region of comparatively low elevation is geologically, and also to a certain extent topographically, made up of two quite distinct portions. The part nearest the coast is almost flat, or with the gentlest possible slope seaward, and unbroken by any elevations worthy of notice. Beyond this belt, to the west and north-west, is another, itself almost a plain, but more undulating, rising more rapidly westward, so as to form almost a tableland at the base of the mountains, and itself diversified, in its western portion, by elevations which in places rise high enough to be called mountains. The belt nearest the shore consists of Tertiary and Cretaceous rocks having a very gentle dip seaward. These are first met with, as we proceed southward, on Raritan Bay, where the belt occupied by them is from 20 to 25 miles wide, but on reaching Philadelphia it is found to have acquired a breadth of more than 50. The stratified mass in New Jersey consists of a great number of alter­nations of sands, marls, and clays, from a third to half the width of the belt being occupied on the surface by the Cretaceous, and the more eastern portion being of Tertiary age. Trenton, near the western edge of this belt, is only 33 feet above the sea-level. These newer formations are of special interest on account of their fossils, and because of their great economic value. This level belt of newer rocks maintains its width through Delaware and Virginia, and attains a width of more than 100 miles in North Carolina and Georgia. Between New Jersey and North Carolina it is deeply intersected by bays, the heads of which approximately mark a change from rocks of recent age to those much lower down in the series, which make up the western portion of the Atlantic slope. This change is also most distinctly marked by an interruption to the navigability of the rivers, and it also manifests itself in the position of the cities of the Atlantic slope, most of which to the south of New York (Trenton, Philadelphia, Baltimore, Washington, Richmond, Petersburg, Raleigh, Columbia, Augusta, Milledgeville, and Montgomery) are not on the Atlantic itself, but on or very near this geological break. From Virginia southward the coast is very little indented, and most of the large towns are at a consider­able distance from it. In North Carolina the slope of the coast belt—here 100 miles wide—is hardly more than 1 or 2 feet to the mile. It is occupied by nearly horizontal strata of Tertiary, over- lain in considerable part by detrital accumulations of still later age, the whole consisting of loose sands, clays, marls, and gravels irregularly piled one above another. Nearly the same may be said of the continuation of this belt through South Carolina and Georgia. In the former State Columbia (between 200 and 300 feet above the sea) marks its western border. In Georgia, at the general level of the country, nearly the whole belt is Tertiary ; but the underlying Cretaceous is revealed in various places where the rivers have cut deeper than usual. The heights of the cities are as follows :— Augusta, 130-180 feet ; Milledgeville, 310 ; Macon, 334 feet.

The second or upper belt of the Atlantic slope is in large part made up of rocks which are destitute of fossils, and in regard to which it has not yet been clearly made out whether they arc really stratified beds older than the lowest Silurian (Azoic or Archæan of Dana), or whether they are highly altered rocks of Palæozoic age. Over most of its area it has very distinctly the character of a plain. In Pennsylvania it is highly cultivated and densely peopled, a "country of rolling hills and gently-sloping vales, with occasional rocky dells of no great depths, and nowhere more than 600 or 700 feet above the sea-level.” It is bordered on the north-west, for a portion of its extent, by *a* low range of elevations, known as the South Mountains, and generally considered to be the northern prolongation of the Blue Ridge of Virginia and the States farther south. The South Mountains enter Pennsylvania at the Delaware, forming a region of irregularly grouped ridges, which occupy a breadth of somewhat less than 10 miles, and which do not rise to an elevation of more than 400 to 500 feet above the valleys. These hills are made up of massive varieties of gneiss, sandstones,—recognized by the Pennsylvania Survey as being of Potsdam age,—and Lower Silurian limestones. The valleys resting on this latter rock are covered with a highly fertile soil. In Virginia the upper belt of the Atlantic slope broadens out and becomes more and more complicated in its topography. In an official report@@1 this region is divided into three portions, called the Middle, Pied­mont, and Blue Ridge divisions of the State. The Middle division is said to extend westward from the sea to the foot of the low broken ranges which, under the names of Kitoctin, or Kittoctan, Bull Run, Yew, Clark’s, South-West, Carter’s, Green, Findlay’s, Buffalo, Chandler’s, Smith’s, &c., Mountains and Hills, extend across the State south-west from Fairfax county on the Potomac to Pittsylvania county on the North Carolina line. These broken ranges, which preserve a general parallelism with the Appalachian ranges proper, and form, as it were, the outliers of this system, are designated by Major Hotchkiss the Atlantic Coast range. This middle country is described as a moderately undulating plain, from 25 to 100 miles wide, and rising from the south-eastern border, where it is from 150 to 200 feet above the sea, to an altitude of from 300

