



FIG. 465. — Relief map of New Jersey and Pennsylvania. Coastal plain in extreme east; next the rolling Piedmont belt; then the long mountain ridges of the Appalachians, with broad valleys between; and, still farther north and west, the rugged plateau, reaching into Ohio and New York.

are crossed by water gaps (Figs. 172, 192, 193, 463, 467), which the trails of the Indians and trappers, the wagon roads of the early settlers, and the railways and canals of present-day commerce all have followed. The principal lines of passage are along the Cumberland, Potomac, Susquehanna, Delaware, and Mohawk gaps.

This belt includes some of the most sparsely settled regions of eastern United States (p. 84), and is an important timber reserve. It would be still less populous if it were not for two important facts. In the first place, where the rock is soft the valleys have been so broadened as to invite an agricultural population (Fig. 466). This is best illustrated by the broad, fertile limestone valleys of New Jersey, Pennsylvania, the Shenandoah valley of Virginia, and the Tennessee valley. In the second place, the rocks contain stores of valuable mineral (p. 108), the most important being coal, iron, oil, and gas. The coal and iron have been exposed in many of the deep valleys.

These conditions have led to the development, not only of mining industries, but of important manufactures. Of the many busy centers of mining and manufacturing the greatest is at Pittsburg and Allegheny, where the Monongahela and Allegheny unite to form the Ohio. This point has water connection with a wide area; and the meeting of railways where the valleys come together has added facilities for extensive railway transportation. Therefore iron and other raw products for manufacture are easily obtained, and the manufactures are readily distributed. This favorable situation was caused by the effect of the ice sheet (p. 155).

Scranton and Wilkes Barre, farther east in the anthracite coal fields, have also developed into important mining and manufacturing cities. Indeed, all Pennsylvania has had its growth stimulated by its great mineral resources, and especially its coal.

Throughout the Appalachian belt similar mineral wealth is causing development. In no place is this better illustrated than at

Birmingham, Ala., where, within a radius of a few miles, are found abundant stores of coal, iron, and limestone, the three materials necessary for iron smelting. Under such favorable conditions a large manufacturing city has rapidly grown.

Summary. — *The Appalachian belt, extending from New York to Alabama, consists of (1) true mountains, and (2) a plateau portion. Both are for the most part rugged, sparsely settled, and, over large areas, forested, forming a barrier which was first and most easily crossed along the water gaps. Some of the broad valleys are good farm land, and there is much mineral wealth, especially coal. This has given rise to a number of important mining and manufacturing centers, of which the Pittsburg-Allegheny region is most important.*

199. **The Central Plains.**— The region that slopes toward the Mississippi river, from the Rocky Mountains on one side and the Alleghany plateau on the other, is for the most part an expanse of level plains (p. 76). This levelness is due to two facts: (1) the rock strata are nearly horizontal; (2) the valleys are mature. In a few places the strata have been disturbed by mountain folding, as in the Black Hills and the low mountains of central Texas, Indian Territory, Arkansas, and southern Missouri (Fig. 461). Around Lake Superior is another low mountain area, a southward extension of the ancient mountain land of central Canada.

In so level a country, railways may be built almost anywhere, though they naturally follow the valleys. These are so broad and open that they are well settled, quite unlike the steep-sided valleys of the Alleghany plateau. The large rivers have so nearly approached grade that they are navigable for long distances. The Mississippi, for example, is navigable for 1000 miles from the sea, as far as St. Paul.

The ice sheet covered the northern part of these plains (Fig. 270), filling the valleys with drift and thus making the surface more level (Fig. 292). These glacial deposits have turned many streams out of their valleys, causing falls and rapids, as in the

