

DISTRUST, INNOVATIONS, AND PUBLIC SERVICE:

**'PROJECTING' IN SEVENTEENTH- AND EARLY
EIGHTEENTH-CENTURY ENGLAND**

KOJIYAMAMOTO

Submitted for the degree of Doctor of Philosophy

University of York, Department of History

September 2009

ABSTRACT

This thesis reappraises the role of distrust in an era of innovation that was preoccupied with public service. It does so by introducing the concept of 'projecting', something which was central to early modern economic innovation and improvement, but which has not been systematically explored by historians.

Combining the *English Short Title Catalogue* and a database of all patents for invention granted between 1617-1716, the thesis offers the first long-term account of projecting from the seventeenth to early eighteenth centuries, one that explores both concrete economic initiatives and complex public understanding about them. It reveals that economic innovations were almost always offered as a kind of public service, and that, by the end of Charles's Personal Rule, negative stereotypes of the 'projector' emerged, as the promoter of spurious innovations, and, more specifically, as the one who would abuse political authority by pretending public service. By conducting pilot case studies of economic initiatives, the thesis then demonstrates that these negative stereotypes fundamentally shaped the practices of innovation.

By reappraising the early modern notion of projecting, this thesis offers fresh perspectives on the history of economic innovation. It suggests that the terms 'project' and 'projector' were not accurate descriptions of the practices of innovation but negative stereotypes about them; that negative stereotypes about the 'projector' shaped promoters' identity, constrained their conduct, and influenced how they formulated the actual arrangement of their schemes; and that both the late sixteenth-century monopoly policy and early eighteenth-century joint-stock companies must be understood as different parts of the historical evolution of projecting activities. In doing so, this thesis contributes to our understanding of trust and commercial culture, two vital themes in economic history and history of technology and science.

TABLE OF CONTENTS

Acknowledgements.....		IV
Abbreviations.....		V
Conventions.....		VI
Introduction	Towards a History of ‘Projecting’ as Practice and Stereotype: A Reappraisal	1
Chapter One	Contexts and Contours of Projecting Culture.....	49
Chapter Two	‘Counted a Subtill Projector’?: Promoting Husbandry in the Hartlib Circle, c. 1639-1651	102
Chapter Three	Post-Restoration Projecting Cultures: <i>From Reformation to Improvement</i> Revisited	159
Chapter Four	Economic Interests, Properties, and Credit-lines: Turning The Stour Navigation ‘Project’ into Reality, 1661-1677	216
Chapter Five	Consuming Economic Projects in the Early Financial Revolution: A Case of Sir Humphrey Mackworth, a Tory Gentleman	277
Conclusion.....		335
Appendix 1	Figures and Tables	349
Appendix 2	Subject Classification for the Patent Database and Table 2	360
Bibliography.....		362

ACKNOWLEDGEMENTS

I first encountered 'projecting' in a post-graduate seminar taught by Dr Natasha Glaisyer in 2004. Natasha not only supervised my MA theses, but has now agreed to act as my internal examiner. I would like to thank her for the initial inspiration and for her ongoing interest in my project. I owe profound debts to my supervisor, Dr Mark Jenner. His intellectual rigour and moral support have inspired and encouraged me so many times, and I look forward to returning my debts in years to come. I also wish to thank Professors David Wootton and Simon Smith, who read much of my thesis as members of my thesis advisory panel.

An Overseas Studentship from the University of York partially funded my study, and bursaries from the Economic History Society and the Royal Historical Society enabled me to visit archives. I want to thank the archivists and members of staff at the archives and the libraries I visited. Conferences and seminars in York, Sheffield, Oxford, Paris, Montreal, and Tokyo offered excellent opportunities to test my arguments. Professor Mark Greengrass and Professor David Harris Sacks kindly answered my queries, and Professor David Hayton and Dr James Taylor read and commented on parts of this thesis. At critical moments, Barbara Glibring, Jo Hepworth, Bronach Kane, Anna Kiciak, Matthew Neufeld, John Kay Numao, Nick Tosney, and Kendra Warmald also read portions of this thesis. It owes much of its virtues, but none of its vices, to these friends and fellow historians.

Noburu Notomi and Ken Tsutsumibayashi taught me classics and history of political thought when I was an undergraduate in Tokyo. Since then they have been invaluable sources of inspiration. Beyond the academic communities, Yuzuki Matsushita, Ken Murakami, Ruth Puig-Peiro, Yukako Takanashi, and Hiroto Tanaka have shown keen interest in my research. If my project has something of a modern relevance, it owes much to their friendship. I am grateful to Niels van Manen and Vidhi Trehan for their friendship, hospitality, and much more. Lastly, I wish to record my deepest thanks to my parents, and dedicate this thesis to them.

17 September 2009
Koji Yamamoto

ABBREVIATIONS

<i>AHEW Vii</i>	Joan Thirsk (ed.), <i>The Agrarian History of England and Wales, Volume Vii 1640-1750: Agrarian Change</i> (Cambridge: CUP, 1985).
BL	British Library, London
Bodl.	Bodleian Library, Oxford
<i>CJ</i>	<i>Journals of the House of Commons</i>
<i>CSPD</i>	<i>Calendar of State Papers, Domestic</i>
<i>CTB</i>	<i>Calendar of Treasury Books</i>
<i>CTP</i>	<i>Calendar of Treasury Papers</i>
CUP	Cambridge University Press
HMC	Historical Manuscripts Commission
HP	Sheffield University, <i>The Hartlib Papers</i> , (2 CD-ROMs, 2 nd ed., Sheffield: HR Online, 2002).
<i>LJ</i>	<i>Journals of the House of Lords</i>
<i>Oxford DNB</i>	H. C. G. Matthew and Brian Harrison (eds.), <i>Oxford Dictionary of National Biography</i> (60 vols, Oxford: OUP, 2004).
NLW	National Library of Wales, Aberystwyth
<i>OED</i>	<i>Oxford English Dictionary Online</i> , 4 th edition.
OUP	Oxford University Press
Scott, <i>Joint-stock</i>	William Robert Scott, <i>The Constitution and Finance of English, Scottish and Irish Joint-stock Companies to 1720</i> , (3 vols, Cambridge: CUP, 1910-12).
SRO	Staffordshire Record Office, Stafford
TNA	The National Archives, Kew
<i>T&C</i>	Joan Thirsk and J. P. Cooper (eds.), <i>Seventeenth-Century Economic Documents</i> (Oxford: Clarendon Press, 1972).

CONVENTIONS

I have given all the dates in the old style but with the year taken to have started on 1 January. When citing early modern sources, I have replaced ‘i’ and ‘v’ with ‘j’ and ‘u’ unless they appear in titles of printed books. Except these, I have retained all the spelling and punctuation. Patent numbers given in the text and in footnotes refer to those given in Bennet Woodcroft, *Titles of Patents of Invention, Chronologically Arranged, from March 2, 1617 (14 James I) to October 1, 1852 (16 Victoriae), Part I. Nos. 1 to 4,800* (London: Queen’s Printing Office, 1854). When discussing tables and figures, decimals are rounded to the nearest whole number. All quotations from the Bible are taken from *The Bible: Authorized King James Version*, eds. Robert Carroll and Stephen Prickett (Oxford: Oxford Paperbacks, 2008). Place of publication of primary sources published prior to 1800 is London unless otherwise stated.

INTRODUCTION

Towards a History of 'Projecting' as Practice and Stereotype: A Reappraisal

In 1695, John Cary, a Bristol merchant and a friend of John Locke, wrote of the decreasing price of commodities in his *An Essay on the State of England*. 'The refiners of sugars lately sold for sixpence per pound what yielded twenty years since twelve pence'; the distillers were selling their spirits 'for one third' of their former price. Equally cheaply sold were 'glass bottles, silk stockings, and other manufactures (too many to be enumerated)'. This had been accomplished, he claimed, 'without falling [i.e., devaluing] the labour of the poor'. One of the reasons Cary identified was 'the ingenuity of the manufacturer'. Another – which is the central concern of my thesis – was 'projects', commercial applications of new knowledge and techniques. 'New projections are every day set on foot to render the making our manufactures easy'. 'The glass maker hath found a quicker way of making it out of things which cost him little or nothing. Silk stockings are wove instead of knit'. This development, importantly, was not just about manufactures. 'Tobacco is cut by engines instead of knives'. 'Pits are drained and land made healthy by engines and aqueducts instead of hands; the husbandman turns up his soil with the sallow [i.e. plough], not digs it with his spade; [. . .] brings home his harvest with carts, not on horsebacks; and many other easy methods are used both for improving of land, and raising its product'.¹ Such crucial economic sectors as agriculture, mining, and transport, Cary tells us, benefitted from 'projects'. Of course, the advancement in those areas of the economy was probably not as dramatic as Cary claimed; while

¹ John Cary, *An essay on the state of England in relation to its trade, its poor, and its taxes for carrying on the present war* (1695), pp. 145-47.

some 'projects' contained technological breakthroughs, many of them had more to do with incremental, small-scale improvements, or with applications of existing techniques and resources to new contexts. Yet, according to D. C. Coleman, Cary's observations contain 'a classic statement about productivity-increasing investments, lowered prices, and higher real wages.'² As Defoe put it, 'projects' were, at their best, schemes 'of publick Advantage, as they tend to Improvement of Trade, and Employment of the Poor, and the Circulation and Increase of the publick Stock of the Kingdom'.³

The promoters of those schemes also had a bad reputation, however. This simple fact provides us with a departure point for exploring the history of projecting. In the year Cary published *An Essay*, the anonymous pamphlet *Angliae tutamen* offered a very different 'ACCOUNT OF THE *Banks, Lotteries, Mines, Diving, Draining, Lifting, and other Engines, and many pernicious Projects now on foot*'. The author claimed that they were 'tending to the Destruction of *Trade and Commerce, and the Impoverishing [of] this REALM*.'⁴ The promoters of new schemes were aware of their bad name among many people. Dalby Thomas was a Gentleman of the Privy Chamber and one of the promoters of the Hampstead Aqueduct Company and (with Hugh Chamberlen) the 'General Fishery' scheme. When Defoe dedicated his '*Book of Projects*' to him, he made a very revealing qualification:

Your having a Capacity to Judge of these things [i.e. economic projects], no way brings You under the Despicable Title of a Projector, any more than knowing the Practices and

² D. C. Coleman, *The Economy of England, 1450-1750* (Oxford: OUP, 1977), p.157.

³ Daniel Defoe, *An essay upon projects* (1697), pp. 10-11.

⁴ *Angliae tutamen: or, the safety of England* (1695), title-page.

*Subleties of Wicked Men, makes a Man guilty of their Crimes.*⁵

This concern was not just a public posture. In a letter to Locke, Cary confided that he had omitted from his *Essay* some of his proposals for levying tax and improving industries. It was because, Cary explained, writing about them in this ‘Treatise designed for a publique use [. . .] might bringe me under the name of a Projector, which I carefully endeavour to avoyd’.⁶

Contemporary opinions were not neatly divided between those for and against projects. While praising beneficial ‘projects’, Defoe attacked the ‘meer Projector’ as a ‘Contemptible thing, driven by his own desperate Fortune’.⁷ The vociferous author of *Angliae tutamen* declared that his intention was not to ‘discountenance Ingenuity, but quite the contrary, to support and advance it’ by exposing chicanery.⁸ Even Swift, who disparaged dubious ‘projects’ of all kinds, nonetheless approved of ‘a projector’ working on agricultural improvement.⁹ These commentators would have agreed

⁵ Defoe, *Essay upon projects*, pp. i, ii. For Dalby Thomas, see J. H. Thomas, ‘Thomas Neale, A Seventeenth-century Projector’ (Ph. D thesis, University of Southampton, 1979), p. 395.

⁶ John Locke, *Correspondence of John Locke*, ed. Edmund de Beer (8 vols, Oxford: Clarendon, 1976-1989), vol. 5, pp. 633-34. For background, see Jonathan Barry, ‘The “Great Projector”: John Cary and the Legacy of Puritan Reform in Bristol’, in Margaret Pelling and Scott Mandelbrote (eds.), *The Practice of Reform in Health, Medicine and Science, 1500-2000* (Aldershot: Ashgate, 2005), 185-206.

⁷ Defoe, *Essay upon projects*, p. 33

⁸ *Angliae tutamen*, pp. 23, 25, 30, at p. 30.

⁹ Jonathan Swift, *Gulliver’s Travels*, eds. Peter Dixon and John Chalker with an Introduction by Michel Foot (London: Penguin, 1967), p. 225. Even satirical playing cards acknowledged that some ‘projects’ could be beneficial. See British Museum, London, Schreiber Collection, English 66, ‘English Bubble Companies Playing Cards’, ace of hearts, two of hearts, and ace of diamonds. Transcriptions of these playing cards are given in Jno [sic] Sudlow, ‘South Sea Playing Cards’, *Notes & Queries*, 3rd ser., 5 (1852), 217-20. My account qualifies accounts of Simon Schaffer and Christine MacLeod which suggest that Swift and others might have been unequivocally against ‘projects’. Simon Schaffer, ‘Defoe’s Natural Philosophy and the Worlds of Credit’, in John Christie and Sally Shuttleworth (eds.), *Nature Transfigured: Science and Literature, 1700-1900* (Manchester: Manchester U.P., 1989), p. 37; Christine MacLeod, *Heroes of Invention: Technology, Liberalism and British Industry, 1750-1914* (Cambridge: CUP, 2007), pp. 37, 36 (fn. 41).

with Cary that some projects had been, and could be, beneficial to society as well as to their promoters. At one level, then, their responses highlight the problem Francis Bacon put so pithily in his essay ‘On Innovations’: ‘the novelty, though it be not rejected, yet be held for a suspect’.¹⁰ Something more specific and fundamental was also at stake. Could economic initiatives, which inevitably involved elements of private gain, be trusted as a means by which to serve the public? Would the king, MPs, or other groups not pretend to be advancing beneficial innovations and improvement in order to pursue nefarious interests? Such a concern explains why Cary gratefully received Locke’s comment that Cary’s *Essay* was written ‘without partiality’. From his perspective, the philosopher’s approval confirmed that he was not among projectors who aired schemes ‘fitted for their private Interests under the splendid name of the Publique Good’.¹¹ Then, as now, there was great concern about whether the public good and private interest could be reconciled when it came to the promotion of new economic initiatives.

Most historians would agree that there were more schemes for economic and technological innovations – the kind of things Cary described as ‘new projections’ – during two centuries after the succession of Elizabeth (1558) than, say, the period between the Black Death in the 1340s and the Dissolution of the Monasteries in the 1530s.¹² They would also agree that such schemes were, collectively, extremely

¹⁰ Francis Bacon, *The Essayes or Counsels, Civill and Morall*, ed. Michael Kiernan (Oxford: Clarendon, 1985), p. 76.

¹¹ Locke, *Correspondence*, vol. 5, pp. 633-34.

¹² Joan Thirsk, *Economic Policy and Projects: The Development of a Consumer Society in Early Modern England* (Oxford: Clarendon, 1978), p. 179; Paul Slack, *From Reformation to Improvement: Public Welfare in Early Modern England* (Oxford: Clarendon, 1998), p. 8. See also Keith Wrightson, *Earthly Necessities: Economic Lives in Early Modern Britain, 1470-1750* (London: Penguin Books, 2002), pp. 108-109.

important for the incremental development of the economy well into the eighteenth century.¹³ It has also been suggested that, from the mid-sixteenth century, under the influence of Renaissance humanism, promoters began to present their schemes (as Defoe did) as public service, drawing upon slogans such as ‘commonweal’, ‘commonwealth’, and the ‘public good’.¹⁴ Of course, as Joan Thirsk puts it, ‘We do not have to believe that they were all pure philanthropists.’ Indeed, studies in political history, social history, and history of science and technology, have acknowledged that economic and technological innovations hinged crucially upon a kind of ‘the partnership of public business and personal gain’, or upon ‘the unification of the public good with private interest’.¹⁵ ‘Englishmen found that they did well by doing good. [. . .] The motives of every projector mixed public and private in different proportions.’¹⁶

Despite these acknowledgements, historians have not fully explored consequences that followed when innovations came to be vigorously promoted as public service from the mid-sixteenth century. Instead, as we shall see below, they have tended to conceptualise ‘projects’ in a somewhat anachronistic fashion,

¹³ Charles Wilson, *England's Apprenticeship, 1603-1763* (2nd ed., London: Longman, 1984), pp. 188, 385-86; Larry Stewart, *The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660-1750* (Cambridge: CUP, 1992), pp. 28, 259, 393; Thirsk, *Economic Policy and Projects*, pp. 7, 158. See also my discussion of Thirsk's work below. These historians also issue caveats because it has been difficult to pin down precisely how such schemes contributed to economic performance.

¹⁴ A. B. Ferguson, *The Articulate Citizen and the English Renaissance* (Durham, N.C.: Duke U.P., 1965), esp. p. 363; Thirsk, *Economic Policy and Projects*, p. 1; Slack, *From Reformation to Improvement*, pp. 1, 5-7.

¹⁵ John Cramsie, *Kingship and Crown Finance under James VI and I, 1603-1625* (Woodbridge: Boydell Press, 2002), p. 36; Margaret C. Jacob and Larry Stewart, *Practical Matter: Newton's Science in the Service of Industry and Empire, 1687-1851* (Cambridge, Mass.: Harvard U.P., 2004), p. 82. See also Slack, *From Reformation to Improvement*, p. 161; Thomas Leng, *Benjamin Worsley (1618-1677): Trade, Interest and the Spirit in Revolutionary England* (Woodbridge: Boydell, 2008), p. 144.

¹⁶ Thirsk, *Economic Policy and Projects*, p. 18.

equating it with fraudulent schemes or with capitalistic enterprises. As a result, it has been implied that the assertion of public service was either sporadic or insignificant, and therefore irrelevant to our understanding of the practices of innovation. Hence we know relatively little about the anxiety Cary expressed in his letter to Locke, or the care with which Defoe dedicated his *Essay* to his patron. Nor do we know for certain what it was that the author of *Angliae tutamen* deplored so vehemently. Was the author criticising the unscrupulous fraudster, who had no pretence to advance the public good? Or was (s)he lamenting the fact that promoters of innovative schemes turned out to be so unreliable or even fraudulent despite their repeated claims to serve the public?

