point in West Virginia, the summit of Spruce Knob, Pendleton County

Virginia. The state is often referred to as "The Mountain State," and "Mountaineers are always free" is the state motto. These terms are used because the western ridges of the Appalachian Mountain System extend in parallel groups through the entire eastern part of the state from Morgan County on the north to McDowell County on the south.

The principal mountain ranges in the state are known as the Blue Ridge, the Allegheny, the Cheat, the Rich, the Greenbrier, and the North mountains. These great, forestcovered ranges overlooking peaceful valleys and rugged gorges, and rising at many points

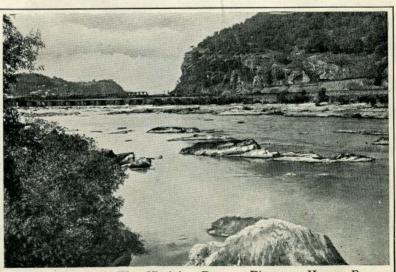
to lofty peaks, afford scenery that rivals in beauty and grandeur any to be found in America. It is important that the state and nation take action to preserve the beauty of these regions by the proper care of the forests and streams. Permanent roads will do much to develop the mountainous sections, and to bring their attractive features within reach of many persons of this state and other states.

The names of the highest mountains in the state with their elevation and location in counties are given in the following table:

(A)			300				COUNTY	FEET
Spruce Knob							Pendleton	4860
Spruce Knob				7		33	Pocahontas	4730
High Knob .			+:				Randolph	4710
Mace Knob .							Pocahontas	4700
Red Lick Mount	air	1	11		2		Pocahontas	4671
Barton Knob							Randolph	4600
Roaring Plains					+		Pendleton	4400
Cold Knob .				2			Greenbrier	4318
Keeney Knob							Summers	3955
Sewell Mountain							Fayette	3500
Swopes Knobs							Monroe	3000

The West Virginia Hills.—Geologists tell us that most of that great portion of the state between the mountains and the Ohio River was an ancient plateau, which is a part of the Appalachian Plateau. Rivers from the rising mountains in the east gradually cut deep gullies and wide valleys in this plateau, thus making the innumerable hills that are found almost everywhere in that wide region of the state. The state song, entitled "The West Virginia Hills," expresses the attachment the natives have for the hills of the state in lines such as, "Oh! the West Virginia Hills! How majestic and how grand!"

As a general rule, the hills grow less rugged from the mountains westward and decrease in height at a rate estimated at from twenty to thirty feet a mile. The protection of forests and, later, of grass has kept most of the



The lowest point in West Virginia. Potomac River near Harpers Ferry



Valley of the South Branch of the Potomac

hills from destructive erosion. For that reason, most of them are rounded and pleasing in their contour and productive to their tops. Unless forest preservation and the best methods of grazing are encouraged and practiced, the great hilly region of the state will lose much of its beauty and richness.

Valleys and Rolling Land.—West Virginia is not entirely covered with hills and mountains. At many points, the Ohio River valley on the West Virginia side is more than a mile wide, while its larger tributaries—the Little Kanawha, the Great Kanawha, and the Guyandot - run through beautiful, fertile valleys. Perhaps the finest bottoms in the state are found along the South Branch of the Potomac in Hardy County and Hampshire County.

Much of the surface in Iefferson and Berkeley counties and in the counties of the Northern Panhandle is gently rolling, presenting a sharp contrast to the wild, mountainous regions.

Questions and Exercises. —1. Why is the boundary of the state so irregular? 2. What parts of the boundary line are straight? 3. Why? 4. What is the width of the state in latitude? In miles? 5. Name the states in the same general latitude. 6. What is the average size of the fortyeight states? 7. How does that compare with the size of West Virginia? 8. Why are the people of the state called "Mountaineers"? 9. What ranges of mountains in the state have you seen? 10. What is the highest point you have visited in the state?

11. Locate on a map the mountains listed on page v. 12. How does Spruce Knob compare in height with Pikes Peak? 13. What is the Appalachian Plateau? 14. How were the West Virginia Hills formed? 15. Locate the principal valleys of the state. 16. What should be done

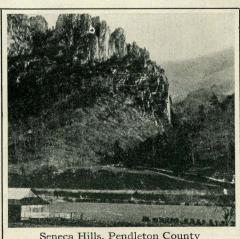
to protect the surface and beauty of the state?

DRAINAGE

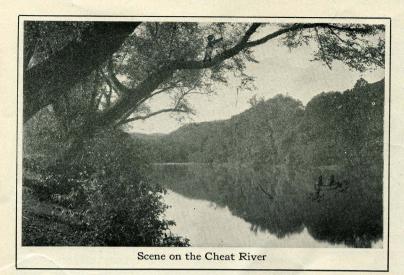
Rivers.—Before studying this topic, pupils should examine carefully the river systems of the state as shown on the general map on pages ii and iii, and on the regional map on page iv. By tracing from their mouths to their sources, the Big Sandy, Kanawha, Elk, Greenbrier, Gauley, Little Kanawha, Monongahela, and Cheat, one soon realizes that most of the state is drained by rivers flowing to the west and north, from the mountains into the Ohio. Further observation will show that the Eastern Panhandle and other small portions are drained to the east by the Potomac and its tributaries.

It is interesting to note that the New River,

the Potomac, at Harpers Ferry, the Cheat, at Brier Mountain, and the South Branch of the Potomac, at Hanging Rocks, seem to have defied the mountains by breaking through them and forming picturesque gaps. Geologists tell us that the rivers are older than the mountains, and that in these cases, by constant erosion, the rivers held their places as the mountains gradually arose.



Seneca Hills, Pendleton County



An annual rainfall of 40 inches provides abundant water at all seasons for farms, towns, and cities, and for navigation on rivers improved with locks. The immense forest areas about the headwaters and along the courses of the West Virginia rivers have held in check the waters from heavy rains and snows, thus preventing floods. These same forest floors have held the water and given it up gradually, pure and clear, to the streams of the state. The use and beauty of our river system depend largely upon the preservation of our forests.

Water Power.—The rapid fall of such rivers as the Cheat, Tygart, Elk, New, Gauley, and

Kanawha gives West Virginia great possibilities in water power. It is estimated that 500,000 horse power could be produced annually by damming our rivers at the most advantageous points. Such power represents a value estimated by good authorities at \$250,000,000. Here again, we must depend upon the regulating power of our forests to give our streams the steady flow necessary to satisfactory water power.