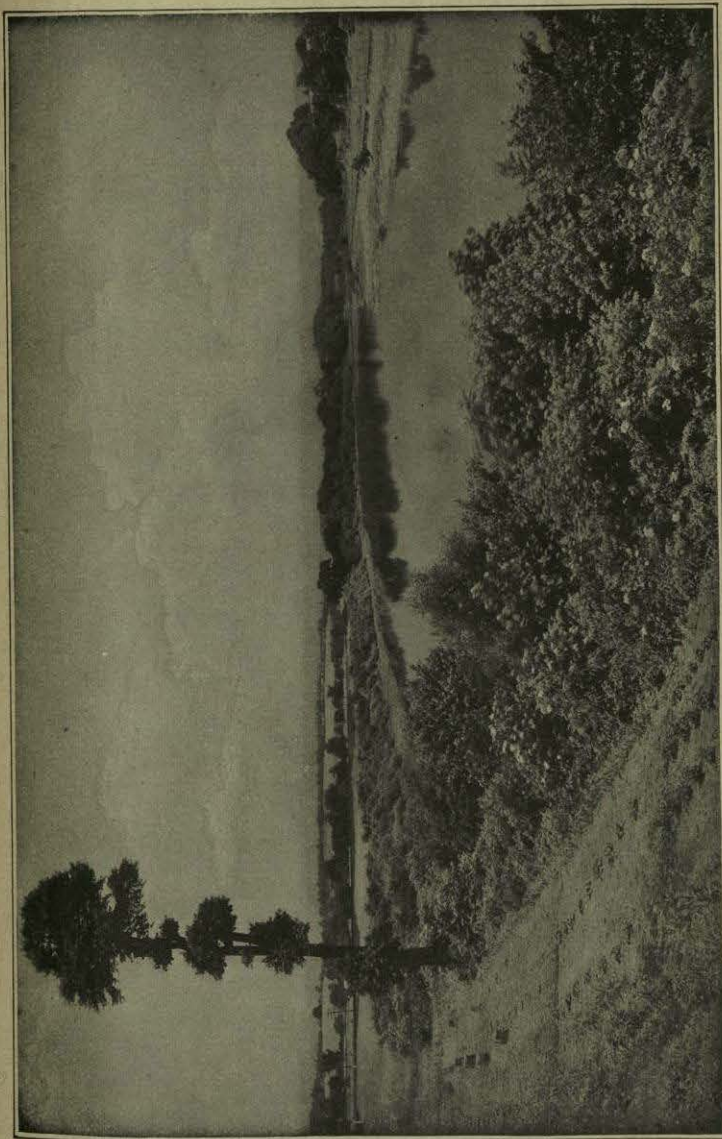


FIG. 466. — A broad valley in the Appalachian Mountains of Pennsylvania. Where this stream crosses the hard rock of the mountain ridges its valley contracts to narrow water gaps.