This thesis begins by drawing attention to the remarkable extent to which the advocacy of new commercial and technical schemes was pervaded by the assertion of public service, and how, as a result, distrust of such assertions persisted and fundamentally affected the practices of innovation. I show that distrust persisted not only because schemes for economic innovations often failed and sometimes involved frauds, but also because, crucially, the assertion of public service lent itself to abuse of political authority. In doing so I want to draw attention to the profoundly ambiguous reputation of economic innovations in early modern England, something the complex meanings of the terms 'project' and 'projector' precisely reflected. As Cary and Defoe did, it was possible to speak of 'projects' in neutral, if not positive, sense to describe economic initiatives.¹⁷ 'Projects' were, as has been indicated above,

¹⁷ One seventeenth-century dictionary defined the term 'project' to mean 'wise contriving of any thing, or casting forth.' See Robert Cawdry, *A table alphabeticall contayning and teaching the true writing and vnderstanding of hard vsuall English wordes* (1609), no pagination. See also similar definitions in Henry Cockeram, *The English dictionarie: or, An interpreter of hard English words* [. . .] (1623), no pagination; Elisha Coles, *An English dictionary explaining the difficult terms* [. . .] (1692), no pagination. For neutral uses of the term 'projector', see Samuel Johnson, *A Dictionary of the English*

attempts at achieving ‘big-bang’ technological inventions, introducing new skills from abroad, exploiting existing techniques on a larger scale, or applying them to a new frontier. ‘Projects’ were innovative schemes that could help improve various economic sectors, employ the poor, and contribute to economic prosperity at large. Yet, from the early seventeenth century the terms ‘project’ and ‘projector’ also began to acquire negative meanings. The ‘projector’ often meant a calculating opportunist seeking monopoly patents for spurious ‘arts’, ‘inventions’, ‘secrets’, or ‘mysteries’ to enrich himself.¹⁸ While this cluster of meanings was rooted in the criticism of monopolists and patentees that was current from about the 1570s to the outbreak of the Civil Wars, the term ‘project’ and ‘projector’ carried more generic pejorative meanings. The ‘projector’ often meant a deluded dreamer advancing wild impossible schemes, or a relentless conman who would run away with the profits. Accordingly their ‘project’ could be an impractical scheme or a nefarious ‘plot’.¹⁹ This was how the author of *Angliae tutamen* used these terms. I will accordingly allow a degree of flexibility in our use of these terms ‘project’ and ‘projector’, without obscuring the specific meanings in each context. So when referring to negative meanings I will often speak of ‘dubious projects’ or ‘fraudulent projectors’. I will also refer to ‘economic projects’ and ‘financial projects’ to describe schemes in a neutral fashion,

Language (2 vols, 1756), vol. 2, projector, *n.*; Christine MacLeod, *Inventing the Industrial Revolution: The English Patent System, 1660-1800* (Cambridge: CUP, 1988), p.245, n. 148.

¹⁸ Neither *OED*, project, *n.*, nor *ibid.*, projector, *n.*, nor contemporary dictionaries that I have examined records this specific sense. But see my discussion below and Chapter One. My gendered reference to men is deliberate. Female projectors were not unknown, but rare. See, for example, Joan Thirsk, ‘The Crown as Projector on its Own Estates, from Elizabeth I to Charles I’, in R.W. Hoyle (ed.), *The Estates of the English Crown, 1558-1640* (Cambridge: CUP, 1992), p. 343; Ben Jonson, *The Devil is An Ass*, ed. Peter Happe (Manchester: Manchester U.P., 1994), pp. 150-51.

¹⁹ This sense is not recorded in *OED*, project, *n.* But see definitions of the term ‘project’ in Cawdry, *A table alphabeticall*; Cockeram, *The English dictionarie*. Few seventeenth-century dictionaries seem to have defined ‘projector’. But see Johnson, *Dictionary*, vol. 2, projector, *n.*: ‘One who forms wild impracticable schemes.’

without excluding the possibility that these schemes could have been stereotyped as dubious ‘projects’.

This thesis demonstrates that the promotion of economic innovations as public service brought into being in the early seventeenth century what we could call *projecting culture*, something in which assertions of public service became routinely ridiculed and distrusted according to the negative stereotype, compelling promoters of innovations to elaborate and modify how their schemes would serve the public without defrauding or oppressing them. I track negative stereotypes about projects from their earliest emergence in the first decade of the seventeenth century, paying close attention to the ways in which various media (not only pamphlets like *Angliae tutamen*, but also bills, petitions, and even songs) continued to use the terms ‘project’ and ‘projector’ and thereby sustained and modified both pejorative and neutral connotations of these terms. Importantly, I explore how the practices – or what we might call projecting activities – and stereotypes about them shaped one another. So I examine concrete schemes in the fields of husbandry, river navigation, and mining, economic sectors that collectively played a fundamental role in the growth of early modern economy. In particular, I explore how the possibility of being seen as the ‘projector’ affected the presentation of economic innovation in these areas, precisely the kind of self-consciousness Cary revealed in his letter to Locke. We will also consider some of the ways in which some promoters began to avoid soliciting extensive governmental backing in order to avert comparisons with controversial ‘projectors’ under Charles I who had been accused of unjustly imposing spurious ‘inventions’ and economic reform upon private lives. We will ponder how such reinvention of projecting activities might have pushed a long-term change in the dominant mode of projecting from early Stuart monopolies to later Stuart joint-stock

companies, and how the projector stereotype was reinvented accordingly. (For example, from the 1690s, the ‘projector’ came to be associated with the stockjobber.)

Thus, by bringing together the analysis of literary stereotypes and their circulation and that of concrete economic practices, the thesis offers the first systematic, long-term account of the culture of innovation that explores both neutral and pejorative senses of the term ‘project’: as concrete activities presented as capable of *public service*; and as negative stereotypes that exposed promoters like Cary to enduring *distrust*. Beyond this immediate goal, this thesis also contributes to our understanding of trust and commercial culture, two vital themes in economic history and history of technology and science.

In the last few decades, historians of science and technology have shown that natural philosophers could not verify, share, or circulate knowledge about nature as reliable ‘matters of fact’ without establishing a degree of trust among participants.²⁰ More recently, they have also shown that what we nowadays call ‘science’ and ‘technology’, or ‘enquiry’ and ‘invention’, or ‘knowledge’ and ‘ingenuity’ were very much intertwined during the early modern period.²¹ Economic initiatives that were dubbed ‘projects’ often combined exactly these elements. Separately, social historians have shown that, precisely because keeping financial credit was never so easy (many credit transactions depended on oral promises), the negotiation of

²⁰ Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth Century England* (Chicago: University of Chicago Press, 1995); Steven Shapin and Simon Schaffer, *Leviathan and the Air-pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton U.P., 1985).

²¹ Lissa Roberts, Simon Schaffer, and Peter Dear (eds.), *The Mindful Hand: Inquiry and Invention from the Late Renaissance to Early Industrialisation* (Amsterdam: Koninklijke Nederlandse Akademie van Wetenschappen, 2007). See also A. E. Musson and Eric Robinson, *Science and Technology in the Industrial Revolution* (Manchester: Manchester U.P., 1969); Ian Inkster, ‘Discoveries, Inventions and Industrial Revolutions: On the Varied Contributions of Technologies and Institutions from an International Historical Perspective’, *History of Technology*, 18 (1996), 39-58.

creditworthiness played a central role in mundane commercial transactions.²² Many of the economic initiatives that were dubbed ‘projects’ operated at the interface of these scientific, technological, and commercial spheres, where useful knowledge and ingenuity were combined with power and purse for practical ends. So while this thesis is not primarily concerned with daily credit relations or with the practices of experiments or scientific observations *per se*, a history of projecting activities will enable us to illuminate what happened to the pursuit of useful knowledge and techniques when it came to practical applications through political and commercial spheres. It will also help us explore to what extent the negotiation of (dis)trust in the promotion of new economic projects might have resembled the negotiation of financial credit instruments.

Studying distrust and its impacts upon the practices of innovation will also enhance our understanding of economic development. Joel Mokyr and others have recently suggested that industrial growth owed much to the development of the knowledge economy, that is, to the cultural and institutional frameworks (such as the republic of letters, joint-stock companies, the Royal Society, and the Society for Arts) through which ‘useful knowledge’ was exchanged, refined, funded, and put to use.²³ My thesis complements these studies of *enabling factors* by exploring the pervasiveness of distrust, an element that *constrained* promoters and backers by

²² Craig Muldrew, *Economy of Obligation: The Culture of Credit and Social Relations in Early Modern England* (London: Macmillan, 1998); Margot C. Finn, *The Character of Credit: Personal Debt in English Culture, 1740-1914* (Cambridge: CUP, 2003).

²³ Joel Mokyr, *The Gifts of Athena: Historical Origins of the Knowledge Economy* (Princeton: Princeton U.P., 2002); Maxine Berg, ‘The Genesis of “Useful Knowledge”’, *History of Science*, 45 (2007), 123-33; Larry Stewart, ‘Experimental Spaces and the Knowledge Economy’, *History of Science*, 45 (2007), 155-77; Joel Mokyr, ‘Knowledge, Enlightenment, and the Industrial Revolution: Reflections on *The Gifts of Athena*’, *History of Science*, 45 (2007), 185-96. This special issue of *History of Science* contains three other articles on Mokyr’s works.

inducing (and often even compelling) them to behave in ways that would prevent them from being stereotyped as unreliable ‘projectors’. This topic is consequential. For, even sound proposals could be dismissed according to negative stereotypes; their economic potential could be lost, and as a result the diffusion of ‘new projections’ (which Cary and Coleman linked to economic development) could be hindered.²⁴

We will now survey the emergence of late Elizabethan and early Stuart monopolies and patents, controversial activities which first sparked the criticism of oppressive ‘projects’. Doing so will invite us to engage with a wide range of historical studies that have examined what early modern contemporaries deemed ‘projects’.

The Emergence of Projecting Activities

In Renaissance Italy and Germany technical arts and craft knowledge such as metallurgy, gunnery, and fortification were increasingly vigorously promoted to, and taken up by, powerful patrons. As a result, according to Pamela O. Long, these subjects were no longer considered forms of mere manual labour or *techne*, and were often accorded higher epistemic and symbolic status.²⁵ This close liaison between

²⁴ For the diffusion of inventions and new techniques, see, for example, Christine MacLeod, ‘The Paradoxes of Patenting: Invention and its Diffusion in Eighteenth- and Nineteenth-century Britain, France, and North America’, *Technology and Culture*, 32 (1991), 885-910; Liliane Hilaire-Pérez and Catherine Verna, ‘Dissemination of Technical Knowledge in the Middle Ages and the Early Modern Era: New Approaches and Methodological Issues’, *Technology and Culture*, 47 (2006), pp. 540-59. For the diffusion of new crops, see Frank Emery, ‘The Mechanics of Innovation: Clover Cultivation in Wales before 1750’, *Journal of Historical Geography*, 2 (1976), 35-48; Joan Thirsk, *Alternative Agriculture: A History* (Oxford: OUP, 1997), pp. 139-43 (esp. p. 140).

²⁵ Pamela O. Long, *Openness, Secrecy, Authorship: Technical Arts and the Culture of Knowledge from Antiquity to the Renaissance* (Baltimore: Johns Hopkins U.P., 2001), pp. 15, 247, 250. For an account of the elevation of husbandry as a noble art, see Joan Thirsk, ‘Making a Fresh Start: Sixteenth-Century Agriculture and the Classical Inspiration’, in

useful knowledge, ingenuity, and political authority also emerged in Renaissance England. The statesman Sir Thomas Smith's *Discourse of the Common Weal of this realm of England* (1549) was, according to Joan Thirsk, one of 'the most informative and early drafts of a programme' in England for systematically introducing new knowledge and ingenuities.²⁶ Eric Ash has shown that Elizabeth's reign saw the flourishing of navigation manuals, and the rebuilding of Dover Harbour and the working of Cumberland mines overseen by the Privy Council.²⁷ In the Elizabethan metropolis, as Deborah Harkness has shown, new lines of inquiry and invention were much sought after, and elite administrators, their informants, learned men, merchants, skilled craftsmen and foreigners rubbed shoulders, negotiating patronage and investment for alchemy, mining, and hydrostatics among others.²⁸

Letters patent became an established means for encouraging innovations. They had long been used by English monarchs for conferring privileges. Berne and Venice had used them to protect technical ingenuity in the early fifteenth century, and, according to Mario Biagioli, this trend was 'soon followed by the Hapsburg and Spanish Empires, the Netherlands, and England'.²⁹ It was first taken up in England to encourage the immigration of foreign workers skilled in glassmaking in 1552 and

Michael Leslie and Timothy Raylor (eds.), *Culture and Cultivation in Early Modern England: Writing and the Land* (London: Leicester U.P., 1992), 15-34.

²⁶ Thirsk, *Economic Policy and Projects*, p. 13.

²⁷ Eric H. Ash, *Power, Knowledge, and Expertise in Elizabethan England* (Baltimore: Johns Hopkins U.P., 2004).

²⁸ Deborah Harkness, *The Jewel House: Elizabethan London and the Scientific Revolution* (New Haven: Yale U.P., 2007), chap. 4. See also Felicity Heal and Clive Holmes, 'The Economic Patronage of William Cecil', in Pauline Croft, (ed.), *Patronage, Culture and Power: The Early Cecils* (New Haven: Yale U. P., 2002), 199-229.

²⁹ Mario Biagioli, 'From Print to Patents: Living on Instruments in Early Modern Europe', *History of Science*, 44 (2006), p. 140 (see also pp. 169-70 (n. 9-12) which provide an extensive bibliography).

then those skilled in mining and refining of metals in 1554. After Elizabeth succeeded to the throne in 1558, William Cecil (whom she appointed as a secretary of state) promoted the systematic use of the patent 'for the sole making of a new product' and 'for the sole use of a new technique'.³⁰

A number of factors encouraged promoters to emphasise their public service when applying for patents. Promoters often had to compete for patronage, and present their schemes to elite listeners and investors in an attractive light;³¹ Christian humanism was influential among the ruling class who were often among patrons and investors;³² patents for inventions were exempted from the Statute of Monopoly on the ground that they would 'not [be] contrary to law, nor mischievous to the State, [. . .] or hurt of trade, or generally inconvenient.'³³ Thus, while economic initiatives were driven by a multitude of public and private interests, the rhetoric of commonwealth and (godly) public service became a strong undercurrent in the promotion of economic innovations and improvement.³⁴

Although would-be patentees stressed their service to the public, the combination of four developments made grants of monopolies highly controversial. Firstly, once new economic schemes became successful native industries, the

³⁰ Thirsk, *Economic Policy and Projects*, p. 52; Lien Bich Luu, *Immigrants and the Industries of London, 1500-1700* (Aldershot: Ashgate, 2005), p. 64.

³¹ Cf. Heal and Holmes, 'Economic Patronage of William Cecil', p. 222; Stewart, *Rise of Public Science*, pp. xxxiii, 393.

³² For the impact of humanism on the self-presentation of Elizabethan 'expert-mediators', see Ash, *Power, Knowledge, and Expertise*, pp. 12-16, 213-14. For intellectual history accounts, see Margo Todd, *Christian Humanism and the Puritan Social Order* (Cambridge: CUP, 1987); Markku Peltonen, *Classical Humanism and Republicanism in English Political Thought 1570-1640* (Cambridge: CUP, 1995).

³³ 21 Jac. 1, c. 3. See also Bacon's speech on monopolies in Hartley (ed.), *Proceedings*, vol. 3, p. 372.

³⁴ For examples see Chapter One.

government started granting patents not only to encourage the introduction of new industries, but also with the ulterior motive of raising revenue. This was because, as Joan Thirsk has suggested, 'the customs receipts from foreign imports of these same articles fell', and because promoters of new schemes tried to 'forestall criticism' by offering fees or 'a percentage of their profits to offset any loss that might be incurred in custom revenues.'³⁵ Secondly, by the 1580s, the majority of patents were being granted to courtiers in order to reward them, although they had little to do with technical aspects of production. Cecil, who became Lord Treasurer in 1572 and embarked on a policy of retrenchment, seems to have encouraged such grants. When these courtiers were granted patents (sometimes on behalf of artisans, but always with the prospect of a share in the profits), they often vigorously exercised the legal force of letters patent, using agents and informers to collect fines and even drive competitors out of business.³⁶ Patents were thus being abused to enrich figures at court. Thirdly, patents now began to be used for devising economic regulations, devolving their implementation to those who had proposed them. As Ian Archer has explained, 'Rather than claiming the benefit of new processes of invention patentees now obtained their grants on the basis of allegations of abuses in existing industries which would receive regulation by the patentee.'³⁷ This provoked many complaints. The protection of genuine inventions certainly continued, but patents were now granted also for spurious 'inventions', 'mysteries', and 'improvements' to empower the patentee to regulate an entire industry. Fourthly, essentially *financial* schemes

³⁵ Thirsk, *Economic Policy and Projects*, pp. 57-58.

³⁶ Thirsk, *Economic Policy and Projects*, pp. 59-60.

³⁷ Ian Archer, 'The London Lobbies in the Later Sixteenth Century', *Historical Journal*, 31 (1984), p. 32. See also Thomas Brugis, *A discovery of a projector* (1641), sig. B2-[B2v].

came to be proposed and granted patents. Some, like a tonnage duty for ships passing the Channel and the new licensing of inns, taverns, and ale-houses, were devised in the 1570s in order to fund the rebuilding of Dover Harbour, while others, like the discovery of 'surrounded grounds' which the mathematician and MP Thomas Digges proposed in about 1570, were intended to raise revenues for the crown.³⁸ As William Hyde Price noted, the patent system 'was being given an unprecedented extension'.³⁹

Monopolists and patentees attracted criticism at least from the 1570s, and repeatedly thereafter. As the 1603 proclamation put it, the 'too large extending' of royal prerogative led to great 'abuse' and 'hinderance to multitudes of people'.⁴⁰ The early Stuarts issued proclamations against such abuses in 1603, 1610, 1621, 1623, and 1639.⁴¹ For reasons that are not entirely clear, these proclamations did not use the term 'projector' to denounce the abuse. But James declared in his parliamentary speech in 1609 that all lawful sovereigns were '*to be bound themselves within the limits of the Lawes, and they that perswade them to the contrary, are [. . .] Projectors, Vipers, and Pests*'.⁴²

³⁸ See Frederick C. Dietz, *English Public Finance, 1558-1641* (2nd ed., London: Frank Cass, 1964), pp. 44-47; Joan Thirsk, 'The Crown as Projector on its Own Estates, from Elizabeth I to Charles I', in R. W. Hoyle (ed.), *The Estates of the English Crown, 1558-1640* (Cambridge: CUP, 1992), pp. 312-14.