River Commerce.—The ability of the streams of West Virginia to carry commerce is one of the state's valuable resources. The United States Government has spent large sums of money in building locks on rivers in the state. Our Federal authorities furnish the following facts:

Monongahela River, navigable 33 miles

Ohio River (in W. Va.), navigable 285 miles

Little Kanawha River, navigable
120 miles

Kanawha River, navigable 90 miles

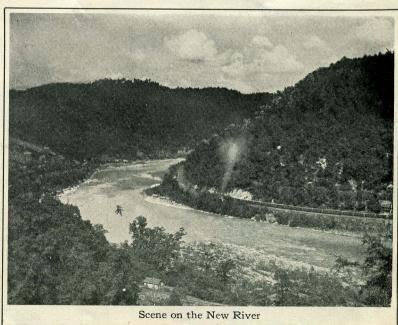
In addition to the rivers listed above, the Big Sandy, Guyandot, the Elk, Buckhannon, Cheat, and many others carry light boats, barges, and rafts.

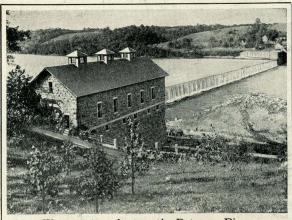
Mineral Springs. — Among the many interesting natural features of the state are the numerous mineral springs. They are found in the east-

ern section, especially in Mercer, Monroe, Summers, Webster, Greenbrier, and Morgan counties. White Sulphur Springs, Greenbrier County, is one of the most popular and fashionable resorts in the country. Berkeley Springs, Morgan County, with a constant temperature of about 74°, is visited by thousands each year on account of its healing qualities.

CLIMATE

A variety of climate is to be expected in West Virginia, a state extending over 3.5° of lati-

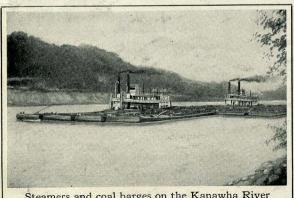




Water power plant on the Potomac River

tude, and having altitudes varying from 279 feet to 4860 feet. The mean annual temperature for the entire state is about 52°, being approximately 48° for the counties of the uplands and 56° for the southwestern counties. During the summer months the temperature usually ranges from 70° to 75°, and for the winter, from 30° to 35°, although in some of the mountain sections the thermometer often registers 10° to 15° below zero in winter. Heavy snows often prevail in such counties as Pocahontas, Randolph, and Preston, when rainy or mild weather is found in the regions about Charleston and Huntington.

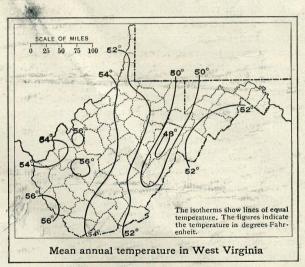
The prevailing winds blow from the southwest, and sometimes from the northwest, toward the mountains. Clouds driven by these winds give up their burdens on account



Steamers and coal barges on the Kanawha River

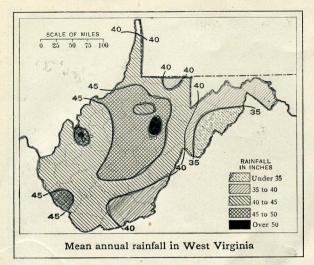
of the cooler temperatures on the western slope of the mountains, thus causing an annual snowfall of five or six feet and rainfall of nearly 50 inches in these regions. As will be seen by reference to the map on page ix, the annual rainfall in parts of the Potomac, Ohio, and New River valleys is not more than 35 inches. The rapid melting of snow in the mountains often causes floods in the Ohio and its tributaries. As the forests are cleared out such floods are likely to become more frequent and more violent.

The climate is healthful and, in a general sense, moderate. The seasons are marked one from another with attractive contrasts-winter with



mountains, hills, and streams wrapped in snow and ice, spring with a return of a great chorus of birds and a dash of flowers and green verdure everywhere, summer with life at its full in deep forests and on a "thousand hills," and autumn with myriad colors splashed upon the fields and forests by the crisp frosts which come with October. The part climate plays in determining the extent of certain crop areas will be discussed later.

Questions and Exercises .- 1. Name and describe the principal rivers of the state flowing into the Ohio. 2. Where do rivers break through the mountains? 3. How were these river gaps formed? 4. What relation does the forest have to the water supply of the state? 5. Why does West Virginia have great water power? 6. What



use can be made of the water power? 7. What is the extent and nature of the river commerce of the state? 8. Why does the state have a large number of mineral springs? 9. Discuss those visited by members of the class or their friends. 10. Describe the climate of the state. 11. Why is the climate at Charleston milder than that at Athens? 12. Why is the climate of the Eastern Panhandle especially suited to fruit growing?

FORESTS

Before the white man came into the state with his ax and saw, it was covered with forest except a few cliffs, rocky peaks, two or three old Indian corn fields, and a few hundred acres of open glades in Pocahontas, Webster, Preston, and two or three other counties. Primeval West Virginia should be thought of as one vast forest of more than 15,500,000 acres.

In 1911, A. B. Brooks, after a careful study, made the following statement: "There once existed within the present limits of West Virginia an almost unbroken forest containing 150 billion feet of timber. During the time which has elapsed, from the clearing of the first acre by civilized men to the present, the virgin forest area has been reduced to one tenth its original size or to 1½ million acres. In addition to this area there are extensive cut-over forests aggregating about 3 million acres; and 5 million acres of farmers' woodlots. The present forests, then, cover 60 per cent of the state and contain not less than 25 billion feet of standing

timber. There are 83 mammoth band-saw mills and about 900 portable saw mills operating within the state. These have a combined annual capacity of approximately $1\frac{1}{2}$ billion feet. Should all of them continue to operate as at present, they would cut the timber of the state in a little over 16 years."

Since the foregoing statement was made, timber has been removed from vast areas, and clearing has gone on steadily. If cut-over land and woodlots are counted as forest, probably 40 per cent of the state is still wooded, although only small areas have the original forest. It is estimated that there is over 2,500,000 acres of cut-over land in 22 counties of the state. Much of this should be cleared for grazing and cultivation, and much of it should be allowed to grow new forests under scientific management.