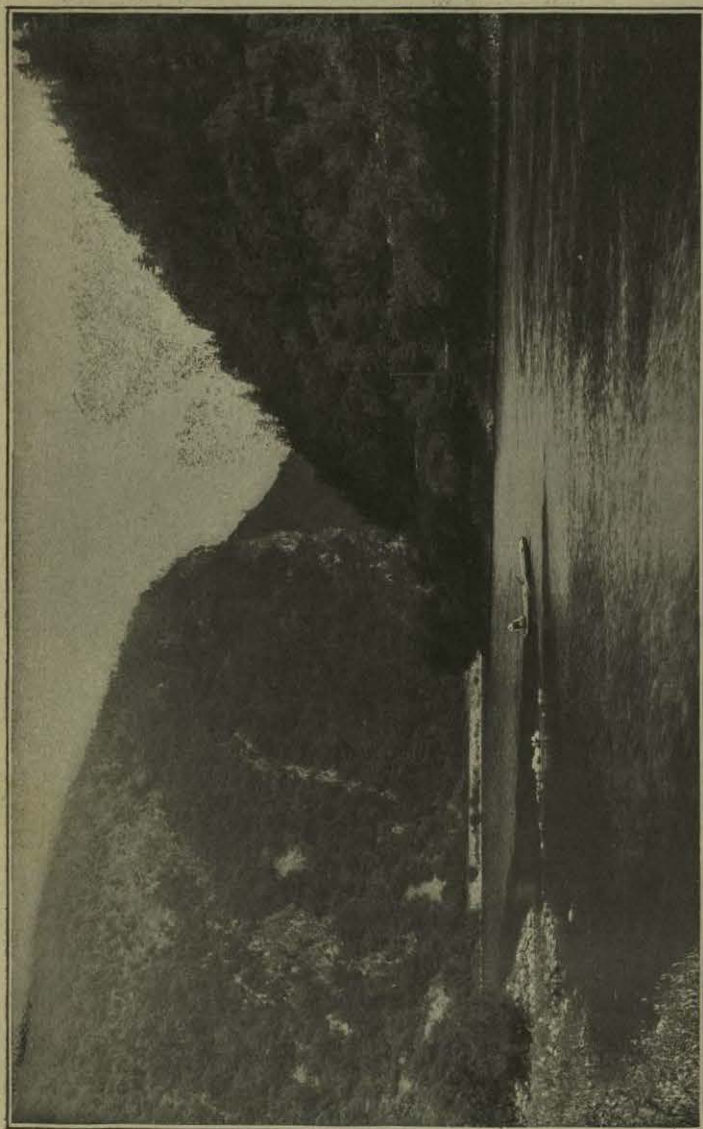


FIG. 467. — The Delaware Water Gap, a narrow valley where the Delaware River cuts across a ridge of hard conglomerate in the Appalachians.

case of the Falls of St. Anthony at Minneapolis. Many ponds and lakes were also formed, as in the low, hilly country of Minnesota, in which there are said to be 10,000.

One of the most important effects of the glacier was to make the Great Lakes water route (p. 156) which, supplemented by canals, offers facilities for interior water transportation that are not equaled on any other continent. Continuous water transportation is possible from the sea to Duluth, a distance, via Montreal, of over 2000 miles.

The generally level surface, the fertile soil, and the climate have combined to make these plains one of the greatest of

agricultural regions (Fig. 468). The further fact that large sections of prairie were treeless helped in the rapid development of the region. The agricultural products vary with the climate from hardy grains in the North to tobacco and cotton in the South. In the hilly lands and along the rivers, especially in Michigan, Wisconsin, and Minnesota, there is forest, from which much valuable timber is obtained.

The western part of this plains region (west of the 100th meridian) has an arid climate (Figs. 127, 129), unfitting it for agriculture without irrigation (p. 287). This part of the Great Plains is the seat of an important grazing industry (Fig. 128).



FIG. 468. — Notice to what extent the wheat of the country is raised in this section. Much the same is true of other grains.

There are great stores of mineral wealth, including building stone, clay, salt, lead, zinc, oil, gas, and coal; and the copper and iron of the Lake Superior region contribute to the natural resources. The almost unlimited supplies of coal, widely distributed, make manufacturing possible throughout almost the entire area. The farms, mines, and forests supply the raw materials, and the excellent facilities for transportation permit the distribution of raw and manufactured products.

It is natural that there should be busy manufacturing cities along the large, navigable rivers. The greatest of these river cities are St. Louis, on the Mississippi, near the mouth of the Missouri, and Cincinnati and Louisville, on the Ohio. That the situation of St. Louis, near the junction of two great rivers, is favorable, is shown by its marvelous growth, making it the fourth city in size in the United States. Its position makes it a manufacturing and distributing point for products from north, south, east, and west.

Another great industrial community is found at the head of navigation on the Mississippi — the twin cities of St. Paul and Minneapolis. The latter has the further advantage of a fall in the Mississippi, supplying water power. New Orleans, near the mouth of the Mississippi (p. 306), and Pittsburg, at the head of the Ohio (p. 309), are closely related in prosperity to the fertile interior plains, for they are in close communication with them by water and rail.



FIG. 469. — Sketch map to show the variety of materials available for shipment by the Great Lakes.

Along the lake route many important cities have developed: in Canada, Montreal and Toronto; in United States, Buffalo, Cleveland, Toledo, Detroit, Chicago, Milwaukee, and the two neighboring cities of Duluth and Superior, besides many smaller places. Each of these cities profits by the commerce that the water route opens to it; and each is able to receive the raw products of the entire lake region (Fig. 469). Iron, one of the most important of these products, must be brought to the coal fields for smelting, and all lake ports near the coal fields share in the benefit. With the recent wonderful development of the iron region there has been a corresponding growth of the lake ports.

Each of these cities has some special reason for its growth at that particular point. Duluth-Superior and Buffalo are at the two American ends of the lake route. Toronto is on a good harbor on the Canadian side of Lake Ontario, opposite the Welland Canal. Montreal is at the head of navigation for large ocean vessels, and at the foot of rapids in the St. Lawrence, around which a canal has been built. Cleveland and Toledo are on good harbors on Lake Erie, and near extensive coal fields. Detroit is on a narrow strait, through which lake traffic must pass, and at a point where railways cross from United States to Canada. It is, moreover, practically at one end of Lake Erie. Milwaukee is on a good lake harbor backed by a fertile country.