³⁹ William Hyde Price, *The English Patents of Monopoly* (Boston: Houghton Mifflin, 1906), p. 9.

⁴⁰ *Stuart Royal Proclamations*, eds. James F. Larkin and Paul L. Hughes (2 vols, Oxford: Clarendon, 1973, 1983), vol. 1, p. 11.

⁴¹ *Stuart Royal Proclamations*, vol. 1, pp. 11-14; *Commons Debates 1621*, eds. Wallace Notestein, Frances Helen Relf, and Hartley Simpson (7 vols, New Haven: Yale U.P., 1935), vol. 7, Appendix B, pp. 491-96; *Stuart Royal Proclamations*, vol. 1, pp. 511-19; 568-70, vol. 2, pp. 673-76. See also Elizabeth's 'golden speech', in T. E. Hartley (ed.), *Proceedings in the Parliaments of Elizabeth I* (3 vols, Leicester: Leicester U. P., 1981), vol. 3, pp. 288-97, 412-14. See also Chapter One for a survey of projecting activities under the early Stuarts.

⁴² James's speech is in William Prynne, *An humble remonstrance to his maiesty, against the tax of ship-money* (1641), p. 39 [recte p. 65]. There is little evidence to suggest that plantation and trading companies were attacked as 'projects' before the speculation boom of

This brief overview suggests that new ‘projects’ could not only be schemes for setting up new industries, but also schemes for improving tax collection, for social and economic regulation, or (as we shall see) for poor relief. An individual scheme could be a mixture of these features, and the term ‘project’ thus covered a wide range of economic, fiscal, and social welfare activities. Moreover, this overview also indicates that monopolists’ abuse of royal patents was one of the pervasive policy concerns of the early Stuarts. This was the period in which the pejorative image of the ‘projector’ became widespread, and started to influence the conduct of promoters. Distrust of the monopolist is particularly important for this thesis because it fed into the understanding of the ‘projector’. And crucially, it kept coming back in subsequent decades and thereby influenced how promoters organised their schemes. Tracing this long-term influence of distrust of the monopolistic ‘projector’ exemplifies one of the ways in which my thesis takes distrust seriously and examines its impact upon the concrete practices of innovation.

Historiography

When economic history had begun to take shape as an academic discipline in the early twentieth century, some historians discussed economic ‘projects’ promoted under the early Stuarts. We shall first survey these various accounts that had teleological tendencies. We shall then see how Joan Thirsk and others came to revise these interpretations. I will point out that uncritical attitudes to the concepts of ‘project’ and ‘projector’ have persisted despite such revisions. By surveying literary studies as well as social and economic history accounts of economic innovations, I

the 1690s. See, for example, Theodore K. Rabb, *Enterprise and Empire: Merchant and Gentry Investment in the Expansion of England, 1575-1630* (Cambridge, Mass.: Harvard U.P., 1967).

will suggest that more recent accounts have focused attention on certain periods in the seventeenth and early eighteenth centuries, and have examined economic innovations in isolation from innovations in areas such as public finance and social welfare. I will end the review by suggesting that we need a critical approach to the notions of ‘project’ and ‘projector’. Only by doing so, will we be able to overcome these chronological and thematic fragmentations and develop a more integrated understanding of economic innovations.

Many scholars in the early twentieth century tended to view the ultimate demise of early Stuart ‘projects’ as a cornerstone of economic freedom and eventual industrialisation. William Hyde Price concluded that the “projecting” spirit gave birth to some monstrous and artificial schemes’ and ‘culminated in failure’, but added that it had ‘some indirect consequences’.⁴³ The ‘corruption and exploitation’ that thrived under early Stuart monopoly policy ‘taught the crown the necessity of finding other forms of bounty for favorites.’ In the legal and constitutional sphere, the ‘permanent outcome’ of monopolists’ encroachments upon liberties and privileges ‘was the triumph of [economic] freedom.’⁴⁴ The link between monopolies, government intervention, and economic stagnation seemed self-evident.⁴⁵ Studying the salt industry, Edward Hughes argued that ‘the first condition of healthy industrial growth was the exclusion of the parasitic entourage of the Court’.⁴⁶ Speaking of controversial monopoly grants to London corporations under Charles I, George

⁴³ Price, *Patents of Monopoly*, pp. 129, 131.

⁴⁴ Price, *Patents of Monopoly*, p. 132.

⁴⁵ Price, *Patents of Monopoly*, p. 130; George Unwin, *Industrial Organization in the Sixteenth and Seventeenth Centuries* (2nd ed., London: Frank Cass, 1957), p. 194.

⁴⁶ Edward Hughes, *Studies in Administration and Finance, 1558-1825* (Manchester: Manchester U.P., 1934), p. 36.

Unwin maintained that 'If such a system could have been maintained, the Industrial Revolution would never have happened', a view Christopher Hill found convincing as late as in 1980.⁴⁷ These historians thus took the negative stereotype of the destructive 'projector' at face value, and interpreted the projectors' demise as a step towards economic modernity.

Others, by contrast, portrayed schemes for economic innovations as the precursors of modern capitalism. H. M. Robertson looked at the 'plantations, fen drainage, mining operations and projects of all sorts' that flourished from the late Elizabethan reign.⁴⁸ Many of them, he admitted, 'were fraudulent or piratical' and 'all' driven by 'the spirit of gain', but, he concluded, the 'business projector [. . .] brought into being a new philosophy of business and paved the way for modern large-scale capitalistic enterprise.'⁴⁹ In this reading, the stereotype of the projector and his nefarious 'wiles' signalled the emerging spirit of capitalism.⁵⁰ 'The profit motive', J. W. Gough disagreed, 'has never been more than part of the incentive of the entrepreneur'. But Gough too highlighted the historical contribution of innovators, this time by celebrating individual talent: the entrepreneur – though stigmatised as the 'projector' – was 'the individual whose energy, and willingness to assume risks and responsibilities, enabled an enterprise to be launched'. He was thus

⁴⁷ George Unwin, *The Guilds and Companies of London* (London: Methuen, 1908), p. 328; Christopher Hill, *The Century of Revolution 1603-1714* (2nd ed., London: Routledge, 1980), pp. 21-28, at p. 28.

⁴⁸ H. M. Robertson, *Aspects of the Rise of Economic Individualism: A Criticism of Max Weber and his School* (New York: Kelley&Millman, 1959), [first published in 1933], p. 190.

⁴⁹ Robertson, *Rise of Economic Individualism*, pp. 192-93, 189-90. See also idem, 'Sir Bevis Bulmer: A Large-scale Speculator of Elizabethan and Jacobean Times', *Journal of Economic and Business History*, 4 (1932), p. 100.

⁵⁰ Robertson, *Rise of Economic Individualism*, p. 192.

'a typical leader of the Industrial Revolution'.⁵¹ This line of interpretations thus treated projecting activities, not their demise, as the embodiment of economic modernity.

So historians of the early twentieth century like Price, Unwin, Hughes, and Robertson were concerned in a somewhat teleological fashion with describing the emergence of economic freedom, 'economic individualism', and the industrial revolution, and tended to jumble early Stuart concrete 'projects' with negative stereotypes about them. Coleman has issued a convincing critique of such teleological accounts:

The temptation to resort to hyperbole [. . .] to detect in sixteenth- and seventeenth-century England an 'industrial revolution'; or to feel oneself present at the unearthing of the roots of modern, materialistic industrial civilization: such delights need to be resisted.⁵²

Early Stuart England, according to Coleman, was simply catching up with economically more advanced Continental rivals. Moreover, the criticism of early Stuart patent policies, in Linda Peck's words, 'came not from doctrines of free trade but from the opposition' of those whose livelihood was threatened by patentees.⁵³

By far the most important revision of the teleological accounts of Elizabethan and early Stuart projecting activities has been Joan Thirsk's work culminating in her *Economic Policy and Projects* (1978). Although she has not engaged explicitly with the historiography of this topic her work has clearly reversed earlier dismissals of the

⁵¹ J. W. Gough, *The Rise of the Entrepreneur* (London: Batsford, 1969), pp. 289, 15. See also B. A. Holderness, *Pre-Industrial England: Economy and Society 1500-1750* (London: Dent, 1976), chap. 6.

⁵² Coleman, *Economy of England*, p. 88.

⁵³ Linda Livy Peck, *Court Patronage and Corruption in Early Modern England* (London: Unwin Hyman, 1990), p. 159.

early Stuart 'projector' as 'synonymous with rogue and speculator', and as detrimental to industrial development.⁵⁴ And she has done so without celebrating 'economic individualism' or the projector as the 'typical leader of the Industrial Revolution' as Robertson and Gough had done. Instead, Thirsk has drawn attention to the growth of new rural industries and the cultivation of new commercial crops during the seventeenth century. The dazzling list of goods she mentions is worth quoting:

Whereas cloth had dominated exports in the sixteenth century, it had to share a place in the seventeenth century [. . .] with miscellaneous home-produced wares, originally designed for the home market, such as knitted woollen stockings, knitted caps, felt hats, iron cooking pots, iron frying pans, knives, sword blades, daggers, nails, pins, glass bottles, globes, earthen pots, and copper wares, not to mention some of the specialized products of farms and market gardens, such as saffron and hops.⁵⁵

At the outset, attempts to produce them were 'modest' and many 'projects' proved abortive. But these items came to appear in lists of exported goods, and Gregory King's estimate of national wealth at the end of the seventeenth century indicated that nine percent of total agricultural production was devoted to new industrial crops like dyes, hemp, and flax, and commercial fruits and vegetables.

They effected a redistribution of wealth: geographically – as new industries and new crops in agriculture introduced fresh employment and new commercial attitudes into dark, neglected corners of the kingdom – and socially – as cash flowed in new channels to reach more of the labouring classes at the very bottom of the social scale.⁵⁶

Eventually, Thirsk has argued, 'the truth of the matter dawned upon the political economists', teaching them 'new attitudes towards labour and labour-intensive enterprises'. Thus, seemingly modest activities led to the 'development of a

⁵⁴ Thirsk, *Economic Policy and Projects*, p. 27.

⁵⁵ Thirsk, *Economic Policy and Projects*, p. 2.

⁵⁶ Thirsk, *Economic Policy and Projects*, pp. 8, 2

consumer society.⁵⁷ Thirsk has attracted a host of revisions because her account too neatly described the period 1540-1580 as 'the constructive', and 1580-1601, 1601-1624 as 'the scandalous' phases.⁵⁸ Yet over all, Thirsk's account has made a clear departure from previous interpretations. Economic initiatives which began as improbable 'projects' are significant not because they triggered the emergence of economic freedom or economic individualism, but because in the long-run they helped change learned opinion about labour and labour-intensive goods, and, more importantly for this thesis, because they contributed to the growth of certain economic sectors.

This is a powerful argument with which few historians seem to disagree. I would argue, however, that we are yet to redress uncritical attitudes towards contemporary terminologies, something recent studies have inherited from the early twentieth-century predecessors. To begin with, for all its virtues, Thirsk's analysis paid little attention to early modern public understandings of the 'projector'. 'Scandals about projects', she declared, 'were but the scum on the surface'.⁵⁹ 'If London sometimes appears to command most attention in the history of projects because the scandal of monopolies made most noise there, it is in distant regions of the country that we must look for the more impressive evidence of their constructive

⁵⁷ Thirsk, *Economic Policy and Projects*, p. 8, 141-48 (quotation from p. 8).

⁵⁸ For qualification, see David Harris Sacks, 'The Countervailing of Benefits: Monopoly, Liberty, and Benevolence in Elizabethan England', in Dale Hoak (ed.), *Tudor Political Culture* (Cambridge: CUP, 1995), pp. 273-74; Keith Fairclough, 'A Successful Elizabethan Project: the River Lea Improvement Scheme', *Journal of Transport History*, 3rd ser., 11 (1998), 54-65; Luu, *Immigration and the Industries*, chap. 3.

⁵⁹ Thirsk, *Economic Policy and Projects*, p. 11.

economic consequences.’⁶⁰

Historians in other subfields have not explored the terms ‘project’ and ‘projector’ critically either. Historians of economic thought have tended to focus on issues like the balance of trade, coinage, and usury, giving only passing reference to the ‘projector’ and their ‘projects’.⁶¹ This is perhaps because few seventeenth- and eighteenth-century contemporaries discussed ‘projectors’ systematically in the way they did other issues like the balance of trade. Studies of particular individuals and speculative companies are very useful, and I will be drawing liberally upon them.⁶² But the frame of their discussion is not necessarily suited to a systematic investigation of the categories by which contemporaries conceptualised and promoted schemes for economic innovations and improvement. Studies of particular social groups, like ‘entrepreneurs’ or the ‘business community’ as J. W. Gough and Richard Grassby have chosen to call them, are equally informative. Yet, in imposing these categories, ones that were not used at the time, they have projected backwards

⁶⁰ Thirsk, *Economic Policy and Projects*, pp. 105, 154, 160, at p. 160.

⁶¹ J. A. W. Gunn, *Politics and the Public Interest in the Seventeenth Century* (London: Routledge, 1969); A. O. Hirschman, *The Passions and the Interests: Political Arguments for Capitalism before Its Triumph* (Princeton: Princeton U.P. 1977); Joyce Oldham Appleby, *Economic Thought and Ideology in Seventeenth-Century England* (Princeton: Princeton U.P., 1978); Lars Magnusson, *Mercantilism: the Shaping of an Economic Language* (London: Routledge, 1994); Donald Winch, *Riches and Poverty: An Intellectual History of Political Economy in Britain, 1750-1834* (Cambridge: CUP, 1996); Andrea Finkelstein, *Harmony and the Balance: An Intellectual History of Seventeenth-century English Economic Thought* (Ann Arbor: University of Michigan Press, 2000). But see a brief discussion of ‘English concepts designating entrepreneurial activity before Adam Smith’ in Bert F. Hoselitz, ‘The Early History of Entrepreneurial Theory’, *Explorations in Entrepreneurial Theory*, 3 (1951), pp. 200-205.

⁶² For example, J. W. Gough, *Sir Hugh Myddelton: Entrepreneur and Engineer* (Oxford: Clarendon, 1964); Thomas, ‘Thomas Neale’; A. J. G. Cummings, ‘The York Buildings Company: A Case Study in Eighteenth Century Corporation Mismanagement’ (Ph. D thesis, University of Strathclyde, 1981); Christine Gerrard, *Aaron Hill: The Muse’s Projector 1685-1750* (Oxford: OUP, 2003); Ted McCormick, ‘Sir William Petty, Political Arithmetic, and the Transmutation of the Irish, 1652-1687’ (Ph. D thesis, Columbia University, 2005); Leng, *Benjamin Worsley*. The list, of course, becomes much longer if we include studies of alchemists and medical practitioners.

the economist Joseph Schumpeter's concept of entrepreneur: a talented individual capable of breaking economic routines and bringing about long-term economic change.⁶³ So, for example, Grassby has concluded that the seventeenth-century businessman was 'committed to change and oriented towards growth', an implicit, but unmistakable Schumpeterian depiction.⁶⁴ Accounts like this run the risk of anachronism, and of analyses that 'might actually reveal more about the lenses through which scholars and contemporaries have looked at and judged particular phenomena than about the properties of the phenomena themselves.'⁶⁵

By contrast, a host of historians and literary scholars have implied that negative representations of the 'projector' fairly accurately reflected the economic initiatives described as 'projects' at the time. This assumption has old roots. 'A study of the leading characters in *The Devil is an Ass*', Unwin declared, 'would be by far the best introduction to the economic history of the period'.⁶⁶ 'As Jonson depicts them', the literary historian Leah S. Marcus has suggested more recently, 'all the grand designs

⁶³ Joseph A. Schumpeter, *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*, tr. Redvers Opie (Cambridge: Mass.: Harvard U.P., 1961), pp. 65-66, 74. This is a translation of the 1926 second German edition.

⁶⁴ Richard Grassby, *The Business Community of Seventeenth-century England* (Cambridge: CUP, 1995), pp. 411-12; Gough, *Rise of the Entrepreneur*, pp. 12, 290, 291 (n. 3). Recall also Gough's Schumpeterian depiction of the 'entrepreneur' quoted earlier, which highlights their 'energy, and willingness to assume risks and responsibilities'. For significance of Schumpeter in business history, see Geoffrey Jones and R. Daniel Wadhvani, 'Entrepreneurship and Business History: Renewing the Research Agenda', Harvard Business School Working Paper: 07-007 (2006), pp. 3-6.

⁶⁵ The quotation is from a recent discussion of the use of the category of 'inventors' in the first Victorian edition of the *DNB*. See Christine MacLeod and Alessandro Nuvolari, 'The Pitfalls of Prosopography: Inventors in the *Dictionary of National Biography*', *Technology and Culture*, 47 (2006), p. 774.

⁶⁶ George Unwin, *Studies in Economic History: The Collected Papers of George Unwin* (London: Macmillan, 1927), p. 330. See also Robertson, *Rise of Economic Individualism*, p. 192.

of the City financiers are equally mad and fantastical'.⁶⁷ The 'playwright acknowledges that the world of Jonsonian comedy, *like the urban society it mirrors*, is irremediably corrupt.'⁶⁸ It is clearly not the prime aim of literary historians to explore the concrete details of projecting culture, but we surely need to establish a better understanding of the relationship between projecting activities and their representations than the equation of representations and reality.

Other literary studies have avoided hinting unqualified links between literary types and reality. But their discussions have tended to focus, often too closely, on the most mundane and conventional aspects of the projector stereotype: their greed, fantasy, duplicity, and excessive ambition. So, according to Julie Sanders, the projector Merecraft in Jonson's *Devil is an Ass* was 'a dangerous juncture of greed, conscience-free ambition, fraud and overweening energies, with little personality to balance this out.'⁶⁹ 'The virtuous triangle of love and trust between Wittipol, Manly, and Frances Fitzdotterel [in *Devil is an Ass*] is in diametric opposition to the "diabolic" scheming and self-interest elsewhere in the play.'⁷⁰ In the eighteenth century, J. M. Treadwell suggests, an 'eccentric' like Defoe 'might still plead for the existence of the "honest" projector who aimed only at a just profit for his schemes; but for the public generally the projector was a simple fraud whose projects were cheats and whose profits came from preying upon unwary investors.'⁷¹ 'The term

⁶⁷ Leah S. Marcus, *The Politics of Mirth: Jonson, Herrick, Milton, Marvell, and the Decline of Old Holiday Pastimes* (Chicago: University of Chicago Press, 1986), p. 101.

