



**GUILDS, INNOVATION AND THE
EUROPEAN ECONOMY, 1400-1800**

EDITED BY

S. R. EPSTEIN *and* MAARTEN PRAK

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Guilds, Innovation, and the European Economy, 1400–1800

Since the time of the French Revolution guilds have been condemned as a major obstacle to economic progress in the pre-industrial era. However, this re-examination of the role of guilds in the early modern European economy challenges that view by taking into account new research on innovation, technological change, and entrepreneurship. Leading economic historians argue that industry before the Industrial Revolution was much more innovative than previous studies have allowed for and explore the new products and production techniques that were launched and developed in this period. Much of this innovation was fostered by the craft guilds that formed the backbone of industrial production before the rise of the steam engine. The book traces the manifold ways in which guilds in a variety of industries in Italy, Austria, Germany, Switzerland, France, Belgium, the Netherlands, and Britain helped to create an institutional environment conducive to technological and marketing innovations.

S. R. Epstein (1960–2007) was Professor of Economic History and Head of the Economic History Department at the London School of Economics. His numerous publications include *Freedom and Growth: Markets and States in Europe, 1300–1750* (2000), and, as editor, *Town and Country in Europe, 1300–1800* (2002).

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Guilds, Innovation, and the European Economy, 1400–1800

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In the night of February 3, 2007, S. R. (Larry) Epstein passed away, completely unexpectedly, as the result of injuries to the head sustained in a motorcycle accident almost thirty years before. At the time of his death all the chapters in this book had been completely revised, and Larry was about to start writing a first draft of the introduction. As it was, he left behind only 19 PowerPoint slides, which he presented in another conference on guilds in Utrecht, on October 6, 2006.¹ On that occasion, he stated in so many words that this was indeed the outline of the introduction for this book as he imagined it. Utilising some research notes and photocopies found in Larry's study, as well as my own material, I have put words to the structure outlined in that PowerPoint presentation.

Maarten Prak
Spring 2007

¹ The proceedings of this conference, *The Return of the Guilds*, will be published in the 2008 Supplement of the *International Review of Social History*.

Introduction: Guilds, Innovation, and the European Economy, 1400–1800

*S. R. Epstein and Maarten Prak*¹

Craft guilds, Adam Smith famously suggested in 1776, are ‘a conspiracy against the public’, and the government should ‘do nothing to facilitate such assemblies, much less to render them necessary’.² As in so much other economic thinking, Smith was a trendsetter in this too. Not only were his ideas about guilds shared by some of his late eighteenth-century contemporaries, they seemed to apply almost overnight when French revolutionaries abolished the guilds, first in France (in 1791) and then in much of the rest of continental Europe. For a long time, historians have interpreted the simultaneity of ideas and policies as definitive proof that the guilds had outlived themselves as the gothic remnants of a bygone age and should make way for the modern world of the steam engine and laissez-faire. Guilds, in other words, were seen as part of an economic system that had prevented the European economy from realising its full economic potential. It was, if anything, a demonstration of the validity of this argument, that England was the first European country to lose its guilds – English guilds were supposed to have vanished through some unplanned process starting in the second half of the seventeenth century – and also the first country to industrialise.

The negative view of guilds survived for the best part of two centuries in history textbooks and specialised works.³ A recent survey of the early modern European economy routinely portrays guilds as ‘restrictive’, as instruments of elite rent seeking, and as hotbeds of economic

¹ The authors wish to thank the anonymous reviewers of this book for several helpful suggestions, Rita Astuti, Tine De Moor, Oscar Gelderblom, Ulrich Pfister, and Jan Luiten van Zanden, as well as the participants of the conference ‘The Return of the Guilds’ (Utrecht, October 2006), for their comments on earlier drafts of this introduction, and Patrick Wallis also for linguistic assistance. The usual disclaimer applies.

² A. Smith, *The Wealth of Nations*, Book One, ch. 10, part 2.

³ For a survey concentrating on the German literature, R. Reith, ‘Technische Innovationen im Handwerk der frühen Neuzeit? Traditionen, Probleme und Perspektive der Forschung’, in K. H. Kaufhold and W. Reininghaus (eds.), *Stadt und Handwerk in Mittelalter und Frühe Neuzeit* Städteforschung, vol. A54 (Cologne: Böhlau, 2000), 23–32.

conservatism.⁴ In his wonderful work on the history of clocks and clock making, David Landes observes, without much supporting evidence, that because ‘most guilds defended the interests of their weakest and most timorous members . . . , they were compelled to wage a ceaseless struggle against the forces of change’.⁵ Similarly, Joel Mokyr, in his groundbreaking work on the origins of the knowledge economy, blames guilds, together with tax collectors and foreign invaders, for the industrial decline of Northern Italy, Southern Germany, and the Low Countries.⁶

This generally negative evaluation of the guilds slowly started to change, however, in the 1980s.⁷ Anglo-American historians like Steven Kaplan, Michael Sonenscher, and James Farr produced work that cast doubt on the negative impact of guilds.⁸ Concentrating on French towns, their work set out to demonstrate that guilds were of great significance to urban life during the Old Regime, and not necessarily in a negative sense. They each discovered how, in a variety of ways, guilds had, in the course of time, adapted to new circumstances. Far from being the fossilised

⁴ P. Musgrave, *The Early Modern European Economy* (Houndmills, 1999), 71 (quote), 89, 133; see also D. Landes, *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present* (Cambridge: Cambridge University Press, 1969), 134; H. Kellenbenz, ‘Technology in the Age of the Scientific Revolution’, in C. Cipolla (ed.), *Fontana Economic History of Europe*, vol. 2: *The Sixteenth and Seventeenth Centuries* (s.l.: Fontana/Collins, 1973), 243–5; J. de Vries, *The Economy of Europe in an Age of Crisis, 1600–1750* (Cambridge: Cambridge University Press, 1975), 94, 238; D. Landes, *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor* (New York: Norton, 1999), 174, 242–5.

⁵ D. Landes, *Revolution in Time: Clocks and the Making of the Modern World* (Cambridge, MA: Belknap Press, 1983), 210.

⁶ J. Mokyr, *The Gifts of Athena: Historical Origins of the Knowledge Economy* (Princeton: Princeton University Press, 2002), 31.

⁷ Also J. Ehmer, ‘Traditionelles Denken und neue Fragestellungen zur Geschichte von Handwerk und Zunft’, in F. Lenger (ed.), *Handwerk, Hausindustrie und die historische Schule der Nationalökonomie: Wissenschafts- und gewerbegegeschichtliche Perspektive* (Bielefeld: Verlag für Regionalgeschichte), 19–77.

⁸ Arguably, the first major revisionist publications were R. W. Unger, *Dutch Shipbuilding before 1800* (Assen: Van Gorcum, 1978), and S. L. Kaplan, ‘Réflexions sur la police du monde de travail, 1700–1815’, *Revue historique* 261 (1979), 17–77. See also S. L. Kaplan, ‘Social Classification and Representation in the Corporate World of Eighteenth-century Paris: Turgot’s “Carnival”’, in S. L. Kaplan and C. Koepp (eds.), *Work in France: Representations, Meaning, Organization, and Practice* (Ithaca, NY: Cornell University Press, 1986), 176–228; id., ‘Les corporations, les “faux-ouvriers” et le faubourg Saint-Antoine au XVIIIe siècle’, *Annales ESC* 43 (1988), 453–78; S. L. Kaplan, *La fin des corporations* (Paris: Fayard, 2001); M. Sonenscher, *The Hatters of Eighteenth-century France* (Berkeley: University of California Press, 1987); M. Sonenscher, *Work and Wages: Natural Law, Politics and the Eighteenth-century French Trades* (Cambridge: Cambridge University Press, 1989); J. R. Farr, *Hands of Honor: Artisans and Their World in Dijon, 1550–1650* (Ithaca, NY: Cornell University Press, 1988); J. R. Farr, ‘“On the Shop Floor”: Guilds, Artisans, and the European Market Economy, 1350–1750’, *Journal of Early Modern History* 1 (1997), 24–54; J. R. Farr, *Artisans in Europe, 1300–1914* (Cambridge: Cambridge University Press, 2000).

remains of the Middle Ages, they suggested that guilds were indeed capable of absorbing change in the run-up to the Industrial Revolution. In their work, Kaplan, Sonenscher, and Farr emphasised the social and political dimensions of the corporate world and seemed to suggest that economically guilds were indifferent, rather than a positive or a negative influence. The new keyword for guilds was *flexibility*; guilds were survivors, adapting to changing environments.⁹

This book aims to move beyond the discourse of ‘flexibility’ and seeks to reinstate the economy into the debate about guilds.¹⁰ It raises fundamental questions about the economic impact of craft guilds:¹¹ were they indeed the rent seeking institutions of middle-class producers, as Adam Smith saw them? Did they uniformly obstruct the introduction of innovations? And was their impact on the fate of the late medieval and early modern European economy at best indifferent, or even outright negative? There are some *prima facie* arguments against this thesis. The abolition of the guilds was in most of continental Europe a political

⁹ Farr, ‘On the shop floor’, 25, 54; Farr, *Artisans*, 88, 91; H. Deceulaer, ‘Guilds and Litigation: Conflict Settlement in Antwerp (1585–1796)’, in M. Boone and M. Prak (eds.), *Statuts individuels, statuts corporatifs et statuts judiciaires dans les villes européennes (moyen âge et temps modernes)* (Leuven: Garant, 1996), 207; J. P. Ward, *Metropolitan Communities: Trade Guilds, Identity and Change in Early Modern London* (Stanford: Stanford University Press, 1997), 146; D. Woodward, *Men at Work: Labourers and Building Craftsmen in the Towns of Northern England, 1450–1750* (Cambridge: Cambridge University Press, 1995), 28; see also Sonenscher, *Work*, 364; G. Rosser, ‘Crafts, Guilds, and the Negotiation of Work’, *Past and Present* 154 (1997), 30; or H. Swanson, ‘The Illusion of Economic Structure: Craft Guilds in Late Medieval English Towns’, *Past and Present* 121 (1988), 29–48, who makes the same point without using the word *flexible* as such.

