



# The Geography of Tennessee

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## THE GEOGRAPHY OF TENNESSEE

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TENNESSEE is the child of North Carolina and Virginia. Her northern and southern boundaries are inherited lines from colonial land grants given by Charles II. The rugged Unaka Mountains, the western range of the Blue Ridge, are the barrier on the crest of which is the eastern boundary; the western limit of the state is determined by the Mississippi River. This stream was a route offering easy access to the early explorers, among whom were DeSoto in 1541 and LaSalle in 1682. The Unaka Mountains were such a difficult barrier that the early settlers in the state felt so isolated from their homes in North Carolina and Virginia, that they formed the state of Franklin and, for the purpose of protecting their trade upon the Mississippi, even considered casting in their lot with a foreign country. In consequence of these early ambitions, Tennessee was admitted as a state in 1796 with its capital located at Knoxville. The early settlement of the state was due to its rivers, which were a means of easy transportation reaching back to the gaps in the mountains; also the early quieting of Indian claims had a considerable share in rendering the land safe to the pioneer. Tennessee was the route across which moved a great stream of settlers for other states, and in this manner became a "mother of states." It has been the home of three Presidents: Jackson, Polk, and Johnson. Many southern statesmen claim Tennessee as their native state, and in the Civil War it was a battlefield second in importance only to Virginia.

The state includes a portion of nearly all the great physiographic regions east of the Mississippi River. The hard crystalline rocks along its eastern border form the highest mountains of the Appalachians; the folded limestones and shales have been deeply eroded to form the Great Valley; the horizontal sandstones constitute the Cumberland Plateau, west of which is the Central Basin and the western valley of the Tennessee River; and the extreme western portion of the state is a low plateau, the bluff of which overlooks the alluvial plain of the Mississippi.

These eight distinct physical regions of Tennessee have influenced or controlled the occupations and industries of the state to such an extent that it seems best to describe them more in detail.

### 1. *The Unaka Mountains*

These granite mountains are the most massive of the Appalachian Highland and in their parallel ranges on the eastern border of the state are the high, well-rounded domes of Mt. Mitchell and Mt. Guyot. These mountains are the base upon which was deposited the series of sedimentary rocks from which

the features of other portions of the state have been eroded. The long continued erosion has entirely removed the former covering of sedimentary rocks, and now the granite core forms the well weathered slopes of the Unakas. These smooth, waste-covered slopes are heavily forested nearly to the grassy "bald" at their summit. Where the tributaries of the Tennessee cross these mountains occur deep, rugged valleys occupied by railroad lines and highways.

## 2. *The Valley of East Tennessee*

This portion of the Great Valley was eroded from layers of sedimentary rocks which have been greatly folded and faulted. This long valley is about sixty miles wide from the Cumberland Gap to the edge of the Unakas, while farther south in the vicinity of Chattanooga it is less than forty miles in width. The western edge of this great valley is determined by the almost continuous escarpment of the Cumberland Plateau, Walden Ridge, which stands about 1000 feet above the general level of the valley floor. On the floor of this valley are low longitudinal ridges which are the most continuous and the highest in its western half, while in the eastern portion the ridges are much smaller and less continuous. These ridges determine in a very striking manner the course of the minor streams and the lines of traffic. The Tennessee, flowing southwest, is the master stream; the southern half of its course is at the foot of Walden Ridge which position it has attained by cutting across the longitudinal ridges from Knoxville to Kingston. The Clinch, Holstein, and French Broad are its tributaries from the northeast, while the Hiwassee is a transverse branch from the southeast. The latter stream has many creeks, joining it at right angles from the valleys or "coves" between the main ridges. Near Chattanooga the Tennessee River turns sharply upon its course in the famous "Moccasin Bend" and passes into the deep, steep-sided gorge which it has cut into the Cumberland Plateau. It has been suggested that this course of the Tennessee is the deeply intrenched course of the ancient river.

## 3. *The Cumberland Plateau*

This region, often incorrectly called the Cumberland Mountains, is a smooth tableland except along its ragged western edge and the steep, irregular face overlooking the Great Valley. The bed rock is a horizontal sandstone which bears the coal measures of the state. The land is wooded with scrub oak and the lean soil derived from the underlying sandstone is ill adapted to agriculture.