⁶⁸ David Riggs, *Ben Jonson, A Life* (Cambridge, Mass.: Harvard U.P., 1989), p. 244 (my emphasis).

⁶⁹ Julie Sanders, *Ben Jonson's Theatrical Republics* (Basingstoke: Macmillan, 1998), p. 119.

⁷⁰ Richard Dutton, 'Jonson's Satiric Styles', in Richard Harp and Stanley Stewart (eds.), *The Cambridge Companion to Ben Jonson* (Cambridge: CUP, 2000), p. 69.

⁷¹ J. M. Treadwell, 'Jonathan Swift: The Satirist as Projector', *Texas Studies in Literature*

Project [. . .] possessed connotations of fantasy and unfulfillability', John Christie has noted.⁷² MacLeod has recently shown that until at least the later eighteenth century the reputation of the 'inventors' was very much tainted by the negative stereotype of 'the projector' as 'calculating swindlers and cheats'.⁷³ These accounts collectively suggest that the negative image of the projector as a cheat and conman persisted. My account in Chapter One will substantiate this with numerous examples. However, focusing on this mundane aspect of the projector stereotype runs the risk of neglecting a more specific aspect of the stereotype that was concerned with the perversion of the public good and private interests – something of which Defoe and Cary were acutely aware. This element of distrust should not be neglected because the abuse of political authority backed by the language of the public good was precisely what made early Stuart 'projectors' most socially and politically divisive.⁷⁴

If literary studies have depicted the stereotype of the projector as a banal equivalent of the fraudster, case studies of projecting activities (including individual promoters, companies, and economic sectors) have tended only to acknowledge the negative stereotype of the projector. William Robert Scott's monumental survey of joint-stock companies published in 1912 only briefly mentioned attacks on various controversial projects in Richard Brome's *The Court Beggar* (1640) and the anonymous *Angliae tutamen* (1695).⁷⁵ The classic works of Keith Horsefield and P.

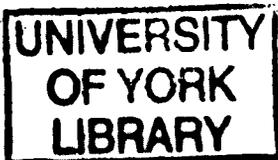
and Language, 17 (1975), p. 444.

⁷² John Christie, 'Laputa Revisited', in Christie and Shuttleworth (eds.), *Nature Transfigured*, p. 58.

⁷³ MacLeod, *Heroes of Invention*, p. 39. See also Julian Hoppit, *The Land of Liberty? England 1689-1727* (Oxford: Clarendon, 2000), p. 337.

⁷⁴ See Chapter One.

⁷⁵ Scott, *Joint-stock*, vol. 1, pp. 140, 331.



G. M. Dickson did use the terms ‘project’ and ‘projector’, but did not explore their meanings in any depth.⁷⁶ In a similar way, Maximillian E. Novak has recently acknowledged that ‘the word “project” [. . .] had a distinctly unsavoury connotation’ during the long eighteenth century, ‘being associated with unscrupulous schemes for getting money’.⁷⁷ But instead of exploring the complexity of negative stereotypes, the volume he has edited has imposed its own broad definition of ‘project’ as a ‘spirit of age’: ‘the spirit of the projector – the belief that human thought and action could transform society – was a vital force for change.’⁷⁸

Because historians have not developed an integrated approach to the concepts ‘project’ and ‘projector’, the conventional account of economic innovations in seventeenth- and eighteenth-century England have often treated early Stuart monopolies and later Stuart joint-stock companies in isolation, and discussed these *economic* initiatives (organised in different forms) independently from innovations in other kinds of activities such as *welfare provision* and *public finance*, initiatives early modern contemporaries often conceptualised as ‘projects’. We will first look at the chronological fragmentation.

Early Stuart historians often lump ‘projectors’ and ‘monopolists’ together as a problem of royal patronage and end their discussion with the outbreak of the Civil War.⁷⁹ Yet with the conquest of Ireland and overturning of the old political order,

⁷⁶ See below.

⁷⁷ Maximillian E. Novak, ‘Introduction’, in Maximillian E. Novak (ed.), *The Age of Projects* (Toronto: University of Toronto Press, 2008), p. 3.

⁷⁸ Novak, ‘Introduction’, p. 7 (see also p. ix-x).

⁷⁹ See Thirsk, *Economic Policy and Projects*, chaps. 3-4; Peck, *Court Patronage*; Cramsie, *Kingship and Crown Finance*; Michael Zell, ‘Walter Morrell and the New Draperies Project, c. 1603-1631’, *Historical Journal*, 44 (2001), 651-75; Stephen Pumfrey and Frances

‘the Commonwealth and Protectorate government provided a potentially attractive political climate for projectors.’⁸⁰ As Charles Webster has shown in his *Great Instauration*, the outbreak of the Civil War fostered an unprecedented wave of schemes for innovation and reform in virtually every sphere of social life, attempts in part inspired by versions of millenarianism.⁸¹ If early twentieth-century historians saw the march towards economic modernity at the outbreak of the Civil Wars, Webster has set an alternative framework by contending that ‘the adoption of an apocalyptic framework by the Puritans was not the occasion for wild behaviour, bizarre speculation or withdrawal from social realities.’⁸² Instead, he has argued, the period witnessed the emergence of recognisably modern scientific practices, such as the aversion to secrecy, the use of experimental methods, and methodical and open transmission of knowledge. As we shall see in Chapter Two, however, the scholarship on the mid-century reform has rarely considered the fact that the mid-century reformers were deeply concerned with the danger of being compared

Dawbarn, ‘Science and Patronage in England, 1570-1625: A Preliminary Study’, *History of Science*, 42 (2004), 137-88. Studies touching upon ‘projects’ across the seventeenth century have also tended to focus on the early Stuarts. See Victor Morgan, ‘Some Types of Patronage, Mainly in Sixteenth- and Seventeenth-Century England’ in Antoni Maćzak (ed.), *Klientelssysteme im Europa der Frühen Neuzeit* (München: Oldenbourg, 1988), 91-115; Linda Livy Peck, *Consuming Splendor: Society and culture in seventeenth-century England* (Cambridge: CUP, 2005), chap. 2. Exceptions include, along with studies of particular industries, Slack, *From Reformation to Improvement*; Mark Jenner, “‘Another epocha’? Hartlib, John Lanyon and the Improvement of London in the 1650s’, in Mark Greengrass, Michael Leslie, and Timothy Raylor (eds.), *Samuel Hartlib and Universal Reformation* (Cambridge: CUP, 1994), 343-56; Lindsay Sharp, ‘Timber, Science, and Economic Reform in the Seventeenth Century’, *Forestry*, 48 (1975), 51-79; Leng, *Benjamin Worsley*.

⁸⁰ Mark Greengrass, ‘The Projecting Culture of Samuel Hartlib and His Circle’, (unpublished conference paper for ‘Publicists and Projectors in Seventeenth-Century Europe’, Wolfenbüttel, 1996), no pagination. I am grateful to Professor Greengrass for sending me his paper.

⁸¹ Charles Webster, *The Great Instauration: Science, Medicine and Reform 1626-1660* (2nd ed. with new Preface, Oxford: Peter Lang, 2002).

⁸² Webster, *Great Instauration*, p. xxxi.

with stereotypical Caroline ‘projectors’. My study will add to existing accounts by showing how the reforming initiatives of Hartlib and others took shape in direct response to existing negative stereotypes about the projector.

Schemes for economic innovations continued to emerge after the Restoration, in response to events such as the king’s return, the 1666 Great Fire, and the Second Anglo-Dutch War. As for this post-Restoration period, much of the scholarly attention has been paid to the Royal Society and its Fellows.⁸³ According to Larry Stewart, their activities were characterised by ‘longstanding wariness of projectors’.⁸⁴ This brief acknowledgement seems exceptional; few scholars have explored how such wariness may have influenced the promotion of economic and technological innovations in and outside the Royal Society. The lack of critical attention to the projector stereotype has triggered something of a domino effect. Because historians working on the mid-century have been oblivious to the extent to which the avoidance of stereotypes preoccupied the contemporary reformers, it has

⁸³ It is impossible to do adequate justice to this fertile field of study in a footnote. But in addition to works cited above, see also Reginald Lennard, ‘English Agriculture under Charles II: The Evidence of the Royal Society’s “Enquiries”’, *Economic History Review*, 4 (1932), 23-45; Michael Hunter, *Science and Society in Restoration England* (Cambridge: CUP, 1981), chap. 4; idem, *Establishing the New Science: The Experience of the Early Royal Society* (Woodbridge: Boydell, 1989), chap. 3; Mayling Stubbs, ‘John Beale, Philosophical Gardener of Herefordshire Part II. The Improvement of Agriculture and Trade in the Royal Society 1663-1683’, *Annals of Science*, 46 (1989), 323-63; Robert Iliffe, ‘Material Doubts: Hooke, Artisan Culture and the Exchange of Information in the 1670s London’, *British Journal for History of Science*, 28 (1995), 285-318. Recent works have begun to explore economic and technological schemes outside the Royal Society. See, for example, Sarah Barter Bailey, *Prince Rupert’s Patent Guns* (Leeds: Royal Armouries Museum, 2000); Marika Keblusek, “‘Keeping It Secret’: the Identity and Status of an Early-modern Inventor”, *History of Science*, 43 (2005), 37-56; S. R. Ratcliff, ‘Samuel Morland and his Calculating Machines c. 1666: the Early Career of a Courtier-inventor in Restoration England’, *British Journal for History of Science*, 40 (2007), 159-79. For the Ordnance Office and its relation to expert knowledge, see Frances Willmoth, ‘Mathematical Science and Military Technology: The Ordnance Office in the Reign of Charles II’, in J. V. Field and Frank A. J. L. James (eds.), *Renaissance and Revolution: Humanists, Scholars, Craftsmen, and Natural Philosophers in Early Modern Europe* (Cambridge: CUP, 1993), 117-31.

⁸⁴ Stewart, *Rise of Public Science*, p. 15.

been difficult to discuss how such concerns persisted or changed after the Restoration. Tracing the practices of innovation and stereotypes about them *both before and after the Restoration*, therefore, will be a crucial task. This thesis does this. In so doing, it suggests not only that the aversion to being compared with early Stuart monopolists continued to shape promoters' behaviour after the 1660s, but also that the advocacy of the state-led universal reformation – something that had been perfectly acceptable in the mid-century – fell out of favour and came to be subtly avoided after the Restoration.

There were numerous economic initiatives after the 1690s, and contemporaries discussed these 'projects' very prominently. A typical example is Defoe's assertion in 1697: 'the past Ages have never come up to the degree of Projecting and Inventing [. . .] which we see this Age arriv'd to'. He even dubbed his era the '*Projecting Age*'.⁸⁵ Some critical attention has been given accordingly. The early 1690s saw 'a spectacular outburst of patenting', writes Christine MacLeod. Patents for invention not only protected new inventions, but also began to give them prestige, and patentees 'promoted both worthless "projects" and a few technically valuable experiments' to would-be investors.⁸⁶ This 'flood of projects', Larry Stewart has remarked, provided an 'opportunity for the patronage of natural philosophers', for they could promote their knowledge and expertise by claiming that they could help distinguish which technological schemes would be bogus ones relying upon spurious 'inventions'.⁸⁷

⁸⁵ Defoe, *Essay upon projects*, p. 1.

⁸⁶ Christine MacLeod, 'The 1690s Patents Boom: Invention or Stock-Jobbing?', *Economic History Review*, new ser., 39 (1986), p. 550.

⁸⁷ Stewart, *Rise of Public Science*, pp. 309-310.

My findings will confirm that patents began to acquire a greater publicity function, and that natural philosophers could promote themselves as reliable ‘experts’ in the burgeoning stock market. As has been hinted earlier, however, there is a danger of depicting the stock market and Defoe’s *‘Projecting Age’* too neatly as a nascent capitalistic culture in which unscrupulous ‘projectors’ conned the public, only to be policed by more conscientious philosophers. By placing this period in the long-term perspective, my thesis will complicate this picture. Promoters of (what were from our perspective) ‘private’ joint-stock companies asserted their willingness to serve the public as Elizabethan and early Stuart courtiers had done. Such assertions were so pervasive and so problematic that, company promoters were repeatedly accused of (unreliably and deceitfully) claiming to serve the public.

Julian Hoppit has observed that the ‘nature of business enterprise in this [post-1688] period has been addressed in a rather fragmented way.’⁸⁸ It should by now be clear that a similar fragmentation has been taking place chronologically. Thirsk, whose case studies of economic initiatives are largely derived from the first half of the seventeenth century, has acknowledged that, ‘carried along on the rising tide, financial and trading projects increased in number and recklessness [from the 1680s], only to be shattered with the South Sea Bubble in 1720.’⁸⁹ As Mark Greenglass has observed, ‘Thirsk’s analysis leaves us with something of a “black hole” as to what happened to projecting in between the “scandalous phase” [of the early Stuarts] and the later seventeenth century.’⁹⁰ Speaking of the ‘numerous abortive ventures’ and the scandals they caused in the early eighteenth-century,

⁸⁸ Hoppit, *Land of Liberty*, p. 537.

⁸⁹ Thirsk, *Economic Policy and Projects*, p. 10.

⁹⁰ Greenglass, ‘Projecting Culture’, no pagination.

Stewart has done little more than refer to Thirsk's *Economic Policy and Projects* and acknowledge that we 'should not assume that these were new fears; they were not'.⁹¹ Steve Pincus has also acknowledged that projecting activities in Defoe's '*Projecting Age*' were not unrelated to the 'sixteenth- and early-seventeenth-century projects that Thirsk describes'. But he has implicitly dismissed the need to bring them together and study them as part of a long-term history.⁹² This thesis will fill this chronological gap by taking the notions of 'project' and 'projector' seriously. Doing so will help us develop a long-term account, one that helps us understand both early Stuart administration of monopolies, and commercial enterprises from the later seventeenth century, as different kinds of projecting that shared some fundamental characteristics.

Such an integrated approach will also enable us to overcome another analytical problem, thematic compartmentalisation. This problem is most conspicuous in studies exploring the post-1688 period. Significantly, historians of social welfare and public finance as well as those exploring economic initiatives in the stock market have written of 'projects'. So, for example, Paul Slack has documented how early eighteenth-century 'projectors and philanthropists' competed to fill 'gaps in welfare provision'.⁹³ The Nine Years War made revenue raising an urgent task. Accordingly, as P. G. M. Dickson remarks in his paradigmatic *The Financial Revolution*, because 'the revenue departments were as yet too small and too inexperienced in these matters', the Commons and the Treasury considered proposals from individuals like

⁹¹ Stewart, *Rise of Public Science*, p. 390.

⁹² Steve Pincus, 'A Revolution in Political Economy?', in Novak (ed.), *The Age of Projects*, p. 118, p. 135 (n. 18).

⁹³ Slack, *From Reformation to Improvement*, p. 124.

William Paterson and Sir John Foch, ‘enthusiastic projectors anxious to convince parliament of the soundness of their ideas.’⁹⁴ Keith Horsefield has described the establishment of the Bank of England in 1694 as ‘the outcome of one of a long series of projects for the capitalisation of future revenues’.⁹⁵ Prior to the 1690s, few ‘enthusiastic projectors ever succeeded in putting their [paper credit] schemes into practice’.⁹⁶ Especially between 1694 and 1695, in parliament ‘the “country” leaders were willing to consider many an alternative form of taxation’, a condition that ‘encouraged projectors to come forward with their schemes.’⁹⁷ These historians have used the terms ‘project’ and ‘projector’ because contemporaries frequently did when promoting banks and taxation schemes as well as economic schemes.⁹⁸ This signals that there were some underlying commonalities in diverse economic, financial, social welfare schemes which contemporaries dubbed ‘project’. This overlap, however, has been little explored. Although my thesis will not explore these diverse spheres of activities in equal depth, it will offer the first account of the commonalities between them. In doing so, it will identify long-term changes in the sphere of economic projects and stereotypes about them, and also clarify why economic innovations were so often promoted as public service.

⁹⁴ P. G. M. Dickson, *The Financial Revolution in England: A Study in the Development of Public Credit, 1688-1756* (London: Macmillan, 1967), p. 52.

⁹⁵ J. Keith Horsefield, *British Monetary Experiments, 1650-1710* (Cambridge, Mass.: Harvard U.P., 1960), p. 102.

⁹⁶ Horsefield, *British Monetary Experiments*, p. 125.

⁹⁷ Colin Brooks, ‘Projecting, Political Arithmetic and the Act of 1695’, *English Historical Review*, 97 (1982), p. 48.

⁹⁸ See Chapter One.

Management of Distrust: A New Approach

The key to a more integrated understanding of economic innovations is to pay closer attention to the terms ‘project’ and ‘projector’. My thesis does this by exploring various ways in which these terms were put to use. Doing so will allow us to investigate how *concrete practices* of innovations and *ideas about them* shaped one another. We can begin this endeavour by reappraising the richness of these terms. In Latin *proiecere* could mean ‘to throw forward’ and ‘to display’, and *jactare* to ‘discuss, to boast of’ and to ‘make an ostentatious display’.⁹⁹ These shades of meaning were not lost when Samuel Butler satirised the projector as ‘a Man of *Forecast*’, whose ‘Talent consists in Quacking and Lying, which he calls answering of Objections, and convincing the Ignorant’, or when Addison identified a projector in a coffeehouse by ‘the Extravagance of his Conceptions, and the Hurry of his Speech’.¹⁰⁰ According to this layer of meaning, projecting activities were a specific class of schemes, ones that required vigorous promotion with claims of forthcoming benefits (financial or otherwise) in order to solicit investment or political support.

More specifically, in the alchemical tradition the ‘powder of projection’ meant the ‘Philosopher’s Stone’, ‘a *Powder* supposed to have the Virtue of changing any quantity of’ base metals ‘into a more perfect one, as Silver or Gold’.¹⁰¹ This alchemical sense of the word ‘projection’, the (doomed) attempt at creating wealth

⁹⁹ *OED*, project, v., jactation, n..

¹⁰⁰ Samuel Butler, *Samuel Butler 1612-1680: Characters*, ed. Charles W. Daves (Ohio: Press of Case Western Reserve University, 1970), p. 167; *Spectator*, ed. Donald F. Bond (5 vols, Oxford: Clarendon, 1965), vol. 1, no. 31, p. 127.