Of all the cities in this section, Chicago has the best natural site and has, therefore, grown the fastest. It is no accident that it has become the second city of the country in size; nor is there reason to expect that its growth will not continue. The small harbor, around which Chicago started, was scoured out by the overflow stream of the glacial lakes that existed while the ice sheet was melting away (Fig. 280). The city soon outgrew its small natural harbor, but continued to prosper because of its favorable situation.

Like Buffalo, Toledo, Detroit, and Duluth, it occupies a

position near the end of a great lake. With other lake ports it shares all the advantages of lake shipping; and, like several of them, it is near coal fields, and in the midst of a fertile agricultural region which supplies raw products and a market for manufactured goods. More than this, it is a natural railway center; railroads from the East swing around the southern end of Lake Michigan to reach Chicago, where they unite with railroads from other sections. For these reasons Chicago has become a great manufacturing and commercial center, being a distributing point for a wide area of country. It is a center of distribution for some products, such as meat products, for cities even as far away as the seacoast.

Summary. — *The Great Plains region, though mostly level, has a few low mountainous sections. The northern portion was covered by the ice sheet. The greater part of the plains region is adapted to agriculture; but some of the more hilly portions are forested. The western portion is arid, and hence devoted mainly to grazing. The Plains have great mineral resources, notably coal and iron, and consequently have become an important manufacturing section. The navigable rivers and broad valleys have encouraged the growth of a number of large river cities of which St. Louis is the greatest. The Great Lakes water route is even more important for navigation, and hence has a series of large and busy manufacturing cities. Of these Chicago is the largest. This, the second city in the country, has a fine natural situation at the end of one of the lakes, in the midst of a fertile agricultural country, and near extensive coal fields.*

200. The Far West. — This broad area is mainly a great plateau with mountain ranges rising here and there. Both the mountains (Figs. 158, 161, 165, 166, 470, 471) and plateaus (Figs. 137, 138, 141, 476-478) are so young that they are very rugged. Yet there are many broad mountain valleys and extensive areas of level plateau, so that, if the climate favored, this might become much more important as an agricultural region. Over most of this area the climate is so arid that the land is suited only to grazing; and vast

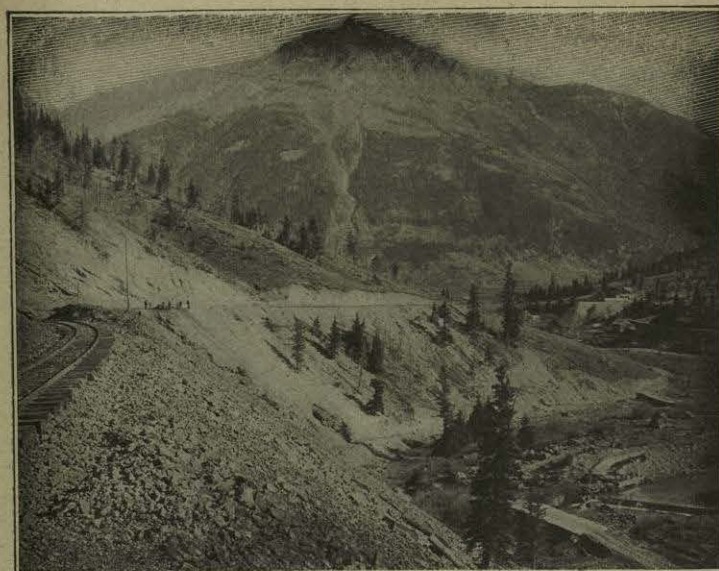


FIG. 470. — A view in the Rocky Mountains of Colorado, near the timber line, showing the steep slopes and small amount of surface available for farming.



FIG. 471. — A railway line crossing the Rocky Mountains near Georgetown, Colo.

