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CHAPTER XV.

PHYSIOGRAPHY OF THE UNITED STATES.

THE United States illustrates in many ways the effect of physiographic conditions on the industries and development of the various sections. In previous chapters reference has frequently been made to these influences. These references, with others added, are summarized in this chapter.

194. **New England.** — New England is a region of very ancient mountains of hard rock, including crystalline gneisses, schists, and granites. These strata are complexly folded, and worn by denudation to the condition of hills and low mountains (Fig. 460). It is held by many that this region was worn down to a peneplain (Fig. 171), with here and there a peak, or group of peaks, rising above the general level. Such peaks have been called *monadnocks*, after Mt. Monadnock, N.H. (Fig. 455), which rises well above the fairly uniform sky line of the surrounding hilltops.

After the mountains were reduced to a low hilly condition, there was an uplift of the land, which permitted the streams to sink their valleys into the ancient mountains. This occurred so long ago that, even in the resistant rocks, the valleys have been broadened to the condition of early maturity. The Connecticut valley, in weaker sandstones and shales, has been broadened to a wide lowland (Fig. 86), with here and there hills of more resistant trap rock, like Mts. Tom (Fig. 229) and Holyoke, rising above the valley floor.

There is little mineral wealth in New England, with the exception of abundant building stone, including granite,

slate, and marble, which finds a market in many parts of the country. There is hardly any coal, and very little iron or other metals.

Over all this region the ice sheet spread, rounding the hills and deepening some of the valleys. The residual soil was swept away, and in places, especially on steep slopes, the rock was left bare; but usually it was covered by a glacial soil. This soil varies greatly from sterile to fertile, from thin to thick, and from clayey to bowldery (Figs. 284, 285). Over a large part of New England the glacial soil is too thin, or too sandy, or too rocky, for cultivation.

Because of the hilly nature of the land, the many steep slopes, and the poor soil, New England is not a good farming country. In fact, the forest has been allowed to remain on large areas (Fig. 189); and, for this reason, the more mountainous northern and western parts are among the important forest regions of the country. Under such conditions the farms are necessarily small (Fig. 457), and the area suited to farming is not nearly large enough to supply the needs of the busy manufacturing towns and cities. The great food staples, such as wheat, are brought from the West, while New England farms are devoted mainly to the production of vegetables, dairy, and similar products for neighboring towns.

The glacial deposits have formed many lakes and turned aside many streams, which now tumble in rapids and falls over ledges which they have discovered. Hundreds of cities and towns use this water power for manufacturing, which stands at the foundation of New England's prosperity. The lakes aid in regulating the water supply.

During the glacial period the land sank and the sea entered the valleys, forming a very irregular coast line (Figs. 388, 389), with many bays and good harbors. This irregular coast line is favorable to fishing, one of the most important industries of New England; and it early encouraged ship building, for which the forests supplied the lumber. The beautiful

scenery of this irregular coast, and the cool climate, attract many people in summer.

The many harbors have encouraged navigation. This navigation aids manufacturing by furnishing a means of bringing raw materials and of removing manufactured articles to places where they are used. Though irregular, the coast is low enough to permit the easy construction of railways; and the broad, mature valleys of the interior are also easily traversed by them. Consequently, railway lines radiate from the leading ports to cities both inland and along the coast. In this respect New England differs greatly from mountainous Norway, where communication between points along the irregular coast must be by boat.

Many of the busy manufacturing cities of New England (Fig. 456), such as Providence, Fall River, New Bedford,

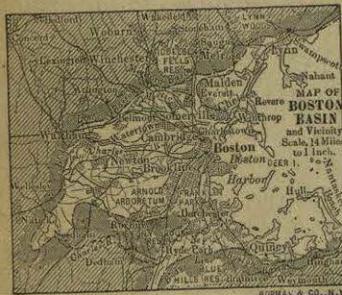


FIG. 454.—To show the location of Boston with the ring of surrounding towns and cities.

New Haven, Bridgeport, and Portland, are on the sea. Others, like Worcester, Lowell, Lawrence, Hartford, and Springfield, are in the interior, generally near water power. By far the largest city is Boston, on the sea. Its growth depends upon a number of favorable circumstances. It is in a central position, on that part of the coast which extends farthest into the interior of New England, and it has an excellent harbor. Communication along the coast is possible by rail and boat; the interior is easily accessible by rail; and all parts of the world are open to its commerce. All eastern Massachusetts is tributary to this port, which lies in the center of a semi-circle of manufacturing towns (Fig. 454), one of the busiest manufacturing regions of the world.