The great range in altitude of 4600 feet, equivalent in its effect on climate to 15° of latitude, gives the state every variety of plant life that thrives from the southern border of Virginia to the Canadian border. Among the common trees of nearly all sections of the state, especially of the Ohio basin, are several species of oak—white, black, shingle, Spanish, yellow, and pin-the yellow poplar, sweet gum, box elder, persimmon, silver maple, vellow pine, and several varieties of hickories. In the more humid area, including parts of Preston, Barbour, Upshur, and Webster counties, beech, birch, hemlock, and sugar maple abound with most of the common varieties just named. On the mountains above the 3000-foot level may be found trees



Spruce forest in Webster County

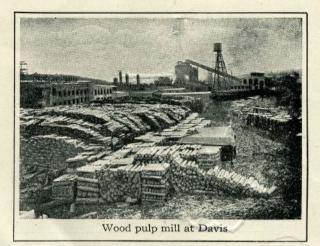
common to Canada, such as the red spruce, hemlock, and yellow birch.

The forests add their delicacies in chestnuts, hazelnuts, walnuts, butternuts, and hickory nuts, besides wild grapes, service berries, and huckleberries.

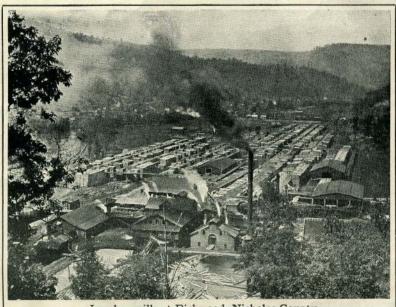
A systematic effort to prevent forest fires is being made through the coöperation of the Federal and state governments and the lumbermen. In several counties of West Virginia many acres have been purchased by the United States as a part of the National Forest.

LUMBERING AND ALLIED INDUSTRIES

The assessed value of the lumber plants of the state is \$10,000,000 and the actual value of these establishments is probably twice that amount. The counties that lead in the production of lumber are Nicholas, Pocahontas, Tucker, and Randolph. The lumber cut in West Virginia in 1918 amounted to 720,000,000 board feet. The hard woods of the state are valued highly by manufacturers. Some of the walnut and the best poplar is exported.



Pulp mills, where wood is used for making paper, are found in several counties, Tucker, Nicholas, and Pocahontas being the largest producers of pulp. The bark of the hemlock and certain varieties of oak is used in tanning hides for leather. Tanneries are operated in more than a dozen counties, most of them being in the eastern counties. One of the largest clothespin factories in the world is at Richwood. Valuable chemical by-products are made from bark, sawdust, and waste wood at some of the modern lumber plants.



Lumber mills at Richwood, Nicholas County

WILD ANIMALS

The early settlers found an abundance and great variety of game in what is now West Virginia. Buffaloes, beavers, and elks, once plentiful, have been extinct in the state for more than one hundred years. In the deep forests of Pocahontas, Nicholas, Webster, Randolph, and Pendleton counties bears and deer are still found. Rabbits, squirrels, and opossums are abundant in nearly all parts of the state, and foxes, wildcats, and raccoons still delight the hunter.

Fish abound in many of the rivers of the state. Trout fishing in the mountain streams is a favorite sport. The Federal Government assists the state in stocking the rivers of the state with young fish.

There are more than two hundred and fifty kinds of native birds, including a great number of beautiful songsters. Pheasants and quail are plentiful, and wild turkeys are found in upland counties such as Pendleton and Hampshire.

Questions and Exercises.—I. Describe the original forests of West Virginia. 2. What is meant by "cut-over land"? 3. For what should such lands be used? 4. What effect has the altitude of the state upon the nature of the forests?

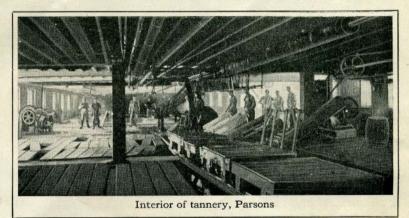
5. Make a collection of samples of the common kinds of wood provided in the forests of the state and discuss the uses of each kind. 6. Make a "four minute" talk or write a short composition on "Wild Nuts_and Berries of West Virginia." Describe the lumber industries of the state. (8, Where are the pulp mills located? Why? 9. In what ways is our method of Tumbering wasteful? 10. Where are most of the tanneries located? II. What forest products are utilized in these establishments? [12]. What use is made of the waste bark and wood in some of the lumber

plants? 13. What is a by-product? 14. What wild animals have you seen in the state? Describe them. 15. What wild animals, once plentiful, have now become extinct in the state? 16. What can be done to protect our valuable birds? 17. Name some of the game birds of West Virginia. 18. How may young fish be secured from our Federal Government for the mountain streams of the state?

AGRICULTURE

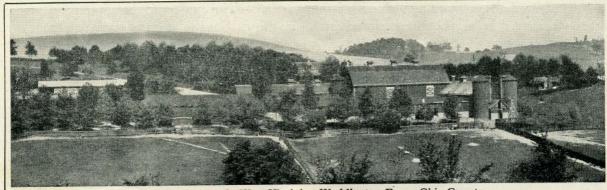
Importance of Farming.—The number of farms in West Virginia, 1920, is 87,889. These farms contain 2,250,000 acres, valued at \$496,439,617. The crops produced in that year were worth \$112,269,400 and the live stock on the farms had a value of \$76,430,000. More than 70 per cent of the people live on the farms.

Soil.—The soil of the limestone region is shown on the mineral map on page xv. This region extends through the eastern counties of the state where the limestone soil of the broad valleys is especially rich. In the river valleys like the Potomac, Ohio, and Kanawha and their tributaries the land is generally very fertile because the rich soil has been washed down from the hills. Most of the hill land to the west of the limestone belt is fairly rich in loam and clay, and is suited to general farming and grazing. The steep hillsides when under cultivation are subject to rapid erosion, hence grazing should be encouraged on lands of this character.



Crops.—In 1920 the farm crops were worth more than the value of all the coal sold from the state in the same year. The great extent of the state north and south, and the different altitudes make it suited to the production of many kinds of farm crops. The leading products in order of importance are corn, hay, wheat, vegetables, and fruits. Nearly every farmer raises corn, but the largest acreage and highest yields are in the valleys of the Ohio and its large tributaries and in the Eastern Panhandle.

