

In every case it will be found that the production of iron depended on the proximity of fuel and ore. The iron trade of Sussex died when the exhaustion of the forests removed the fuel. Staffordshire, Scotland, South Wales, indeed every ancient seat of the iron trade in Great Britain, tell the same story, which is true of Sweden, of Russia, and of every country whence, before we entered on the new phase, we drew supplies. For it is interesting to observe that, in the past, England was an importer rather than an exporter of iron. From Sweden, which in 1780 was the chief producer, and from Russia she brought the metal which her smiths were to fashion into those goods for which she was early to become renowned. But though Sheffield holds and has long held the highest reputation for the excellence of her wares, it is significant that from Spain we derive bilbo as a name for our sword, and from Syria the word damascening to describe the pattern with which it is adorned.

But neither Bilboa nor Damascus bears any part in the history of the iron trade a hundred years ago. We must look to Germany, to France, to Belgium, and to Austria if we would see how the continent of Europe stood at the date we are considering. It will be noted that I do not repeat the names of the two northern countries from which, in earlier days, Great Britain drew her supplies. Sweden and Russia barely count in the developments we are considering. From producing something like one-seventh part of the output of the world in 1830, they have fallen to producing but about one-eighteenth in 1905, though their total outputs have risen from about a quarter of a million tons at the earlier date to over three million tons at the later date.

The great ironmaking districts of Germany which lie in proximity to the Rhine owe their importance to the facilities of transport afforded by the river and by the railways which line its bank.

The works at Essen date from about the time at which my review opens, for the firm of F. Krupp was founded in 1810, but it is not till 1850 that Westphalia begins to play an important part in the history of the trade. By that time, already, it had become possible to transport the ores of the Seig and the Lahn to the coal districts. The discovery of the Bessemer process marks another step in advance. Bessemer compels Westphalia to bring ore from Spain, Gilchrist and Thomas restore to the native ores their importance. The basic process marks a great stride, and in 1879 the astonishing development of the German iron trade begins, the production of basic pig iron rising to 8,039,808 tons out of the German pig iron production of 12,293,825 tons in 1906, whilst the output of Bessemer pig iron was only 491,086 tons. Again, it is the possibility of bringing ore from distant countries to the fuel needed to smelt it that this region owes its present position. It may be permitted to a subject of King Edward to point out that here too a citizen of these islands appears as taking a prominent part, and to recall the fact that one of the chief collieries in Westphalia is called "Hibernia," in honor of the nationality of the man to whom the initiation of the enterprise is due.

With the help of Mr. Brough I am able to append to my address a chronological table of great interest. In it, under the year 1811, will be found the following entry: "Moyeuve was purchased by François de Wendel from the French Government." I may be allowed to pause to welcome as a member of the Institute the great-grandson of that François de Wendel (himself a François), to express our grief at the loss we have sustained by the death of his father, who was a Bessemer

gold medallist, and our satisfaction at enrolling the honored name once more on our lists, which have been adorned by those of his father and his uncle, Robert de Wendel. I restrain myself from telling the story, full of romance, related to me by the second François de Wendel, which is covered by the words in the Appendix: The spoliation by the revolutionary government in 1794, the years of suffering and of preparation under a foreign sky, the painful return and recovery of the family properties in 1803, and the building up of a great family industry—a monument of perseverance continued over four generations and through political changes to which I must do no more than allude.

Among the other great works in France to which I should like to refer are those of Le Creusot, which have a special interest to Englishmen, as they were partly owned at one time—in 1823—by an English company, Manby-Wilson & Company, who purchased an interest in them from a French company. They date from a somewhat earlier period than that with which I am dealing, but it was not till 1836 that they passed into the hands of Messrs. Schneider, by whom they were rapidly developed, till they became the important establishment to which we were welcomed in 1899. We are proud to have counted among our honorary members one of the founders of the Schneider dynasty, to have had his son as member and Bessemer medallist, and now to be honored by the presence of his grandson on our Council. Terre Noire is of about the same date, having been founded in 1819.

In Belgium the great establishments at Seraing call for mention. They interest us in this country since the founder was John Cockerill, a Lancashire man, who settled in Belgium early in the century to join his father in the management of a factory for the construction of spinning and weaving machinery, and in 1817 founded the works now under the management of our colleague on the Council, Mr. Greiner.

Our approaching visit to Vienna would make me wish specially to refer to the part borne by Austria in the wonderful story I am attempting to tell. The Austro-Hungarian Monarchy is also an example of the same process of development. The manufacture of iron dates from the remotest antiquity, but does not begin to attain to important figures till the introduction of improved methods of transport. In 1830 the output is said to have amounted to 80,000 tons. Fifty years ago this quantity had grown to just under a quarter of a million tons, while to-day Austria-Hungary contributes over one and a half million to the world's output.

The American continent presents the matter in yet clearer terms. I am glad that the limits I have laid down for myself do not call for any account of the position of the trade in that vast country before 1776. The selfish and short-sighted policy which marked our legislation as to our colonial trade makes unpleasant reading for us to-day. I may pass to 1810, when the make of iron was under 54,000 tons, which compares with 243,851 tons made in Great Britain. In 1840 this had grown to 286,903 tons against Great Britain's 1,396,400 tons. This slow growth continues, the United States not reaching the 1,000,000 tons, to which Great Britain had attained in 1836, till 1864, nor the second million till 1872. By this time, however, the means of transport were improving with extraordinary rapidity. The production pauses between the second and third million for seven years, the reaction of 1876 sending it below 2 millions (1,868,961 tons), jumps from 2 3-4 millions in 1879 to 3,835,191 tons in 1880, stays for five years between 4 and 5 millions, rushes to 5,683,329 in 1886, and so