¹⁰ Unger, *Dutch shipbuilding*, was not only unusual because it was an early revisionist work, and not about France, but also because it claimed that guilds were economically beneficial. It contains many observations underscored and amplified by the work presented in this volume.

¹¹ We would like to emphasise from the outset that this book is not about all varieties of guilds, and not even about all professional corporate associations, but about one specific type, the craft, or industrial, guild. The service sector, where other economic forces are at work, is therefore not included in our discussion; cf. S. R. Epstein, ‘Craft Guilds’, in J. Mokyr (ed.), *The Oxford Encyclopedia of Economic History*, vol. 2 (Oxford: Oxford University Press, 2003), 35–9. For the variety of guild types and organisations, see D. Keene, ‘English Urban Guilds, c. 900–1300: The Purposes and Politics of Association’, in I. A. Gadd and P. Wallis (eds.), *Guilds and Association in Europe, 900–1900* (London: Centre for Metropolitan History, 2006), 5–10; G. Rosser, ‘Big Brotherhood: Guilds in Urban Politics in Late Medieval England’, in *ibid.*, 31; see also the discussion in A. Black, *Guild and State: European Political Thought from the Twelfth Century to the Present* (New Brunswick: Transaction, 2003), 4–7, and S. A. Epstein, *Wage Labor and Guilds in Medieval Europe* (Chapel Hill: University of North Carolina Press, 1991), chs. 1 and 2. On merchant guilds: A. Greif, *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade* (Cambridge: Cambridge University Press, 2006), ch. 4, esp. 93 n2.

decision, for which economic motivations were at best of secondary importance.¹² New quantitative research has suggested that economic growth in pre-industrial Europe could in fact coincide with an upsurge in the number of craft guilds.¹³ This book seeks to further explore the possibilities of an alternative interpretation of the guilds' economic history, across a range of European countries and regions, and through a variety of approaches.¹⁴ In the language of Douglass North's institutional economics, it claims that guilds helped reduce transaction costs in at least three distinct, significant stages of the industrial process. First, by creating a stable environment, which encouraged craftsmen to invest in training the successor generation. Second, through the coordination of complicated production processes. And finally, in the marketing stage, through the reduction of information asymmetries between producers and customers. Some of the following chapters pursue these aspects for the guild system as a whole: guild organisations, apprenticeship, subcontracting, labour mobility. Others look at specific branches of craft industry, to investigate in detail the contribution guilds made in the Venetian silk and glass industries, the silk industry of Lyon, the painting industry of Holland, and instrument making in various European countries. Special attention will be paid to the craft guilds of Britain, because the interpretation of their history has been so enormously influential in the debate over the economic role of guilds. The purpose of the rest of this introduction is to provide a general framework for the specialised case studies in this book. It will do so by sketching a number of general features of industrial production before the Industrial Revolution, and subsequently demonstrate how these features were handled by guilds. We will concentrate on their contribution to the growth of human capital (through the training of the skilled workforce), the coordination of production functions, the creation of markets, and on guilds' reactions to innovation. We will also briefly discuss the main alternatives to guild organisation.

¹² G. Bossenga, 'La révolution française et les corporations: Trois exemples lillois', *Annales ESC* 43 (1988), 405–26; H.-G. Haupt (ed.), *Das Ende der Zünfte: Ein europäischer Vergleich* Kritische Studien zur Geschichtswissenschaft vol. 151 (Göttingen: Vandenhoeck & Ruprecht), 2002; Kaplan, *Fin*, 600–01.

¹³ B. De Munck, P. Lourens, and J. Lucassen, 'The Establishment and Distribution of Craft Guilds in the Low Countries, 1000–1800', in M. Prak, C. Lis, J. Lucassen, and H. Soly (eds.), *Craft Guilds in the Early Modern Low Countries: Work, Power, and Representation* (Aldershot: Ashgate, 2006), 64.

¹⁴ Previous collective works on craft guilds that cover substantial parts of Europe include S. R. Epstein, H.-G. Haupt, C. Poni, and H. Soly (eds.), *Guilds, Economy, and Society* (Madrid: Fundación Fomento de la Historia Económica, 1998); Haupt (ed.), *Ende der Zünfte*; P. Massa and A. Moiola (eds.), *Dalla corporazione al mutuo soccorso: Organizzazione e tutela del lavoro tra XVI e XX secolo* (Milan: FrancoAngeli, 2004); Gadd and Wallis (eds.), *Guilds and Association*.

Characteristics of Craft Production

It is now generally accepted that, rather than a complete break with the previous period, the changes of the Industrial Revolution were the outcome of a long process of innovations during the preceding centuries.¹⁵ These innovations were characterised by micro, rather than macro, inventions and hence were incremental, though significant.¹⁶ Most pre-modern industries, in particular those producing traded goods, such as printing (where a macro invention did indeed happen), textile fabrics, glass making, and clock making, as well as shipbuilding and the metal industry, all displayed marked process and product innovations between roughly 1400 and 1800.¹⁷ In view of their specific characteristics, the source of these innovations, and of their transfer and adoption, must have been primarily the organisation of the production process and the training of the (skilled) workforce.¹⁸ Knowledge of how to make things – and make them well – was experience-based, rather than propositional and objectified. Therefore, to understand the process of industrial innovation in pre-industrial Europe, we have to investigate workers' training and the organisation of the various branches of industry, more specifically the institutions that promoted the creation of pools of skills. Given the face-to-face character of the transmission of skills and hence technology, communities of craftsmen were, at least potentially, the sites where technological development, and innovation more generally, were most likely to occur. The institutional framework for the training and clustering of the skilled workforce in 1800 was not fundamentally different from what it had been in, say, 1400: throughout this period guilds were the predominant institution governing early modern Europe's urban industries.

¹⁵ Cf. Jan de Vries, 'The Industrial Revolution and the Industrious Revolution', *Journal of Economic History* 54 (1994), 250–4.

¹⁶ J. Mokyr, *The Lever of Riches: Technological Creativity and Economic Progress* (Oxford: Oxford University Press, 1990), 13; see also S. R. Epstein, 'Property Rights to Technical Knowledge in Premodern Europe, 1300–1800', *American Economic Review* 94 (2004), 382–3. For a more general reorientation of the history of technology along similar lines, see David Edgerton, *The Shock of the Old: Technology and Global History since 1900* (Oxford: Oxford University Press, 2007).

¹⁷ E. Eisenstein, *The Printing Revolution in Early Modern Europe* (Cambridge: Cambridge University Press, 1983); N. B. Harte (ed.), *The New Draperies in the Netherlands and England, 1300–1800* (Oxford: Oxford University Press, 1997); Unger, *Dutch shipbuilding*, chs. 2 and 5; chs. 6–9 in this volume. Arguments have been made for a transition even before the Black Death, as for example in E. M. Carus-Wilson, 'An Industrial Revolution of the Thirteenth Century', *Economic History Review* 1st ser. 11 (1941), 1–20.

¹⁸ As Ian Inkster has underlined, it was the production of 'useful and reliable knowledge' (URK) rather than science that generated technological progress before the 18th century; craftsmen were therefore vital to the promotion of technological innovation: 'Potentially Global: "Useful and Reliable Knowledge" and Material Progress in Europe, 1494–1914', *The International History Review* 28 (2006), 237–86.

Many pre-industrial products made huge demands on the skills of their producers, as anyone will be able to testify who has ever looked inside a watch, tried to paint a realistic human figure, or considered the complicated patterns in many textile fabrics. These demands are in fact not unlike the type of expertise required for work that the readers of this book will perhaps be more familiar with: academic research.¹⁹ From undergraduate to PhD is a trajectory that for most people takes the best part of a decade. Cognitive psychologists have discovered that the time of training required to master complicated skills is in fact remarkably similar across a wide variety of tasks: it takes roughly ten years to become a top-level expert in any kind of skill-based task.²⁰ Obviously, one does not have to go through the whole curriculum to be able to execute certain aspects of a job at a reasonable level. Therefore, the training of skills is usually subdivided into a number of stages. Again the academic curriculum provides a helpful illustration of the point: one can get out with a degree at BA, MA, and PhD levels, and at each point some students will feel they have developed the skills they are looking for, while at the same time it is well understood that there are further levels of expertise they are forsaking.