Wheat is produced in large quantities in the same sections of the state. Oats is raised generally north of the Chesapeake and Ohio Railway, but especially in the northern



One of the finest farms in West Virginia: Waddington Farm, Ohio County

counties. Buckwheat is an important crop in the north-central counties such as Randolph, Tucker, and Preston, which is sometimes called the "Buckwheat County." West Virginia ranks fourth among the states in the production of buckwheat. The cool, rainy seasons, and light, fertile soil of these three counties make them especially well suited to potato raising, although this crop is common throughout the state.

As will be seen in the crop table, hay and forage are second only to corn among the crops of the state. Blue grass, clover, and alfalfa grow well in both the Northern and Eastern Panhandles and along the rest of the limestone belt. Timothy and clover are the most common meadow grasses. Scientific farming is causing an increase in acreage and acre yield in alfalfa, soy beans, cowpeas, and silage corn.

The counties of Cabell, Wayne, Lincoln, Putnam, and Mason lead in the production of tobacco. Since it requires new or very rich soil, tobacco is not raised as abundantly as it was when the land was being cleared.

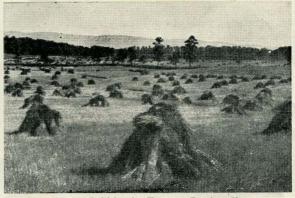
Vegetables of nearly all varieties are raised with profit in the home gardens and in special commercial gardens near the cities and other

CROP TABLE, 1919

Crop	Acres	Amount	VALUE	
Corn	568,219	17,010,357 bu.	\$29,768,131	
Wheat	298,036	3,747,812 bu.	8,395,097	
Oats	169,115	3,054,668 bu.	3,054,668	
Buckwheat. Hay and for-	31,095	537,883 bu.	1,075,766	
age	910,550	1,099,679 T.	23,746,574	
Potatoes	34,526	2,809,398 bu.	6,461,619	
Tobacco	11,233	7,587,052 lb.	2,731,338	
Vegetables .			16,715,867	



Picking apples in a Berkeley County orchard



Wheat field in the Eastern Panhandle

industrial centers. Industrial activity in the state and the large cities near by make a ready market for vegetables and other farm products.

Fruit.—West Virginia is becoming well known for the large quantity and fine quality of its apples and peaches. Good home orchards are found in all parts of the state, but most of the large commercial orchards are situated in the Eastern Panhandle, Hampshire County leads in the production of peaches, and Berkeley County in apples.

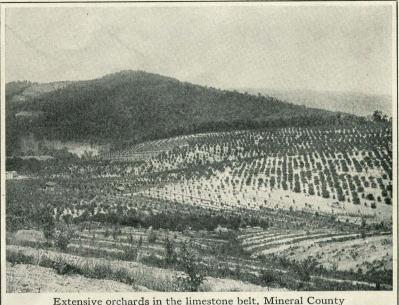
The soil and climate of the state are well adapted to the

profitable production of plums, pears, cherries, and berries of all kinds. Experiments have shown that the hills are favorable to the cultivation of many well known varieties of grapes.



FRUIT-PRODUCTION AND VALUE, 1919

Product	QUANTITY	VALUE	
Apples Peaches Pears Plums and prunes Cherries Grapes Small fruits	706,411 bushels 33,364 bushels 37,099 bushels 42,861 bushels	\$7,540,491 1,518,784 70,068 96,462 139,305 196,809 400,638	



Live Stock.—The good grazing and the extent of general farming account for the fact that live stock is found on 84,000 of the 87,000 farms in the state. Horses, cattle, and hogs are owned by most of the farmers, and sheep by about one third of them. West Virginia had more than 1,500,000 farm animals in 1920, valued at \$62,572,000, which shows an increase of over 55 per cent above the value of the live stock in 1910.

The counties to the west and northwest of a line drawn from the southern point of Wayne County to Preston County and the counties bordering on



Corn club boys, Lincoln County



Fine wool sheep, Northern Panhandle

Virginia produce most of the cattle of the state. The number of pure-bred cattle is increasing, the Guernsey, Hereford and Black Angus being the leading breeds. The value of the dairy cattle is nearly equal to that of the beef cattle. The blue grass of the limestone counties and of the counties with rich rolling hills, like Mason, Jackson, Roane, and Harrison, puts cattle in fine condition for the market. The state is well suited to the dairy business, which is a growing industry.

FARM ANIMALS AND THEIR VALUE, JANUARY 1, 1920

An	IMALS		NUMBER	VALUE	
Horses .	141			169,148	\$17,829,634
Mules .				14,981	1,839,287
Beef cattle				332,441	18,419,657
Dairy cattle	200		-	255,021	15,307,562
Sheep .				509,831	5,049,727
Swine .		*:		305,211	4,046,132

Sheep are found in largest numbers in the counties of the eastern border and those west of the mountains and north of Putnam County.

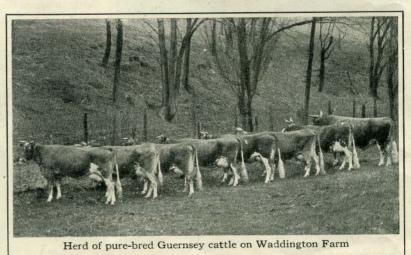
Some of the choicest wool in the market of the world is produced in the Northern Panhandle, the soil there being especially adapted to such production. Large areas of cut-over land should be used for sheep and cattle grazing.

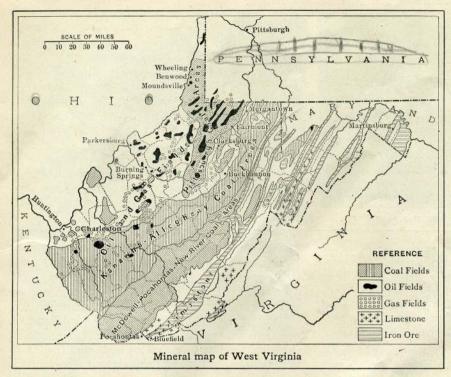
Swine and poultry are found on almost every farm in the state. There are about 100,000 hives of bees in the state. Horses are raised mostly for farm use. There is a great demand for mules in the coal mines.