¹⁰¹ Ephraim Chambers, *Cyclopaedia: or an universal dictionary of art and science* (2 vols, 1728), vol. 2, p. 887. See also Kimberly Latta, “‘Wondring Ghosts of Trade Whymsies’”: Projects, Gender, Commerce, and Imagination in the Mind of Daniel Defoe’, in Novak (ed.), *The Age of Projects*, pp. 141-42; Pamela Smith, *The Business of Alchemy: Science and Culture in the Holy Roman Empire* (Princeton: Princeton U.P., 1994), p. 269.

abundantly, was not lost in uses of the term 'project'. Thomas Fuller suggested that 'disaffected' readers of the alchemist George Ripley's tracts 'demand whether these *gates* [i.e., twelve alchemical operations] be let in, or let out the *Philosophers Stone*, seeing *Projection* the last of all, proves but a *Project*, producing nothing in effect.'¹⁰²

Of course, we do not need to assume that the term 'project' was always used in pejorative sense. Promoters like Hartlib and those under Charles II often described their schemes as 'improvement', which originally meant to 'raise rents', but also 'to make a thing better in it self' or 'to bring a thing to perfection by many trials, or essays' towards the mid- and later seventeenth century.¹⁰³ It was possible to speak of 'project' or 'projection' in somewhat neutral fashion, perhaps in relation to this cluster of positive connotations of improvement. Even so, technological and economic 'projects' were frequently stereotyped as ostentatious promises of new invention in its traditional sense *inventio*, which would discover the hidden laws or 'mysteries' for unlocking a key for *cornu copia*.¹⁰⁴

Negative connotations of the terms 'project' and 'projector' did not necessarily reflect practices of innovation. Rather, they can be compared with what social psychologists have called *social representations*, 'a form of symbolic knowledge

¹⁰² Thomas Fuller, *The history of the worthies of England* (1662), p. 204.

¹⁰³ Henry Cockeram, *The English dictionarie: or, An interpreter of hard English words* (1623); Stephen Skinner, *A new English dictionary shewing the etymological derivation of the English tongue, in two parts* (1691); Edward Phillips, *The new world of words: or, universal English dictionary* (6th ed., 1706). See also Slack, *From Reformation to Improvement*, pp. 81, 96 (fn. 89); Andrew McRae, *God Speed the Plough: the representation of agrarian England, 1500-1660* (Cambridge: CUP, 1996), pp. 136-37.

¹⁰⁴ In this sense, art and nature, hence invention and discovery, were not distinct. For a relevant discussion of medieval and early modern philosophy, see William R. Newman, *Promethean Ambitions: Alchemy and the Quest to Perfect Nature* (Chicago: University of Chicago Press, 2004).

intrinsic to public life'.¹⁰⁵ Social representations, in order 'to make the unfamiliar familiar, connect to everyday experience and established belief', thus simplify the subject matter for easier comprehension. So, for example, a study of public understanding of genetically modified food across Europe in the 1990s has found that the public understood modified tomatoes according to the familiar trope of the 'contagious and monstrous'.¹⁰⁶ Similarly, in the later seventeenth century, 'all of the church's enemies, atheists, Dissenters and papists, were associated in sin'.¹⁰⁷ In the same way, when early moderns first confronted the abuse of monopoly grants and other economic privileges the categories of 'project' and 'projector' enabled them to *anchor* the abuse – something that resulted from the Elizabethan patronage – onto the existing trope of the alchemical 'projection' that pretended to generate unlimited wealth. Crucially, the 'resulting trope does not need to be "correct" or "accurate" in the sense of scientific truth.' Speaking of the image of monstrous GM foods, Wagner and Kronberger suggest that such an image 'just needs to be *good to think*'.¹⁰⁸ Accordingly, we may suggest, images of the sinful papist or the fraudulent 'projector' generated reverse images of the values a society should uphold, such as

¹⁰⁵ Sandra Jovchelovitch, 'Social Representations, Public Life, and Social Construction', in Kay Deaux and Gina Philogène (eds.), *Representations of the Social: Bridging Theoretical Traditions* (Oxford: Blackwell, 2001), p. 165.

¹⁰⁶ Wolfgang Wagner and Nicole Kronberger, 'Killer Tomatoes! Collective Symbolic Coping with Biotechnology', in Deaux and Philogène (eds.), *Representations of the Social*, pp. 148, 150-151, 161. Public understanding of satellite space technology in the 1950s and nuclear energy in the 60s are also mentioned as parallel examples.

¹⁰⁷ John Spurr, *The Restoration Church of England, 1646-1689* (New Haven: Yale U.P., 1991), p. 235. The concept of social representation seems to help understand the negative stereotypes of the Dissenter and the Catholic.

¹⁰⁸ Wagner and Kronberger, 'Killer Tomatoes', p. 150. For the concept of *anchoring* and the theory of social representation more generally, see Sandra Jovchelovitch, *Knowledge in Context: Representation, Community and Culture* (London: Routledge, 2007), esp. pp. 59, 111, 119.

unimpaired piety or honest business enterprises.¹⁰⁹ As has been noted earlier, the negative stereotype of the projector was multi-layered. Like scientists who understand the intricacy of biotechnology, for example, Francis Bacon examined petitions and suits for economic proposals as Attorney General and later as Lord Chancellor, and thus knew well that more than just cheating was at stake in nefarious 'projects'. 'Many ill Matter and Projects are undertaken; And Private *Sutes* doe Putrifie the Publicque Good. Many Good Matters are undertaken with Bad Mindes [. . .] that intend not Performance.'¹¹⁰

Taking the stereotypes of 'project' and 'projector' this way will enable us to clarify how these terms had both generic pejorative connotations (i.e., fraud, deception, and so on), and more specific ones (i.e., the perversion of the public good and the imposition of governmental authority as a consequence). More importantly, we no longer have to conflate stereotypes with the practices of innovation. The approach will help us move beyond the question of whether particular figures like Jonson's *Merecraft* accurately described concrete practices or alluded to certain individuals. Instead, my thesis explores how promoters of economic innovations transformed (and failed to transform) their business practices in order to avoid being stereotyped. It will also consider how negative stereotypes about them came to be reinvented, reflecting these transformations in concrete activities.

Indeed, some studies have warned us against considering projecting activities and stereotypes in isolation from each. Jonathan Barry has shown that provincial doctors publicised previous successes of their innovative cures. They thereby tried to

¹⁰⁹ Cf. Spurr, *Restoration Church of England*, p. 236, 277-78.

¹¹⁰ Bacon, *Essayes*, p. 150 (cf. p. 75 'Of Innovations'). See also Cramsie, *Kingship and Crown Finance*, p. 215; Peck, *Court Patronage*, p. 161.

have 'their claims validated' in order to fend off 'public scepticism'.¹¹¹ Eric Ash and Stephen Johnston have studied Elizabethan mining and harbour-construction, and suggested that promoters fashioned themselves carefully so that they could win the trust of cautious Privy Councillors.¹¹² Deborah Harkness's study of ambitious Elizabethan economic and scientific proposals also confirmed the necessity for different parties to evaluate credibility.¹¹³ It is conceivable that the negotiation of credibility Ash, Johnston, and Harkness have studied involved negotiation of certain stereotypes. Indeed, studying the exploitation of natural philosophy in the marketplace in the early eighteenth century, Larry Stewart has suggested that 'by revealing false projects' and by distancing themselves from 'the farce of the bubble', natural philosophers like John Theophilus Desaguliers lent credibility to their textbooks, public lectures and ultimately to the application of natural philosophy in the commercial sphere.¹¹⁴ More strikingly, studying new wartime taxation schemes proposed after the 1688 revolution, Colin Brooks has conjectured that 'Writers had not only to deny the fact of projecting; but also to cleanse themselves and others of guilt by association.'¹¹⁵ Thus, it is conceivable that once the criticism of Elizabethan monopolists established the negative stereotype of the 'projector', its circulation subsequently made it urgent for promoters to avoid being stereotyped so that they

¹¹¹ Jonathan Barry, 'Publicity and the Public Good: Presenting Medicine in Eighteenth-century Bristol', in W. F. Bynum and Roy Porter (eds.), *Medical Fringe and Medical Orthodoxy, 1750-1850* (London: Croom Helm, 1987), p. 35.

¹¹² Stephen Johnston, 'Making Mathematical Practice: Gentlemen, Practitioners and Artisans in Elizabethan England' (Ph. D thesis, University of Cambridge, 1994); Ash, *Power, Knowledge, and Expertise*.

¹¹³ Harkness, *Jewel House*, chap. 4.

¹¹⁴ Stewart, *Rise of Public Science*, pp. 393, 39.

¹¹⁵ Colin Brooks, 'Taxation, Finance, and Public Opinion, 1688-1714' (Ph. D thesis, University of Cambridge, 1970), p. 221.

could establish their trustworthiness and schemes' credibility.

For many, such negotiation was indispensable. It was partly because promoters were 'drawn from almost every social group except the very poorest', and did not have adequate means to implement their ambitious schemes.¹¹⁶ But equally importantly, schemes for economic innovations and improvement such as river navigation or mining schemes often required huge overheads and legal assistance for implementation. Defoe's 'true definition of a Project' highlighted just such a need for financial and political support: a project was 'a vast Undertaking, too big to be manag'd'.¹¹⁷ Cressy Dymock was one of the numerous promoters whose grandiose schemes could not be implemented without extensive assistance. Writing to Boyle (whom he probably did not know well) Dymock appealed that he required extensive support in order to materialise his comprehensive package of economic improvement that covered agriculture, architecture, brewing, motion engines, distillation, and shipbuilding:

Note that none of these things can bee donne without sufficient numbers of Mechanicall hands and tooles allwayes in readines, nor without good authority, power, & Command, nor without sufficient encouragemet, and Money and fitt [materials?].¹¹⁸

Boyle's response does not seem to survive; but he would have asked: Is this man offering unreliable 'projects'? The need for negotiation and the danger of being distrusted were therefore conceivably greater in projecting activities than, for

¹¹⁶ Holderness, *Pre-Industrial England*, p. 149. See also Thomas, 'Thomas Neale', p. xvii. For contemporary literary evidence, see Thomas Heywood, *Machiavel. As he lately appeared to his deare sons, the moderne proiectors* (1641), sig. [B3v-B4]; John Wilson, *The projectors. A comedy* (1665), p. 5.

¹¹⁷ Defoe, *Essay upon projects*, p. 20.

¹¹⁸ Royal Society Archives, London, Boyle Papers, RB/1/40/28 (previously BP 40, fol. 92), Dymock to Boyle, 16 January 1678.

example, in the expansion of merchants' business within well-established trading networks, something they could achieve through what economic historians call 'backward integration'.¹¹⁹ Both current research and a glimpse into projecting culture therefore urge us to move beyond the acknowledgement of pejorative connotations and explore how promoters managed (or failed to manage) distrust of the projector. We will therefore not only examine negative stereotypes but also juxtapose them with the actual process of promoting and implementing schemes for economic innovations and improvement.

The Aims and Structure of the Thesis

In order to explore the history of projecting, however, we must first overcome its fragmentation into separate periods and gain a bird's eye view of the subject. I will bring together the growth of projecting activities in the sixteenth century, through the collapse of the Personal Rule to the financial revolution in the early eighteenth century. In doing so, I will pay close attention not only to a history of projecting activity but also to the emergence of the terms 'project' and 'projector' as stereotypes. The historiography seems to suggest that projecting activities changed their appearance from early Stuart monopolies and grants, to public finance, capitalist enterprises, and public science of post-1688 England. What were, if anything, the underlying characters of the seemingly diverse activities that contemporaries construed as 'projects'? What precisely changed between the early seventeenth and early eighteenth centuries both in their conceptualisation and execution? Chapter

¹¹⁹ David Hancock has found that British merchants operating in the Atlantic trade often carried out backward integration 'first by adding trading on their own accounts to commission merchandising, and later by producing or managing the goods that they had hitherto only brokered or transported.' See *idem, Citizens of the World: London Merchants and the Integration of the British Atlantic Community, 1735-1785* (Cambridge: CUP, 1995), p. 81.

One, Contexts and Contours of Projecting Culture, will address these questions, drawing heavily upon the *English Short Title Catalogue* and a database of all patents for invention granted between 1617-1716. It will establish the seventeenth and early eighteenth centuries as a crucial period in the history of projecting, a period in which the practices of innovation and stereotypes about them began to influence one another, a period characterised not only by the ubiquitous assertion of public service and distrust of such assertion, but also by changing modes of projecting activity from early Stuart monopolies to post-1688 commercial enterprises.

Put simply, economic projects *in action* involved four stages: *conceptualising* a scheme with particular audience(s) in mind, *promoting* it to potential backers through various media, *negotiating and modifying* the original scheme based on responses from the potential backers and critics, and *executing* it, mobilising both human and financial resources under complex circumstances. Chapters Two to Five will explore all of these aspects through four case studies, placing particular emphasis on certain stages according to the availability of evidence.

Throughout these chapters, my overall goal is to explore the interaction between practices of projecting and stereotypes about them, and in doing so critically engage with two competing interpretations of projecting culture that are implicit in the historiography. The first, often evoked by some of the historians and literary scholars I have discussed above, associates projecting culture with a Mercraft-like spirit of capitalism. As Defoe put it bluntly, '*the World's a Cheat, the Knaves carry it on, and he's a Fool that has no Hand in it.*'¹²⁰ Few scholars would go so far as to endorse such a picture of commercial culture. Yet it has often been implied that the advocacy

¹²⁰ Daniel Defoe, *Defoe's Review*, ed. Arthur Wellesley Secord (22 vols, New York: Columbia University Press, 1938), vol. 8, bk. 21, no. 191, p. 765.

of economic innovations was driven by transhistorical forces of competition, profiteering, and possibly even greed. If we adopt this line of interpretation, we would by the same token assume that people like Defoe and Cary were exceptions. This thesis will demonstrate, however, that few promoters of economic innovations could afford to ignore the danger of being stigmatised as the ‘projector’ and therefore dismissed as unreliable.

The second line of interpretations likens the culture of projecting to the working of natural philosophers who could (some historians argue) secure their intellectual exchange through ‘intensely-trusting relationships’.¹²¹ Steven Shapin’s *A Social History of Truth* (1994) has most boldly presented this argument. Commenting on the practices of natural philosophy and culture of civility (which he takes as the central feature of seventeenth-century England) Shapin has controversially argued for the ‘power of the “credible person”’ to forge consensus:

Cultural silence about the identification of the credible person was not a sign of ignorance but of immense knowledgeability. Participants “just knew”: who a credible person was. They belonged to a culture that pointed to gentlemen as among their society’s most reliable truth-tellers, a culture that associated gentility, integrity, and credibility.¹²²

Others have sought to qualify Shapin’s thesis on the ground that those from non-gentle social strata could be trusted.¹²³ Yet such objections seem to reinforce

¹²¹ Steven Shapin, et al., ‘Gently Boyle’ [Review Symposium on *A Social History of Truth*], *Metascience*, 6 (1994), p. 1 (a remark by Theodore M. Porter).

¹²² Shapin, *Social History of Truth*, p. 241.

¹²³ Shapin, et al., ‘Gently Boyle’, pp. 13-16 (Barbara Shapiro); Peter Lipton, ‘The Epistemology of Testimony’, *Studies in the History and Philosophy of Science*, 29 (1998), 1-31; Palmira Fontes da Costa, ‘The Making of Extraordinary Facts: Authentication of Singularities of Nature at the Royal Society of London in the First Half of the Eighteenth Century’, *Studies in History and Philosophy of Science*, 33 (2002), p. 279; Barbara J. Shapiro, ‘Testimony in Seventeenth-Century English Natural Philosophy: Legal Origins and Early Development’, *Studies in History and Philosophy of Science*, 33 (2002), p. 255. See also idem, *A Culture of Fact: England 1550-1720* (Ithaca: Cornell U.P., 2000), chap. 6.

Shapin's central point that an intense trusting relationship was secured one way or another to enable sustained collaboration among participants. Similar arguments have also been advanced in history of technology. Studying the role that the MP and mathematician Thomas Digges played in the rebuilding of Dover Harbour, Johnston has suggested that the Privy Councillors trusted Digges as one of the 'particularly valued and expert advisors' because of his noble birth, connections, education in mathematics and geometry, and above all because of his skilful self-presentation as a superior, public-spirited gentleman.¹²⁴ Ash has gone so far as to suggest that the success of the Dover scheme was 'in large part because the former [Privy Council] found an expert whom they trusted.'¹²⁵ Highlighting promoters' capacity to win trust, this line of interpretations seems to support an account of projecting culture that is strikingly different from the one which foregrounds Mercraft-like greed in capitalist culture. Like natural philosophers who displayed disinterestedness and civility and cogently came to agree upon 'matters of fact', promoters of innovations skilfully displayed their competence and trustworthiness, capable of convincing their backers of 'whom to trust'.

I will argue that we need to reconcile these pictures of projecting culture, for many promoters were neither entirely disinterested (thus credible) nor fraudulent (therefore unreliable). Many promoters had clear material interests in pursuing particular economic schemes, and such elements of gain made it difficult for promoters and backers alike to trust each other without a degree of reservation. But this did not mean that there was a complete lack of trust between individuals. We must explore how economic initiatives were promoted and undertaken despite the

¹²⁴ Johnston, 'Making Mathematical Practice', p. 268.

¹²⁵ Ash, *Power Knowledge, and Expertise*, pp. 74, 82, 85, at p. 85.

negative stigmatisation that *constrained* promoters and backers. This is crucial precisely because negative stereotypes began to spread very rapidly from the early seventeenth century. My thesis will thus complement the discussions about promoters' self-fashioning that may have *enabled* them to build trusting relationship. It will also demonstrate that many promoters of economic innovations, like Defoe and Cary, were anxious about their reputation.

As I have implied, exploring case studies will also enable us to explore the *implementation* of schemes for economic innovations and improvement. Historians of science and technology have argued that practical applications and the emphasis on utility were vital for the propagation of natural and mechanical philosophy.¹²⁶ If this was the case, it is conceivable that promoters of economic innovations also had to assert the practicality of their schemes, and demonstrate it through *actual implementation*. As Thomas Fuller declared in 1655: 'the best *Argument* to prove that a thing may be done, is actually to do it.'¹²⁷ Recent studies of promoters of economic and technological innovations do mention concrete details as *contexts*, but they seem to be primarily concerned with the identity of promoters and their self-fashioning.¹²⁸ I will argue that self-fashioning was crucial for promoters when they sought to persuade their listeners of their competence and trustworthiness. But, I will also argue that it was just one aspect of complex processes through which

¹²⁶ Stewart, *Rise of Public Science*; Jacob and Stewart, *Practical Matter*, p. 8, chap. 5.