to 500 feet along its north-western edge. It is a succession of low north-east and south-west trending ridges, the valleys between them being sometimes narrow and deep, but the ridges themselves not very prominent. The rocks are metamorphic slates and gneiss, with numerous eruptive masses in the form of dikes, and with many quartz veins, some of which contain considerable gold, although mining has not, on the whole, been successful. The Piedmont division forms a belt of from 20 to 30 miles in width, and may properly be considered as being the foothill border of the Blue Ridge itself. There is a marked tendency to the formation of a continuous valley between the broken ridges already noticed as forming the so-called Coast range and the Blue Ridge proper. In this valley lie Culpeper (400-500 feet), Fairfax (382), Charlottes­ville (450), Lynchburg (650), and other towns. This foothill region is described as exceedingly intricate. The coast range is succeeded, in the west, by numberless valleys of all imaginable forms, which extend across to, and far into, the Blue Ridge, to which, in point of fact, they topographically belong. Portions of the Piedmont country, however, form quite extensive plains.

The Blue Ridge with its belt of foot-hills—the Piedmont region —forms a conspicuous feature of the topography of Virginia and the States farther south. The Potomac breaks through it at Harper’s Ferry, at an elevation of 242 feet, the mountains adjacent rising about 1200 feet higher. The passes, locally known as “gaps,” are numerous, and several of them are traversed by railroads. The James river intersects the Blue Ridge 706 feet above the sea. The elevation of this range is considerable, even in its northern portion, —Mount Marshall, near Front Royal and Manassas Gap, being about 3370 feet. The height as well as the breadth of the range increases rapidly as the southern line of Virginia is approached,— the Peaks of Otter, in Bedford county, near Buford’s Gap, rising to 4000 feet, and Balsam Mountain, just at the North Carolina line, to 5700 feet. Here the Blue Ridge has already begun to expand into that wide and high plateau, occupying the western portion of North Carolina, in which are found the highest points of the entire Appalachian system. This elevated region is formed by a broadening out and bifurcation of the Blue Ridge, which begins near Christiansburg (2012 feet), opposite the point where the New river changes its course from a direction parallel with that of the Appalachian ranges to one at right angles to this, and breaks through that part of the system which lies north-west of the Great Valley, flowing in that direction to the Ohio. This plateau rises in North Carolina to an average height of 2500 feet, while portions of it are over 3500. It is about 150 miles in length, with a width varying from 15 to 50 miles and averaging about 30, and reaches its highest altitude (3500-4000 feet) at its narrowest part. The plateau is bordered by broken ranges ; that on the south-east still continues to be called Blue Ridge; the more or less continuous line of elevations in the south-west has various names—Unaka, Smoky, Bald, and Iron being among the number. Between these exterior ridges run various spurs, with many points over 6000 feet, the culminating one being the Black Dome (6707 feet). The northern portion of this high region is drained by the head waters of the New river, but the principal drainage of the most elevated part is to the north-west, from the plateau, through gaps in the western ridges, to the Tennessee.

The geology of the Blue Ridge division of the Appalachian system is obscure and difficult. Most of the rocks are highly crystalline, but whether of Palæozoic or Azoic age is as yet undecided. These crystalline rocks are more or less intersected by ancient eruptive masses, the range and extent of which are uncertain. Flanking the Blue Ridge on the west side, and involved in the disturbances of the strata by which it has been built up, are sandstones and lime­stones which in Pennsylvania have been recognized as being of Lower Silurian age. These limestones seem to become more aren­aceous farther south, and also to become unfossiliferous. ft may be assumed, however, that the range in general is made up of rocks not newer than Lower Silurian.

To the west and north-west of the Blue Ridge division of the Appalachian system lies the Great Valley. Its north-western limit in Pennsylvania is the Kittatinny Mountain, which separates it from the mountain district lying adjacent to it on that side by a very regular natural wall. The entire length of the valley in that State is about 165 miles, and its width between 10 and 11 miles. Throughout its whole extent it presents a gently undulating surface, approximating to a level plain, with here and there a belt of low hills. In Virginia the Great Valley is a very important feature, having a length of a little over 300 miles, and a quite uniform width of about 20. The mountains on its north-west side (the Kittatinny) are known by a variety of names, their northern portion being designated on some maps as the Great North Mountains. A small portion of this valley is also included within the limits of West Virginia. The drainage of the Great Valley is complicated. The north-eastern portion is the beautiful and fertile valley (about 140 miles in length) of the Shenandoah, drained by two parallel branches of that river,—a well-marked double range, 50 miles in length, dividing the Great Valley longitudinally. Through this

@@@1 Hotchkiss, *Virginia, a Geographical and Political Summary,* based on infor­mation obtained during the Geological Survey by Prof. W. B. Rogers in 1835-41.