## 4. *The Highlands and the Basin of Middle Tennessee*

The central portion of the state is a saucer-like depression, the deep portion of which is the Central Basin while the broad rim is the Highland Region or Rim. The Central Basin is 300 to 400 feet lower than the Rim, and its surface is gently rolling with here and there a small unconsumed rocky hill. The Basin has outlets cut in its rim by the Duck, Elk, and Cumberland rivers. The rich soil has been weathered from the underlying blue limestone, and it is the richest agricultural region in the state. It is a "Blue Grass" region as

fertile as the more famous one of Kentucky. This "Dimple of Tennessee" supports the largest part of the population of the state. Nashville, which is situated on the southern-most bend of the Cumberland river, is in a low part of the Central Basin. The Rim of Highlands consists of barrens along the edge of the Basin. Back from the edge is a belt of fertile red soil, while throughout the Highlands limestone sinks are widely distributed, and caves frequently occur.

#### 5. *The Western Valley of the Tennessee*

The Tennessee in its northern course across the state has entrenched itself in a deep and narrow valley, less than ten miles wide and nearly 500 feet below the general surface. Excellent soils occur in the narrow bottom lands, and the stream is a highway for river traffic.

#### 6. *Uplands of Western Tennessee*

The lands slope gradually from the valley of the Tennessee to the bottom-lands of the Mississippi. The "Bluff" edge of these uplands overlooks the broad flood plain of the Mississippi, and where the river reaches the base of the bluff, there is a natural site for a landing place and a trading city. The light sandy soils are formed from the soft Cretaceous and Tertiary bed rock. The bluff loess is a broad belt 20 to 30 miles wide in the western half of this region, and undoubtedly owes its origin to the fine alluvium carried by the wind from the bottom lands to the bluff.

#### 7. *The Mississippi Bottom Lands*

Along the western border of the state are the low swampy bottom-lands of the Mississippi flood plain, which are not over 215 feet above the Gulf of Mexico. It is the smallest of the natural provinces of the state, and it has its greatest width in the Reelfoot Lake district at the northwestern corner of the state. This latter region is of considerable interest as it was not in existence before the earthquake of 1811-12. This disturbance dammed up the old course of Reelfoot River forming a lake 18 miles long and three miles wide.

### CLIMATE, SOIL AND AGRICULTURE

*Climate.*—The climate within the state is considerably modified by the range in elevation from 200 feet above sea in the Western bottom-lands to 5,000 feet in places in the Unaka Range. The average annual temperature for places in the latter range is 45 degrees and for the bottom-lands 61 degrees. The length of the growing season, or the season between killing frosts, is of the greatest importance where agriculture is the chief occupation. The growing season ranges from 180 days to 200 days. In some sections of the state a wheat and corn crop may be taken from the same soil each season. The total precipitation is nearly 50 inches, and the months of the growing season receive the most rain, while fall droughts are common. In 1913 Nashville had 261 days with no measurable fall of rain. Snowfalls are light and remain only a few days. Low temperatures are rare and of short duration; in conse-

quence, pastures are green throughout the year, and stock does not require much shelter. High temperatures are common in summer, and the periods of excessive heat frequently prevail for two weeks. At Nashville in 1914, there were five days when the temperature was 100 degrees or over.

*Soil.*—The soils of Tennessee are largely residual and are closely related to the geological formations of each section of the state. The Appalachian Mountains on the eastern border are covered with gentle slopes of waste formed from the long weathering of the granites and metamorphic rocks. The rich and fertile soils derived from limestone and shale cover the largest area of the state, being confined to the Great Valley, the Highland Rim, and the Central Basin. The sandstone of the Cumberland Plateau forms the poorest soils and, in consequence, the farm values in Cumberland, Morgan, and Fentress counties are low, ranging from four to seven dollars an acre. The loessial soils in the western portion of the state are easily worked and especially adapted to cotton. The rich bottom-land along the Mississippi River where it has been well drained is highly productive. About one-half of the state is improved farmland, and in this respect Tennessee ranks first in the southern states.