¹²⁷ He was commenting on the draining of Cambridgeshire fens tried in the 1430s. Thomas Fuller, *The history of the University of Cambridge* (1655), p. 82 [appended to idem, *The church-history of Britain from the birth of Jesus Christ until the year M.DC.XLVIII endeavoured by Thomas Fuller* (1655), with separate pagination].

¹²⁸ For example, see Ash, *Power, Knowledge, and Expertise*; Keblusek, 'Keeping Secret'; Ratcliff, 'Samuel Morland'; C. E. McGee, 'The Presentment of Bushell's Rock: Place, Politics, and Theatrical Self-Promotion', *Medieval and Renaissance Drama in England*, 16 (2004), 31-80.

schemes could be brought into action. We must broaden our analysis to examine implementation of schemes in which more mundane issues such as managing conflicting interests and securing liquidity also came into play.

Chapters Two to Five are chronologically arranged, but also incorporate a thematic chapter to develop an in-depth analysis of the negotiation and implementation of a large-scale undertaking. The temporal gap in the historiography has determined the chronological scope of my case studies. They focus on the seven decades from the end of 1630s to the end of the 1700s, from the end of Charles's Personal Rule to the flourishing of Defoe's *'Projecting Age'* at the height of the financial revolution.

Chapter Two examines pamphlets and letters of Samuel Hartlib and other millenarian reformers in order to explore how they promoted schemes for improving husbandry from the end of Charles's Personal Rule through to the Civil Wars and the Interregnum. The negative stereotype of the 'projector' was used intensively during 1641-1642 to criticise monopolists who had been granted privileges under Charles, and although monopolistic patents were rarely granted afterwards, the term continued to circulate as the stereotype about monopolists and economic innovators. Hartlib, Dury and others recognised the need to avoid being stereotyped. But, as we shall see, they did not agree as to how. Like some of the early Stuart patentees, Cressy Dymock and others claimed the possession of secrets and 'mysteries' which they promised to put to use for the public good if they obtained the necessary financial and political backing. Others like Gabriel Plattes highlighted their financial independence and the open-communication of their knowledge in a bid to avoid being stereotyped as the monopolistic 'projector'. Hartlib and others supported these husbandry promoters employing different modes of projecting. Paying close

attention to the ongoing circulation of negative stereotypes will thus enable us to reconsider some of the seemingly 'modern', 'scientific' practices as part of the strategies reformers patchily adopted in order to distance themselves from the negative images of the early Stuart 'projector'.

Chapter Three examines post-Restoration projecting culture, focusing chiefly upon the promotion of new schemes for horticulture after 1660. The restored regime was anxious to portray itself as the legitimate protector of economic prosperity. Some promoters, including Dymock, were no longer readily trusted primarily because they continued to draw upon modes of projecting (like monopolistic patents and other ambitious schemes) that required the imposition of extensive governmental authority, methods that could expose both promoters and the state to distrust of the destructive 'projector'. Disintegration of the Hartlib circle, and the changing reputation of millenarianism meant that men like Dymock would no longer receive sustained support as part of a millenarian mission. The chapter will contrast the frustration of some of these promoters with the relative success of other promoters like John Evelyn and Andrew Yarranton, who promoted their horticultural schemes by minimising the need for government imposition upon existing economic interests. Conceptualising economic projects this way not only made them less prone to being distrusted as destructive 'projectors', but also enabled them to win support from virtuosi and possibly even from the government.

Chapter Four is a thematic interlude. The chapter first places the history of river navigation into that of projecting. Then, by exploring bills, petitions, letters, and business records, it considers how the first new inland navigation scheme after the Restoration, the one on the river Stour, was negotiated and modified under the Cavalier parliament, and was later implemented in the Midlands. Noting that the

negotiation of promoters' competence and trustworthiness only played limited roles, the chapter shows that the safeguarding of regional economic interests and the maintenance of credit-lines respectively attracted much attention in these legislative and implementation stages of the undertaking. The chapter thus demonstrates that it is necessary to move beyond the discussion of promoters' self-presentation if we are to understand complex processes of turning a 'project' into reality.

Chapter Five pushes the chronology to the 1690s. By this time unincorporated joint-stock companies became the dominant form of projecting. Economic projects became commodities to be sold and sought after; the issue of the imposition of governmental authority – a specific reason for distrusting the monopolistic projector – accordingly became largely irrelevant. After establishing this, the chapter examines letters, pamphlets, and a diary of Sir Humphrey Mackworth, who directed the Mine Adventure. It shows that this Tory gentleman conceptualised and promoted his seemingly 'private' enterprise as godly public service (as Hartlib and Dymock and others had done before him). It also suggests that periodicals and pamphlets reinvented the stereotype to ridicule company promoters like him as 'projectors' who would fleece investors. The Conclusion brings together findings from the case studies and raises questions for future research.

Overall, the approach I have adopted has meant giving primacy to certain 'hotspots' in the history of projecting and weaving them into a broader history while omitting close examination of issues such as the patronage of the early Stuarts and James II, and the impact of the 'Exclusion Crisis' and the 1688 revolution upon projecting culture, topics that would surely deserve fuller investigation. Nor does this thesis offer an exhaustive account of multiple factors that would explain why projecting

activities evolved from monopolies to joint-stock companies in the way in which they did. What it does offer is the first long-term account of the projecting culture that not only identifies enduring features of projecting both as practice and as stereotypes, but also charts how both evolved in the seventeenth and early eighteenth centuries.

As each chapter will indicate, some of the promoters we will encounter left significant legacies and are worth our attention in their own right. For example, some of Hartlib's and his allies' writing proved highly influential; the Mine Adventure greatly contributed to the economic development of South Wales. These cases are also deliberately chosen from within what we may call natural resource management, a group of basic domestic industries such as agriculture, horticulture, land and water transport, and mining.¹²⁹ The kind of distrust management that each case study will examine also took place in areas outside natural resource management.¹³⁰ In this thesis, however, I have chosen to focus on episodes drawn from natural resource management because they offer an ideal test ground for exploring the impact of negative stereotypes. For, land was commonly understood as the most stable and desirable form of property, and by the early seventeenth-century estate management (broadly conceived) and the maintenance of rivers and harbours were highly regarded as the exercise of civic Christian virtues.¹³¹ If the necessity to negotiate

¹²⁹ Economic importance of natural resource management will be briefly discussed in Chapter One.

¹³⁰ I have primary evidence to suggest that similar strategies were taken in other sectors such as textiles, fishing, construction, and banking.

¹³¹ For intellectual perspectives, see J. G. A. Pocock, *Virtue, Commerce, and History: Essays on Political Thought and History, Chiefly in the Eighteenth Century* (Cambridge: CUP, 1985), pp. 48, 130; Quentin Skinner, *Liberty before Liberalism* (Cambridge: CUP, 1998), pp. 93-96. For the classical inspiration for agriculture, see Thirsk, 'Making a Fresh Start'. For public significance of what 'Cicero calls the *NAVALIA*, Works pertaining to *NAVIGATION*, such as the imbankng of Rivers, making of new Cuts, Docks, Harbours, Aqueducts and the

distrust pervaded even in this relatively reputable arena, then similar pressures would have been conceivably greater in projecting activities in other spheres in lower repute, such as manufacturing, trading, and banking. So the case studies I have chosen serve as a *prima facie* representative for projecting activities more broadly, samples from which the first systematic survey can be developed. Equally importantly, many of the schemes that I will examine operated outside the realm of patenting. They will allow us to complement the discussion of the long-term picture I will delineate in the next chapter by drawing heavily upon the patent records.

like', see John Thomas, *Liberality in promoting the trade and interest of the publick display'd: A sermon preach'd at St. Mary's in Chester September 1733 on occasion of obtaining an act of parliament for making the river Dee navigable* [1733?], pp. 11-12.

CHAPTER ONE

Contexts and Contours of Projecting Culture

If there had been no projects,
Nor none that did great wrongs; [. . .]
How should we do for songs?

Witt's recreations augmented (1641), sig. [X6v]-X7.

One of the ‘nonsense songs’ published in 1641 associated ‘projects’ with ‘great wrongs’, implying, perhaps, that ‘projects’ stood for all that had gone wrong under the Personal Rule.¹ Some five decades later, songs against Jacobite ‘plots’ could still tap into the pejorative connotations of the term ‘project’. ‘There is a cursed Project, grown common in the town, | As plaguy an invention as ever yet was known: | By the *Jacobitish* Crew and the Devil else knows who, | That try their tricks, the Land to vex, and Nation to undo’.² These songs remind us that the term ‘project’ could be used in jocular or even political contexts, and that such pejorative meanings could in turn affect promoters of economic innovations. They also remind us that the negative stereotypes about projects and projectors were in flux, ‘always in the making, in the context of interrelations and actions that were themselves always in the making.’³

In this chapter, therefore, I avoid relying too much upon dictionary-like definitions, and instead explore the range of meanings of the terms ‘project’ and ‘projector’. In particular, I will examine how they varied and changed over time. I will then juxtapose the history of stereotypes with some overviews about concrete

¹ For nonsense songs, see Noel Malcolm, *The Origins of English Nonsense* (London: Fontana Press, 1998).

² *Conscience by scruples, and money by ounces; or, new fashioned scales for old fashioned money* (1697). See also *Sport upon sport; or, the Jacobite tos'd in a blanket* [1692]: ‘we in those projects were plaguely crost, | And I like a Dog in a Blanket and tost.’

³ Serge Moscovici, ‘Notes towards a Descriptions of Social Representations’, *European Journal of Social Psychology*, 18 (1988), p. 219.

economic projects, something with which historians such as Thirsk and MacLeod have been concerned. I will examine not only the distribution of projecting activities across different economic sectors, but also the way in which dominant *modes of projecting* changed from early Stuart monopolies to commercial enterprise in the early financial revolution. In doing so I will also suggest the long-term interaction between projecting as an activity and projecting as a stereotype. I conclude the chapter by demonstrating that the assertion of public service was one of the enduring features of projecting activities throughout the period. Business companies flourishing in the stock market highlighted their public service just like their predecessors had done when addressing early Stuart statesmen.

Distrust of the 'Projector': Continuity and Change

We have seen Bacon's and Cary's concern that the projector would pretend to advance the public good in order to pursue their own nefarious private gain.⁴ Their views echoed one of the defining features of the stereotype. In 1636, when controversial monopolies flourished under Charles I, Daniel Featley declared that 'Let not the Projector pretend the publike good when he intends but to robbe the riche and to cheat the poore.'⁵ Writing in the 1670s, Samuel Butler also sarcastically depicted the projector as the one who seemingly 'prefers the public Good before his own Advantage, until he has joined them both together in some Monopoly, and then he thinks he has done his Part, and may be allowed to look after his own Affairs in

⁴ See Introduction.

⁵ Daniel Featley, *Clavis mystica; a key opening divers texts of scripture* (1636), as in *OED*, projector *n.*, 1-b. See also Thomas Haywood, *Machiavel. As he lately appeared to his deare sons, the moderne projectors* (1641), sig. [A3v]; *A dialogue or accidental discourse betwixt Mr. Alderman Abell, and Richard Kilvert, the two maine projectors for wine* (1641), p. 6; *A looking-glasse for sope-patentees* (1646), pp. 3-5.

the second Place'.⁶ The anonymous author of *Angliae tutamen* asserted in 1695: 'never did Projector yet aim at any thing so much as his own particular Profit and Interest, though they always pretend the contrary.'⁷ In his tract promoting his beech-oil extracting venture, the poet Aaron Hill complained that 'this word *Project* has now become downright scandalous', because 'Tricks and Cheats dress'd up with Artifice, and cover'd with the specious Show of publick Good, or private Benefit, have tempted many, and made wild Havock among credulous People'.⁸

Despite this recurrent emphasis on the perversion of the public good, the usage of the terms 'project' and 'projector' was hardly monolithic. If more proposals for innovations and improvement tended to emerge during the periods of fiscal and economic crises, then these terms gained greater currency in these 'ages of projects', and certain aspects of their connotations became more prominent than others. In order to explore the evolution of these terms, I have searched the *English Short Title Catalogue (ESTC)*. It is by far the most comprehensive bibliography of printed books and pamphlets published in Britain and its colonies up to 1800. It includes major printed formats by which schemes for economic innovations and improvement were promoted, i.e., books, pamphlets, broadsheets, and handbills. I have counted publications that contained the words 'project(s)', and 'projector(s)' in their title-pages. Title-pages of printed publications are of course just the tip of an iceberg of early modern discourse. Title-pages of this period were, however, crammed with lines of explanations of their contents. For this reason, they often look more like

⁶ Samuel Butler, *Samuel Butler, 1612-1680: Characters*, ed. Charles W. Daves (Ohio: The Press of Case Western Reserve University, 1970), p. 167.

⁷ *Angliae tutamen: or, the safety of England* (1695), pp. 10, 13, 14 (at p. 10).

⁸ Aaron Hill, *An Account of the Rise and Progress of the Beech-Oil Invention* (1715), pp. 7-8, quoted in Christine Gerrard, *Aaron Hill: The Muse's Projector 1685-1750* (Oxford: OUP, 2003), p. 40. See also Francis Brewster, *Essays on Trade and Navigation* (1695), p. vii.

abstracts than the cover-pages of modern publications. The total number of the titles counted for each decade is shown in Figure 1.

The term 'project' appeared on title-pages from the turn of the seventeenth century without much interruption. The use of the term 'projector' soon followed as we shall see below. The earliest use of the term 'project' recorded in the *ESTC* is William Stoughton's *An assertion for truee and Christian church-policie*, containing 'sundrie projetes' of spreading 'the discipline by pastors & elders' (1604).⁹ The next one was an irrigation scheme described in 1610 as 'a project, for the great benefit of the common-wealth generally'.¹⁰ It was in 1614 that a printed proclamation first bore a phrase like a 'project of dying and dressing of broad cloathes within the kingdome'.¹¹ The *OED* suggests that the term 'project' first gained currency in the 1580s.¹² The term was soon picked up by authors and began to appear as part of book-titles.

There were significant rises in the usage of 'project' and 'projector' in the 1640s and from the 1680s onward. To begin from the latter, the three decades after 1691 saw the average of 39 pamphlets in each decade, almost double the 20 pamphlets in the 1680s, and fivefold increase compared to the average of 7.7 titles between the 1650s and 1670s. While it is somewhat difficult to explain the decline of the usage from the 1740s, we shall later see how the surge from the 1690s was connected to a series of important developments often understood as the 'financial revolution'.

⁹ William Stoughton, *An assertion for truee and Christian church-policie* (1604).

¹⁰ Rowland Vaughan, *Most approued, and long experienced water-workes* (1610).

¹¹ *By the King. A proclamation conteyning his Maiesties royall pleasure, concerning the proiect of dying and dressing of broad cloathes within the kingdome, before they be exported* (1614).

¹² *OED*, project, *n.*, 2. a: 'A planned or proposed undertaking; a scheme, a proposal'.

The sharp rise in the 1640s coincided with the explosion of printing activities in London and elsewhere from the eve of the Civil War.¹³ It was accelerated first by the opening of the Long Parliament in November 1640, and later by the abolition of the Star Chamber in July 1641 that in effect ended censorship by the Stationers' Company. The total number of publications increased threefold in the 1640s (18247 titles) from the average of the previous two decades (6015 titles).¹⁴ The surge of pamphlets with titular words 'project' and 'projector' was proportionally greater than this general trend. The number of such publications increased to 50 titles, a five-fold jump from the average of 9.5 titles in the previous two decades. While only one pamphlet was published with the word 'project' in 1639 and another with 'projector' in 1640, 19 pamphlets published in 1641 and then 12 pamphlets next year contained these terms. The use of these terms then declined: only two pamphlets were published between 1643 and 1645. Between 1641 and 1642, 31 pamphlets were published, that is to say, 62% of the decade's total number (50). This two-year period also saw a great concentration of printing activity more generally (5700 titles), but it occupied only 31% of the decade total. The *ESTC* search results therefore hint that something extraordinary was happening to projecting culture during the 1640s, but particularly in 1641 and 1642, a detail of which we shall explore shortly.

But before that, we need to discuss the emergence of the terms 'project' and

¹³ See Joad Raymond, *Pamphlets and Pamphleteering in Early Modern Britain* (Cambridge: CUP, 2003), chaps. 5-6. George Thomason's monthly acquisition of prints from 1640 is discussed in Michael Braddick, *God's Fury, England's Fire: A New History of the English Civil Wars* (London: Allen Lane, 2008), p. 153. On governmental regulation of the printing trade, see Alan Downie, 'The Growth of Government Tolerance of the Press to 1790' in Robin Myers and Michael Harris (eds.), *Development of the English Book Trade, 1700-1899* (Oxford: Oxford Polytechnic Press, 1981), 36-65.

¹⁴ John Barnard and D. F. McKenzie (eds.), *The Cambridge History of the Book in Britain, vol. IV, 1557-1695* (Cambridge: CUP, 2002), Appendix 1, Statistical tables, Table 1. Annual book production 1475-1700, pp. 782-783.

'projectors' as stereotypes. While projecting *activities* certainly began to flourish in the later sixteenth century, *stereotypes about their promoters* did not become conspicuous until the first decade of the next century. I argue that this was precisely what is reflected in the *ESTC* search results. To begin with, Tudor commentators on economic affairs like Thomas More, Thomas Becon, and Richard Morison did not comment extensively on those who sought grants for setting up new industries. Instead, they tended to focus on themes such as enclosure, the 'depopulation' it allegedly caused, and the 'covetousness' of those who failed to perform God-given duties as they were allotted to various stations of life.¹⁵ Grants of monopolies and economic regulations were sporadically criticised as early as in the 1570s.¹⁶ For example, in 1571, the Speaker Robert Bell urged to 'prohibite the eivll practises of purveiors [for woods], who takeinge under pretence of her Majestie's service what they woulde at what price they themselves like'.¹⁷ The same parliament debated a de-facto monopoly of Bristol's overseas trade by the city's Society for Merchant Venturers. Mr Young of Bristol argued that the grant had been made 'without the

¹⁵ For criticisms of enclosure and covetousness, see respectively Thomas More, *A fruteful, and pleasant worke of the beste state of a publyque weale, and of the newe ysle called Vtopuia*, trans. Ralphe Robynson (1551) sig. [C8v], [D1v]; Thomas Becon, *The Catechism of Thomas Becon*, ed. John Ayre (Cambridge: CUP, 1844), pp. 115-16. For general discussions of Tudor literature on economic issues, see Arthur B. Ferguson, *The Articulate Citizen and the English Renaissance* (Durham, N.C.: Duke U.P., 1965); Whitney R. D. Jones, *The Tudor Commonwealth, 1529-1559: A Study of the Impact of the Social and Economic Developments of Mid-Tudor England upon Contemporary Concepts of the Nature and Duties of the Commonwealth* (London: Athlone Press, 1970); Laura Caroline Stevenson, *Praise and Paradox: Merchants and Craftsmen in Elizabethan Popular Literature* (Cambridge: CUP, 1984); Neal Wood, *Foundations of Political Economy: Some Early Tudor Views on State and Society* (Berkeley: University of California Press, 1994).