State Aid to Agriculture.— The Agricultural Experiment Station has carried on many investigations and experiments to aid the farmers in combating diseases of plants and animals, and has discovered many ways of improving farming. The College of Agriculture trains many teachers and leaders to help in bringing about the practice of scientific agriculture. Many thousands of farm men and women and boys and girls on the farms are helped by the Division of Agricultural Extension. Through bulletins and many field workers—county and club agents and others—this Division shows how to apply science to the betterment of farming and farm life.

The State Department of Agriculture, under a State Commissioner elected every four years, administers laws relating to crop pests, animal diseases, pure seeds, and fertilizers. The Department encourages people of this and other states to settle on farm land that needs improving, and advertises the advantages of West Virginia as an agricultural state.

Questions and Exercises .- I. How does the average acre value of the farms of the state compare with the acre value of the farms near your school or home? 2. Describe the soil of West Virginia. 3. Why should the steep land be used for grazing and forests? 4. Name the crops of West Virginia in their order of importance. 5. In what section of the state is each crop produced? Why? 6. What crops should be increased most rapidly? 7. Why is West Virginia a good fruit state? 8. Where are most of the commercial orchards? (9. What county leads in the production of peaches? Why? 10. How does the value of the crops of the state compare with the value of the live stock? 11. If you think the relative value should be changed, tell





why. 12. In what parts of the state can beef cattle be made ready for the best markets on grass alone? Why? 13. Why should the state produce more hogs? More sheep? 14. What is the Agricultural Division of the State University doing for the farmers of the state? 15. Discuss the duties of the State Department of Agriculture.

MINERAL WEALTH AND MANU-FACTURING

The minerals alone in West Virginia are worth as much as all of the natural wealth of an equal area in some less fortunate states. The map on this page shows how generally the rich mineral deposits are distributed throughout the state.

Coal.—West Virginia ranks second in the production of coal, being surpassed by only one state—Pennsylvania. The tonnage in the bituminous coal beds of the state is estimated to be as much as the combined amount in the states of Pennsylvania, Ohio, Virginia, and Maryland. According to the Geological Survey 48 of the 55 counties of the state have

coal deposits. About 40 counties have coal properties listed. The number of men employed in coal mining in 1920 was 91,500. The annual production for the same year was 75,000,000 tons.

In the southern part of the state are the McDowell-Pocahontas and New River districts. These fields produce coal of very high value, especially suited to use in the navy and in the production of highgrade steel. Near the center of the state is the Kanawha district, while the fields of the north belong to the Allegheny and Monongahela regions. McDowell, Fayette, Mar-

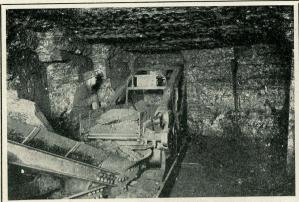
ion, Logan, Monongalia, and Kanawha, in the order named, are the leading counties in coal production.

production

More than half of the coal produced is shipped out of the state. Much of it is transported to the Pittsburgh region and to points on the Ohio by barges that are floated down the Monongahela, Kanawha, and Ohio. The industries on the Atlantic seaboard and in the region of the Great Lakes use much of the West Virginia coal.

About 5 per cent of the coal is made into coke. Nearly 3,000,000 tons of coal were used in the coke ovens of the state in 1920. Coke is used in making steel and is a very desirable fuel. The number of coal by-product plants is increasing in the state. These plants make use of many valuable materials—oils, tars, gas, and other useful ingredients—lost by ordinary coking.

Oil and Gas.—Petroleum or rock oil is one of the greatest natural resources of the state. The first oil well in the state was drilled in 1858, at Burning Springs. Since that time oil or gas has been produced in 35 or more counties. (See mineral map.) It is found in layers of sand lying at depths ranging from 800 feet to 3500 feet below the surface.



Modern coal mining machinery in operation



Exterior of coal mine

The state reached its greatest production of oil in 1910, when over 16,000,000 barrels were pro-Although many new fields have been discovered since that date, the production in 1917 was only 8,379,285 barrels. Oil is pumped through pipe lines to tanks grouped at great pumping centers, and there refined or pumped, as needed, to industrial centers for direct use or for refining.

Natural gas comes from the oil-producing sands but is somewhat more widely distributed than oil. It is used by homes and industrial plants in nearly all of the towns and cities west of the mountains. Much of the gas produced in West Virginia is piped to cities out of the state-Cincinnati, Cleveland, Pittsburgh, and Cumberland. Immense quantities of natural gas have been allowed to escape or to burn to no purpose. With the rapid decrease in production, measures of conservation are being adopted. In 1917, 308,-617,101,000 cubic feet of natural gas were produced,

valued at \$57,389,161. West Virginia ranks first in this production. Many carbon, gasoline, and other by-product plants are found where gas is produced.

Other Mineral Products. -West Virginia has vast deposits of limestone in the eastern counties and along the western slope of the Allegheny Mountains (see map on page xv), and in mixed form in many other It makes soil sections. especially adapted to wheat, fruit, and grass, hence to the growing of fine wool, and is used in road building. When burned into lime, it is widely used to "sweeten" sour land, and as a flux for glass sands, iron, and other ores. The principal lime plants are found in Preston, Berkeley, and Jefferson counties.

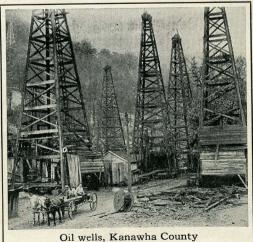
Glass sand of the finest quality is found in immense quantities. It is quarried extensively in the eastern counties, especially in Morgan and Preston counties, and is shipped to manufacturing centers well supplied with fuel and transportation. The state stands second in the production of glass sand and has vast deposits for development. No other state in the Union contains more varieties of sandstone well adapted for building purposes. The Preston County sandstone is used in some fine structures in Eastern cities.

Clays and shales of good quality are widely distributed in the state. They are made into brick, sanitary ware, tile, pottery, and china, the principal centers for such manufacturing being in the

Northern Panhandle and the counties of Marion, Taylor, Cabell, and Wood.

Salt is manufactured in Kanawha and Mason counties. This industry was greatly revived during the World War on account of the by-products.

