

people in industrial or commercial employment, at 17%, compared with Germany's. Here Hungary is not included. Of course, the scale was still very small relative to what was to come – a million tons of coal produced in 1850, for example, compared to 43 million in 1913.

How had this come about? The Monarchy had several of the traditional prerequisites for industrialisation. Its population increased by 40% from the late eighteenth century to 1848, to some 33.7 million. More to the point was the particularly rapid growth in German Bohemia, whose strong traditions of domestic textile industry made it easier to support larger families than on the land, thereby creating a reservoir of labour. The presence of coal and iron in largely German parts of Bohemia and Moravia, as in Syria and Upper Austria, enhanced the highly regional bias in Austrian development, for cultural dominance, proto-industrial traditions and natural resources went together.

Communications also improved greatly in these years. Some two thousand miles of main roads were built and the network of side roads grew two and a half-fold. Large areas of the Hungarian plain between the Danube and the river Tisza were opened to trade, while a canal linked the Danube (now regulated) with the Moldau and thence the Elbe, Bohemia's outlet to the North Sea. Regular steamships began to ply the Adriatic in 1818 and the Danube in 1831. Government was relatively quick to see the importance of railways. Not long after Salomon Rothschild's *Kondbahn* from Vienna to Olmütz (Olomouc) in Moravia had been begun in 1836 official plans provided for an additional three main routes south, south-west and west, to be built by the state if necessary. Austria's engineering tradition, expanded in the Enlightenment, had continued to develop, with the foundation of polytechnics in Prague (1807), Vienna (1815) and Graz (1844). Their teaching staff were not just pedagogues. The Prague mathematician Gerstner planned the first, albeit horse-drawn, railway in Austria, from Linz to Budweis (České Budějovice) on the Moldau, later built by his son (1832), while the Viennese polytechnic professor Riepl brought back experts from a study tour of England to introduce the iron-puddling process to Austria.

This example suggests the crucial role of foreign and particularly English techniques in early industrial development in the Habsburg lands. Count Karl Zinzendorf had praised Manchester as early as 1769. The Lombard Count Contalonieri, returning from England in 1819, ordered from there an engine for a steam-boat on the Po.

gas-making apparatus and information on the Lancastrian schools system. He became involved in the Carbonari movement, was imprisoned in the notorious Spielberg prison in Brno and received a visit from Metternich, intrigued to plumb the workings of the revolutionary mind. Early borrowings often had to be surreptitious: a Brno company in 1805 claimed to have spent 70,000 florins on purloining the secrets of wool-spinning machines from England. As time passed English skills could be transmitted more openly and in person, though they were also often mediated through German agents, particularly Rhinelanders. Between them the British engineers Edward and John Thomas, Thomas Bracegirdle and David Evans, and Joseph Lee helped set up what became the three leading firms in the Bohemian machine-building industry. Englishmen were involved in the pioneering Moravian iron works of Vítkovice, the start of the Danube and the Adriatic steamship companies, the construction of the first bridge over the Danube at Budapest and the supply of gas-lighting to Vienna. It was a time when British prestige was at its height and the Hungarian aristocratic reformer István Széchenyi could write to a native audience, 'Bless a thousand times the ashes of [Adam] Smith and [Arthur] Young and their immortal works which will certainly be known to the reader!'⁷

Economic liberalism pervaded the upper reaches of the administration itself. 'All kinds of compulsion and restriction are the mortal enemies of industry', opined the Hofkammer; 'only where a liberal administration leaves free play for the spirit of enterprise will it raise its mighty head and take bold wing.'⁸ Frequently central government overrode local authorities when these withheld the issuing of factory licences. A perceptible embourgeoisement of industrial enterprise followed, though great nobles could still be preponderant in certain fields like the iron industry and the new, agrarian-orientated sugar beet manufacture. Three-quarters of the sugar beet factories founded in Hungary before 1848 were on noble properties and estates often maintained their own machine workshops and made their own paper.

It was in the textile industry that middle-class entrepreneurs came most clearly to the fore. A trading background was more common than one in banking or handicraft. Thus Moravian carpet factories, when not foreign-owned, were founded by Jewish wool merchants; early Slovene industry was pioneered by Ljubljana wholesalers; Jews again built on their traditional mercantile roles in Hungary, which varied from local hawker and regional factor to the