ridges, giving the whole tract a deeply channelled character, the ridges consisting of sandstone and dolomite and the valleys of friable schists. These all trend in the prevalent direction of the Appalachian upheaval, from north-east to south-west. The rivers take the same directions, except when they break through transverse fissures in the ridges, or work round their terminations where they give way to the outcropping of other rocks ; in these cases the current runs at right angles to their prevalent direction. All these formations belong to the Silurian period, the oldest cropping out to the eastward, the later members appearing to the westward. In some spots the Subcarboniferous rocks which once covered the entire valley have escaped the erosive action which swept the rest away. The whole district is a valley of denudation which has been excavated by the Tennessee and its tributaries,—some breaking through the Unaka barrier, and others descending from Virginia along the longitudinal valleys above described.

1. Rising in a steep elevation at from 800 to 1200 feet above the average level of the eastern valley of the Ten­nessee is the plateau popularly called the Cumberland Mountain. This mass, superincumbent on the Silurian system, consists of four very distinctly marked formations, —(i.) the Devonian black shale, (ii.) the Subcarboniferous silicious beds, (iii.) the Mountain Limestone, (iv.) the Coal- measures. These can easily be distinguished one above another on the face of the eastern escarpment ; but on the western side the first two extend in a wide plain far beyond the base of the plateau, constituting the fourth district. The Mountain Limestone is shaly at the bottom, and more solid at the top, where it abounds in silicious concretions. The Coal-measures consist of thick slabs of sandstone and conglomerate with the seams of coal interstratified between them. In its southern portion the plateau is divided longi­tudinally by the narrow valley of the Sequatchie river, which cuts deep into the subjacent Silurian beds. The portion east of this valley, known as Walden’s Ridge, has its strata much disturbed and tilted, conformably with the Silurian rocks below; the western portion, on the con­trary, has all its strata nearly horizontal. This formation, averaging about 40 miles in width, is divided by a stratum of conglomerate 80 feet thick into the upper and lower Coal-measures, the former of which are much the more productive, but cover a less area, large portions of it hav­ing been carried away by denudation. These coal-seams are believed to average an aggregate thickness of 8 feet and to cover an area of 5000 square miles.
2. 5, 6. The Subcarboniferous area, the central basin, and the western valley of the Tennessee can best be con­sidered together. They consist of the Subcarboniferous silicious beds, together with the basins formed by their erosion. On the western face of the Carboniferous belt the Mountain Limestone has been carried away with the harder rocks of the Coal-measures above it, but the under­lying silicious beds have resisted all erosive forces and are spread out over an extended area on both sides of the Mississippi. In Tennessee they form a margin round the central basin and are styled by local geologists the “ high­land rim.” They consist of two strata, a lower one dis­tinguished by the absence of lime and iron, and an upper one which contains both these materials in abundance. Both members consist mainly of a peculiar gravel, formed of silicious concretions embedded in a stiff retentive clay. The upper stratum has in addition considerable horizontal beds of limestone ; it contains abundant fossils of a large coral, *Lithostrotion canadense,* by which it is easily recog­nized, is very fertile, and possesses inexhaustible beds of limonite. The lower stratum is destitute of both fossils and minerals and is of but little account for agriculture. Excavated from this formation is the central valley of

Tennessee (No. 5), surrounded on all sides by an escarp­ment of about 200 feet in depth, by which descent is made from the “ rim ” into the valley. All the members of the Silurian period, except the three lowest, are represented in this valley, which has been formed by the erosive action of the rivers within its borders : its higher strata were carried off northwards by the Cumberland and its tribu­taries, westward by the Duck, and southward by the Elk, the last two being tributaries of the Tennessee. A channel of erosion along the lower portion of the Duck river con­nects this valley with another (No. 6) much narrower—the western valley of the Tennessee—where again the Silurian beds have been reached by the removal of the Subcarbon­iferous formations above them. Again, south of the main basin, the portion drained by the Elk is nearly separated from the rest by a number of detached hills of the Subcar­boniferous formation, marking the watershed which divides the headwaters of the Elk from those of the Duck.

7, 8, 9, 10. A little west of the Tennessee river the Palæozoic rocks disappear under the Cretaceous formations (No. 7), and these in their turn are covered successively by the Tertiary, Quaternary, and recent formations (Nos. 8, 9, and 10). The tract of ground covered by these four formations constitutes the Mississippi slope of western Tennessee, all of whose rivers run westward and discharge into the Mississippi. The dip of the strata is very slight, and the surface inclines with a very gentle slope.

In general terms, the territory embraced in Tennessee may be described as a great mountain chain on the east, from the foot of which extends a gently inclined plane, interrupted by an elevation, the Cumberland or Carboni­ferous plateau, and a depression, the central valley.

*Rivers.—*The Cumberland and the Tennessee are the principal channels of inland navigation, while the Mississippi, washing the whole western frontier of the State, is its outlet to the Gulf of Mexico. The headwaters and embouchure of the Cumberland are in Kentucky, but much the greater part of its navigable stream is in Tennessee. From its confluence with the Ohio, at Smithland, Kentucky, to Nashville, a distance of 200 miles, it is generally navigable for eight months in the year, and during high water it is sometimes accessible to light-draft steamboats more than 300 miles further. The Tennessee rises in Virginia, crosses east Tennes­see in a south-western direction, and enters Alabama a little above Bridgeport ; in that State it assumes successively a westerly and a northerly direction, and then re-enters Tennessee and crosses the State northwards to its confluence with the Ohio at Paducah, Ken­tucky. Its navigable waters are divided by obstructions into three portions,—(1) from the mouth to Florence, Alabama, 300 miles, where navigation is arrested by the Muscle shoals ; (2) thence through Alabama, about 100 miles, when the river breaks through the Cumberland Mountain ; and (3) from Chattanooga to Kingston, about 100 miles further.

*Agriculture.—*In 1880 the number of farms was 165,650, embrac­ing 8,496,556 acres of improved land, valued at $206,749,837. The principal productions are Indian corn, wheat, oats, cotton, tobacco, potatoes, pea-nuts, and hay, particulars of which for different years are shown in the following table :—

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Product. | 1860. | 1870. | 1880. | 1884. |
| Indian corn | 52,089,926 bush. | 41,343,614 bush. | 62,764,429 bush. | 65,723,000 bush. |
| Wheat .... | 5,459,268 „ | 6,188,916 „ | 7,331,353 „ | 9,320,000 „ |
| Oats | 2,267,814 „ | 4,513,315 „ | 4,722,190 „ | 7,680,000 ,, |
| Cotton .... | 296,464 bales. | 181,842 bales. | 330,621 bales. | 313,807 bales. |
| Tobacco .. | 43,448,097 lb. | 21,465,452 lb. | 29,365,052 ft. | 31,392,000 ft. |
| Potatoes .. | 3,786,677 bush. | 2,330,020 bush. | 3,724,382 bush. | 2,390,000 bush. |
| Hay | 143,499 tons. | 116,582 tons. | 186,698 tons. | 217,316 tons. |

In 1884 1,250,000 bushels of pea-nuts were produced, as against 800,000 in 1883. In recent years considerable attention has been given to the cultivation of fruit and vegetables.

The live stock statistics in different years are shown in the table which follows next :—

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year. | Horses. | Cattle. | Sheep. | Pigs. | Mules and Asses. |
| 1860  1870  1880  1885 | 290,882  247,254  266,119  288,604 | 764,732  643,696  783,674  801,823 | 773,317  826,783  672,789  603,780 | 2,347,321  l,S28,690  2,160,495  2,122,646 | 126,345  102,983  173,498  187,208 |