

good financial basis. Birmingham is the biggest iron producer south of Pittsburgh. There are twenty-six iron furnaces within thirty miles of the town, which have a daily output of almost 4,000 tons of pig iron. They employ nearly 4,000 men and pay wages of \$150,000 a month. They claim to make iron cheaper than anywhere else in the world, and one of the furnace companies shipped some of its product not long ago to London and sold it there at a profit.

The south is doing its business on a big, broad scale. There is an enormous amount of money invested, and I visited the furnaces of one company which has a capital stock of \$21,000,000. This is the Tennessee Coal and Iron Company. It has mines scattered throughout Tennessee and Alabama, and I am told that its property is worth as much as some of the small European kingdoms. It has a vast area of coal beds and it is now mining more than 17,000 tons of coal a day. It owns mountains of iron ore and last year it produced more than a half million tons of pig iron and more than three and one-half million tons of coal. I visited its coke ovens at the town of Bessemer, south of Birmingham, and was told that the ovens there, together with the others owned by the company, makes almost 5,000 tons of coke a day, while out of its Alabama iron mines alone are daily taken more than 6,000 tons of ore. This is perhaps the biggest company of the south, but there are other large establishments, and you may look for an enormous industrial development there within the next few years.

The coal and iron of the south are fairly hugging each other. They lie side by side, and when their marriage takes place in the furnaces with the aid of the fleecy bridal veil of limestone, which is also found near by, they can produce industrial children in the shape of iron and steel more cheaply than their kind in any other portion of the world. Next to Alabama the greatest iron mines of the United States are along Lake Superior. The biggest coal beds are in Pennsylvania, more than a thousand miles away. The limestone is also far off and the products have to travel hundreds of miles before they can come together. Chicago makes a vast deal of iron. It gets its ore from Lake Superior and its coal from Pennsylvania. It is the same with Cleveland and Toledo, but the freight rates on the great lakes are so low that we are able to shoe the seven-league boots of our industrial progress with iron. Even at such great distances we have brought the iron and coal together and have made ourselves the greatest iron manufacturers of the world. A little over ten years ago Great Britain produced ten times as much pig iron as we did. We caught up to her in 1890, and we now beat her in the production of both iron and steel. I have only the figures of 1892 before me. In that year and every year since then we have led the world in these respects. In 1892 we made more than one fourth of all the iron and steel in the world, and Germany and Great Britain lagged far behind us on the metallic road. Then the world produced 57,000,000 tons of iron, and our share of this was over 16,000,000 tons. Our pig iron product that year was worth more than all our gold and silver.

There is no doubt that we are to fur-

nish the greater part of the iron for the world in the future. We have bigger ore beds than any other country and our coal fields are practically inexhaustible. There is enough coal in Alabama to do all the manufacturing of the United States for many years to come. I was told at Bessemer that the available coal of Alabama alone if it could be put into a lump would make a solid chunk seventy miles long by sixty miles broad, and ten feet thick. Such a lump would, it is estimated, furnish ten thousand tons of coal a day for more than eleven thousand years, or a million tons a day for 115 years. But Alabama has only a small amount of the great Appalachian coal fields. These fields end somewhere in Alabama. They run from there northward a distance, it is said, of about nine hundred miles, and they are from thirty to one hundred and eighty miles wide. They furnish about two thirds of all our bituminous coal output, and we produce, you know, about one-third of all the coal of the world. In 1894 we mined 170 million tons of coal, while the whole world produced only 570 million tons. The only country which beat us that year was Great Britain. We have thousands of square miles of coal lands outside of the Appalachian fields, and there are great undeveloped coal areas in the west. I was told of a great iron mountain which is to be opened by a railroad from Salt Lake City to Los Angeles during my stay in Utah, and there are large iron deposits in Missouri. Today the leading countries of the world which produce iron are Great Britain, Germany, France, Austria Hungary, Russia, Belgium and Sweden. Spain mines a great deal of iron ore, but she ships the most of it to England. I heard of big undeveloped iron mines in China during my stay there, and there are some good mines in Mexico and Central America. There is one iron region in Cuba and you find small beds scattered throughout the West India Islands. The great bulk of the product of this hemisphere, however, comes from the United States, and as I have said, the indications are that our resources have not yet been touched.

It is said that a good iron business means good times, and that prosperity and the reverse in the United States rise and fall with the prices of steel rails. If this is so, we are on the eve of good times, for the iron industries of the country are picking up. The foundries of Pittsburgh and Cleveland have taken back their men, and the mines of iron and coal are being worked along Lake Superior as well as in the south. A report was published last week, stating that the Carnegie and Rockefeller iron and steel interests have united, and that the new combination has a hundred million dollars capital behind it. Rockefeller owns some of the biggest iron mines of Lake Superior. The Carnegie company have the biggest steel works in the world, and this combination will result in an enormous production of iron and steel at the lowest cost. The Lake Superior iron mines are wonderful. I visited some of them a year or so ago. Many of them are located from twelve to eighteen hundred feet above Lake Superior, and from fifteen to one hundred miles from the water. The iron is worked down to a distance of about fifteen hundred feet below ground. The mining is done with the finest of machinery. Electricity furnishes the light and

compressed air and steam work the pumps, drills and hoists.

These Lake Superior mines show the wonderful advance we have made over the old world in the use of machinery. Many of the European mines are still worked in a very crude manner, and it is not long since the cars underground in the Belgium mines were hauled by women, who crawled along on their hands and knees, being harnessed up like mules. Even now horses are used in some of the European coal and other mines. There are mines where horses are born, live and die underground. They have stables under the earth, and spend their lives hauling minerals. I have a picture showing how horses are let down into such mines. They are sometimes swung up in a net of straps and thus lowered. They are paralyzed with fear during the descent, and it takes them some time to recover after they are in the mine. Such horses are used to haul the cars to the shafts, whence they are raised by machinery. All of our mines, so far as I am able to learn, are worked by steam, and the American miners receive better wages than any others of their kind in the world.

I went up the lakes on one of the steel steamers which are built especially to carry iron ore down to Cleveland. The ship was one of 3,500 tons, and it carried nothing but ore. We traveled almost as fast as you do on the ocean steamers crossing the Atlantic. Arriving at the mines, not far from Duluth, the vessel was loaded within a couple of hours. Everything was done by machinery, and thousands of tons of iron ore were dropped into the steel holds of the ship with the use of hardly an ounce of human muscle. No one who has not been to Lake Superior can appreciate the enormous amount of capital invested in the iron business there. Millions of dollars have been expended on shipping and receiving docks and on railroad terminals. Millions are invested in steel steamships for carrying iron, and the whaleback ships were built to carry iron and wheat. The ore deposits of Michigan lie in the shape of a great wedge leaning against the state of Wisconsin, while those of Minnesota occur in two parallel ranges, along the other side of the lake. More than half of the iron ore of the United States comes from Lake Superior and in 1890 more than 8,000,000 tons of this ore was carried to furnaces which were an average distance of 600 miles away.

It is far different in the south. The furnaces at Bessemer are within a half a mile of the mines from which the iron is taken out. In company with one of the superintendents of the Tennessee coal and Iron company I visited them. We rode up to the mouth of the mine in a carriage, winding our way up a little range of mountains the sides of which were covered with terra cotta stones. I picked up one of these stones and found it exceedingly heavy and was told that it was iron ore. The iron lies right on the surface of the ground. They begin on the vein and work right down into the mountain, taking out nothing but iron. Deposits of this kind extend through the mountains of that region, and it is a wonder that they were not developed long ago. I was told that iron mines were worked there during the late war and that the confederate government got a large part of its coal and iron from