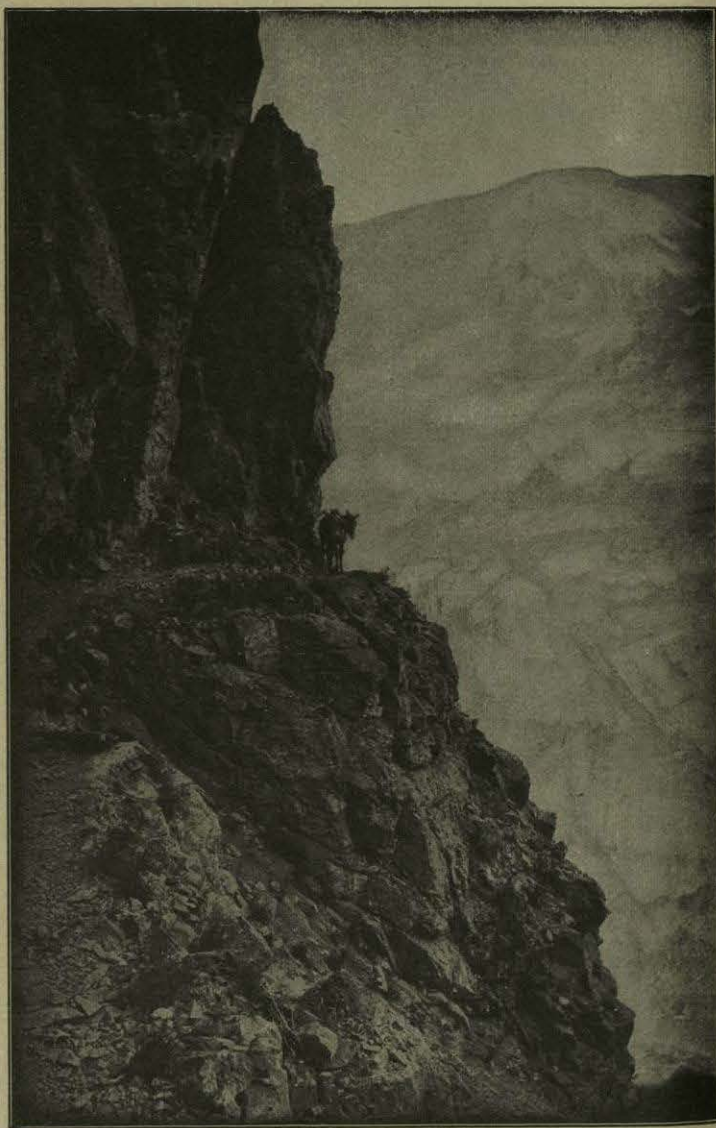


FIG. 472. — A trail in the mountains of western United States.

numbers of cattle, sheep, horses, and goats are raised on the plains, plateaus, and mountain slopes. Parts of Nevada, southern California, and Arizona are true deserts, with too little grass and water even for grazing (Fig. 150).

On the other hand, some of the high plateaus and mountain valleys have rainfall enough for agriculture, and many of the mountain slopes and higher plateaus are forested. One very large area, including the northern half of California, western Oregon, and much of Washington, has sufficient rainfall to make it a very important agricultural region.

Farming is also carried on wherever irrigation is possible; but, unfortunately, the water supply is lowest in summer. One of the great problems of the future, in which the entire country is interested, is how to store the winter rain and melting snow for use in summer. The government is now at work on this problem, and reservoirs are being built which will supply water to reclaim thousands of square miles of arid land. In this way the West may be made to support a much larger population.

The mountain rocks contain great stores of mineral, only portions of which have been developed. No part of the world equals this section in the production of precious metals; and, in addition, much copper, lead, and zinc are obtained. Coal, oil, gas, iron, salt, building stone, and many other mineral products, though found in many places, are not yet produced in large quantities. They are among the undeveloped resources of United States.

Scattered through the Far West are many thriving towns and cities (Figs. 133, 190), some engaged in mining, some in manufacturing, and all serving as distributing centers for surrounding sections. Of these the largest are Denver, at the eastern base of the Rocky Mountains, Salt Lake City in Utah, and several cities on the Pacific slope. Denver is a railway center and an important distributing and manufacturing center for a great mineral section.

On the Pacific slope are Seattle, Tacoma, and Portland, manufacturing and shipping points for a productive agricultural country. Their harbors, like that of San Francisco (Fig. 350), have been caused by sinking of the land. The great agricultural and mineral resources of California have made San Francisco a busy manufacturing and shipping center, already ranking in size as the ninth city in the country. With the growing trade across the Pacific, this city seems destined to take a still higher rank.