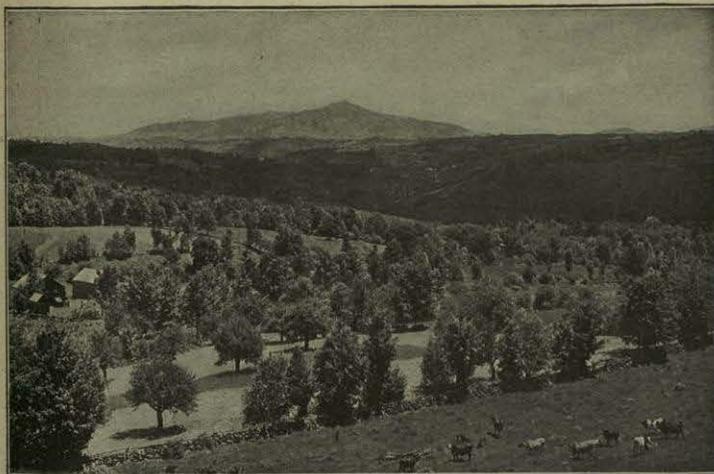


FIG. 455.—Mt. Monadnock, rising above the general level of the upland of southern New Hampshire.

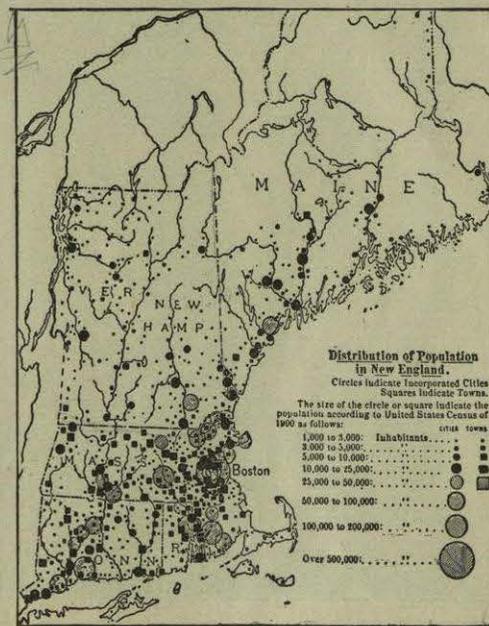


FIG. 456.—Distribution of towns and cities in New England.