One reason why it took – and, in fact, still takes – so long for adolescents and young adults to become fully trained, is that crafts (like academic courses) typically combine so-called propositional and tacit types of knowledge.²¹ Propositional knowledge is factual as well as theoretical, logical, and explicit, and can therefore be learned from printed sources. Tacit knowledge, on the other hand, is implicit, non-linear, and addresses ‘how’ rather than ‘why’ questions.²² Because it cannot be articulated – ‘we can know more than we can tell’, as one scholar put it – tacit knowledge needs to be transferred from person to person.²³ This is confirmed by psychological research that demonstrates how this transfer of tacit knowledge happens most effectively in ‘communities of practice’, like craft guilds;

¹⁹ Cognitive psychologists make no distinction between expertise in crafts and in science: see K. A. Ericsson, ‘An Introduction to *Cambridge Handbook of Expertise and Expert Performance*: Its Development, Organization, and Content’, in K. A. Ericsson, N. Charness, P. J. Feltovich, and R. R. Hoffman (eds.), *Cambridge Handbook of Expertise and Expert Performance* (Cambridge: Cambridge University Press, 2006), 3–19.

²⁰ K. A. Ericsson, ‘The Acquisition of Expert Performance: An Introduction to Some of the Issues’, in K. A. Ericsson (ed.), *The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports and Games* (Mahwah, NJ: Lawrence Erlbaum Associates, 1996), 10–11.

²¹ Moky, *Gifts of Athena*, ch. 1; Epstein, ‘Property rights’.

²² Equivalent terms are *explicit* and *implicit knowledge*, or *overt* and *covert knowledge*: A. S. Reber, *Implicit Learning and Knowledge: An Essay on the Cognitive Unconscious* (New York: Norton, 1981), 10, 15.

²³ M. Polanyi, *The Tacit Dimension* (Gloucester: Peter Smith, 1966, orig. 1966), 4.

modern skills training programmes in fact still reflect this.²⁴ Think of the university again: one can learn a lot about the historian's craft from textbooks, but to become good historians, students must *practice* that craft, over and over again, under the supervision of their teachers. These teachers work not as individuals, but collaborate in collectives of experts that usually identify themselves as, say, a History Department. In fact, the ideal of this learning environment, the university college, where teachers and students work and live together, was originally derived from the guild format; accomplished students still obtain a *master's* degree, another reflection of that shared origin with craft guilds.²⁵ Given the huge importance of skills for their economic performance, it comes as no surprise that craftsmen, and hence their organisations, showed a marked preference for labour-intensive over capital-intensive innovations. On numerous occasions, they indeed showed a strong dislike of the latter. Yet it would be wrong to equate this with an aversion to innovation per se, as will be demonstrated by many of the chapters in this book.

Guilds and the Pre-industrial Economy

Apprenticeship

So how exactly did craft guilds help promote innovation? The literature, and indeed the essays in this book, suggests that this could happen in a variety of ways. Probably their single most important contribution to innovation and the pre-industrial economy generally was the guilds' involvement in the training of human capital, as S. R. Epstein argues in the second chapter of this book.²⁶ Despite an extensive literature, it is a topic that still gives rise to a lot of confusion. One major source of this confusion is the length of time necessary to learn a craft. In the literature one can detect a tendency to see training, and hence apprenticeship,

²⁴ A. C. Cianciolo, C. Matthew, R. J. Sternberg, R. K. Wagner, 'Tacit Knowledge, Practical Intelligence, and Expertise', in Ericsson et al. (eds.), *Cambridge Handbook*, 623–4.

²⁵ B. B. Price, 'Paired in Ceremony: Academic Inception and Trade-Guild Reception', *History of Universities* 20 (2005), 1–37. Hilde Symoens helped me to identify this source.

²⁶ Owing to its statutory character, English apprenticeship has been especially well studied: C. Brooks, 'Apprenticeship, Social Mobility and the Middling Sort, 1550–1800', in J. Barry and C. Brooks (eds.), *The Middling Sort of People: Culture, Society and Politics in England, 1550–1800* (Houndmills: MacMillan, 1994) 52–83; I. Krausman Ben-Amos, *Adolescence and Youth in Early Modern England* (New Haven: Yale University Press, 1994), chs. 4–5; J. Lane, *Apprenticeship in England, 1600–1914* (London: UCL Press, 1996); for recent contributions on the rest of Europe, see B. De Munck, S. L. Kaplan, and H. Soly (eds.), *Learning on the Shop Floor: Historical Perspectives on Apprenticeship* (Oxford: Berghahn, 2007). See also W. Smits and T. Stromback, *The Economics of the Apprenticeship System* (Cheltenham: Edward Elgar, 2001).

as one single programme, rather than a series of modules, each providing access to another level of competence and expertise. A subdivision of the training process into separate stages can, for instance, help explain the discrepancies, often observed, between the length of training programmes prescribed in various pre-industrial countries for roughly similar jobs, as well as the fact that many apprentices bailed out of their training programme before completion. Why should it take an apprentice tailor in England seven years to complete his training, in the Dutch Republic three to four years, in the Spanish Netherlands a mere two, but in Paris three to six years?²⁷ On the basis of the foregoing it is easy to see that the most likely answer is that English apprentices who completed the full seven years must have reached a much more advanced level of expertise than their Dutch counterparts after two. But then again, even in the Low Countries the nominal course was seldom seen as sufficient preparation for the independent exercise of a skilled craft. Most Dutch tailors' guilds, for example, formally required two years of experience as a journeyman before admission as a master. The masters of the Amsterdam tailors' guild were on average thirty years old on admission. All this suggests that a complete training took much longer than the number of years specified in the regulations, which must be read as the minimum time to develop a specific and locally defined set of necessary skills.²⁸

The comparison with the university is illuminating in another respect. As in any training programme, a lot of people dropped out on the way. Of almost 2,000 carpenters' apprentices in London between 1540 and 1589, only 40 percent became free of the City, hence entered the corporation. A staggering 15 percent died during their apprenticeship, while the largest number, 45 percent, were recorded as 'gone', that is, disappeared, either into another trade or to set up shop in a non-incorporated community.²⁹ In Bristol the rate of attrition was slightly lower, but there, too, half the apprentices failed to become masters, at least in the local corporations.³⁰ Data for other English towns suggest the same pattern.³¹

²⁷ B. Panhuysen, *Maatwerk: kleermakers, naaisters, oudkleerkopers en de gilden (1500–1800)* (Amsterdam: Stichting beheer IISG, 2000), 140; H. Deceulaer, *Pluriforme patronen en een verschillende snit: Sociaal-economische, institutionele en culturele transformaties in de kledingsector in Antwerpen, Brussel en Gent, 1585–1800* (Amsterdam: Stichting beheer IISG, 2001), 268; S. L. Kaplan, 'L'apprentissage au XVIIIe siècle: Le cas de Paris', *Revue d'histoire moderne et contemporaine* 40 (1993), 450.

²⁸ Panhuysen, *Maatwerk*, 156, 302.

²⁹ Rappaport, *Worlds*, 313 (table 8.7).

³⁰ I. Krausman Ben-Amos, 'Failure to Become Freeman: Urban Apprentices In Early Modern England', *Social History* 16 (1991), 167.

³¹ P. Wallis, 'Apprenticeship, Training, and Guilds in Pre-industrial Europe', paper presented at the XIVth International Economic History Congress, Helsinki 2006.

Still, the numbers involved in apprenticeship were impressive. Rappaport estimates that in sixteenth-century London, roughly 10 percent of the population were apprentices.³²

There is evidence, discussed in Prak's chapter in this book, to suggest that specific craftsmen trained apprentices in specific skills. Some masters were no doubt better teachers, or, more important, perceived as better practitioners, and could therefore also command higher training fees. These varieties in the supply of skill training created problems, discussed in Epstein's chapter, because of the fact that masters could only gradually recoup the costs of their investment of time and effort in the apprentice's training, and would therefore refuse to make that investment unless they could be reassured that the apprentice would serve the whole length of his (or her) contract. Guilds' apprenticeship arrangements were designed to overcome these externalities.

Nonetheless, there were areas where guild regulations seem to have had a negative impact on human capital formation. The most obvious was, no doubt, gender. In general, guild membership was heavily tilted towards males, but this was especially true in craft guilds. Some of them, particularly in Germany, explicitly excluded women from membership, but even where this was not stated in so many words, the male domination of guild membership speaks volumes.³³ Other exclusion mechanisms might also apply, such as those based on origin and religion. Masters' sons would receive preferential treatment. Religious discrimination often worked through local citizenship regulations; citizenship in most towns was a prerequisite for membership of a guild.³⁴ The available evidence suggests, however, that the net effects of discriminatory rules against aliens and religious minorities were limited.³⁵ Direct descendants

³² Rappaport, *Worlds*, 232.

³³ For references to the extensive literature, see C. Crowston, 'Engendering the Guilds: Seamstresses, Tailors, and the Clash of Corporate Identities in Old Regime France', *French Historical Studies* 23 (2000), 342n7; S. Ogilvie, 'How Does Social Capital Affect Women? Guilds and Communities in Early Modern Germany', *American Historical Review* 109 (1994), 325–59; S. Ogilvie, 'Women and Labour Markets in Early Modern Germany', *Jahrbuch für Wirtschaftsgeschichte* 2004/2, 25–60; as well as S. Ogilvie, *A Bitter Living: Women, Markets, and Social Capital in Early Modern Germany* (Oxford: Oxford University Press, 2003).

³⁴ P. Lourens and J. Lucassen, '"Zunftlandschaften" in den Niederlanden und im benachbarten Deutschland', in W. Reininghaus (ed.), *Zunftlandschaften in Deutschland und den Niederlanden im Vergleich* (Münster: Aschendorff, 2000), 11–43; Maarten Prak, 'The Politics of Intolerance: Citizenship and Religion in the Dutch Republic (Seventeenth to Eighteenth Centuries)', in R. Po-Chia Hsia and H. F. K. van Nierop (eds.), *Calvinism and Religious Toleration in the Dutch Golden Age* (Cambridge: Cambridge University Press, 2002), 159–75.

