An event of still greater importance took place almost immediately after the value of the copper region in question had been fully ascertained. This was the demonstration of the fact that gold existed in large quantities along the western slope of the Sierra Nevada of California, a region which had just come into the possession of the United States. The discovery led to extraordinary excitement throughout the older States, and to an immigration from all parts of the world on an unprecedented scale. The pro­duction of this precious metal rose almost at once to figures far surpassing anything definitely known in history. In five years from the discovery of gold at Coloma on the American river, the yield from the auriferous belt of the Sierra Nevada had risen to an amount estimated at between sixty-five and seventy millions of dollars a year, or five times as much as the total production of this metal throughout the world at the beginning of the century. This rapid development led to a great mining excitement in the eastern States, as a result of which new veins and deposits of various metals were discovered, and many which had been previously worked to a limited extent and then abandoned were again taken up. This ex­citement was at its height in 1852 and 1853, but soon slackened as it began to be shown by the results of actual working that, while “ indications ” of the valuable ores of the metals are very abundant in the Appalachian belt, the localities where these ores occur in sufficient abundance to be profitably worked are comparatively few.

The following details show the development of the mineral re­sources of the country at the middle of the present century. In 1850 the shipments of anthracite amounted to nearly 3,500,000 tons ; those of Cumberland or semi-bituminous coal were about 200,000 tons. The yearly production of pig iron had risen to between 500,000 and 600,000 tons. The annual yield of gold in the Appalachian belt had fallen off to about $500,000 in value, that of California had risen to $36,000,000, and was rapidly approach­ing the epoch of its culmination (1851-1853). No silver was ob­tained in the country, except what was separated from the native gold, that mined in California containing usually from 8 to 10 per cent. of the less valuable metal. The ore of mercury had been dis­covered in California before the epoch of the gold excitement, and at New Almaden, about 100 miles south of San Francisco, was being extensively and successfully worked, the yield of this metal in the year 1850-51 being nearly 2,000,000 lb. At this time the copper mines of Lake Superior were being successfully developed, and nearly 600 tons of metallic copper were produced in 1850. At many points in the Appalachian belt attempts had been made to work mines of copper and lead, but with no considerable success. About the middle of the century extensive works were erected at Newark for the manufacture of the oxide of zinc for paint ; about 1100 tons were produced in 1852. The extent and value of the deposits of zinc ore in the Saucon valley, Pennsylvania, had also just become known in 1850. The lead production of the Missouri mines had for some years been nearly stationary, or had declined slightly from its former importance ; while that of the upper Mississippi region had, in the years just previous to 1850, risen to from 20,000 to 25,000 tons a year, but was gradually declining, having in 1850 sunk to a little less than 18,000 tons.

*Coal.—*Coal exists in the United States in large quantity in each of its important varieties,—hard coal, or anthracite ; soft or bi­tuminous coal ; and lignite, or brown coal. Semi-bituminous coal, which stands midway between hard and soft coal, is also an article of importance, being especially well adapted for blacksmiths’ use, and also for ocean-going steamers. Geologically, the anthracite, semi-bituminous, and bituminous coals nearly all belong to the same formation, the Carboniferous *par excellence.* All the coal of the Appalachian region and Central Valley is of this geological age, excepting the small field near Richmond, Va., and two in North Carolina, the Deep River and Dan River fields, which are of Mesozoic age. That of Richmond was the first coal-field worked in the United States ; but it is no longer of any importance. The North Carolina Mesozoic areas have never been developed to any extent. All the Cordilleran coal and that at the eastern base of the Rocky Mountains is either Tertiary or belongs to the very uppermost portion of the Cretaceous. Some of it is decidedly lignite, and is so called by the people who use it ; but most of it, although of so recent geological age, is called coal, and, in point of fact, does not differ essentially from Palæozoic coal in external appearance. The area underlain by the Coal-measures in the United States is very large.

The areas of the various coal-fields are, in round numbers, as follows:—Rhode Island, 500 square miles; Appalachian, 59,000; Central (Illinois, Indiana, Kentucky), 47,000 ; Western (Missouri, Iowa, Kansas, Arkansas, Texas), 78,000 ; Michigan, 6700 ; total, 191,200. Of these fields the Appalachian is, and is likely long to remain, by far the most valuable. Those of Rhode Island and Michigan are practically of very little importance. Different portions of the fields are of very different value, as respects quality and quantity of coal, and portions of them do not contain coal-beds of sufficient thickness or of good enough quality to be worked with profit.

