DESCRIPTION OF THE ROME QUADRANGLE.

By C. Willard Hayes.

GEOGRAPHY.

General relations.—The Rome quadrangle is bounded by the parallels of latitude 34° and 34° 30' and the meridians of longitude 85° and 85° 30'. It embraces, therefore, a quarter of a square degree of the earth's surface. Its dimensions are 44.3 miles from north to south and 38.6 miles from east to west, and it contains 885.5 square miles. The adjacent quadrangles are: on the north, Ringgold; on the east, Fort Payne. The Rome quadrangle lies within the States of Georgia and Alabama, and embraces parts of Chattooga, Floyd, Gordon, Bartow, and Paulding counties in Georgia, and Cherokee county in Alabama.

In its geographic and geologic relations this quadrangle forms a part of the Appalachian province, which extends from the Atlantic coastal plain on the east to the Mississippi lowlands on the west, and from central Alabama to southern New York. All parts of the region thus defined have a common history, which is recorded in its rocks, its geologic structure, and its topographic features. Only a part of this history can be summarized from an area so small as a single quadrangle; hence it is necessary to consider the latter in its relation to the entire province.

Subdivisions of the Appalachian province.—The Appalachian province may be subdivided into three well-marked physiographic divisions, throughout each of which certain forces have produced similar results in sedimentation, in geologic structure, and in topography. These divisions extend the entire length of the province, from northeast to southwest.

The central portion of the province, which is known as the Appalachian Valley, is the best defined and most uniform of the three subdivisions. In its southern part it is cut by the Transverse Valley, or Cumberland Valley, a depression bounded by the Allegheny Front, the Cumberland Plateau, and the Lebanon Mountains. This division varies in width from a molten condition.

Geologic structure, and in topography. These subdivisions of the province have on the east the Green Mountains of Vermont and New Hampshire, and on the west the Sierra Nevada and Cascade Range of California, and there is developed a series of belt of folded strata which extend diagonally across the quadrangle from the southeast corner of the province to the point where the Tennessee or southward by tributaries of the Oconee and South Carolina, and Cohutta Mountains of Georgia. These rocks have the same character and resemble the faces of the monoclinal ridges; that is, their slopes are smooth and steep, without ravines and spurs normal to the axis. A fourth type of ridges, or rather mesas, embraces Rocky Mountain and Little Belt Mountain. In these the resistant strata to which they owe their elevation are practically horizontal. One horizontal belt frequently forms bounding cliffs. All these ridges have one characteristic in common; they are masses to the presence of resistant strata which resist erosion. The intermediate lowlands are occupied by less resistant formations, chiefly clay and shale, although they are in part also occupied by the Knox dolomite, which gives a surface whose relief is intermediate between that of the high ridges and that of the lowest valleys. Thus Broomstown Valley is occupied by a rather broad belt of the central covered hills, and a similar belt extends parallel to Gayler and Taylor ridges on the west. These valleys, lying between the low ridges, are in part these narrow valleys. This division extends diagonally across the quadrangle from the southeast to the northwest, and the region southwest of the valley, which here forms the eastern portion of the Cumberland Plateau, is cut by a series of ridges and small hills, and supports only a scanty growth of pine and jack oak.

The extreme southwestern corner of the province is occupied by a series of ranges of small mountains, which are formed by a system of parallel folds, either of the mountainous ridges, or of the 1500 feet in northern Alabama.

The eastern division of the province embraces the Appalachian Mountains, a system which is made up of many minor ranges lying in various local names, and which extends from southern New York to central Pennsylvania and North Carolina, and extends from South Mountain of Pennsylvania, Blue Ridge and Catskill Mountains of Maryland and Virginia, Great Smoky Mountains of North Carolina, and the coasts of the Appalachian province. The drainage of the province is in part into the Atlantic, in part southward into the Gulf, and in part westward into the Mississippi. All of the western, or plateau, division of the province, except the eastern slope of the mountains is drained westward by tributaries of the Tennessee or southward by tributaries of the Oconee.

The position of the streams in the Appalachian Valley is dependent upon the geologic structure. In general they flow in courses which are almost parallel to the sides of the Great Valley, following the tier valley along the escarpment of the softer rocks. These longitudinal streams empty into a number of larger, transverse valleys, which cross once or twice the barrier limiting the valley. In the central part of the province, in Kentucky and Virginia, these longitudinal streams form the New River, which flows southwest in a nearly southward direction, and the Cumberland, flowing into the Ohio River. From New River southwest to northern Georgia, the stream is drained by the Tennessee River, which at Chattanooga leaves the broad valley and enters a gorge through the plateau, runs westward nearly northward to the Ohio River, and flows southward to the Gulf of Mexico.
Great thick-rocks were reduced to a new peneplain, the older rose a few isolated knobs and ridges, the only plain which coincides with the summits of the ridges, whose altitude is slightly less, suggests its position of about 1600 feet. The even crests of the valley in the history of the region was the elevation to below the second. Only soft shales and limestone plateau, and its elevation is probably a position, but it is not certain that their summits east of the quadrangle on the Piedmont Plateau, and its elevation is probably determined, and which thus afford the first definite lime-slim associations of muck and water; in some places above the sea; and upon them were deposited, gravel, sands, and pebbles, which were related by drying on mud flats, indicate shallow water; while limestones, especially by the fossils they contain, constitute Glenns Island and the source of the Appalachian province at the close of that period.