³⁵ The almost universal discrimination of Jews in early modern Europe is an obvious and important qualification of this general observation.

of guild members were usually a minority of total membership; with some well-known exceptions, religious discrimination rarely determined patterns of craft labour migration and, by implication, of apprenticeship.³⁶ This raises questions about the guilds' role in the discrimination against female workers: how could it be so effective – or was it merely reinforcing other, possibly more significant social mechanisms?

Alternatives to guild-based apprenticeship nonetheless did exist, and especially for women they were of vital importance.³⁷ There was first of all the family. Many teenagers must have received their first taste and experience of a craft while watching and helping their parents at home, before entering their apprenticeship with a non-family master. This would explain why, in many guilds, masters' sons could be apprenticed for a shorter period and against reduced rates: they were assumed to have already mastered some of the basic skills at home. At the same time, the fact that only a minority of craftsmen followed in the footsteps of their parents suggests that the family should not be overrated as a source of training.³⁸ Charitable institutions constituted another alternative. In Paris, the Hôpital de la Trinité already provided craft training in the sixteenth century, partly through masters in its own employment and partly by placing orphan boys and girls with ordinary guild masters.³⁹ In Amsterdam, on the other hand, the Civic Orphanage – many of whose charges came from artisan families, a reason for the institution to care deeply about their education – provided for skills training by placing the boys with guild masters. For girls, who were usually not permitted to leave the premises unsupervised, the orphanage provided in-house training in knitting and sewing, but it is not entirely clear if these were aimed at productive or household use.⁴⁰ A third alternative form of education was provided by a range of non-guild professional institutions, the best known of which are probably the artist academies

³⁶ S. Cerutti, *La ville et les métiers: Naissance d'un langage corporatif (Turin, 17e-18e siècles)* (Paris, 1990), 167 (table 10), reproduced in S. Cerutti, 'Group Strategies and Trade Strategies: The Turin Tailors' Guild in the Late Seventeenth and Early Eighteenth Centuries', in S. Woolf (ed.), *Domestic Strategies: Work and Family in France and Italy 1600–1800* (Cambridge: Cambridge University Press, 1991), 113 (table 5.3); Crowston, *Fabricating Women*, 334–5 (figure 7.4); J. M. Montias, *Artists and Artisans in Delft: A Socio-economic Study of the Seventeenth Century* (Princeton, NJ: Princeton University Press, 1982), 150–2 (table 6.3); Panhuysen, *Maatwerk*, 169–70; Rappaport, *Worlds*, 293 (table 8.1); Sonenscher, *Work*, 107–8. Towns with high rates of family continuity include sixteenth-century Ghent: J. Dambruyne, 'Guilds, Social Mobility, and Status in Sixteenth-century Ghent', *International Review of Social History* 43 (1998), 37–54.

³⁷ See esp. C. H. Crowston, 'L'apprentissage hors des corporations: Les formations professionnelles alternatives à Paris sous l'Ancien Régime', *Annales HSS* 60 (2005), 409–41.

³⁸ See note 36.

³⁹ Crowston, 'Apprentissage', 418–27.

⁴⁰ A. E. C. McCants, *Civic Charity in a Golden Age: Orphan Care in Early Modern Amsterdam* (Urbana: University of Illinois Press, 1997), 70–88.

that emerged in many of Europe's large towns in the course of the early modern period.⁴¹ It is unlikely that we will ever know precisely how these alternatives measured up against training within the corporate context. Training by orphanages and similar institutions, as well as academies, seems to have been marginal, in purely quantitative terms, next to the sheer numbers apprenticed by guild masters. It would also be extremely difficult to separate informal family training from formal apprenticeship. However, the relatively low levels of skill premium in Europe, compared to East Asia and India, suggest that the corporate system of professional education must have been generally efficient.⁴²

Specialisation, Division of Labour, Coordination

In the past, historians liked to point to conflicts between guilds over the demarcation of their respective 'spheres of influence' as proof of the inefficiency of the guild system. However, new evidence is emerging relating to the coordination roles played by guilds in complex production processes. In the leather industry in Bologna, for instance, the tanners' and shoemakers' guilds negotiated about the prices and qualities of the hides delivered by the former to the latter, thereby sustaining a delicate equilibrium in the industry.⁴³ As Ulrich Pfister explains, in his first contribution to this volume, guilds were performing several economic functions that were later absorbed by firms, especially contributing to the reduction of information costs incurred by the necessity of multiple measurements and monitoring. Guilds could thus provide institutional advantages in a world of craft production, characterised by numerous small workshops.⁴⁴ This was especially important in proto-industries, where competitive advantages were determined by institutional, rather

⁴¹ A. W. A. Boschloo et al. (eds.), *Academies of Art between Renaissance and Romanticism*, Leids Kunsthistorisch Jaarboek, vol. 5–6 (The Hague: SDU, 1989); B. De Munck, 'Le produit du talent ou la production de talent? La formation des artistes à l'Académie des beaux-arts à Anvers aux XVIIe et XVIIIe siècles', *Paedagogica Historica* 37 (2001), 569–607; see also K. Davids, 'Guilds, Guildsmen, and Technological Innovation in Early Modern Europe: The Case of the Dutch Republic', unpublished paper 2003, available at <http://www.lowcountries.nl/2003-2.pdf>.

⁴² J. L. van Zanden, 'De timmerman, de boekdrukker en het ontstaan van de Europese kenniseconomie: over de prijs en het aanbod van kennis vóór de Industriële Revolutie', *Tijdschrift voor sociale en economische geschiedenis* (2005), 112–13; the (at the time of writing unpublished) English version, 'The Skill Premium and the "great divergence"', is available at <http://www.iisg.nl/hpw/papers/vanzanden.pdf>, see pp. 18–9.

⁴³ C. Poni, 'Local Market Rules and Practices: Three Guilds in the Same Line of Production in Early Modern Bologna', in Woolf (ed.), *Domestic Strategies*, 82.

⁴⁴ C. F. Sabel and J. Zeitlin, 'Stories, Strategies, Structures: Rethinking Historical Alternatives to Mass Production', in C. F. Sabel and J. Zeitlin (eds.), *World of Possibilities: Flexibility and Mass Production in Western Industrialization* (Cambridge: Cambridge University Press, 1997), 20–1.

than technological, innovations, but they must have applied equally in technologically more advanced industries, such as coach making or the production of clocks and watches, where the production of complex parts, usually in a variety of different trades, had to be coordinated to allow the assemblage of the final product. Collective action by the producers in the whole chain of production, mediated by their craft guilds, underscores the importance of industrial organisation in these branches of industry.⁴⁵

Numerous authors have by now pointed out that the world of craft production was much more flexible than guild regulations had suggested. This was often perceived as a weakness of the corporate system: its monopoly claims on the production of specified goods were circumvented by the presumably illegal practices of outsourcing and subcontracting.⁴⁶ Catharina Lis and Hugo Soly, in their contribution, suggest a radically different interpretation of this phenomenon. Subcontracting was not so much the opposite of guild-based production as an integral part of it. It permitted artisan entrepreneurs to expand their operations, while leaving intact the socially and politically desirable structures of 'small commodity production'.⁴⁷ It helped create effective networks of credit supply and overcome the coordination problems of increasingly complex and specialised skills.⁴⁸ And it provided an opportunity for entrepreneurs to transfer production risks to the subcontractees in the network. Such subcontracting networks within the corporate world were more likely to emerge, Lis and Soly add, where artisan-entrepreneurs had political voice, through guild representation in local governing councils. Artisan-entrepreneurs were likely to promote, and possibly invest in, product innovation when the profits of those innovations would accrue to themselves rather than to merchant-entrepreneurs. The latter were, for obvious reasons, more interested in cost cutting, that is, labour saving, and hence favoured process innovations.

⁴⁵ M. Prak, 'Individual, Corporation, and Society: The Rhetoric of Dutch Guilds (18th C.)', in Boone and Prak (eds.), *Status individuels*, 262. This is not to say that guilds always performed this role in the most efficient way. In many trades innovations first led to conflicts between guilds, before one was able to take the lead and managed to coordinate the whole production column, as is shown by the history of Parisian umbrella making: C. Fairchild, 'The Production and Marketing of Populuxe Goods in Eighteenth-century Paris', in J. Brewer and R. Porter (eds.), *Consumption and the World of Goods* (London: Routledge, 1993), 235–9.

⁴⁶ On the 'weakness' of guild monopolies, see Sonenscher, *Work*; Kaplan, 'Les corporations, les "faux ouvriers"'; R. S. Duplessis, *Transitions to Capitalism in Early Modern Europe* (Cambridge: Cambridge University Press, 1997), 36.

⁴⁷ The phrase was coined by R. S. DuPlessis and M. Howell, 'Reconsidering the Early Modern Urban Economy: The Cases of Leiden and Lille', *Past and Present* 94 (1982), 49–84.

⁴⁸ Sonenscher, *Work*, 213–14.