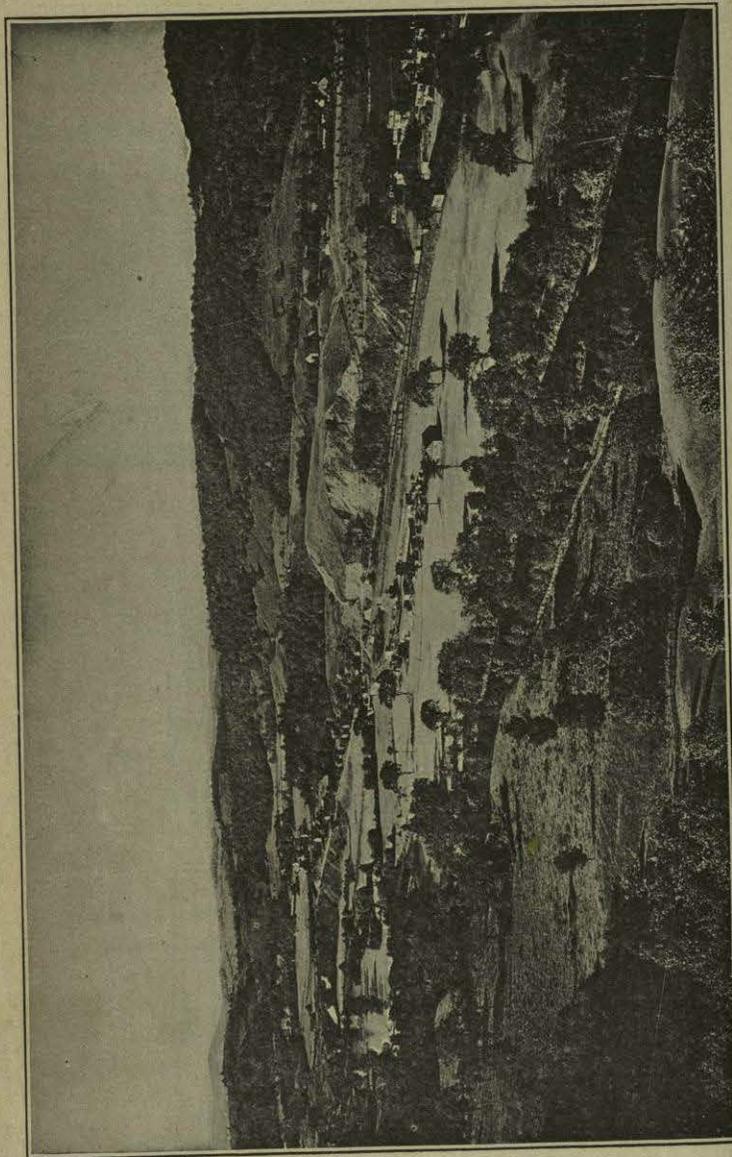


FIG. 457. — St. Johnsbury, Vt. A typical view in hilly New England, showing the irregular topography and the large percentage of wooded surface.

In its physical geography, New England resembles parts of Great Britain and Scandinavia. In each case the coast is irregular, the land hilly, and much of the soil poor. Scandinavia, like the more hilly part of New England, has a large proportion of its area uncleared of forest. It is more mountainous than most of New England, and has little manufacturing; but its irregular coast has encouraged the development of fishing and shipping. Great Britain pays far more attention to manufacturing than to agriculture, and, like New England, depends upon other sections for a large part of its supply of food and raw materials.

Summary. — *New England is a region of worn-down, ancient mountains, with hilltops rising to a fairly even sky line, but with peaks and groups of peaks rising above this level, especially in the west and north. Many of these are still forest-covered. The valleys are fairly broad, even in the hard rock, favoring the construction of roads and railways. The ice sheet has left a glacial soil, which, together with the hilly condition, makes this a poor farming region. There is little mineral wealth, excepting building stone. In spite of the general absence of raw products, the water power, due to glacial interference with streams, has encouraged the development of manufacturing; and this has been further aided by the irregular coast, caused by sinking of the land. This irregular coast is favorable to fishing and to navigation. Of the many manufacturing cities Boston is most favorably situated and is, therefore, the largest.*

195. New York. — The physiography of the Empire State is more varied than that of New England. New York may be divided into four quite different regions: (1) the Adirondacks, resembling the more mountainous parts of New England; (2) the low, hilly region of southeastern New York, which resembles southwestern New England; (3) the high, hilly plateau, including the Catskills and southern and western New York; and (4) the plains which border Lakes Erie and Ontario. The ice sheet covered the entire state, excepting the extreme southwestern corner (Fig. 270). Therefore, in various parts of the state, there are moraines (Figs. 273, 274), wash plains (Fig. 275), drumlins (Fig.

287), and other glacial deposits, and gorges, waterfalls (Figs. 61, 67, 71, 75), rapids, and lakes.

The basis for the great growth of New York is agriculture, in which it ranks high among the states of the Union. In mineral wealth the state is not especially rich, though building stone, clay, and salt are found in excess of local needs. There is also some iron, oil, and gas, but no coal. However, the oil, gas, and coal of Pennsylvania are readily accessible; and the iron of the Lake Superior region is easily brought by water to Buffalo. Hence, manufacturing cities have developed wherever facilities for transportation favored their development. Water power, due to glacial action, has also aided in the growth of many towns and cities.

The Adirondacks, like the higher parts of New England, are rugged, mountainous, rocky, and forest-covered (Fig. 188). Water power is used in a series of towns around their base, partly in manufacturing the products of the forest, as in making paper from wood pulp. There are some mineral resources, including iron; but distance from lines of water transportation renders the stores of building stone, and most other mineral products, of little present use. As in New England, these beautiful mountains (Fig. 299) are much resorted to by sportsmen and summer visitors.