The Far West is justly noted for its magnificent scenery. No part of the world rivals in grandeur the canyon of the Colorado (Figs. 1, 139, 478); in no part of the world is there the equal of the Yellowstone Park, with its hot springs (Figs. 243, 474), geysers (Figs. 244, 473), and canyons (Fig. 480); nowhere is there another Yosemite (Fig. 475). But these are only some of the best known of the points of scenic interest in the West. Symmetrical volcanic cones (Figs. 214, 215), rugged peaks and glaciers, and grand mountain valleys (Figs. 57, 66, 472) and lakes, whose surroundings are nowhere excelled in picturesqueness, are found in various parts of the West. Each year the stream of travel toward these centers of scenic attraction increases.

The dry climate, unfavorable to agriculture, is favorable to health; and, consequently, many parts of the West — Colorado, New Mexico, Arizona, and southern California, especially — are much frequented. The city of Los Angeles owes a large part of its growth to the number of people who have gone there in search of a healthful climate. The climate of southern California is so sunny and balmy, like that of the Mediterranean, that, wherever irrigation is possible, the orange grows to perfection. It is one of the most attractive parts of the country.

Summary. — *Except in the northwestern part, and on some high plateaus and mountain slopes, the plateau and mountain area of the West has a climate too dry for agriculture without irrigation. Much of it is, therefore, essentially a grazing region. The building of reservoirs, to store the winter and spring floods for use in summer, is greatly increasing the area of agricultural land. The West is an*



FIG. 473. — Eruption of Fountain geyser in the Yellowstone Park.



FIG. 474. — The Hot Springs near the entrance to Yellowstone Park.

San Diego City of U.S.
Fassen Peak



FIG. 475. — Granite peaks in the Yosemite valley, California.

important mineral belt, being the greatest producer of precious metals in the world. Of the cities, the largest in the eastern Rockies is Denver. On the Pacific slope are several cities, of which San Francisco is the largest, having a fine location, on a splendid harbor, the outlet of a productive country. The West is noted for its wonderful scenery, especially the Colorado Canyon, Yellowstone Park, and Yosemite valley; the arid climate also makes the Southwest a favorite health resort.

TOPICAL OUTLINE AND REVIEW QUESTIONS.

TOPICAL OUTLINE.—194. **New England.**—(a) Surface features: rocks; effect of denudation; monadnocks; uplift; nature of valleys; mineral products. (b) Farming: glacial soil; reasons for forests; small farms; food supply. (c) Manufacturing: water power; lakes. (d) Coast line: cause for irregularity; fishing; ship building; summer resorts; navigation; effect on manufacturing; comparison with Norway. (e) Cities: location; Boston; reasons for growth. (f) Comparison: with Scandinavia; with Great Britain.

195. **New York.**—(a) General features: four divisions; glacial action; agriculture; mineral resources; manufacturing. (b) Adirondacks: forests; manufacturing; mineral; summer resorts. (c) Plateau region: uplands; valleys; agriculture; railways; cities. (d) Lake plains: cause of levelness; farming; Erie Canal route; cities; valleys leading into the plateau. (e) Largest two cities: influence of canal; causes of growth. (f) New York: cause of harbor; water communication with New England; with the interior; peculiar situation; effect on homes; on transportation.

196. **The Coastal Plains.**—Extent; surface features; agriculture; mineral wealth; coast line; interior navigation; railway transportation; location of cities; instances.

197. **The Piedmont Belt.**—Surface features; peneplain; soil; agriculture; Fall Line cities; Philadelphia and Baltimore; Atlanta.

198. **The Appalachian Belt.**—(a) Surface features: extent; two divisions; ruggedness; effect as barriers; river gaps. (b) Industries: lumber; agriculture; mineral resources. (c) Cities: Pittsburg and Allegheny; Scranton and Wilkes Barre; Birmingham.

199. **The Central Plains.**—(a) Surface features: extent; cause of levelness; mountain areas; broad valleys; navigable rivers; effect of glacier; Great Lakes water route. (b) Industries: agriculture; lumbering; grazing; mineral resources; manufacturing. (c) River cities: St. Louis; Cincinnati; Louisville; advantages of location of St. Louis; St. Paul and

Minneapolis; New Orleans; Pittsburg. (d) Lake cities: cities on the lakes; importance of situation on the lakes; location of Duluth-Superior; Buffalo; Toronto; Montreal; Cleveland; Toledo; Detroit; Milwaukee; Chicago,—origin of harbor, position, commerce, surrounding country, railway center, manufacturing and distributing center.