Coordination by guilds was not limited to the production process alone. As Maarten Prak argues in his chapter, clustering created a range of externalities beneficial to the membership and to the industry as a whole, like for instance the reduction of information asymmetries between producers and customers. Pre-modern markets were seriously hampered by a lack of information about both producers and their products, and this problem could ultimately lead to a complete standstill of the trade in products, when customers became too suspicious about their quality.⁴⁹ In a variety of ways, guilds contributed to the reduction of this problem. First and foremost, they would ensure the quality of the workforce, or more specifically the master craftsman who was responsible for output quality. The production of a masterpiece was a peer-reviewed demonstration of skill. It was not, as is sometimes assumed, an attempt to impose a uniform standard of quality, but merely testified to the fact that the master was able to produce at a certain (minimum) level of expertise.⁵⁰ Alternatively, guilds could require that their members' products meet certain quality standards, and attach a label or other testimony for export purposes.⁵¹ Local authorities often showed a strong interest in this type of quality control. In most towns, guilds of silver- and goldsmiths were formally charged with upholding regulations concerning the precious metal content of their members' products.⁵² In England, this so-called assay, that is, the testing of gold and silver products to determine their ingredients and quality, was a national privilege of the London Goldsmiths' Company. As Ian Anders Gadd and Patrick Wallis demonstrate in their chapter, such national regulations were closely related to the Crown's tax policies, but also to the specific characteristics of the product itself. Next to gold and silver, pewter – with similar problems of quality control – was one of the few products for which the same arrangements were successfully introduced. With one or two exceptions, attempts by other London guilds to obtain similar national privileges for purely rent-seeking motives, were either non-starters or otherwise short-lived. Still another possibility for

⁴⁹ A. G. Akerlof, 'The Market for "lemons": Quality Uncertainty and the Market Mechanism', *Quarterly Journal of Economics* 84 (1970), 488–500; B. Gustafsson, 'The Rise and Economic Behaviour of Medieval Craft Guilds', in B. Gustafsson (ed.), *Power and Economic Institutions: Reinterpretations in Economic History* (Aldershot: Edward Elgar, 1994), 84–94.

⁵⁰ Cf. Lis and Soly, this volume.

⁵¹ G. Richardson, 'Brand Names before the Industrial Revolution', *Research in Economic History* (in press); see also the same author's 'Christianity and Craft Guilds in Late Medieval England: A Rational Choice Analysis', *Rationality and Society* 17 (2005), 139–89, where it is argued that, by bundling religious and economic activities, guilds helped create greater security for their members' customers.

⁵² L. Hesselink, 'Goud- en zilversmeden en hun gilde in Amsterdam in de 17e en 18e eeuw', *Holland, regionaal-historisch tijdschrift* 31 (1999), 143–4.

guilds to contribute to market transparency, discussed in Prak's chapter, was the guild salesroom, where customers could make an informed choice from a range of price–quality combinations. Dutch painters' guilds would also mediate between producers and their dissatisfied customers, another way of dealing with the problems arising from information asymmetries.

Protecting and Sharing Knowledge

Given the importance of tacit knowledge in most crafts, the experiential nature of most technological knowledge and the fact that technological progress was small-scale and incremental, rather than wholesale and revolutionary, intellectual property rights were difficult, often impossible, to establish. Knowledge sharing – voluntary, or as an unintended outcome of labour mobility – thus seems to have been the norm, despite contemporary references to the 'mystery' of the craft. These can seem to suggest, at first sight, some sort of secretiveness, but on closer inspection it turns out that this 'mystery' was precisely the tacit knowledge that was impossible to articulate with any precision and hence had to be transmitted in person. The documents in which this language is found are mostly about the conditions that will give apprentices access to these 'mysteries'. It would be fair to say that this type of environment is indeed more conducive to micro, rather than macro, inventions. The primary impact of such inventions would be local, as is suggested by evidence presented in Prak's chapter about the development of new pictorial traditions in seventeenth-century Netherlands. In technologically advanced trades, however, where technological innovations were at a premium, craftsmen could pick up inventions very quickly, as Anthony Turner's chapter in this book demonstrates. When Christiaan Huygens invented the pendulum clock in 1658, and had a prototype built by one Salomon Coster, clock maker in the Hague, it was imitated within months, perhaps even weeks. Attempts by Huygens and Coster to establish a patent and twenty-one-year monopoly on the new technology failed miserably, as the invention (a macro invention, in this case) was copied, adapted, and improved upon by craftsmen all over Western Europe. Turner makes the important point that clock makers' and instrument makers' guilds were not opposed to innovation per se, but tended to resist attempts to monopolise such innovations for individual profit. Their argument was, precisely, that inventions were a common good, because they built upon cumulative knowledge that could not be ascribed to this or that individual, but was the shared property of the trade as a whole.

In quite a few areas, such as shipbuilding and construction, mining, or some aspects of metalworking, the division of labour was such that it was

indeed extremely difficult to identify major technological innovations, let alone pinpoint the individual ‘inventor’.⁵³ Typically, nobody knows who ‘invented’ the first *fluitschip* (flute ship), which was to carry Dutch international trade to world dominance in the seventeenth century. There can be no doubt that the *fluitschip* as such was a major technological innovation, but its creation was the outcome of a process of incremental improvements, made by hundreds, possibly thousands of unknown craftsmen, on many dozens of shipyards scattered along the North Sea coast.⁵⁴ Such a system of shared intellectual property rights might act as a disincentive to the development of new technology.⁵⁵ Some guilds tried to overcome these constraints by introducing reward schemes for inventors. As Liliane Pérez’s contribution in this book demonstrates, the Lyon silk industry could be highly innovative owing to a system that rewarded individual inventors, and at the same made the results of their efforts available to the industry as a whole. The Lyon scheme at times even managed to make the payout to inventors dependent on the adoption of their innovation, by paying a specified amount of money for each individual loom employing the innovation.

Important though it is, technology was just one form of innovation relevant to craftsmen, and the debate about guilds and innovation has been unduly focused on this particular aspect. In the luxury trades, product innovations were randomly introduced by incorporated trades, without any technological developments whatsoever. The Parisian clothing trade, for instance, witnessed dramatic changes since the late seventeenth century, rapidly developing into a genuine fashion industry and introducing innovations at an ever-increasing pace.⁵⁶ The *manteau*, garbled in English to become ‘mantua’, revolutionised women’s everyday dress code throughout Europe in this period. It was developed in Paris simultaneously with the incorporation of the seamstresses, that is, the female producers of these dresses, who acquired their statutes in 1675.⁵⁷ Even process innovations did not necessarily require technological change. Think of the clothing industry again. In Antwerp, around 1600, incorporated trades started to experiment with the production of readymade, rather

⁵³ Cf. Epstein, ‘Property Rights’, 383.

⁵⁴ Unger, *Dutch shipbuilding*, 36–7; also A. Wegener Sleeswijk, *De gouden eeuw van het fluitschip* (Franeker: Van Wijnen, 2003), ch. 1.

⁵⁵ Modern open-source software suggests, however, that this is not necessarily true. On skill as a collective property, also J. Rule, ‘The Property of Skill in the Period of Manufacture’, in P. Joyce (ed.), *The Historical Meanings of Work* (Cambridge: Cambridge University Press, 1987), 111–12.

⁵⁶ Daniel Roche, *The Culture of Clothing: Dress and Fashion in the Ancien Régime* (Cambridge: Cambridge University Press, 1994).

⁵⁷ Crowston, *Fabricating Women*, 36–41.

than customised, clothes such as cloaks, stockings, and breeches. Fabritius Pamphi, a hosier possibly of Italian origin, in 1604 held a stock of 1,836 pieces. Almost 80 percent of his business was outside Antwerp. By 1610 the tailors of Brussels and Mechelen (Malines) were complaining about the selling of these ready-made clothes from Antwerp by second-hand dealers in their own towns.⁵⁸

Labour Mobility

Many innovations either occurred as a result of the combination of know-how developed in different production locations, or more straightforwardly through the mobility of the labour force.⁵⁹ It has by now been firmly established that the world of the crafts, as much as the rest of early modern urban society, was one of significant mobility. Some more or less random figures can help illustrate the point. A survey in Vienna in 1742 showed that out of a total of 4,773 guild masters, a mere 1,160, or 25 percent, had been born locally. A third of the masters were foreigners, mostly originating from the non-Habsburg territories in the Holy Roman Empire.⁶⁰ In eighteenth-century Amsterdam, the largest single region of origin for master tailors was Germany – 37 percent had immigrated from there; on the other hand, only 21 percent were natives of Amsterdam itself.⁶¹ The London Goldsmiths' Company in the sixteenth and seventeenth centuries had a constant influx of craftsmen, both from other English regions and from the continent, in particular the Low Countries and France, but also Germany.⁶² Dietrich Meyer, one of a long line of

⁵⁸ H. Deceulaer, 'Entrepreneurs in the Guilds: Ready-to-wear Clothing and Subcontracting in Late Sixteenth and Early-Seventeenth-century Antwerp', *Textile History* 31 (2000), 137–9; see also Giorgio Riello, *A Foot in the Past: Consumers, Producers, and Footwear in the Long Eighteenth Century* (Oxford: Oxford University Press, 2006).

⁵⁹ H. Schilling, 'Innovation through Migration: The Settlements of Calvinistic Netherlanders in Sixteenth- and Seventeenth Century Central and Western Europe', *Histoire sociale/Social History* 16 (1983), 7–33; S. R. Epstein, 'Labour Mobility, Journeyman Organisations and Markets in Skilled Labour, 14th–18th Centuries', in M. Arnoux and P. Monnet (eds.), *Le technicien dans la cité en Europe occidentale 1250–1650* (Rome: École française de Rome, 2004), 251–69; S. Ciriaco, 'Migration, Minorities, and Technology Transfer in Early Modern Europe', *Journal of European Economic History* 34 (2005), 43–64.