*Crops.*—Corn, cotton, wheat, tobacco, and hay are the five important staple crops of the state. Tennessee is an ideal corn country, especially the shale and limestone soils of the Central Basin and the Great Valley. The largest production is in the counties of Maury, Giles, Rutherford, and Gibson. The corn patch is an essential part of every farm, and it enters largely into the people's food. This is the home of johnny cake, corn dodger, hoe cake, and other forms of corn bread. Cotton is the second crop in value and its production is confined largely to the southwestern part of the state, especially Shelby and Fayette counties. The acreage devoted to cotton has not increased as rapidly as that of some other crops for there has been an active and state-wide campaign to discourage the one crop system, and this has resulted in mixed farming. Wheat ranks third in value as a state crop, and the Central Basin is the chief region for its production. The hay and forage crops are fourth in the agricultural products of the state. Timothy and red top are important as fodder, while blue grass is the chief pasture in the Central Basin and the Great Valley. Clover, soy beans, cowpeas, and alfalfa are being increasingly used on lands worn-out under one-cropping. Tobacco is among the five great crops of the state, and in the annual value of this crop, Tennessee ranks fifth in the country. The dark tobacco is raised most extensively in Montgomery, Robertson, and Weakly counties. This district belongs to the black tobacco region of Kentucky, and much of the product is shipped through London and Liverpool to be consumed in Belgium, Italy, and some of the western Asiatic countries.

Outside of the staple crops, Tennessee has some special agricultural products worthy of mention. The peanut belt is in the western valley, and sweet potatoes are widely grown throughout the entire state. In the growing and

marketing of strawberries for the northern markets, the state ranks first in the South. It is one of the leading states in egg production and turkey raising. It ranks second in the growing of sorghum cane for the home manufacture of "long sweetening."

The state possesses excellent climatic advantages for stock raising in the long out-door grazing season and the mild winter. The corn crop is turned into pork, and the hog ranks fourth among the domestic animals. The horse is the most important of the farm animals for work and for breeding. On the famous stock farms, such as the "Belle Meade" near Nashville, have been bred some of the fastest running and harness horses in the world. In the breeding of the finer types of mules Tennessee excels, and a large number of these useful draft animals are exported to European countries.

The per capita farm wealth is \$380, as compared with \$1380 for Wisconsin and \$2695 for Illinois. This is due in part to the Civil War which completely disorganized all lines of business, and still more to the influence of the one crop, farm tenancy, and supply merchant system. It is stated by careful investigators that "the production of food stuffs in Tennessee (\$65 per capita) does not provide enough bread and meat for its people." Only about one-third of the counties are self-supporting in their production of food stuffs. It is further stated that "the state spends 39 millions of dollars for hog and hominy which is imported from other states and could be raised at home." The per capita wealth of Tennessee's farm population by counties ranges from \$97 in Polk County to \$703 in Williamson. The rough lands of Polk County are unsuited to agriculture and most of its people are engaged in copper mining. In Williamson, the soils are rich; there are nearby markets in Nashville easily reached by good "pikes"; its farmers practice the many crop, live-stock ownership system.

#### MINERAL RESOURCES

Tennessee has a wide range in its mineral resources for its rock formations extend from the oldest granites to the latest river formations. Its 200 soft coal mines are chiefly in the Cumberland Plateau, in the counties of Campbell and Claiborne, and yield annually about seven million tons. The three iron ore fields are closely associated with the coal deposits and yield each year about three-quarters of a million tons of ore which is consumed in the 24 iron furnaces of the state. The rich phosphate beds are widely distributed in Middle Tennessee, from which nearly half a million tons are annually mined, giving the state second rank in this product. Columbia is the chief center for the preparation of the phosphate fertilizer for market. The hard crystalline rocks of Polk County have rich deposits of copper which are mined chiefly in the vicinity of Ducktown; this is the second largest copper producing center east of the Mississippi. Fine kaolin occurs near Sparta, high grade china and pottery clays are mined in Fayette, Henry, and Carrol counties. Large amounts of the high grade clays are shipped to East Liverpool, Ohio, for chinaware. The shales of the coal measures are being used to some extent for brick, sewer pipe,

and paving blocks. The quarries of Knox County yield the famous Tennessee marble which is widely used for interior decorating and finishing. The Parian white, black, blue, brown, and pink are some of the shades of these marbles quarried near Knoxville.

#### FORESTS

The forests of Tennessee are rich in the hardwoods and their distribution is closely related to the soils of the different regions. In the Central Basin, where the soil is largely a decomposed limestone, rich in plant food, the natural forests were black walnut, hickory, beech, tulip, and hackberry. The lean soil of the Cumberland Plateau produces a scrub oak which is the source of much of the present oak lumber, some pine, and some hemlock. On the rich western bottom lands are the cottonwood, the bald cypress, and the live oak. Oak, maple, walnut, and hickory are the chief forest growth on the flanks of the Unaka and in the Great Valley. Tennessee is the leading state in the production of hickory, oak, and yellow poplar. The forests have been very rapidly removed since the Civil War and in many places great injury has been done to the soil.