The uplands of the Catskills, and the hilly plateau of the south and west (Figs. 145, 465), have a thin and often stony soil. This plateau is, therefore, sparsely settled, and there are large areas that are still forest-covered. The valleys, being more level, and having thicker and better soil, are dotted with farms and country villages. The abundance of creameries, for the manufacture of butter and cheese, shows that much of this region is better adapted to pasturage than to grain and other crops.

The hills are so difficult to cross, and so sparsely settled, that railways are found mainly in the larger valleys; and it is often a long, roundabout railway journey from one valley to the next. The towns and cities, such as Binghamton and Elmira, are in the larger valleys, usually at points where railways from tributary valleys enter, making these places railway junctions.

The level plains along the shores of the Great Lakes have a deep soil, deposited by the glacier and in the glacial lakes (p. 149). These lake-shore plains are among the best farming lands of the East, and the influence of the lake water gives them a climate especially suited to fruit culture (p. 166). From near Buffalo to Rome, the Erie Canal (Fig. 458) crosses these plains. Its route is now followed by railways; and the excellent facilities for transportation have encouraged the growth of numerous towns and cities, including Rochester, — at the falls of the Genesee, — Syracuse, Utica, Troy, and Albany.

Numerous broad, mature valleys lead back into the plateau, and in some of them are large lakes, such as Cayuga (Fig. 298) and Seneca, which have been caused by ice erosion and dams of glacial drift. These valleys and lakes afford opportunities for communication by water, road, and railway with the heart of the plateau country. In early days the Erie Canal was the only great artery connecting this interior with the sea; but railways are now added to the canal to accommodate the steady stream of trade, between the West, the interior of the state, and the sea.

The movement of goods along this route, which has aided in the growth of many towns and cities, has especially favored the cities at the two ends — New York, on the sea,

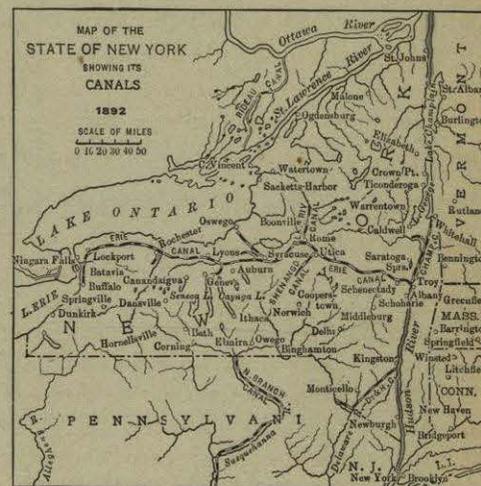


FIG. 458. — Erie Canal route.

and Buffalo, on Lake Erie. The unloading of goods at Buffalo and New York, for further shipment, accounts in part for their growth. They are, moreover, supplied with abundant raw material for manufacture and have, therefore, become great centers of manufacturing and of commerce.

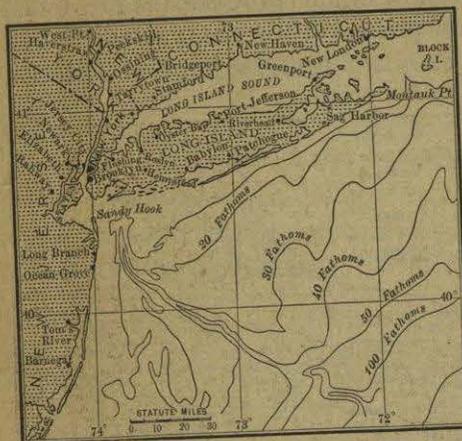


FIG. 459.—New York City and surroundings, showing the submerged channel, which extends offshore from the Hudson to the edge of the continental shelf. Before the land was lowered the Hudson occupied this channel.

forming islands which add greatly to the water front. As a result, an inclosed waterway has been formed behind Long Island, opening connection with New England, and another along the Hudson (Fig. 351) into the interior. The latter route, extended to the Great Lakes by canals and railways, has concentrated in New York the shipping of a large part of the interior of northern United States. Thus the growth of New York City has kept pace with the growth of the interior.