¹⁶ David Harris Sacks, *The Widening Gate: Bristol and the Atlantic Economy, 1450-1700* (Berkeley: University of California Press, 1991), pp. 201, 203, 204.

¹⁷ T. E. Hartley (ed.), *Proceedings in the Parliaments of Elizabeth I* (3 vols, Leicester: Leicester U. P., 1981), vol. 1, p. 202.

consent of the Major or Commons [of the town]'.¹⁸ These criticisms are significant not only because they anticipated an enduring element of the distrust of the projector, the pretence of public service, but also because they foretold that such pretension might legitimate the imposition of governmental authority upon what were deemed inviolable rights to one's trade and properties. Crucially, however, these attacks were not based on established preconceptions about the abuse or its perpetrator. During the 1601 parliament, MPs launched unprecedented criticisms of monopolies and other grants, and repeatedly disparaged 'monopolists' and other 'bloodsuckers of the commonwealth'.¹⁹ The earliest biography of William Cecil, written by an anonymous author close to him sometime between May 1599 and March 1603, noted that Cecil wanted to support only 'reasonable' and 'lawful' 'suits to Her Majesty':

he would never recommend their suit: as some would sue for monopolies, some for concealments [of Crown lands], some for innovations against law, all which he protested against, terming them cankers of the commonwealth[.]²⁰

So, by the end of the Elizabethan reign, promoters of new schemes of all kinds were gaining a *bad reputation*. Some of them, those who obtained monopoly grants, were specifically singled out and disparaged by the new stereotype of the monopolist.²¹

The more generic negative stereotype of the 'projector' began to emerge in the 1600s. I have mentioned in the Introduction that James I compared 'projector' with 'viper' and 'pest' in 1609. In Ben Jonson's *Volpone*, performed in 1607, Sir Politick was poised to launch 'certaine projects' on 'red herrings', 'tinder-boxes', marine

¹⁸ Hartley (ed.), *Proceedings*, vol. 1, pp. 160, 202, 207, 209-211, 238, 245, 436, at p. 160.

¹⁹ Hartley (ed.), *Proceedings*, vol. 3, pp. 370-78, 381-86, at p. 375.

²⁰ *The Anonymous Life of William Cecil, Lord Burghley*, ed. Alan G. R. Smith (Lewiston, NY: Edwin Mellen, 1990), p. 108.

²¹ The first citation of the term monopolist in the *OED* is in 1601. See *OED*, monopolist, *n.*

insurance, and 'water-workes', which would make 'a fortune'.²² One of the earliest English books of characters, Joseph Hall's *Characters of vertues and vices* (1608), alluded to the courtier projector in the figures of 'The Distrustfull' and 'the Ambitious': the former 'full [. . .] of strange projects, and far-fetched constructions', who 'loves no payments but reall', while the latter 'hath projected a plot to rise' but 'never cares how to come downe'.²³ Jonson later elaborated the theme greatly in *The Alchemist* (1610) and *The Devil is an Ass* (1616).

A brief examination of *The Devil is an Ass* would help us illustrate the rich layers of negative connotations that the figure of the projector began to convey in the early seventeenth century. One of the protagonists, the projector Merecraft, was depicted as a relentless schemer. He declared 'Sir, money's a whore, a bawd, a drudge [. . .] I'll have her!'²⁴ He proposed to set up, *inter alias*, monopolies for 'making wine of raisins' (II, i, 97-110) and tooth-picks (IV, ii, 39-55). Merecraft set up a bogus 'academy for women' to teach them fashionable Spanish deportment (II, viii, 26-28), and proposed to erect the 'Office of Dependances' which would help gentlemen avoid duels (III, iii, 62-88). He also tried to swindle the main character of the play, the gullible Fizeddottrel, by drawing him and others into a bogus drainage scheme. He thus declared that he would 'drive his patent for him. | We'll take in

²² Ben Jonson, *Ben Jonson*, eds. C.H. Herford and Percy Simpson (11 vols, Oxford: Clarendon, 1925), vol. 5, pp. 91-92 (Act III, Sc. i, 44-125).

²³ Joseph Hall, *Characters of virtues and vices in two bookes* (1608), pp. 150-51, 153-54. Neither subsequent editions of Hall's *Character* nor editions of John Earle's *Microcosmographie* (first published in 1628) seem to have contained the projector stereotype. Some character books after 1641 did. For example, Thomas Brugis, *A discovery of a projector* (1641) and Haywood, *Machiavel* cited earlier. See Gwendole Murphy, *A bibliography of English Character-books, 1608-1700* (Oxford: Bibliographical Society, 1925).

²⁴ Ben Jonson, *The Devil is An Ass*, ed. Peter Happe (Manchester: Manchester U.P., 1994), p. 90 (Act II, Sc. i, line 1). In this and the next paragraph, I will cite particular acts, scenes, and lines in brackets.

citizens, commoners, and aldermen, | To bear the charge, and blow 'em off again' (II, i, 41-43).²⁵

Embedded within this generic stereotype of the projector as the conman were more specific stereotypes about those who would turn legal privileges for their own advantage while pretending to serve the public. One revealing example is Lady Tailbush in the same play. Tailbush and Merecraft were 'on a project for [. . .] venting | Of a new kind of fucus (paint, for ladies) | To serve the kingdom: where in she [. . .] hopes to get the monopoly | As the reward, of her invention' (III, iv, 48-54). When asked 'What is her end in this?', Merecraft replied: 'Merely ambition, | Sir, to grow great, and court it with the secret, | Though she pretend some other' (III, iv, 55-57).²⁶ Indeed she declared to her friend that 'If we once see it [the patent] under the seals [. . .] we will live, I' faith, | The examples o' the town, and govern it' (IV, ii, 10, 13-14). But when Tailbush was paid compliments by a stranger about her 'great undertakings', she replied with an air of modesty: 'If I can do my sex by 'em any service | I've my ends, madam' (IV, iii, 14-17). A striking contrast was therefore drawn between her greed and pretended willingness to serve the public. Lurking beneath this exploitation was the abuse of royal patents, something, as we shall see, that caused much stir in the 1630s.

So the projector stereotype proved much more versatile than that of the monopolist. For it could not only satirise all sorts of schemes (including monopolies) that were 'projected' ostensibly for the public good, but also castigate the ambitious

²⁵ Some of these schemes may have alluded to actual schemes promoted in the period. See R. C. Evans, 'Contemporary Contexts of Jonson's "*The Devil is an Ass*"', *Comparative Drama*, 26 (1992), 140-76.

²⁶ The term 'ambition' carried pejorative connotations. See *OED*, ambition, *n.* 1: 'The ardent (in early usage, inordinate) desire to rise to high position, or to attain rank, influence, distinction or other preferment'.

and the greedy more generally. This explains why the projector stereotype remained highly relevant even in the later seventeenth and early eighteenth centuries when there were few monopoly grants, but when numerous schemes for innovations and improvement emerged in the stock market, many of them claiming to serve the public. The first rise in the early seventeenth century of pamphlets bearing the titular word 'project' therefore testified to the emergence of the first enduring stereotype of economic innovators in English history.

This negative stereotype of the projector shaped the self-identity of the promoters of innovations, in a way which parallels the way in which 'Puritan' identity was constructed.²⁷ Like the Puritan, I would argue, the projector came to exist 'by virtue of being perceived to exist, most of all by their enemies, but eventually to themselves and to each other.'²⁸ So in the absence of established stereotypes, few Tudor promoters guarded themselves against the danger of being perceived as the projector. For example, Thomas Trollop, the writer of the earliest surviving printed proposal for setting up a new industry (c. 1563), spoke nothing of the suspicion his audiences (London mayor, aldermen, and the Privy Councillors) might have had of promoters like him. He instead anticipated the criticism that setting the poor on linen manufacturing could end up in neglecting 'plowe & tyllage'.²⁹ Neither the 1549 manuscript version nor the 1581 printed edition of Sir Thomas Smith's *Discourse of the Commonweal* (which Thirsk has hailed as one of

²⁷ Patrick Collinson, 'Ben Jonson's *Bartholomew Fair*: The Theatre constructs Puritanism', in David L. Smith, Richard Strier, and David Bevington (eds.), *The Theatrical City: Culture, Theatre and Politics in London, 1576-1649* (Cambridge: CUP, 1995), 157-69.

²⁸ See Collinson, 'Ben Jonson's *Bartholomew Fair*', p. 158.

²⁹ Lynn Muchmore, 'The Project Literature: An Elizabethan example', *Business History Review*, 45 (1971), pp. 486-87, at p. 487. Trollop was lobbying influential London citizens to take up his scheme and promote it to the Privy Council. The article gives the entire text of the pamphlet otherwise available only in the Kress Library at Harvard (pp. 480-87).

the earliest systematic discussions of new economic schemes) dealt at any length with pre-existing stereotypes.³⁰

In contrast, under the early Stuarts, and certainly by Charles I's Personal Rule, the stereotype of the projector clearly began to affect self-identity and conduct of promoters. In 1616, William Cockayne, the promoter of dyeing and dressing cloth, dedicated to James a (lost) play in which cloth dressers and others 'spake such language as Ben Jonson put in theyre mouthes'.³¹ In 1623, the godly reformist Thomas Scott published a pamphlet titled *The proiector*. This was a playful title as the book was about godly humanist reform. Picking upon the emerging stereotype of the dubious projector, Scott declared that 'I propound a Project more profitable, more gainefull, more necessarie': 'if now I should propound some admirable project, how to raise great summes of mony, filling the Exchequer [. . .] without drayning the Country bogges below, I should be welcome to Court'.³² Such awareness of widespread distrust separated the projecting culture after the early Stuarts from its Tudor counterparts. For the next century, as we shall see, avoiding negative stereotypes would become an integral part of projecting activities.

Even if negative stereotypes about the projector continued to affect the practices of promoters throughout the seventeenth and early eighteenth centuries, we should not suppose that the use of the terms 'project' and 'projector' was static during this

³⁰ Thomas Smith, *A Discourse of the Commonweal of This Realm of England*, ed. Mary Dewar (Charlottesville: University Press of Virginia, 1969). Richard Hakluyt did not distance himself from any negative stereotypes either when he published propaganda literature that encouraged colonial plantation. I wish to thank Professor David Sacks for this information based on his research for idem, 'Richard Hakluyt's Navigation in Time: History, Epic, and Empire', *Modern Language Quarterly*, 67 (2006), 31-62.

³¹ *CSPD 1611-1618*, p. 373.

³² Thomas Scott, *The proiector* (1623), pp. 18, 19, 21 (at p. 18).

period. In order to chart the shifting connotations of these words, therefore, I have divided the result of the *ESTC* search into three categories. The first one includes all pamphlets that used the titular words ‘project(s)’ in proposing, or commenting on, schemes of any kind. Here, I have included titles like ‘A project much desired, & of singular use for all sorts of Christians’, ‘A project for the kingdoms or cities speedy prosperity’, and ‘Remarques upon the new project of association’.³³ Within the second category fall all the works that spoke of ‘project(s)’ and ‘projector(s)’ in explicitly negative tones. This includes such phrases like ‘the moderne projectors. Divulged for the pretended good of the kingdoms of England’, and ‘strange and wonderful plots, projects, policies and stratagem’.³⁴ The third generic category includes all those that do not fall into the two previous categories. Examples include ‘the prudent plots, projects, and policies of warre’ and ‘The rise and fall of the late projected excise scheme impartially consider’d’.³⁵ This means that the third generic category does not have much analytical significance; but in any case, this category remained relatively insignificant over the period (Fig. 2). Figure 3 does not contain the third generic category, and thus illustrates decade-by-decade comparison of the other two categories.

This enables us to reveal the nature of the sudden surge of prints related to ‘project’ and ‘projector’ in the 1640s. It was due almost entirely to the negative use of the words ‘project’ and ‘projector’. Of the forty such pamphlets, 21 used

³³ Nicholas Byfield, *Paterne of wholesome words* (1618); Samuel Kem, *The king of kings his privie marks for the kingdoms choyce of new members; Remarques upon the new project of association: in a letter to a friend* [1646].

³⁴ Haywood, *Machiavel; The French rogue: or the life of Monsieur Ragour de Versailles* (1694).

³⁵ William Lithgow, *A true and experimentall discourse, upon the beginning, proceeding, and victorious event of this last siege of Breda* (1637); *The crisis: or, the Briton's advocate* (1733).

‘project[s]’, and 19 others ‘projector[s]’. Three sub-genres are noticeable. The first one is the particular attacks on wine monopoly concentrating on 1641 and 1642. The second is more generic denunciation of the figure of ‘projector’, especially in satirical writings. Both had been anticipated in petitions and in plays such as Shirley’s *The Triumph of Peace* (1634), Davenport’s *New Trick to Cheat the Devil* (c.1639), Brome’s *The Antipodes* (1638), and *The Court Beggar* (1640). At the climax of *Court Beggar*, for example, Sir Andrew Mendicant, the ‘old Knight, turned a projector’, came on to the stage ‘attir’d all in Patents; A Windmill on his head’, and other protagonists stripped his patents off the cloth, a symbolic act by which ‘The Projects are all cancel’d’.³⁶ The third component of the sharp rise of the terms ‘project’ and ‘projector’ in the 1640s is as a political and polemical weapon. Whereas one pamphlet spoke of ‘devilish designes and killing projects of the Society of Jesuites’, John Wildman warned his readers of the danger of ‘Putney projects [. . .] the serpentine deceit of their [readers] pretended friends in the Armie’.³⁷ These pamphlets – along with the nonsense and anti-Jacobite songs quoted earlier – exemplify how the negative stereotypes of ‘project’ and ‘projector’ sustained their currency by being impinged upon different aspects of social and political life.

At one level, the projector stereotype of the 1640s was a generic satire of the ridiculous, the deceitful or the evil. One anonymous pamphlet *Machiavel* declared: ‘he is every thing but what he should bee, *Honest*’.³⁸ Simultaneously, pretence of public service and the imposition of authority – more specific elements that had

³⁶ Richard Brome, *The court beggar a comedie* [. . .] (1653), sig. N4. [S6], [S6v].

³⁷ *Camiltons discoverie, of devilish designes and killing projects of the Society of Jesuites of later yeares* (1641); John Wildman, *Putney projects. Or the old serpent in a new forme* (1647).

³⁸ Haywood, *Machiavel*, sig. [Bv].

already been criticised in the 1570s – were also singled out for criticism. Thomas Brugis suggested in his *A discovery of a projector* (1641) that the stereotypical projector would endeavour ‘to propose the faire outside of a reformation’:

this he begins with a Petition to his Majestie, with such mighty pretences of enriching the Kingdome, that he dares most impudently to affirme that it shall bring to his Majestie [. . .] many thousands yearely; yea, and employment for all the poore people of the Realme (which how well all those late *Projects* have effected, I leave to judicious censures).³⁹

‘What effect their Project took, is known to all’, declared a printed attack on the notorious ‘Projectors for Wine’ monopoly, Alderman Abell and Richard Kilvert: ‘with what power (without pitty) they executed the force of their Patent, what charge & trouble divers of the best Vinters [. . .] were put too both by fines and commitments [i.e., imprisonment]’.⁴⁰ Another printed attack against projectors highlighted their alleged encroachment upon others’ right to their trade: ‘It was not well done of you to undo | So many poore men, of your owne trade too.’⁴¹ The projector’s encroachment upon daily life was also echoed in the Long Parliament. For example, John Culpeper denounced projectors who allegedly oppressed the public by abusing monopolies:

These, like the frogs of Egypt, have gotten possession of our dwellings, and we have scarce a room free from them: they sipp from our cups, they dip in our dishes, they sit by our fires [. . .] they have marked and sealed us from head to foote. Mr. Speaker, they will not abate us a pinne.⁴²

In short, the remarkable jump in the volume of criticism indicates that the opening of the Long Parliament and the subsequent decline of press control ‘took the lid off’ a

³⁹ Brugis, *Discovery of a projector*, sig. B2-[B2v].

⁴⁰ *A dialogue or accidental discourse betwixt Mr. Alderman Abell, and Richard Kilvert*, p. 7.

⁴¹ *The copie of a letter sent from the roaring boyes in Elizium* [. . .] (1641), sig. [A3].

⁴² Conrad Russell, *The Fall of the British Monarchies, 1637-1642* (Oxford: Clarendon, 1991), 219 (quoting John Rushworth, *Historical Collections*, vol. 3, i, pp. 33-34). Haywood’s *Machiavel* paraphrased this section of the speech. *Ibid.*, sig. [Bv].

decade of grievances under Charles's Personal Rule.⁴³ The explosion of the projector stereotype was integral to the crisis of the mid-century.

The three decades between 1651 and 1680 appear to be insignificant on Figure 3. The negative images of 'projects' and 'projectors', however, continued to circulate. Echoing much of the literature of the previous decade, Daniel Noddell published a pamphlet in 1654, 'setting forth the plot and design of Mr. John Gibbon, and his fellow-projectors, to gain a possession of the said free-holders ancient inheritance'.⁴⁴ Shortly after the Restoration, an anonymous broadsheet, *The new projector; or the priviledged cheat*, was published, announcing that 'I Am a projector that alwaies have thriv'd'.⁴⁵ The legacy of the Personal Rule certainly still conditioned the ways in which various schemes and proposals for innovation were promoted and launched.