#### WATER POWER

The state of Tennessee possesses a valuable resource in its waterpower and hydraulic engineers estimate that only one-tenth of the available power is developed. The greater development of the waterpower began in 1912 when long distance transmission lines were completed and hydro-electric machinery installed. During the above year seven turbines with 29,000 horse power were installed. In 1913 fourteen more were added with a total capacity of 63,000 horse power which makes the total development of the state close to 190,000 horse power. At Hale's Bar on the Tennessee River, four more turbines are soon to be installed, and during 1914 construction was commenced on a plant of 80,000 horse-power on the Little Tennessee River. The developments at Hale's Bar, which is 21 miles from Chattanooga, comprise a dam 40 feet high, and 2500 feet long and a large lock chamber to provide for the navigation of the river. The Ocoee River plants near Parksville, some 48 miles from Chattanooga, combined with the above plant provide abundant power for industrial purposes in Chattanooga and the surrounding region. It is estimated by the Tennessee Geological Survey that "probably more waterpower is within fifty miles of Chattanooga than Niagara Falls." Transmission lines already extend from Hale's Bar and Parksville to Cleveland and Knoxville. Other lines are surveyed and under construction to Nashville, Bristol, Johnson City, Greenville, and Elizabethton.

#### MANUFACTURES

The natural resources of iron, coal, clay, and limestone are located so as to give some advantages in the industries whose raw materials are the minerals. The hardwood forests are widely distributed and they are utilized for the hardwood lumber that enters into the furniture, vehicle, interior finishing,

and veneer woods. Transportation by the Cumberland, the Tennessee, and the Mississippi reaches all parts of the state while the railroad lines comprise several important trunk lines. The output of manufactured products reflects fairly well the natural resources with the exception of the printing business. In printing Tennessee is the leading southern state east of the Mississippi and owes its advantages in this line to the energy and ability of the founders. In total value of manufactured products, the state ranks twenty-sixth and among the southern states its products ranked sixth in value in 1904.

#### POPULATION AND CITIES

The state is seventeenth in population, this in numbers is about the same as the city of Chicago. In 1840-50 the state held fifth rank in population for it received and held a large portion of the western immigration. Some of its counties are laid out in circular form, especially White, Warren, and Overton. This peculiar outline was determined by early grants which included all the land within a given distance of some point. Shelby county has the largest area which is nearly eight times as large as that of the smallest one, Trousdale. The average density of population is 52 persons per square mile, and the region of greatest density is Davidson, Shelby, and Hamilton counties which include the largest cities of the state.

The composition of the population is quite remarkable in almost a complete absence of the foreign element. The negro forms about one-quarter of the total population, and of the colored people about one-fourth are mulatto. The latter, according to the thirteenth census, are increasing which adds complexity to the southern social problem. The negro forms a small part of population in the Cumberland Plateau counties, especially the more remote and inaccessible ones. Pickett county in the northern Cumberland region has only eleven negroes and no foreign-born element. Its people are the typical southern highlanders among whom survive an eighteenth century English, the spinning wheel, the bee "gum" and a religious belief unsullied by modern interpretations. These surviving customs are due almost entirely to the geographical control exercised by the inaccessible surface features, and the lack of minerals and of suitable and sufficient land for cultivation. The negro constitutes seventy-five per cent of the population in Fayette County, for its fertile soils produce the major part of the state's cotton, and the negro is the chief laborer in the cotton fields.

Tennessee is largely an agricultural state for close to eighty per cent of its people are on the farm and in small villages. The modern movement of people to the large cities is indicated by the thirty per cent increase in its urban population since 1900, while the same period shows that the rural population has increased only three per cent. Four cities of the state, each with a population of more than 35,000 people, have developed at points possessing marked advantages in manufacturing and transportation.

*Memphis* possesses commercial advantages in both river and rail transportation. It is sometimes called the "Bluff City" from its location on the bluffs



overlooking the flood plains of the Mississippi. The advantage of its site for a trading center was recognized by the French as early as 1732, when Fort Assumption was built here, and became one of the strongholds in the French line of forts across the country. The interests of the city before the Civil War were largely commercial, but in the modern industrial development it has grown into the first manufacturing center of the state and the leading city in population. Its rapid expansion has resulted largely from the advantageous position it affords railroads in crossing the Mississippi River, and, in consequence, a number of trunk lines are centered here. A large portion of the cotton crop of the Black Belt of Mississippi, Alabama, and Arkansas is brought to Memphis by railroad for shipment via the Mississippi River to New Orleans. The by-products of cotton raising, the seeds, follow the crop to Memphis where there has developed an extensive cotton seed oil industry. Flour mills, lumber and timber, tobacco and food preparations are among the chief industries of the city whose geographical advantages will undoubtedly bring it a greater growth as the commerce of the Mississippi develops.