⁶⁰ J. Ehmer, 'Worlds of Mobility: Migration Patterns of Viennese Artisans in the 18th Century', in G. Crossick (ed.), *The Artisan and the European Town* (Aldershot: Scolar Press, 1997), 179–80.

⁶¹ Panhuysen, *Maatwerk*, 164, 300.

⁶² L. B. Luu, 'Aliens and Their Impact on the Goldsmiths' Craft in London in the Sixteenth Century', in D. Mitchell (ed.), *Goldsmiths, Silversmiths and Bankers: Innovation and the Transfer of Skill, 1550 to 1750*, Centre for Metropolitan History Working Papers Series, no. 2 (London: Allan Sutton, 1995), 43–52.

painters, engravers, and goldsmiths from Zurich, has left a sketchbook with designs for metalwork made on his itinerary as a journeyman. Setting out in 1669, he worked in Basel, in Augsburg, long-time centre of the goldsmith trade, possibly Amsterdam, and then Basel again, before returning to his native city in 1674. In every town he made drawings of the designs he came across, subsequently integrating them into his own work.⁶³

In spite of persistent suggestions to the contrary in the literature, guild petitions and actions against ‘aliens’ were seldom directed against immigrants as such, but rather against non-members, or non-resident aliens. Not only did guilds tolerate migration but, especially in Central Europe, they actively encouraged it, as Reinhold Reith points out in his chapter in this book. The mobility of skilled labour had significant implications for the diffusion of skills and innovations, and must have been a source of innovation in its own right.⁶⁴ Technologically advanced areas, such as Northern Italy and the Low Countries, were major attraction poles for migrant workers, including artisans.⁶⁵ The role of these skilled immigrants in the shifting location of technological leadership in pre-industrial Europe was very significant.⁶⁶

From 1400 to 1800

Response to Change

It is often routinely assumed that guilds opposed every form of technological innovation.⁶⁷ It is true that numerous examples can be found of such opposition. The general equation of guilds and technological conservatism is nonetheless wrong on at least two counts. First of all, as we already discussed, most technological change in pre-industrial Europe was the result of incremental, micro improvements, discovered more or

⁶³ H. Lanz, ‘Training and Workshop Practice in Zurich in the Seventeenth Century’, in: Mitchell (ed.), *Goldsmiths*, 41.

⁶⁴ Next to the literature quoted in ch. 4, see also Thomas Da Costa Kaufmann, *Court, Cloister and City: The Art and Culture of Central Europe 1450–1800* (Chicago: Chicago University Press), for many examples of the innovative results of the interaction between Italian and local artists.

⁶⁵ J. Lucassen, *Migrant Labour in Europe 1600–1900: The Drift to the North Sea* (London: Croom Helm, 1987), 108.

⁶⁶ K. Davids, ‘Shifts of Technological Leadership in Early Modern Europe’, in K. Davids and J. Lucassen (eds.), *A Miracle Mirrored: The Dutch Republic in European Perspective* (Cambridge: Cambridge University Press, 1995), 340–3; the author emphasises (349–52) how, during a phase of economic stagnation, in the second half of the eighteenth century, guilds could act as obstacles to further innovation.

⁶⁷ See the literature quoted in notes 4–6.

less unintentionally by craftsmen practising their trade. In other words, technological change and progress was the unintended outcome of craftsmen going about their normal business, which was to produce industrial products to the best of their abilities. Guilds did not, perhaps, contribute directly to these improvements as such, but they did matter a lot to their diffusion; moreover, as diffusion is, for the application of new technology, at least as important as the actual invention, this contribution could indeed be vital.⁶⁸

Dutch shipbuilding offers a good example of this piecemeal, incremental type of innovation. During the fifteenth and sixteenth centuries the industry was very dynamic and indeed innovative; it became a major export industry in its own right and, crucially, its products helped propel Holland's economy to global dominance.⁶⁹ Shipwrights' guilds contributed to these developments in a number of significant ways. They created stable environments for investments in innovations. The guilds often invested collectively in expensive equipment, such as slipways and cranes. Through price controls they, moreover, forced producers to seek alternative means of distinguishing themselves from their competitors. The superior quality and efficiency of their products, and of the production process, were among the obvious outcomes of such pressures. Innovation in the shipwrights' guilds tended to be collective rather than individual, as the guild provided a forum for the exchange of ideas in its regular meetings, where attendance was compulsory. And last but not least, through the training of apprentice shipwrights, innovations were passed on from one generation to the next. It is a fact that in the seventeenth century the industry lost its innovative capacity, and its guilds became much more conservative. This is, however, no reason to deny their capacity to carry and indeed stimulate a process of long-term innovation in the preceding centuries.⁷⁰

The example of the Holland shipwrights suggests that the thesis of guilds' general technological conservatism is wrong for a second reason: there are numerous examples, in fact, of guilds embracing new technology.⁷¹ It is therefore important to understand when and why guilds would reject new technologies, and when they might accept them. Ulrich Pfister's second contribution to this volume seeks to establish those conditions, through an analysis of the introduction of the silk ribbon loom

⁶⁸ Epstein, 'Property Rights', 384; Inkster, 'Potentially Global', 241.

⁶⁹ Unger, *Dutch Shipbuilding*, ch. 2; J. de Vries and A. van der Woude, *The First Modern Economy: Success, Failure, and Perseverance of the Dutch Economy, 1500–1815* (Cambridge: Cambridge University Press, 1997), 355.

⁷⁰ Unger, *Dutch Shipbuilding*, chs. 5 and 6.

⁷¹ See Chapters 6–9 in this volume.

in various production centres throughout Europe during the seventeenth century. He argues that given the importance of skills and the relative scarcity of capital in most craft workshops, it is reasonable to assume that guilds representing such workshops would generally oppose capital-intensive and labour (esp. skilled labour)-saving innovations, which would undercut their members' competitive advantage. Guilds might react to such innovations by erecting market barriers, but their success in doing so critically depended on two conditions. The political context would ultimately decide whether guild protests were translated into prohibitive measures. Where guilds had a powerful voice in political institutions, as was the case in many German towns, they found it much easier to follow a path of exclusion and rent seeking. In other polities, such as for instance English or Dutch towns, local governments were more likely to take a wider range of interests into account. The other critical aspect was the composition of a guilds' membership. Where this consisted overwhelmingly of small masters, a guild was more likely to seek refuge in restrictions on new technologies. Where the membership was more varied, and included master-entrepreneurs, or even merchants, the guild was likely to be more receptive to innovation. Indeed, the combination of master-entrepreneurs and political access could produce a powerful environment for innovative industrialisation aimed, typically, at product upgrading, as Lis and Soly's chapter in this book demonstrates. Francesca Trivellato's chapter illustrates a somewhat similar scenario. The Venetian silk and glass industries were both incorporated industries without political representation. Rent seeking was therefore not on the cards for them. Instead, both industries reacted to price competition from other centres of production, by upgrading through the application of new technologies and shifting to more complex products, which made the most of the workforce's highly developed skills.⁷² In the late seventeenth century, for example, apprenticeships in the silk weavers' guilds were extended from five to seven years, not, it seems, to exclude outsiders but as a reflection of the increased complexity of the job. For the same reason, masters were no longer permitted to apprentice more than one or two youngsters at a time, to make sure these received proper training. Whereas this might be interpreted as the typical signs of a closed trade, there seems to be another, more straightforward, explanation in the development of the industry as such.

⁷² See also the exemplary discussion of industrial business cycles by H. Van der Wee, 'Industrial Dynamics and the Process of Urbanization and De-urbanization in the Low Countries from the late Middle Ages to the Eighteenth Century: A Synthesis', in H. Van der Wee (ed.), *The Rise and Decline of Urban Industries in Italy and the Low Countries (Late Middle Ages – Early Modern Times)* (Louvain: Leuven University Press, 1988), 307–81.

Alternatives?

The historical literature presents two types of alternatives to the guild as an industrial organisation, emerging in the two centuries before the Industrial Revolution. The first is proto-industry. According to the standard account, proto-industry emerged in the European countryside because entrepreneurs hoped to escape the technological conservatism and high wage levels imposed by urban guilds.⁷³ This argument is at the least misleading, and probably wrong. In several proto-industrial areas, the (rural) industry was actually regulated by guilds. Probably the best-documented example is the worsted industry in the German duchy of Württemberg, investigated by Sheilagh Ogilvie. Her material demonstrates how it was completely dominated by regional guilds of weavers and merchants and, Ogilvie claims, it was ultimately doomed as a result of these guilds' rent-seeking activities.⁷⁴ Guilds dominated proto-industry in much of the German lands, Italy, and Spain.⁷⁵ But this was not necessarily detrimental everywhere and at all times, as Pfister demonstrates in the first chapter of this book.⁷⁶ The second reason why it would be wrong to see rural proto-industry as an alternative to the incorporated industries of the towns, is proto-industry's dependence on exactly those urban producers. Much rural proto-industry concentrated on the low-skill end of the production process; high-skill finishing, such as shearing and dyeing in textiles, were executed by urban craftsmen who were usually members of one or another craft guild. Rather than alternatives, urban and rural industries were thus complementary parts of one chain of production.⁷⁷

In the same vein, England and to a lesser extent the Dutch Republic have often been portrayed as alternatives for guild-ridden Europe, and hence by implication as examples supporting the argument that

⁷³ A recent example is Musgrave, *Early Modern European Economy*, 72.