Iron ore available in the state is estimated at 300 million tons, but the ore is being mined only in small quantities, mostly in the counties of the Eastern Panhandle. The deposits of iron ore extend as far south as Monroe County.



Other Manufacturing Industries. — The abundance of fuel and raw materials with good transportation in West Virginia, and the proximity to great markets make West Virginia an important manufacturing state. The location and extent of many of the principal factories are discussed under "Cities" (page xxi).

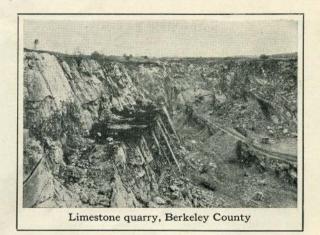


Pouring molten metal in steel plant, Wheeling

The Iron and Steel Industry, situated mostly at Benwood, Wheeling, and other centers in the Northern Panhandle, is the most important in the state in manufacturing. The assessed value of the iron and steel works of the state in 1917 was more than \$15,000,000.

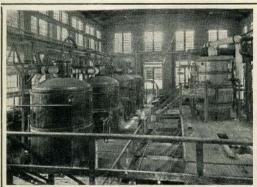
The number of chemical plants in the state is growing rapidly. Plenty of fuel, water, and the proper atmospheric conditions make Charleston prominent in this industry. Similar plants are situated at Clarksburg and Buckhannon.

Many important manufacturing industries are



connected with the natural resources and products of the state: tobacco warehouses in Cabell and Putnam counties; preserving and canning, and the making of cider in the Eastern Panhandle; flouring mills in the wheat belts; oil refining, gasoline, and carbon factories in the oil and gas fields; and furniture making and wood-working in nearly all sections.

Questions and Exercises.—1. Where are the principal coal regions of the state? 2. What counties have no coal? 3. Discuss the advantages and disadvantages that coal mining brings to a region. 4. What is coke? 5. How much is produced in the state annually? 6. Discuss coal byproducts. 7. Locate on the map the first oil field in the state. The present fields. 8. How are we wasting oil and gas? 9. What effect do oil and gas have on industries? 10. Obtain samples of limestone, glass sand, brick, clay, and iron ore and discuss the extent and production of each in our state. 11. What is the chief industry of your locality? 12. Name some chief manufacturing centers of West Virginia and tell what each produces.



Interior of a chemical plant



Oil tanks and refinery, Kanawha Valley

TRANSPORTATION

The Indians marked out the first routes of travel into and across what is now West Virginia. From the valley of Virginia to the Ohio River they used various trails which later served as the earliest paths of the pioneers.

The first wagon road of importance connecting old eastern Virginia with the Ohio River was known as the "James River and Kanawha Turn-Through the influence of Washington and other Virginia leaders, this road was completed to the navigable waters of the Kanawha by 1790. The National Cumberland Road connecting Washington, Cumberland, and Wheeling was one of the best constructed roads of its time. It was built, from 1811 to 1818, by authority of Congress. Another early road of much importance was the

Northwestern Turnpike, extending from Hampshire County to Parkersburg.

After the formation of the state, the counties built dirt roads through most communities. The counties of the Northern and Eastern Panhandles were the first to construct macadam roads. state has about 32,500 miles of road, approximately 1000 miles having hard permanent surface.

In 1920, by popular vote, the legislature was authorized to issue state bonds, not to exceed \$50,000,000 at one time, to construct roads to connect all county seats. Such a system of highways will add to the value of the resources, and will make the beautiful scenery more accessible.

The state has more than 500 miles of navigable rivers, which are used extensively for transportation. Many log rafts and coal barges are floated to market down the rivers of the state.

West Virginia is well supplied with railroads. The Baltimore and Ohio crosses the northern part of the state from Harpers Ferry to Wheeling with branches extending to every section north of the Kanawha River. The southern part of the state is well connected and served by the Chesapeake and Ohio, the Norfolk and Western, the Virginian, and the Kanawha and Michigan railways. The state has 3893 miles of steam railways and 374 miles of electric railways.

Questions and Exercises.-1. Why did the region of West Virginia have many long Indian trails? 2. Why did Virginia wish to build roads to the Ohio? 3. Describe the important early highways of the state. 4. What was the Good Roads movement of 1920? 5. Trace on your map the principal navigable rivers. 6. What is the commerce of these rivers? 7. Name and trace on your map three railroads that run across the state from east to west. 8. Which run from north to south? 9. What do the railroads carry out of our state, and what do they bring into it?

GOVERNMENT

Like that of the United States the government of West Virginia comprises three departments,—legislative, executive, and judicial.

Electric railway and coal train, Bluefield

The legislature, composed of thirty senators and ninety-four delegates, meets every two years in the state capitol. The delegates represent the counties from which they come, the number from counties varying according to the population of the county. The legislature makes the laws.

The executive officers are Governor, Secretary

of State, State Superintendent of Free Schools, Auditor, Treasurer, Attorney-General, and Commissioner of Agriculture. These officers are elected by the people of the state every four years. They execute the general laws of the state.

The governor appoints several state officers whose duties are indicated, for the most part, by their titles. These are State Board of Control (in charge of the business affairs of the state institutions), the State Board of Education, the Advisory Council (for colored schools), the Public Service Commission (to regulate public service corporations), State Road Commission, Compensation Commission (to administer compensation to persons injured in industry), Tax Commissioner, Commissioner of Labor, State Bank Examiner, Chief Mine Inspector, Game and Fish Warden, and State Health Commissioner.

The judicial system consists of the Supreme Court of Appeals, composed of five members elected for a term of twelve years; twenty-three Circuit Courts, with a judge for each, except the first Circuit, which has two, elected for eight years. In addition to Circuit Courts. there are in some counties Criminal Courts and in some places Intermediate Courts, Juvenile Courts, and Courts of Domestic

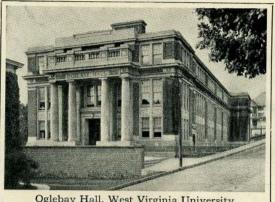
Relations. Justices of the Peace hear minor cases. Each of the 55 counties has its own local government under a County Court composed of three Commissioners in most counties, while a few counties have one member for each district, a Sheriff, Prosecuting Attorney, Clerk of Circuit Court, Clerk of County Court, Assessor, Surveyor, Superintendent of Schools, all elected by popular vote. The County Court fixes county levies and has general charge of the business affairs of the county. Each county is divided into magisterial districts, not fewer than three nor more than ten, with district boards of education, in charge of schools, and Justices of the Peace to hear minor cases at law. The County Court appoints a Coroner and Road Supervisor.