*Nashville* was founded as early as 1714 by Clarebville, a French trader, near a salt "lick" or spring that was much frequented by Indians who came to obtain salt. Around this French trading post, about 60 years after its establishment, and under the leadership of Robertson, the town of Nashborough, later changed to Nashville, grew rapidly. It is situated on the broadest flat at the southernmost bend of the Cumberland River. It was early the focus of Indian trails, and of the blazed trails and roads of early settlers, just as it is today a railroad center. The main portion of the city lies in this small basin on the river, and as it has expanded, portions now occupy large tracts on the surrounding heights. In the center of the flat is a prominent rock hill upon which stands the state capitol building; this is conspicuous throughout the city. Along a now abandoned course of the Cumberland River, the railroads have ample freight yards and a Union Depot in the heart of the city. The chief industries are flour milling, lumber and timber, printing, furniture and the preparation of fertilizers. The lumbering products are largely of the hardwoods which are obtained from the Cumberland Plateau.

*Chattanooga* in the Great Valley may be said to belong to three states, Tennessee, Georgia, and Alabama, for it stands near their junction. Its advantageous site on the Moccasin Bend of the Tennessee River was a camping ground for the Indians, later a trading post, a critical point in the Civil War, and at present it has large industrial interests. The site of the city was originally known as the "Landing" where voyagers would embark for up-river points and those going down stream would disembark to avoid the rapids below the city. Chattanooga, "the Gate City," is located in the southern end of the Great Valley, and near where it opens out to the wide coastal plains along the Gulf of Mexico. The floor of the Great Valley at this place is only 40 miles in width, and on it the Tennessee River is swinging in broad meanders, making a complete turn on its course and leaving the valley by a deep cut gorge

in the Cumberland Plateau. Missionary Ridge, one of the high longitudinal ridges in the valley, is parallel to the Tennessee River and passes a short distance to the east of the city. Its position makes it a vital part of the military key of this region, and caused it to be one of the most fiercely contested battle grounds of the Civil War. Lookout Mountain at the southern edge of the city rises 1500 feet above the river, and from its summit, which is reached by an incline railroad, a wonderful panoramic view of the Great Valley, Walden Ridge and the Unakas is obtained. Chattanooga lies in the heart of the coal regions with iron ore and limestone. Its chief manufacturing interests are concerned with assembling these raw materials and producing foundry and machine shop products. The richness of mineral deposits, their occurrence in such favorable conditions for mining and the minimum of transportation required are factors which will give this region great advantage in the future expansion of its iron ore industry. Chattanooga is near the center of the best hardwood timber of the South. Furniture factories, coffin works, box factories, wagon works, hardwood finish shops, and cooperage plants constitute some of the wood working industries which rank third in the city. Other important lines of industry are flour milling, food products, brewing, and tanning.

*Knoxville* is in the center of the Valley of East Tennessee; it was formerly the capital of the state and its position at the head of the Tennessee River and near the junction of the Holstein and French Broad rivers gave it importance in early river traffic. Its chief industries are the quarrying and preparation of marble for the market. The surrounding land is well adapted to farming and truck gardening. Early vegetables are raised in large quantities for the northern markets.

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#### DIAGRAM-MAP OF WESTERN WAR ZONE

The March issue of the Bulletin of the American Geographical Society contains an article on "Geographic Aspects of the War," by Professor D. W. Johnson, illustrated by a block diagram of the western war zone. The topographic peculiarities of the Vosges and Ardennes Mountains, the plateau of western Germany cut by the gorges of the Rhine, Meuse and Moselle rivers, the cuesta escarpments of north-eastern France, and the principal valleys which have affected the campaign, are clearly represented. With the aid of this bird's-eye view of the entire western theatre of war one can readily trace the positions of the contending armies, and note many striking examples of the influence of landforms upon detailed movements of armies and general plans of campaign. Enlarged copies of the drawing, size about 29x17 inches, can be secured at a cost of fifty cents each by writing to the Columbia University Bookstore, New York City.