

manufacturing them at home meant reducing the outflow of gold from the state, thus enhancing its position in the international balance of power. States turned to developing their own manufacturing by setting up and running government-owned factories, subsidizing specific sectors, and purchasing from local manufacturers. Chambers of industry and mercantilists, however, recognized that these efforts were doomed unless local industries could close the technological gap with foreign competitors. And they were not the only ones who believed that acquiring new technologies was the key to national prosperity. No less than the great prophet of liberalism, Adam Smith, argued that every society could clearly see the advantages in acquiring improved machinery from abroad. Intense competition among the European states made for a high degree of receptivity to new technologies and encouraged assimilating them quickly regardless of their origins. The extent of espionage efforts by foreign countries in Britain demonstrates their conviction that technology was the key to England's industrial and political power and that acquiring this protected know-how would allow them to catch up. For all their efforts, only in the second half of the nineteenth century did European nations manage to free themselves from their dependence on English skill.¹⁴

Recognizing the importance of technology to its political and economic power, England intensified its commitment to protecting its industrial secrets. The British government did not orchestrate all these efforts. British industrialists themselves barred strangers from entering their factories. The private voluntary blocking of access by individuals, however, was not as effective as direct governmental involvement. Sometime this policy took a semiprivate form. Successful enticing of papermakers by French agents, for example, propelled the British government to take the Company of White Paper Makers into royal protection and to prohibit recruiting of artisans and exporting of papermaking materials. Such individual interven-

tion aside, legislation held the most promise for denying rivals access to technology. In fact, England criminalized the diffusion of technology in the eighteenth century. All in all ten major laws were passed between 1695 and 1799 against the emigration of artisans and the export of machinery. They covered the metal, clock, glass, pottery, harness, mining, and certain machine-making trades as well as textiles. From 1749 on, enticement of immigrants from Britain and Ireland to the colonies was also pronounced "a criminal act."¹⁵

Paradoxically, the battery of regulations against the export of machinery and migration of skilled workers stimulated rather than suppressed efforts to recruit artisans and get hold of protected machinery. Industrial espionage and technology piracy were common practice for practically every European country with any ambitions to industrialize. The tsarist government heavily sponsored the import of iron technologies by offering great benefits to skilled foreign workers willing to resettle in Russia. This effort was highly successful as German master craftsmen heavily outnumbered Russians in the St. Petersburg ironworkers' craft guild by the mid 1760s. Sweden sent scientists and experienced workers to spy on the English iron and copper industries and provided them with cash to purchase production secrets. The highest echelons of the royal French government orchestrated industrial espionage in England, regardless of the state of Anglo-French relations. Even in 1777, when France was taking special care not to antagonize its rival so as not to be drawn into the War of the American Revolution, foreign secretary Vergennes sent an industrial spy to Boulton's works. The engineer managed to enter the factory and make a few drawings before exposure forced him to flee back across the English Channel. Indeed, the effort to acquire British technology was a constant in French diplomacy for much of the eighteenth century and beyond. The royal policy of pirating English technology and enticing English workers to migrate to France persisted in the revolutionary and Napoleonic periods.¹⁶