The following table (VI.) shows the amount of coal produced in the several States and Territories (not including the local and colliery consumption), and the value at the mines in 1885 :—

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Tons. | Value. |  | Tons. | Value. |
| Pennsylvania— |  | $ |  |  | $ |
| Anthracite.... | 32,265,421 | 72,274,544 | Colorado | 1,210,769 | 3,051,590 |
| Bituminous.. | 23,214,285 | 24,700,000 | Wyoming | 720,828 | 2,421,984 |
| Illinois | 8,742,745 | 11,456,493 | New Mexico | 271,442 | 918,606 |
| Ohio | 6,978,732 | 8,206,988 | Utah | 190,286 | 426,000 |
| Maryland | 2,865,974 | 3,209,891 | California | 63,942 | 214,845 |
| Missouri | 2,750,000 | 3,850,000 | Oregon | 44,643 | 125,000 |
| West Virginia.. | 3,008,091 | 3,369,062 | Washington | 339,510 | 950,615 |
| Indiana | 2,120,535 | 2,731,250 | Texas | 133,928 | 300,000 |
| Iowa | 3,583,737 | 4,819,230 | Arkansas | 133,928 | 225.000 |
| Kentucky | 1,700,000 | 2,094,400 | Montana | 77,179 | 302,540 |
| Tennessee | 892,857 | 1,100,000 | Dakota | 23,214 | 91,000 |
| Virginia | 567,000 | 666,792 | Idaho | 893 | 4,000 |
| Kansas | 1,082,230 | 1,410,438 | Indian Terri­ |  |  |
| Michigan | 45,178 | 75,000 | tory | 446,429 | 750,000 |
| Alabama | 2,225,000 | 2,990,000 |  |  |  |
| Georgia | 133,929 | 180,000 | Totals | 95,832,705 | 152,915,268 |

The amount consumed for local and colliery use would increase the total five or six per cent Including all the coal thus consumed, the figures for the four years ending 1885 stand as follows, the value at the mine being added for each year, except that for 1885 the value of the “commercial coal” only is given:— 1882, 92,219,454 tons, $146,632,581 ; 1883, 102,867,969 tons, $159,494,855 ; 1884, 106,906,295 tons, $143,768,578 ; 1885, 99,069,216 tons, $152,915,268.

The Appalachian coal-field does not occupy any portion of the State of New York, but extends from near its southern boundary south-west into Georgia and Alabama:—Pennsylvania, 12,302 square miles ; Maryland, 550 ; Ohio, 10,000 ; West Virginia, 16,000 ; Virginia, 1000 ; Kentucky, 8983 ; Tennessee, 5100 ; Georgia, 170 ; Alabama, 5530 ; total, 59,635 square miles.

Pennsylvania, to which State the anthracite of the country is practically limited, produces more than half the coal raised in the United States, and about one-eighth of the total yield of the world, the increase during the past five years having been astonishingly rapid. Ohio stands next in importance among the States so situated as to have a portion of this field within their borders,—its yield, however, being only one-eighth of that of Pennsylvania. Mary­land produces about one-third as much as Ohio. The production of the remaining States over which the Appalachian field extends is small as compared with the extent of their areas underlain by coal. In Kentucky and Alabama, however, some progress has been made within the past few years. About three-quarters of the coal mined in the United States is from the Appalachian field. Next in importance to the Appalachian is the Central coal-field, from which Illinois draws its supplies of fuel. The yield of that State is somewhat less than a fifth of that of Pennsylvania, while Indiana produces about one-fifth as much as Illinois. The coal of the Central field is decidedly inferior to that of the Appalachian, since it contains on the average considerably more ash and more water. The quality of the coal of the Western field is somewhat variable, but on the whole inferior to that of the Illinois field. The region over which it is spread is, however, not well supplied with forests ; and hence the amount annually raised is considerable (nearly 4,000,000 tons for Iowa and 2,500,000 for Missouri). The southern extension of this field through Arkansas and Texas has, as yet, been very little explored or developed. The coal-producing areas of the Cordilleran region are all of comparatively small size, and no one of them is capable of furnishing a large supply for any considerable number of years ; but taken together they are of great value, not only for local consumption, but for supplying the Mexican plateau. The Cordilleran coal (some call it lignite) is all newer than the Carboniferous ; and it is not known that there is any coal at all, either in the Rocky Mountains or farther west, in that portion of the geological series which is the palæontological equivalent of the true “Carboniferous.” A large part of the Cordilleran coal has a geological position close upon the line between the Cretaceous and Tertiary. By some palæontologists it is referred to the one, by some to the other. The quality of this newer coal is very variable : in some localities it is quite good, but in general it is decidedly inferior to the average coal of true Carboniferous age ; some portions are distinctly lignitic in character.

While the amount of coal in the United States is large, it is not by any means so much larger than that of England as it has been always inferred to be from the simple consideration of the compara­tive dimensions of the areas over which coal is known to exist in the two countries. In the Central and Western fields the number of beds is small, and they are never of great thickness ; nor is it known how far the total area embraced within the limits usually assigned as that of these fields was really originally underlain continuously by coal-seams, or how much of these seams has been removed by erosion. It is only in regard to the anthracite fields that even an approximate statement of the total remaining avail­able quantity of coal can be made. Mr P. W. Sheafer, a mining