The peculiar conditions surrounding this rapidly growing city have made the problem of living there difficult to solve. The harbor is in two states, but the main city is on a long, narrow island. There is no space for the population to easily spread outward

By reason of its very favorable physiographic situation New York has become the largest city of the country, and one of the largest and busiest in the world. Sinking of the land (Fig. 459) has caused a fine harbor with extensive water frontage. This sinking has admitted the sea into the Hudson (Fig. 462) and into several small tributaries, even flooding low divides, thus



FIG. 460.—Relief map of southern New England. (Model by E. E. Howell, Washington, D.C.)

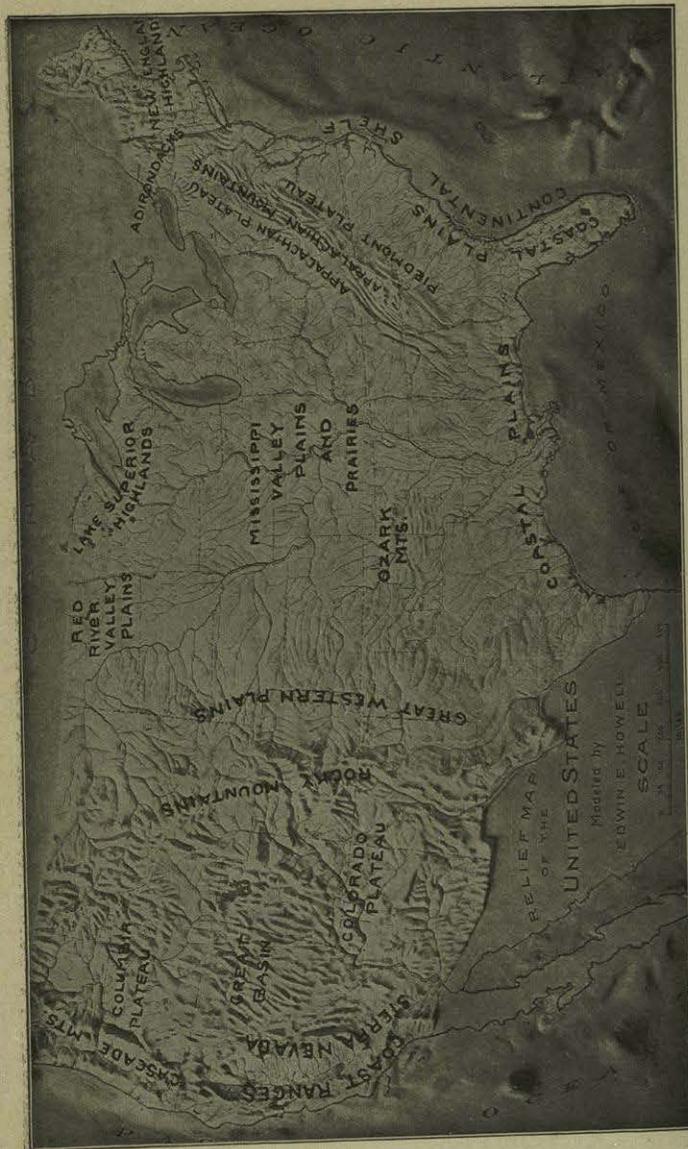


FIG. 461. — Relief map of United States, showing principal physiographic provinces.

in various directions from the harbor, as in many cities. Here, development has had to extend up the narrow island and across the channels of the harbor. This has greatly crowded Manhattan Island, and has forced many New York business men to live at a distance, large numbers going across North River to New Jersey or across East River to Long Island. Therefore a number of cities have grown up around the splendid harbor, such as Hoboken and Jersey City, in New Jersey, and Brooklyn, now a part of New York City, on Long Island. The problem of transporting these people is more serious than in any other city; and surface, elevated, and underground lines, added to bridges, ferry boats, and railway trains, are not yet sufficient. As the city grows the problems of transportation increase.

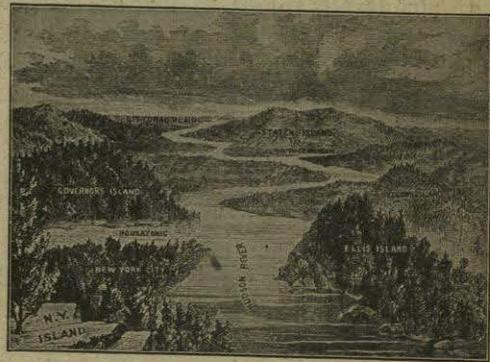


FIG. 462. — Ideal restoration of the neighborhood of New York, if the land were reelevated to its former level.