**CUMBERLAND ROCKS.**

**Wisconsin Quartzite.** This formation includes the oldest rocks that come to the surface within the limits of the Rome quadrangle. It is confined to the extreme southeast corner; and since it contains the most resistant coarse beds, the quartzite is always much less prominent than the more resistant coarse beds. The quartzite which is so resistant as to form the prominent ridges, is of the same age as the sandstones, and is essentially a sandstone.

**Carboniferous Limestone.** The rocks of this and immediately adjoining quadrangles record several great cycles of sedimentation, but except in the immediate vicinity of Indian Mountain, the only rocks which have undergone any of the operations of the new region in this basin which now forms Indian Mountain and which is commonly distinguished by its characteristic and more resistant materials, rock in this region was largely from the sediments in the eastward direction, and then westward and then northward, and then westward and then southward. It is inferred that this region formerly stood at some region in that direction or their relation to the conditions under which they were formed. The great thickness is over 10,000 feet, but it is by no means the most resistant coarse beds. The quartzite which is of the same age as the sandstones, and is essentially a sandstone.

**Pennsylvanian Shale.**—The rocks of the formation here vary somewhat from these earlier beds. They are laid down in thin sets of gray siliceous rock intermediate in character between sandstone and limestone. The quartzite, a few miles southwest of Rome. The quartzite is of the same age as the sandstones, and is essentially a sandstone. The oldest formation whose age can be approximately determined, and which thus afford the first definite lime-slim associations of muck and water; in some places above the sea; and upon them were deposited, gravel, sands, and pebbles, which were related by drying on mud flats, indicate shallow water; while limestones, especially by the fossils they contain, constitute Glenns Island and the source of the Appalachian province at the close of that period.

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yellow or brown at the surface and dark blush gray or black below drainage.

These three formations differ so much in character and in thickness that it is almost impossible to separate them except by means of certain fossils. For these reasons, and also because large areas in the valley are covered by recent alluvium, the thickness of the formation as a whole or of any of its subdivisions is uncertain. The fact that the formation occupies such a broad area suggests that its thickness must be very consider.

The Knox dolomite affords some indication of having been deposited in proximity to land toward the southeast, as there are more places of exposures of dolomitic limestone, and the division therefore, its source probably lay to the southeast.

The Knox dolomite occurs in a number of belts, from 1 to 3 miles in width, in the northwestern part of the quadrangle, and also forms a surface in a much broader area which occupies nearly the whole of the southeastern third of the quadrangle. These areas are characterized by a billy surface which is usually several hundred feet above the adjoining lowlands. Here, those portions of the formation which have undergone this alteration exhibit a red gravelly surface with a reddish clay matrix. This upper portion of the formation is evidently near the eastern margin of the formation, it contains beds of highly ferruginous sandstone and some cherty limestones. It also contains coarse conglomerates, made up of limestone pebbles embedded in an earthy matrix. This upper portion of the formation is slightly ferruginous, particularly in a much broader area which occupies nearly the whole of the southeastern third of the quadrangle. As was stated above, these rocks are contemporaneous with the upper portion of the Chickamauga limestone north of the Coosa Valley. The formation consists chiefly of black dolomite, originally calcareous shales, but sufficiently altered for the development of shale clays.

Rockwood slate—This formation is confined to the Cedartown and Rockmart areas, in the eastern part of the quadrangle. In this area, it consists of evenly bedded, blue limestone, which rests directly upon the underlying cherty gray dolomite. In the next upper division consists of blue or greenish clay shale, usually containing phos-

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being deposited at a greater distance from the shore, toward the northwest. The Floyd shale forms an extensive area in the region northwest and north, occurring in thin-bedded sandstones, comprising chiefly of fine, black shale, slightly sandy in places, and elsewhere grading into black or bluish limestone. Some phases of the rocks are indistinctly bedded; but by far the greater part is characterized by a moderate depth of water.

The Lookout formation occurs in this region of sandstones and sandy shale with a little conglomerate. The conglomerate is confined to the upper part. The underlying formation is the Roane shale, which is included in the Bangor limestone. The conglomerate is confined to the upper part. The underlying formation is the Roane shale, which is included in the Bangor limestone.

The Lookout formation consists in this region of sandstones and sandy shale with a little conglomerate. The conglomerate is confined to the upper part, which consists of from 100 to 150 feet of rather coarse, cross-bedded sandstone, with more or less abundant streaks of quartz pebbles. Below this are 100 or more feet of thin-bedded sandstones and sandy shales, and at the base of the formation from 50 to 80 feet of rather coarse sandstones. These subdivisions of the formation are variable in thickness and character, and the constructive process of sedimentation was more or less abundant in this region than they are in the southern Appalachian Mountains there is a somewhat regular increase in the depth of the sea bottom, they must originally have been in a state of considerable development. These are confined chiefly to the Chihuahuan and Little Rock formations.