Review Ouestions and Exercises .- 1. To what one of the state officers would you write for information about farming? schools? a legal question? state funds? 2. Who are the delegates to the legislature from your county? 3. What counties belong to your state senatorial district? 4. Why do we have two branches of the legislature?

5. Why is the Supreme Court of the state called a Court of Appeals? 6. Who collects the taxes in your county? 7. Who pays your school teacher? 8. Explain the use of government.

EDUCATION

In West Virginia, a free public education from the primary grade through the University is provided for every child of the state; and every child to the age of fourteen is compelled to attend school every day for the full



Oglebay Hall, West Virginia University

term. The enrollment in elementary public schools (1920) was 323,465.

A state superintendent of free schools who has the general direction of public education in the state is elected by the people every four years. He, and six persons appointed by the governor, make up the State Board of Education. That board controls the educational affairs of the

state educational institutions and determines the general educational policies of the state. An Advisory Council of three members assists in managing the institutions for the colored youth.

The schools of each county are supervised by a county superintendent, who is elected by the people every four years. The magisterial district is the unit for school taxes and local administration. The district board of education employs the teachers and sometimes a district supervisor.

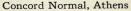
Most of the larger towns and cities run their schools under special charters providing for higher levies and longer terms than prevail in most of the rural districts. There are 44 such independent districts in the state.

The state has a permanent investment school fund of \$1,000,000. The interest from that fund and moneys received from several other sources of state revenue make up a general distributable school fund amounting to about \$700,000 each year. After paying the expenses of the State Department of Education and the salaries of county superintendents from this fund, the state superintendent distributes the remainder to poor



West Virginia University, Morgantown







Main building, Fairmont Normal



Dormitory, Glenville Normal

districts to help pay salaries of teachers and other expenses. Local boards of education are compelled to levy taxes to run the schools at least $6\frac{1}{2}$ months (1920). Ten days will be added to the minimum term each year until it is eight months. The cities and many of the rural districts now have a school term of nine months.

The state has 182 high schools, 116 being fouryear high schools of the first class. The enrollment in the public high schools (1920) was 18,512. Higher education and training for special classes is provided in the fourteen state educational institutions listed below:

STATE EDUCATIONAL INSTITUTIONS

1. The West Virginia University at Morgantown, composed of Colleges of Arts and Sciences, Agriculture, Engineering, Medicine and Pharmacy, and School of Music.

2. Keyser Preparatory Branch of the University at Keyser—secondary courses with special attention to vocational subjects.

3. West Virginia Trades School at Montgomery—secondary courses with special attention to vocational subjects.

4-9. Six state normal schools for the training of teachers located at Athens (Concord Normal),

Fairmont, Glenville, Huntington (Marshall College), Shepherdstown (Shepherd College), and West Liberty.

10. West Virginia Collegiate Institute at Institute, for colored youth,—secondary, collegiate, vocational, and normal courses.

11. Bluefield Colored Institute at Bluefield, for colored youth—secondary, vocational, and normal courses.

12. Schools for Deaf and Blind at Romney.

13. Industrial School for Boys at Pruntytown.

14. Industrial School for Girls at Salem.

There are sixteen private and denominational colleges and preparatory schools in the state.

Review Questions and Exercises.—1. On a map of the state locate the state and private and denominational institutions of higher learning.

2. What section of the state seems to need more educational institutions?

3. Who has general direction of public education in West Virginia?

4. What persons comprise the State Board of Education?

5. By whom are the county schools supervised?

6. What state normal school is nearest your home?

7. What is the enrollment in the elementary public schools? In the high schools?

8. What per cent is the high school enrollment of the enrollment in elementary schools?



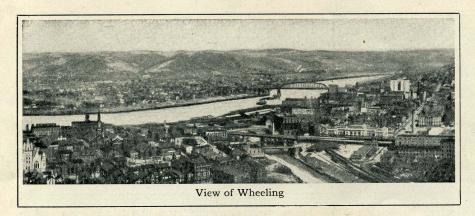
Dormitory, Shepherd College



Marshall College, Huntington



Dormitory, West Liberty Normal



POPULATION AND CITIES

Growth and Density of Population.-The number of people in West Virginia in 1920 was 1,463,701, or about four times the population in 1863 when the state was formed. The table shows the growth in population:

CENSUS YEAR									Population	PER CENT OF INCREASE	
1870										442,014	
1880									•	618,457	39.9
1890	1									762,794	23.3
1900										958,800	25.7
1910		•								1,221,119	27.4
1920										1,463,610	19.9

The largest per cent of increase in the last ten years has been in the counties of Logan (183 %), Raleigh (66%), on account of mining; and in Hancock (91 %), and Harrison (55 %), on account of manufacturing and mining.

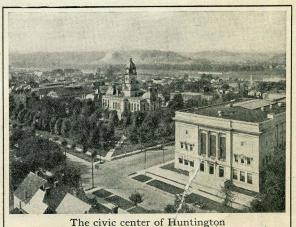
The average number of inhabitants to the square mile in 1920 was 60.9, as against 50.8 in 1910, and 39.9 in 1900. The Northern Panhandle with its many manufacturing centers has 226 people to the square mile, the highest number for any section, while the Eastern Panhandle, with its mountains and mostly rural population, is the lowest, with 34 to the square mile.

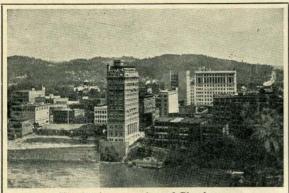
Rural Population.—The per cent of increase in West Virginia of rural population (10.3), is only one sixth as much as the increase of urban population (61.7) from 1910 to 1920. The population of fifteen farming counties of the state decreased in that period. The per cent of the population living in strictly rural territory in 1920 was 65.8.

Urban Population.— The incorporated villages, towns, and cities of the state contain 501,190 people or 34.2 per cent of the population of the state. According to the 1920 census, 369,007 people are in towns and cities of 2500 or more inhabitants. The urban population increased 61.7 per cent from 1910 to 1920.