⁷⁴ S. Ogilvie, *State Corporatism and Proto-industry: The Württemberg Black Forest, 1580–1797* (Cambridge: Cambridge University Press, 1997), chs. 6, 7, and 9 in particular.

⁷⁵ S. C. Ogilvie, 'Social Institutions and Proto-industrialization', in S. C. Ogilvie and M. Cerman (eds.), *European Proto-industrialization* (Cambridge: Cambridge University Press, 1996), 30–3.

⁷⁶ See also G. van Gurp, *Brabantse stoffen op de wereldmarkt: Proto-industrialisering in de Meierij van 's-Hertogenbosch 1620–1820* (Tilburg: Stichting Zuidelijk Historisch Contact, 2004), 106–9, who assesses the role of the weavers' guild in Dutch Brabant in a more positive vein.

⁷⁷ S. Ogilvie, *State Corporatism*, 423–4; S. R. Epstein, *Freedom and Growth: The Rise of the States and Markets in Europe, 1300–1750* (London, 2000), ch. 6; P. Glennie, 'Town and Country in England, 1570–1750', in S. R. Epstein (ed.), *Town and Country in Europe, 1300–1800* (Cambridge: Cambridge University Press, 2001); M. Körner, 'Town and Country in Switzerland, 1450–1750', in Epstein (ed.), *Town and Country*, 249; Th. Brennan, 'Town and Country in France, 1550–1750', in Epstein (ed.), *Town and Country*, 263.

guilds were 'bad for business'.⁷⁸ This is now starting to look increasingly doubtful. Research on guild foundations in the northern Netherlands demonstrates that during the seventeenth century, that is, in the period of the Dutch Republic's very strong economic expansion, more guilds were established than ever before, in traditional as well as innovative sectors. This suggests that the corporate system was still very much in development, and also that such development was perfectly compatible with a dynamic and growing economy.⁷⁹ The Dutch Republic, these data demonstrate, was not exceptional when it comes to the economic role of guilds. New research on England equally suggests that it is seriously problematic to equate the absence, ineffectiveness, or decline of guilds with an increased potential for economic growth. According to the best estimates we now have, per capita growth in England was as high in the seventeenth century as it was in the eighteenth: approximately 50 percent.⁸⁰ Yet the decline of English guilds was a phenomenon of the eighteenth century.⁸¹ Michael Berlin's chapter in this book highlights a much more complex history of English guilds than the standard argument of 'decline' allows for. He emphasises how the seventeenth century was actually the high point of incorporations, in London at least. Figures on membership suggest an even later zenith for the towns of southern England as a whole: 1710–1730.⁸² It would be equally wrong to assume a general decline of English guilds during the eighteenth century, as Berlin demonstrates. In some crafts the guild's position did indeed diminish, but in others, like the organisationally and technologically advanced coach and clock making industries, they remained innovative and significant through the end of the eighteenth century – and beyond. It is true that the English corporate system was in some ways unique in Europe. National legislation on apprenticeship – the 1563 Statute of Artificers, or the national regulation of certain industries by the guilds of the capital, were features found in no other country. The chronology of, and reasons for, the decline of English guilds, on the other hand, are difficult to relate to these features, and indeed to the transition to mechanised industrialisation.

⁷⁸ Landes, *Unbound Prometheus*, 19, 62, 82; Mokyr, *Gifts of Athena*, 269; Ogilvie, *State Corporatism*, 420, 436–7.

⁷⁹ See note 13.

⁸⁰ J. L. van Zanden, 'Early Modern Economic Growth: A Survey of the European Economy, 1500–1800', in M. Prak (ed.), *Early Modern Capitalism: Economic and Social Change in Europe, 1400–1800* (London: Routledge, 2001), 75 (table 4.2).

⁸¹ K. D. M. Snell, *Annals of the Labouring Poor: Social Change and Agrarian England 1660–1900* (Cambridge: Cambridge University Press, 1985), 229–230; Snell himself, on the other hand, situates the decline only in the second half of the eighteenth century: 264, 267–8.

⁸² *Ibid.*, 238, based on M. Walker's unpublished Ph.D. thesis.

The Industrial Revolution itself has implicitly, and often also explicitly, been presented as the most significant alternative to the corporate system. Its arrival, at first sight simultaneously with the decline of guilds, has more than anything else been strongly suggestive of the negative impact of guilds. There are, again, two reasons to be doubtful about this interpretation. As was already pointed out, the decision to abolish the guilds was political rather than economic. In some countries, like the Netherlands, it took place long before the arrival of modern industry, while in England the guilds were never formally abolished. The coincidence between the demise of the guilds and the Industrial Revolution is predicated, in other words, on a chronology that is fundamentally misleading. Moreover, small-scale crafts continued to function in parallel to mechanised factory production. As the various works of Charles Sabel and Jonathan Zeitlin have demonstrated, the industrialisation of nineteenth- and twentieth-century Europe very often took place in small firms, which faced the same types of problems that equally small firms experienced before the Industrial Revolution.⁸³

It is therefore no surprise to see that guilds themselves, or equivalent organisations utilising the guild format, continued to function in the nineteenth century in many skill-intensive industries. The Lyon silk weavers, for example, had a range of associations, clubs, and friendly societies that each catered to a specific aspect of the trade formerly covered by the guild. Typically, many weavers joined several of these organisations simultaneously, so that they still had access to the same range of 'services' as had been formerly offered by the guild. Governance in these voluntary organisations was consciously modelled on the guilds of the Ancien Régime. The most notable among them was the *cercle*, an association devoted to the development of skill and technology through technical instruction, sharing knowledge, and promoting inventions. The Lyon weavers sent delegations to several international industrial exhibitions, to inspect the presentation of their own work and spy on the competition.⁸⁴

⁸³ C. F. Sabel and J. Zeitlin, 'Historical Alternatives to Mass Production: Politics, Markets and Technology in Nineteenth-century Industrialization', *Past and Present* 108 (1985), 133–76; Sabel and Zeitlin (eds.), *World of Possibilities*; M. J. Piore and C. F. Sabel, *The Second Industrial Divide: Possibilities for Prosperity* (s.l.: Basic Books, 1984).

⁸⁴ G. J. Sheridan Jr., 'Craft Technique, Association and Guild History: The Silk Weavers of Nineteenth-century Lyon', in Gadd and Wallis (eds.), *Guilds and Association*, 150, 152–5. This idea of continuity in form, if not in actual organisation, has been elaborated most systematically for France, especially in W. H. Sewell Jr., *Work and Revolution in France: The Language of Labor from the Old Regime to 1848* (Cambridge: Cambridge University Press, 1980); C. M. Truant, *The Rites of Labor: Brotherhoods of Compagnonnage in Old and New Regime France* (Ithaca: Cornell University Press, 1994); S. L. Kaplan and Ph. Minard (eds.), *La France, malade du corporatisme? XVIII-XXe siècles* (Paris: Bélin, 2004),

In the German town of Solingen, renowned centre for cutlery, the abolition of the guilds, and the repression of alternative organisations by subsequent liberal-minded regional, French, and Prussian authorities, led to the opposite development: a negative spiral of product downgrading, declining wage levels, and overall impoverishment of the industry and its workforce. In the absence of institutionalised coordination, nobody had a clue of how to revive the industry.⁸⁵

This book claims that the impact of guilds on the early modern economy was more positive than has so far been acknowledged by historians of the traditional, and even of the revisionist, school. It investigates how and why this was so. Guilds promoted the reproduction of the skilled workforce. They supported the mobility and hence the geographical integration of that workforce. Guilds provided a framework for the vertical and horizontal integration of complicated production processes. They helped set quality standards, and thus generated greater market transparency. In other words, through institutionalised clustering, guilds created an environment that was conducive to the type of tacit, embodied, and incremental innovation typical of most industrial development before the Industrial Revolution, and much of it even after that momentous event.

It is, however, important to circumscribe the claim that guilds were economically beneficial. The authors of this book are concerned with craft guilds, not all guilds. More specifically, most chapters in this book discuss highly skilled industries, crafts where technology was often quite significant in the production process. None of the contributors claims that guilds were an optimal solution to the problems facing the pre-industrial

and the works of Philippe Minard more generally; for further references see his 'Trade without Institution? French Debates about Restoring the Guilds at the Start of the Nineteenth Century', in Gadd and Wallis (eds.), *Guilds and Association*, 83–100. On guilds and the guild tradition in other nineteenth-century European countries, see G. Crossick and H.-G. Haupt, *The Petite Bourgeoisie in Europe 1780–1914* (London: Routledge, 1995), 32–7, 156–7, 202; J. Ehmer, 'Zünfte in Österreich in der frühen Neuzeit', in Haupt (ed.), *Ende der Zünfte*, 125–6; R. Boch, 'Zunfttradition und frühe Gewerkschaftsbewegung: ein Beitrag zu einer beginnenden Diskussion mit besonderer Berücksichtigung des Handwerks im Verlagssystem', in U. Wengenroth (ed.), *Prekäre Selbständigkeit: Zur Standortbestimmung von Handwerk und Kleinbetrieb im Industrialisierungsprozess*, Veröffentlichungen des Instituts für Europäische Geschichte vol. 31 (Stuttgart: Steiner, 1989), 37–69; L. Edgren, 'What Did a Guild Do? Swedish Guilds in the Eighteenth and Early Nineteenth Century', in Gadd and Wallis (eds.), *Guilds and Association*, 43–55; M. Chase, '"A Sort of Corporation (Tho' without a Charter)": The Guild Tradition and the Emergence of British Trade Unionism', in *idem*, 187–98.