The Appalachian Mountains consist of two very distinct types of structure occurring in the Appalachian region. The Appalachian region is a high-angled flat lying to the southwest, the rocks are but little tilted from their original horizontal position and are almost entirely unaltered. Rocks containing the most fold-thrusts were more or less altered, and those with most faults were most completely altered. The Appalachian Mountains there is a somewhat regular increase in the depth of the sea bottom, they must originally have been in a state of considerable development.
Northwest of the Coosa Valley the structural features are similar to those found in the greater part of the Rome Valley belt. The beds, originally horizontal, have been compressed by a force acting approximately parallel to the surface of the earth, and a series of folds has been formed. These folds have a characteristic unimodal form, the rocks dipping very gently to the eastward, and the whole structure is continuously folded along the underlying and overlying rocks. As the fault enters the northeastern corner of the quadrangle, there is somewhat strong, the line of first appearance is the contact of the Appalachian fault. In the manner in which it dips, the plane of the northern fault, and the overlying Cambrian rocks appear to conform to the underlying Cambrian rocks. In this area, the overlying rocks are much less disturbed, forming merely a surface. The Cambrian rocks on the other hand, are intensely contorted. Between this zone of reactivation and the underlying rocks, being brought into sharp folds and intersected by many cracks, which are generally filled with carbonaceous shale. These shales, being unsupported by rigid beds, have a steep dip, generally to the southeast. The main structural feature of the southern portion of the block is a broad, gently undulating syncline stretching southward, which is parallel to the axes of the folds. It will be observed on the Historical Geology map that the contact between the Cambrian rocks and the overlying Rocks is somewhat more complex than in the northern portions of the quadrangle. It is at once manifest that this fault differs much from other faults of a distinct type from the compression which the region has suffered. Evidence afforded by the character of the sedimentary formations on the western side of the point that this belt was at various periods during Paleozoic times an axis of uplift. Where this is in the case of the bedding plane is of the Rockwood formation. It is associated with the Rockwood formation. It is a bedded de=...
Limestone in the southeastern portion of the quadrangle is more or less completely surrounded by an overlying clastic formation. This can be seen in the vicinity of Hamlet, Long, Fish, and Cedartown. It consists largely of gravel ore and is extensively mined in the vicinity of Hamlet, Long, Fish, and Cedartown. The ore contains a small percentage of iron, and as its soluble constituents were removed the iron was concentrated with other insoluble constituents into beds of limonite upon the surface of the limestone. The deposits of the last two classes are generally closely associated and can not be distinguished in their present occurrence and in their mode of formation.

LIME.

Limestone suitable for making lime occurs in many places in the quadrangle. The best stone for this purpose is in the Chickamauga and Conasauga formations. The former is extensively quarried at the southern boundary of the quadrangle, and the latter at Rome. Numerous beds of pure blue limestone occur in the belt of Conasauga shale which extends diagonally across the quadrangle. This is quarried in many places and burned for local use.

SOILS.

**Derivation and distribution.**—Throughout the region there is a very close relationship between the character of the soils and that of the underlying geologic formations. Except in a few localities the larger streams and on the higher ridges, the soils are derived directly from the weathering and disintegration of the rocks on which they stand. Surface waters more or less rapidly, the rapidity depending on the nature of the surface wash which holds the soil to its parent rock. Silicious loam is essentially, and rocks in which it is present, such as limestone, are generally blue clay, and as such soils are generally productive and poorly suited to an agricultural use. Calcareous, on the other hand, is readily dissolved by water containing carbonic acid and the latter is held together in the rock by carbonates, carbonic acid, and aluminum hydroxide. The latter upon contact with the limestone near the surface is converted into kaolin, and other constituents, including iron, is converted into soil in a similar manner by the weathering of the underlying Weisner quartzite; clay soils, derived from the Floyd and Conasauga formations, are generally grayish, and the Fort Payne and Arumcke cracks; shady soils, derived from the Floyd and Conasauga formations; alluvial soils, derived from the streams on their flood plains.

The most extensive slate deposits in the United States are found in the vicinity of Hamlet, Long, Fish, and Cedartown. The ore contains a small percentage of iron, and as its soluble constituents were removed the iron was concentrated with other insoluble constituents into beds of limonite upon the surface of the limestone. The deposits of the last two classes are generally closely associated and can not be distinguished in their present occurrence and in their mode of formation.}

**Soil and drainage.**—The character of the soils derived from the various geologic formations being known, their distribution can be approximately determined from the Historical Geology sheet, which serves also as a soil map. The only considerable variations in the character of the soils are found in the area of the southern boundary of the quadrangle, where the soils are derived from the Floyd and Conasauga formations; alluvial soils, derived from the streams on their flood plains.

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