Summary. — *The Adirondacks resemble mountainous*

New England in physiography and industries; and the low, hilly region of southeastern New York resembles southwestern New England. The plateau section is hilly, sparsely settled on the uplands, but with better soil, and more inhabitants, in the broad valleys. The lake-shore plains are excellent farming land, and the Erie Canal and the railways which cross these plains have caused the growth of many towns and cities, and made much manufacturing possible. The two cities at the ends of this route, Buffalo and New York, have become of special importance, New York having the best physiographic situation of all the cities of the country, and hence becoming its metropolis.

196. The Coastal Plains. — From New Jersey to Mexico there is a narrow belt of low, level land, so recently raised

above the sea that its streams are young and large tracts are undrained (Figs. 78, 79, 119-121). This coastal plains region is broadest in Florida, and extends up the Mississippi valley, which at its lower end is a filled bay. As it is south of the glacial belt, rapids and falls are practically absent from the streams; but there are lakes in the irregularities of the raised sea bottom, especially in Florida.

Much of the surface is too sandy for farming and is covered with pine forests (p. 73). Other tracts are too damp, some in the South being the seat of rice culture, which requires wet ground. Where the soil is dry and fertile enough, the coastal plains are the seat of important agriculture.

There is little mineral wealth in this belt. Sand and clay are abundant, and in some cases are shipped away; and at Charleston and in Florida there are important beds of phosphate, which is sent far and wide for use as land fertilizer.

The coast is low and often swampy, especially near the rivers, into whose mouths the sea has been allowed to enter, by a slight sinking of the land (Figs. 121, 124, 387). There are some good harbors and some large navigable bays, especially in the north, where the sinking has been greatest. But the moving sands, and the sand bars which skirt the coast (p. 214), make many of the harbors of little use. The larger bays, especially Delaware and Chesapeake bays, admit boats far into the land; and because of their gentle slope, and the absence of falls and rapids, many of the rivers are navigable to small boats. Anywhere on the level surface, roads and railways may be built; but the sparseness of settlement, and the general absence of manufacturing, make few railways necessary.

The cities are located either on the Fall Line (Fig. 125), along the inner margin of the coastal plain, or at the head or mouth of the bays. Thus, Galveston is on a sand bar at the mouth of a bay; New Orleans is on the navigable Mississippi at the point where it comes nearest to a shallow bay, navigable in early times by small boats; Mobile, Savannah, and Charleston are on small bays; Norfolk is at the mouth of the large Chesapeake Bay.

Summary. — *The level coastal plains extend from New Jersey to Mexico. They are often so swampy, or have so sandy a soil, as to be unfit for agriculture. There is little mineral wealth. The low, sandy coast has many navigable bays, due to sinking of the land; but sand bars interfere with the entrance to many by ships. The chief cities are on the Fall Line or on the coast, either at the head or mouth of a bay.*

197. The Piedmont Belt. — The low, hilly country, from New York to Alabama, between the coastal plains and the Appalachians, is known as the Piedmont belt (Figs. 461, 464, 465). It is an uplifted peneplain, with hilltops rising to a nearly uniform level, and here and there a monadnock standing above the general surface. An uplift has given the streams power to sink their valleys into the peneplain. That this was once a high, rugged, mountain region is proved by the fact that the rocks are intensely folded.

Excepting in New Jersey the Piedmont region is south of the glacial belt, and, therefore, the residual soil has not been removed from its undulating surface. This soil is usually deep and fertile, and, since the climate is favorable and the surface fairly level, this is a splendid agricultural region. It is one of the greatest cotton and tobacco belts, and, in addition, produces fruits and farm crops of various kinds.

The Piedmont belt is dotted with towns and cities, and crossed by many railway lines. The Fall Line cities (Fig. 125) are along its eastern margin, the two largest being Philadelphia and Baltimore, also near the head of navigation on large bays. Washington is similarly situated. Philadelphia and Baltimore, like Boston and New York, have become great seaports because of good harbors and connection with a productive interior. Being shipping points for the exports and imports of the interior, these cities have naturally become great manufacturing centers. Manufacturing has been further encouraged by the readiness with which coal and iron are obtained.