⁸⁵ R. Boch, 'The Rise and Decline of Flexible Production: The Cutlery Industry of Solingen since the Eighteenth Century', in Sabel and Zeitlin (eds.), *World of Possibilities*, 162–5; see also L. S. Weissbach, 'Artisanal Responses to Artistic Decline: The Cabinetmakers of Paris in the Era of Industrialization', *Journal of Social History* 16 (1982), 70–4.

economy, or that they were the only institutions capable of generating innovation, or were supporting economic growth at all times.⁸⁶ We do claim, however, that the evidence presented here, in combination with the sheer size and longevity of the corporate system, provides strong proof of the often beneficial, and at times indeed crucial, positive effects of craft guilds on Europe's pre-industrial economy and its innovative capacities. The book thus paves the way for a much more variegated, and therefore deeper, understanding not only of the guilds as such but of the transformation of European industry in the centuries leading up to the Industrial Revolution, and indeed beyond.

⁸⁶ On these issues, see also the work of Sheilagh Ogilvie, the most vocal critic of the revisionist position, as quoted in notes 32 and 73–74, as well as her 'Guilds, Efficiency, and Social Capital: Evidence from German Proto-industry', *Economic History Review* 57 (2004), 286–333, and the rejoinder by S. R. Epstein, 'Craft Guilds in the Premodern Economy: A Comment', *Economic History Review* 60 (2007), forthcoming, vol. 61, 2008.

1 Craft Guilds, the Theory of the Firm, and Early Modern Proto-industry

Ulrich Pfister

As economic institutions, craft guilds have been judged unfavourably at least from the late eighteenth century onwards. In the view of the enlightened elites pressing for liberal reforms, craft guilds presented an obstacle to economic growth and welfare. In the course of the nineteenth century, both liberal and radical economists considered craft guilds as a paradigmatic institution of a pre-capitalist economy, while writers of the German historical school, such as Werner Sombart, viewed craft guilds as a materialisation of a typical pre-modern economic spirit. Prominent among the arguments put forward by eighteenth-century *philosophes* and nineteenth-century economists figures the supposition that craft guilds served mainly as cartels for the appropriation of monopoly rents for its members. At the same time, craft guilds are said to have resisted the transition from simple commodity production to more complex production regimes, which increased the control of entrepreneurs over production and enhanced productivity by applying new technology.¹

Recent scholarship has begun to re-evaluate the economic effects of late medieval and early modern craft guilds. First, it has been argued that craft guilds prevented market failure (adverse selection) in long-distance

¹ On developments in political and economic philosophy, see Antony Black, *Guilds and Civil Society in European Political Thought from the Twelfth Century to the Present* (London: Methuen, 1984), 157–63; Dietrich Ebeling, ‘Zur Ökonomie des Handwerks in der frühen Neuzeit: Anmerkungen zur Historiographie und gegenwärtigen Debatte’, in Stefan Brakensiek et al. (eds.), *Kultur und Staat in der Provinz: Erträge und Perspektiven der Regionalgeschichte* (Bielefeld: Verlag für Regionalgeschichte, 1992), 42–9; Josef Ehmer, ‘Traditionelles Denken und neue Fragestellungen zur Geschichte von Handwerk und Zunft’, in Friedrich Lenger (ed.), *Handwerk, Hausindustrie und die historische Schule der Nationalökonomie: wissenschafts- und gewerbegeschichtliche Perspektiven* (Bielefeld: Verlag für Regionalgeschichte, 1998), 21–8; on developments in France and the Netherlands, respectively, see Emile Coornaert, *Les corporations en France avant 1789* (Paris: Éditions ouvrières, 1968), 165–76; Karel Davids, ‘Shifts of Technological Leadership in Early Modern Europe’, in Karel Davids and Jan Lucassen (eds.), *A Miracle Mirrored: The Dutch Republic in European Perspective* (Cambridge: Cambridge University Press, 1995), 349–50. A recent discussion of guilds as institutions that harm economic welfare is provided by Sheilagh Ogilvie, ‘Guilds, Efficiency, and Social Capital: Evidence from German Proto-industry’, *Economic History Review* 57 (2004), 286–333.

trade. Bales of textiles, in particular, were characterised by considerable asymmetry of information, in the sense that a buyer would have had to assess quality by unrolling and inspecting each bale, which would require a lot of time. Since long-distance merchants, local retailers, and consumers might all need to assess quality individually, information costs were unavoidably inflated. Both information asymmetries and the need for multiple quality assessments might inflate transaction costs to levels that precluded trade altogether and lead to market failure. A typical strategy aimed at avoiding both these problems consisted in the creation of trademarks by specialised exporters. The reputation of these urban trademarks was created and maintained through workshop inspections by guild officials and through product inspection boards consisting of guild and town officials, which controlled and sealed all goods destined for export. Examples that demonstrate the importance of these actions include the shift by Flemish towns to high-quality wool cloth production during the fourteenth century and the emergence of fustian manufacture in Swabia around the turn of the fourteenth and fifteenth centuries. Both processes went hand in hand with the creation of urban trademarks supported by quality control in a guild-based framework.²

Second, it has been posited that craft guilds promoted the development of human capital, notably in the form of transferable skills. Before the nineteenth century, apprenticeship training was the principal means to maintain and expand the stock of human capital. Given the absence of technical schools in the modern sense, craft guilds were of major importance for the development and diffusion of transferable skills. This is borne out by the typical stipulations made by guild statutes, particularly with respect to the provision of training and labour market control. Apprenticeship often involved a time inconsistency, in the sense that poor apprentices could pay for training only after it was completed by working for their master at below-market wages. Likewise, the quality of training

² Bo Gustafsson, 'The Rise and Economic Behaviour of Medieval Craft Guilds: An Economic-theoretical Interpretation', *Scandinavian Economic History Review* 35 (1987), 1–40; John H. Munro, 'Urban Regulation and Monopolistic Competition in the Textile Industries of the Late-medieval Low Countries', in Erik Aerts and John H. Munro (eds.), *Textiles of the Low Countries in European Economic History* (Leuven: Leuven University Press, 1990), 44–6; Wolfgang von Strome, *Die Gründung der Baumwollindustrie in Mitteleuropa: Wirtschaftspolitik im Spätmittelalter* (Stuttgart: Hiersemann, 1978), 146–53. For transaction cost theory in general, see Eirik G. Furubotn and Rudolf Richter, *Institutions and Economic Theory: The Contribution of the New Institutional Economics* (Ann Arbor: University of Michigan Press, 1998), ch. 2; the classic discussion of information asymmetries in markets is George A. Akerlof, 'The Markets for "Lemons": Quality Uncertainty and the Market Mechanism', *Quarterly Journal of Economics* 84 (1970), 488–500; on multiple measurement, see Yoram Barzel, 'Measurement Cost and the Organization of Markets', *Journal of Law and Economics* 25 (1982), 27–48.

was difficult to secure contractually, and the threat that their master would exploit apprentices as cheap labour was often a real one. Guild rules defining the duration of training, the punishments for masters who poached apprentices from rivals, and training credentials for apprentices provided institutional solutions to these problems. Likewise, labour market regulations, particularly restrictions to mastership by specifying the length of tramping and of waiting periods for journeymen, and the exclusion of women, foreigners, and countrymen from apprenticeship, secured a rent on human capital and provided incentives for young males to invest in acquiring skills.³

This chapter contributes to the re-evaluation of the economic effects of craft guilds by examining them in the light of the modern theory of the firm. It develops the argument that the craft guild operated at least in part as a functional substitute to the firm, and it explores the nature of the competition between these two institutions. The study focuses on proto-industries, that is, on the regional export industries that emerged between the fifteenth and eighteenth centuries in Western Europe. Given the focus of earlier proto-industry theory on rural areas, it is important to stress that the workforce of these regional export industries comprised both inhabitants of towns and peasants.⁴ Hence, I will refer to urban industrial districts, as for instance Bologna or Lyon, to urban networks such as those in Flanders and Swabia up to about the sixteenth century, or to complex systems that include major cities, small towns, and rural areas, as existed in Northern Ireland, Normandy, the hinterland of Verviers, and northern Switzerland. A common feature of these regional export industries was specialisation in particular types of manufactures, mainly different types of textiles or metal goods, that were produced on a large scale and exported to distant markets. Still, most processes were characterised by relatively simple technology, and were performed either in small workshops owned by merchant-manufacturers or master-manufacturers, or within the household economy of small producers in town and countryside.⁵

³ Cf. Chapter 2.

⁴ Originally, the theory of proto-industrialisation referred mainly to rural areas. By the mid-1980s it was generally established that proto-industrial production systems included both town and countryside; see, for instance, Peter Kriedte, 'Die Stadt im Prozess der europäischen Protoindustrialisierung', *Die alte Stadt* 9 (1982), 19–51; Myron P. Gutmann, *Toward the Modern Economy: Early Industry in Europe, 1500–1800* (New York: Knopf, 1988), chs. 2 and 4.

⁵ Overviews on proto-industrialisation are provided by Leslie A. Clarkson, *Proto-industrialisation: The First Phase of Industrialisation?* (Basingstoke: Macmillan, 1985), and Sheila C. Ogilvie and Markus Cerman (eds.), *European Proto-industrialization* (Cambridge: Cambridge University Press, 1996).