200. The Far West.—(a) Surface features: plateaus; mountain ranges. (b) Climate and agriculture: arid climate,—grazing, desert; humid sections,—location, forests, agriculture; irrigation; storage reservoirs. (c) Mineral: precious metal; other minerals. (d) Cities: Denver; Seattle; Tacoma; Portland; San Francisco,—its harbor, region tributary, growth of city. (e) Scenery: Colorado; Yellowstone; Yosemite; other attractions. (f) Health: favorable climate; Los Angeles.

REVIEW QUESTIONS.—194. What are the surface features of the uplands? What is a monadnock? What is the condition of the valleys? Why? What mineral products are there? What effects had the ice sheet on the soil? Explain the condition of farming. What effect has this on food supply? What conditions have favored manufacturing? Explain the irregular coast. What important effects has this coast? Where are the cities located? What conditions have favored the growth of Boston? Compare New England with Scandinavia and Great Britain.

195. What are the four divisions of the state? What effect has the glacier had? What are the natural resources? What is the condition and what are the industries of the Adirondacks? What is the condition on the plateau upland? In the valleys? Where are the cities of the plateau section? What causes the levelness of the lake plains? What are the industries there? What effect has the Erie Canal? What is the condition of the valleys leading into the plateau? Why have cities grown at the two ends of the water route? What conditions of physiography have favored the growth of New York City? What effect has the peculiar location of the city on homes? On transportation?

196. What is the condition of the coastal plains? What about agriculture? Mineral wealth? What is the condition of the coast line? What favors internal navigation? Where are the cities?

197. Explain the surface features of the Piedmont belt. What is the condition of agriculture? What accounts for the greatness of Philadelphia and Baltimore? What accounts for the growth of Atlanta?

198. What are the two divisions? What are the surface features? How is this rugged barrier crossed? What are the resources of the belt? What conditions have favored the growth of Pittsburg and Allegheny? Scranton and Wilkes Barre? Birmingham?

199. Why are these plains level? Where are the mountainous sections? Why are the rivers favorable to navigation, and the valleys to

settlement? What effects had the ice sheet? Of what importance is the lake route? What conditions favor agriculture? Where are forests found? What is the condition in the western part? What important mineral resources are there? What conditions favor manufacturing? Locate the three largest river cities. How is the situation of St. Louis especially favorable? What advantages of location have St. Paul and Minneapolis? How are New Orleans and Pittsburg related to this region? Name and locate the leading lake cities. What general advantages do they share? What especial reason is there for the growth of each? What is the reason for the exact location of Chicago? What special advantages has it?

200. What are the surface features? What is the general condition of the climate? What is the effect of this on industry? Where are the humid sections? Why are storage reservoirs necessary? What valuable minerals are found? For what is Denver important? Seattle, Tacoma, and Portland? What causes the harbors? What has favored the growth of San Francisco? What scenic attractions are there in the West? In what way is the dry climate favorable? What effect has this had on Los Angeles?

Reference Books.—POWELL, *Physiographic Regions of the United States*, National Geographic Monographs, American Book Co., New York, 1895, \$2.50; SHALER, *United States of America*, Appleton & Co., New York, 1894, \$10.00; MILL, *International Geography*, Appleton & Co., New York, 1899, \$3.50; Tarr & McMurry *Geographies*, Second Book, Macmillan Co., New York, 1900, \$0.75; DAVIS, *Physical Geography of Southern New England*, National Geographic Monographs, American Book Co., New York, 1895, \$2.50; EMERSON, *New England Supplement*, Tarr & McMurry *Geographies*, Macmillan Co., New York, 1901, \$0.30; TARR, *Physical Geography of New York State*, Chapter I, *Physiographic Features*, Macmillan Co., New York, 1902, \$3.50; *Same*, Chapter XII, *Influence of Physiographic Features upon Industrial Development*; WHITBECK, *New York Supplement*, Tarr & McMurry *Geographies*, Macmillan Co., New York, 1901, \$0.30 (also other State Supplements to Tarr & McMurry *Geographies*); KEMP, *Ore Deposits of United States and Canada*, Engineering and Mining Journal, New York, 1893, \$4.00; TARR, *Economic Geology of United States*, Macmillan Co., New York, fourth edition, 1903, \$3.50.