The largest city away from the Fall Line is Atlanta, which, like many other towns and cities of the South, has become of importance as a center for the manufacture of cotton, lumber, and other local products. Atlanta owes its development largely to the fact that it lies at the point of intersection of a number of railway lines, including those that pass around the southern end of the Appalachians.

Summary. — *The Piedmont belt is an uplifted peneplain, with a fertile residual soil and a favorable climate. It is, therefore, an excellent agricultural region, producing especially tobacco and cotton. It is dotted with towns and cities, the largest being on the Fall Line. Among these cities are Philadelphia, Baltimore, and Washington, also at the head of large bays.*

198. The Appalachian Belt. — This belt, extending from New York to Alabama, parallel to the Piedmont, may be divided into two parts, — the eastern, or Appalachian proper, and the western, or Appalachian (Alleghany) plateau (Figs. 461, 464, 465).

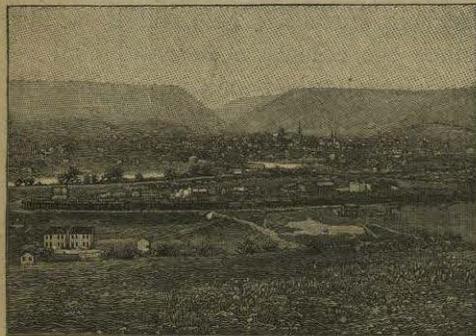


FIG. 463. — The Potomac Water Gap.

The eastern section is a true mountain region of folded rock, while the western portion is true plateau with horizontal strata. Both are so rugged that much of their area is unsuited to settlement and, therefore, still forest-

covered (Figs. 85, 146). The ruggedness is due to so recent an uplift that the streams have cut deep valleys.

For a long time these rugged, forest-covered belts served as a barrier to westward migration; and even now, along all but a few lines, they are passed with difficulty. The ridges

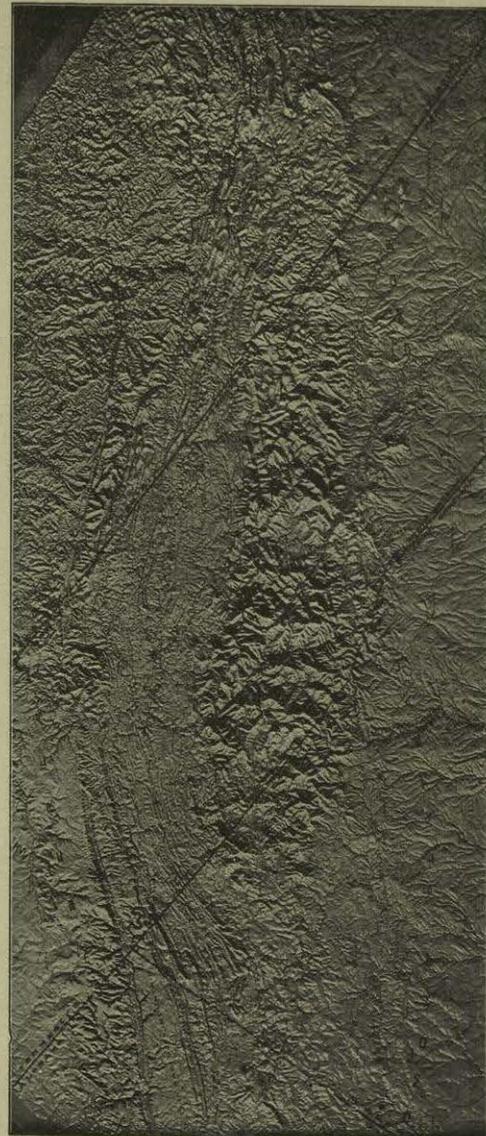


FIG. 464. — Relief map of the Appalachian region, where Tennessee and the Carolinas come together (north in upper right-hand corner). The Piedmont belt occupies the lower portion. Above that is the high, rugged Appalachian region of western North Carolina. Nearer the top are a series of long, low Appalachian ridges and broad valleys, a mature mountain region. In the upper part is the plateau of Tennessee, Kentucky, and West Virginia, deeply dissected in West Virginia, on the right-hand side. It is proposed to make a great forest reserve of part of this area. (Model by E. E. Howell, Washington, D.C.)