Wheeling (Pop. 56,208), the largest and chief commercial city of the state, is situated on the Ohio sixty-three miles south of Pittsburgh. The Baltimore and Ohio, the Wheeling and Lake Erie, Pennsylvania, and several electric lines give the city unusual transportation facilities. The manufacture of iron and steel is the leading industry. Large potteries, glass factories, and stogie factories are located here. Other important industries are tanneries, meat packing, porcelain factories, wood-working establishments, and the wholesale business in many lines. Wheeling was the first capital of the state. Linsley Institute, a military secondary school, and Mount de Chantal Academy for girls are situated here.

Huntington (Pop. 50,177) is highly favored by location on a broad level bottom of the Ohio at the mouth of the Guyandot

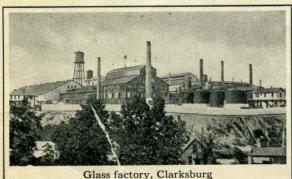




The business section of Charleston

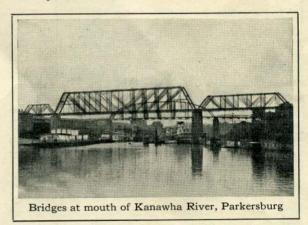
River at the junction of the Baltimore and Ohio and Chesapeake and Ohio railroads with the Norfolk and Western Railroad near by. The streets and avenues are broad and straight. The Chesapeake and Ohio shops located here employ about 2500 men. Furniture, tableware, and lumber products are manufactured in large quantities. Huntington is the market center for the tobacco raised in Cabell, Lincoln, Putnam, and Wayne counties. Marshall College, the oldest and largest state normal school and college, and a state hospital for the insane are situated in Huntington.

Charleston (Pop. 39,608), situated on the Kanawha River at the mouth of the Elk, fifty-seven miles from the Ohio, is the capital city of West Virginia. It has been called the "Cog City" because it is the trade center of a great coal, oil, and gas region; also the "Armor-plate City," because the Federal Government armor-plate and projectile plant which



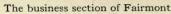
employs about 1000 persons is located here. It is an important center for chemical and glass plants. Among the many other industries are the largest ax factory in the world, bottling works, planing mills, overall and blanket factories, and wholesale houses. Charleston has many great banks, fine stores, and beautiful residences.

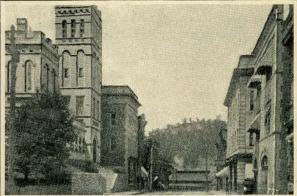
Clarksburg (Pop. 27,869) is near the geographical center of the northern section of the state on the Baltimore and Ohio Railroad. Its population increased 202.9 per cent from 1910 to 1920, due partly to an extension of the corporation lines, but more to its situation in the center of a great coal, oil, and gas region at the junction of several railroad and street car lines. The zinc-spelter and tinplate factories located here are among the largest in the country. Other leading industries are bottling works, lumber mills, and glass and chemical factories. It is the county seat of Harrison County, one of the richest counties in the state.



Parkersburg (Pop. 20,050) is well situated on the Ohio River at the mouth of the Little Kanawha. It is the trading center for a large oil and gas region, and oil refining and the making of oil field supplies are among the chief industries of the city. Shovels and porcelain are manufactured on a large scale. Other principal industries are the manufacture of brick, glass, steel, lumber, and clothing. Many wholesale houses are located here.







Bland Street, Bluefield

Fairmont (Pop. 17,851), at the head of navigation on the Monongahela River, is the center of a great coal region. Abundance of cheap fuel and transportation by river, three railroads, two interurban electric lines, and paved roads make Fairmont an active manufacturing and trading city. Glass factories, copper products plant, and mine equipment and railroad shops, and the coal and coke business are the leading industries. Here are a normal school and a state miners' hospital.

Bluefield (Pop. 15,282), on the Norfolk and Western Railway in the extreme southeast of the state, is one of the state's newer cities resulting from business based upon coal mining. It is the chief shipping center for the great output of the Pocahontas coal fields. Here the Norfolk and Western shops employ more than 1000 men. The location of an important power plant and armature works here, and the electrification of the railway make the city a power center. The Bluefield Colored Institute, a state institution for the special training of colored youth, is located in this city.

Martinsburg (Pop. 12,515) is the largest city of the Eastern Panhandle. It is the center of the commercial orchard industry. The state has an apple-packing plant here under supervision of the State University. The principal industries are woolen and knitting mills, lime and stone quarries, and vinegar and fruit-canning factories. The city is situated at the junction of the Baltimore and Ohio and the Cumberland Valley railroads.

Morgantown (Pop. 12,127) is on the Monongahela River within six miles of the Pennsylvania line. It has transportation facilities by steamboat and the Baltimore and Ohio and Pennsylvania railroads. A dozen or more glass factories make this an important center for the manufacture of glass and its products. A large tinplate mill near the city has nearly 1000 employees. With the recent rapid development of coal mining in this region, and its relation to oil and gas fields, the industries of Morgantown have grown rapidly. The West Virginia University with its several departments, including the Agricultural Experiment Station, is located here.

Moundsville (Pop. 10,669), named for a large Indian mound located here, is situated at the junction of two branches of the Baltimore and Ohio Railroad on the Ohio River twelve miles below Wheeling. The city has also river transportation, besides an electric railway connecting it with Wheeling. Enamel ware, and acids, zinc, and paints represent, in the order named, the most important manufactures. The West Virginia penitentiary is located at Moundsville.

Review Questions and Exercises.-1. What is the census? 2. Why was our increase in population less from 1910 to 1920 than from 1900 to 1910? 3. By reference to Table II on page xxiv find out the average number of inhabitants per square mile in your county. 4. How does that compare with the average for the state? 5. What is the difference in increase of population in cities and in the rural communities? Give reasons for this difference. 6. Locate on your map ten of our large cities, and give reasons for the industrial and commercial growth of these cities. 7. Name and locate some small cities that are growing rapidly and explain their growth. 8. Where do we have our best living conditions? Where are living conditions most difficult? 9. What are some of the things needed most to add to the prosperity and happiness of the people of the state?

Table I.—Population of the Principal Cities Table II.—Area, Population, and County Seats and Towns of West Virginia, 1920 of West Virginia Counties, 1920

Beckley, city	lsburg ntington ntsville y st Union etteville nville ersburg
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