We need to exercise caution in treating a relative rise in the 1680s. Of fourteen pamphlets that used the term 'project' to comment or propose new schemes, seven of them were concerned either with the unification of Christians or with the repeal of certain penal laws. From the 1690s the terms 'project' and 'projector' came to be used more frequently in the context of promoting (and responding to) new fiscal and economic projects. The number of pamphlets with this usage increased to 27 pamphlets in the 1690s, and reached the height of 30 in the following decade. So, for the four decades from 1691 to 1730, this neutral usage occupied 69% (100 pamphlets) of all the 145 pamphlets that had words like 'project' and 'projector' on their title-pages. This is a significant contrast to the total of 42 pamphlets (35%) in

⁴³ For a sharp analysis of Caroline plays (including those of Brome) that helped 'crystallize and shape political expectations' of the early 1640s, see Martin Butler, *Theatre and Criticism 1632-1642* (Cambridge: CUP, 1984), pp. 214-48, (quotation from p. 233).

⁴⁴ Daniel Noddell, *To the Parliament of the Commonvvealth of England, and every individual member thereof* (1654).

⁴⁵ *The new projector; or the priviledged cheat* [1662?].

the same usage, published in the period between 1601 and 1690 (119 pamphlets).

Table 1 suggests that neutral usage increased largely due to the increasing use of the term 'project' and not of 'projector'. Of 38 pamphlets of the 1690s I have examined, 27 pamphlets used terms like 'project' and 'projector' to promote and respond to proposals such as banking, fishing, and tax schemes. Twenty-five of them used the word 'project', a few of which were its variations like 'projection'. This category was the most significant factor (61%, 11 pamphlets increase) that contributed to the rise of the total number from 20 pamphlets of the previous decade. Behind these publications was, as we shall see, the vast number of joint-stock companies that were launched in the Royal Exchange, the Exchange Alley, and London coffeehouses.

These findings have both historical and analytical implications. The negative stereotypes about the 'projector' did not disappear even in the early eighteenth century. Yet unlike the early 1640s, they became more of an undercurrent of suspicion running beneath the torrent of new business schemes. Thus, as we shall see in Chapter Five, economic projects became part of consumer culture and stereotypes shifted their emphasis during the early financial revolution. Accordingly, as we shift our attention from the early seventeenth century to the early eighteenth, I will more frequently use phrases like 'economic projects' in this somewhat neutral fashion, while also speaking occasionally of 'dubious projects' promoted by unreliable 'projectors'.

Projects for Economic Innovations and Improvement: A Reconstruction from the Patent Database

Implied in the long-term evolution of the discourse about projects and projectors is a stream of new schemes proposed throughout the seventeenth and early eighteenth

centuries. What do we know about the scale of projecting activity in all its variety from economic innovations, taxation, to trade regulation? What kind of schemes for economic innovations and improvement were there during this period? In this section, I shall pursue these questions in order to delineate an overall picture of projecting activities.

Questions of evidence and methodology haunt any attempts to measure the scale of projecting activities and to identify specific economic sectors in which they emerged. Many schemes, especially the kind of rural agrarian and industrial schemes Thirsk has studied, left few tangible traces. Even so, Thirsk has convincingly linked her case studies to a larger picture of the growth of the consumer-goods industry by drawing upon evidence of the development and diffusion of new industries such as pin making and stocking knitting.⁴⁶ Such evidence, however, tells us little about the vast majority of innovative schemes that were proposals or promises, rather than *faits accomplis*. Even in fortunate cases for which substantial archival evidence survives, portions of manuscripts were often lost by misfortunes and carelessness. In the case of manuscripts of private individuals and corporate bodies, the very authors often chose to destroy some of their materials as ‘of little importance’.⁴⁷ For these reasons, we cannot take it for granted that the present shape and contents of, say, the papers of Lionel Cranfield, the Hartlib Papers, or the papers of the ‘Georgicall Committee’ of

⁴⁶ Joan Thirsk, *The Rural Economy of England: Collected Essays* (London: Hambledon Press, 1984), 259-85 (esp. pp. 259-60), 287-307.

⁴⁷ For this and other reflections on the archive as an historically contingent entity, see Michael Hunter, ‘Introduction’, in idem (ed.), *Archives of Scientific Revolution: The Formation and Exchange of Ideas in Seventeenth-Century Europe* (Woodbridge: Boydell, 1998), 1-20. For the selective destruction of manuscripts as tools for manipulating literary legacy, see Michael Millgate, *Testamentary Acts: Browning, Tennyson, James, Hardy* (Oxford: Clarendon, 1992).

the Royal Society, reflect the overall range and scale of their activities.⁴⁸

In tackling these problems we can take some hints from seventeenth-century virtuosi like Hartlib, Petty, and Evelyn who faced similar problems when they explored what kinds of potentially beneficial economic schemes there had been before them. Hartlib, for example, developed a kind of ‘check-list’ of published compendia of useful inventions and curiosities. Hartlib, Evelyn and others collected manuscripts of the Elizabethan inventor Hugh Plat.⁴⁹ These virtuosi, Mark Greengrass suggests, sought to bring together ‘constructive’ aspects of projecting activities by collecting ‘a dispersed common stock of potentially realizable treasure.’⁵⁰ Compiling exhaustive ‘histories of trades’ was another method that seventeenth-century virtuosi pursued, and its limitations should give us some lessons.⁵¹ Petty, for example, hoped that the attempt would culminate in a series of books, ‘wherein all the practised wayes of getting a Subsistance and whereby Men raise their fortunes, may be at large declared’. With the help of these volumes, ‘Beggars [. . .] and even Theeves and Robbers [. . .] shall be set on work, barren grounds made fruitfull, wet dry, and dry wet’, ‘all vile Materials shall be turned to

⁴⁸ John Cramsie, *Kingship and Crown Finance under James VI and I, 1603-1625* (Woodbridge: Boydell Press, 2002), pp. 53-59; Mark Greengrass, ‘Archive Refractions: Hartlib’s Papers and the Workings of an Intelligencer’ in *Archives of Scientific Revolution*, 35-47; Reginald Lennard, ‘English Agriculture under Charles II: The Evidence of the Royal Society’s “Enquiries”’, *Economic History Review*, 4 (1932), 23-45.

⁴⁹ For Plat, see Deborah E. Harkness, *The Jewel House: Elizabethan London and the Scientific Revolution* (New Haven: Yale U.P., 2007), chap. 6.

⁵⁰ Mark Greengrass, ‘The Projecting Culture of Samuel Hartlib and His Circle’, (unpublished conference paper for ‘Publicists and Projectors in Seventeenth-Century Europe’, Wolfenbüttel, 1996), no pagination.

⁵¹ A good survey on this theme remains Walter E. Houghton Jr. ‘The History of Trades: Its Relation to Seventeenth-Century Thought: As Seen in Bacon, Petty, Evelyn, and Boyle’, *Journal of the History of Ideas*, 2 (1941), 33-60. See also, K. H. Ochs, ‘The Royal Society of London’s History of Trades Programme: An Early Episode in Applied Science’, *Notes & Records of the Royal Society*, 39 (1985), 129-58.

Noble uses', 'one man or horse shall do as much as three, and every thing improved to strange Advantages'.⁵² Histories of trade were never completed, although attempts to compile them continued after the Restoration. 'Its scope was too vast', Houghton Jr. remarks. Indeed, Petty expected the compiler 'to devote his whole life to this employment'.⁵³

Anyone seeking to gain an overview of projecting culture must therefore heed the warning Thirsk has issued for agricultural historians: we must 'accept the impossibility of measuring' the overall pattern 'in totally satisfactory way'.⁵⁴ For my part, I shall restrict myself to what Petty deemed 'the most pleasant and profitable' element in the whole of the histories of trade, namely, the 'History of Arts or Manufactures':

wherein the whole Processe of Manual Operations and Applications of one Naturall thing (which we call the Elements of Artificials) to another, with the necessarie Instruments and Machines; whereby every piece of worke is elaborated, and made to be what it is, unto which work bare words being not sufficient, all Instruments and tooles must be pictured, and colours added when the discriptions cannot be made intelligible without them.⁵⁵

The record of patents for inventions, which often had only vague descriptions of techniques, is not exactly the detailed history to which Petty aspired. Because the record does not include unpatented innovations or schemes for tax collection and poor relief, the evidence does not allow us to evaluate the scale of innovative

⁵² William Petty, *The advice of W. P. to Mr. Samuel Hartlib* (1647), pp. 18, 23.

⁵³ Houghton Jr. 'History of Trades', p. 60; Petty, *The advice of W. P.*, p. 24.

⁵⁴ A phrase is borrowed from Joan Thirsk, *Agricultural Regions and Agrarian History in England, 1500-1750* (Macmillan: Basingstoke, 1987), p. 61.

⁵⁵ Petty, *The advice of W. P.*, p. 18. See also BL, Sloane MS 654, John Dury, 'The purpose and platform of my journey into Germany' (1631), fols. 247-49; Samuel Hartlib, *A further discoverie of the office of publick adrese for accommodations* (1648), p. 24.

economic schemes in relation to other types of projects either.⁵⁶ But among available bodies of evidence the patent record is probably the closest to Petty's ideal, and throughout the seventeenth and early eighteenth centuries, patenting was a major method of launching schemes for economic innovations and improvement. So the record should at least give us some impression of the contours of economic projects, and more specifically the scale of schemes for natural resource management with which my pilot studies in the subsequent chapters are primarily concerned.

Accordingly, I have used the *Chronological Index for Patents of Invention* and created a database containing all 410 patents for invention granted between 1617 and 1716.⁵⁷ I have corrected incorrect dates in the *Index*, and I have added entries to it using a few supplementary sources. Listed in chronological order, the database helps us examine annual totals of patents enrolled over one hundred years. I have also indexed the database, taking hints from Julian Hoppit's classification of failed parliamentary bills.⁵⁸ I have accordingly created twenty 'labels' representing economic sectors from metallurgy, construction, food and drink, to drainage. I have given some of these labels to each patent, often attaching several of them to a single grant. This is because a single patent frequently referred to several inventions, and because an invention such as a water-raising engine could be exploited in several different economic contexts such as mining, fen drainage, water supply, and fire

⁵⁶ This distortion will be discussed shortly.

⁵⁷ Bennet Woodcroft, *Titles of Patents of Invention, Chronologically Arranged, from March 2, 1617 (14 James I) to October 1, 1852 (16 Victoriae), Part I. Nos. 1 to 4,800* (London: Queen's Printing Office, 1854).

⁵⁸ Julian Hoppit (ed.), *Failed Legislation, 1660-1800: Extracted from the Commons and Lords Journals* (London: Hambledon Press, 1997), pp. 30-32. I have found Hoppit's classification more useful than that of the Victorian inventor Bennet Woodcroft. See idem, *Subject Matter Index of Patents of Invention: From March 2 1617 to October 1852* (2 vols, London: Queen's Printing Office, 1854).

prevention. Because twenty categories are too many for us to gain a meaningful overview, I have again learned from Hoppit's work and grouped them into eight broader areas of economy: manufacture, husbandry, mining, communication technology, health and community, culture, armed services, and miscellaneous.⁵⁹

Table 2 shows the results. Because many individual inventions fall into different sectors simultaneously, the total number of these labels (614) and the sub-totals for each period (shown at the bottom row) exceed the number of patents granted in any given period. 'Total' and 'Subtotal', given in vertical columns on the right, are more meaningful for our analysis. They indicate how many inventions we would find in each category if we create an index to a compilation of patents for invention, something, perhaps, similar to the 'History of Arts or Manufacture' that Petty proposed to compile.

The breakdown between the eight general sectors is shown in Figure 4. The largest category is 'Manufacture'. Nearly half of the patents granted between 1617-1716 (288) were intended to develop innovations in this area. More than half of this category (158) are more or less evenly divided between inventions concerned with 'Domestic and consumer goods' (such as soap, candles, lamps, papers, and earthenware), and those related to 'Metallurgy' including various types of furnaces and methods of smelting ore (see Table 2). Taken together, approximately 26% of all the patents examined were intended to promote innovations in these two sectors, a proportion commensurate with their importance as some of the largest industrial employers after husbandry.⁶⁰ Among inventions that are broadly concerned with

⁵⁹ These categories are laid out and discussed in Appendix 2, Subject Classification for the Patent Database. In the following paragraph as in the Appendix, I will use quotation marks when I refer to the categories used in Table 2 (e.g., 'Food and drink' and 'Mining').

⁶⁰ Christine MacLeod, *Inventing the Industrial Revolution: The English Patent System*,

'Manufacture', those related to 'Textiles' and to 'Food and drink' are also conspicuous (50 and 49 inventions each). They included inventions such as weaving engines, new techniques for dyeing and dressing cloth, improved vessels for brewing, and ovens for drying malt and other ingredients.⁶¹

Inventions related to 'Land and water communications' formed the second largest category (103 inventions, 17% of the grand total). Within it, those concerned with water communication were conspicuous. Twenty-nine of them were concerned with 'Inland navigation, port, and harbour', including locks and sluices (e.g. patent nos. 3, 66), and some 'engines' that would dig or cut the bottom of rivers and sea when extending or repairing harbours (e.g. patent nos. 9, 36, 55, 150, 196). Twenty-four of them were related to 'Navigation technologies' like 'winds ma[jes]ty' for 'a more speedy passage of calmed shippes' when 'com[m]on wynds fayle' (patent no. 59).⁶² Taken together, inventions that fell within these two subcategories comprised a half of the sector (53 inventions). About half this number (25) were inventions concerned with 'Highway and turnpike' and 'Land transport technology'. 'Diving engines' and other devices to help marine salvage – items exploited at the height of speculation mania of the 1690s – comprised the remaining inventions (25). Given the vital importance of inland navigation and maritime trade throughout this period, it is not surprising that there were twice as many inventions concerning water transport as land transport.⁶³

1660-1800 (Cambridge: CUP, 1988), p. 97.

⁶¹ Although I speak of 'inventions' in order to discuss the patent database in this and the following paragraphs, I am using the data in order to explore projecting activities, rather than to measure genuine 'inventiveness'. Cf. Christine MacLeod, 'The 1690s Patent Boom: Invention or Stock-Jobbing?', *Economic History Review*, 2nd ser., 39 (1986), p. 570.

⁶² For more examples, see also nos. 290, 352.

⁶³ The pattern of patenting reversed in the later eighteenth century. See MacLeod, *Inventing*

Seventy-seven patents were concerned with innovations in 'Husbandry', the third largest category. About one third within this category were inventions seeking to improve 'Agricultural "production"' (27 inventions). They contained miscellaneous inventions for agricultural implements like a seed-cleaning engine and an improved beehive (nos. 166, 180), as well as the exclusive rights to grow new species of crops such as French barley and so-called 'steel hemp' (nos. 133, 155). The remaining two thirds were engines and other tools for 'Drainage and flooding' (50 inventions).

About the same number of patents (53) were concerned with 'Mining', the fourth largest category. This included fifteen inventions that were to be used in salt making. The rest were mostly water-raising engines. Table 2 suggests that, in some decades, similar numbers of patents were granted for inventions concerned with 'Mining' and with 'Drainage and flooding'.⁶⁴ This probably reflects a degree of cross-fertilisation between these sectors, for many patents issued for water-raising engines explicitly stated that they could be used not only in land drainage, but also in draining coal pits. The fifth largest category, 'Health and community' (36 patents), included nineteen inventions concerned with 'Water supply'. Of the remaining seventeen, five covered items like fire alarms and street lamps, and twelve others were concerned with broadly defined health, including medical implements and medicines.⁶⁵

As I discussed in the Introduction, Chapters Two to Five will use the relatively well-respected economic sector, natural resource management, as a platform for

the Industrial Revolution, p. 97.

⁶⁴ See Table 2, especially the 1630s, the 1660s, the 1670s, the 1690s, and the 1710s.

⁶⁵ For the remaining categories that are not discussed above, see Appendix 2.

exploring the impact of distrust upon the practices of innovation. Thus, one helpful way to interpret the wide-ranging sub-categories in the patent database would be to adopt this heuristic category of 'natural resource management', and to bring together six sub-categories, 'Agricultural production', 'Drainage and flooding', 'Mining', 'Inland navigation, port, and harbour', 'Highway and turnpike' and 'Water supply' (all asterisked in the Table 2). The underlying notion of 'natural resource' is a broad one that incorporates not only the management of organic resources (agriculture), but also the extraction of inorganic ones (such as coal) and the handling and manipulation of natural environment more broadly conceived (such as draining water, cutting rivers, and paving muddy grounds to make highways). Taken together, 31% of all the patents for inventions were intended to encourage innovations in natural resource management in this broad sense (Fig. 5). This provides us with a starting point for considering the place occupied by the kinds of innovative schemes I will be paying closer attention to in the subsequent chapters.

First of all, the greater visibility of manufacturing industries does not necessarily imply that there were fewer projecting activities in natural resource management. Rather, it indicates that novelties in such industries as textiles and metalwork were more amenable to patenting, taking the form of the wholesale introduction of new products, or new methods of production, or piecemeal improvements in technique or tools that amounted to patentable 'new' methods never introduced before.⁶⁶ These patentable innovations were precisely what Protestant immigrants brought with them from the Continent from the mid-Tudor period onward.⁶⁷ Foreign names continued to appear among patentees (e.g. nos. 65, 83, 119,

⁶⁶ MacLeod, *Inventing the Industrial Revolution*, pp. 102-103.

⁶⁷ The importance of immigrants is discussed in Lien Bich Luu, *Immigrants and the*

198), and there were recurrent attempts at domestically reproducing foreign commodities such as camlet in ‘Turkie manner’ (patent no.17), Venetian glass (patent no. 134), pitch and tar made in Sweden (patent no. 301), and China and Persian wares (patent nos. 164, 234).

In contrast, the place that ‘Husbandry’ occupies (12% of the grand total, 41% of natural resource management) seems very small compared with its importance. After all, husbandry employed about half the population in the later seventeenth century, and the pace of innovation ‘was probably as rapid in the years 1640 to 1750 as at any time before or since’.⁶⁸ Husbandry was not well represented in the patent records because it operated in ways that were ‘incompatible with the effective exploitation of patent’. In agriculture, ‘the key to technical change lay less in patentable hardware than in the reallocation of resources, the more careful or systematic management of materials, the application of ingenuity and experience to novel problems, or the acquisition of a knack communicable only by direct demonstration.’⁶⁹ Thus, while some tools for agriculture were patented, many schemes for improving husbandry thrived without entering the realm of patenting. This explains why the Patent Database puts this sector in the third position.

For similar reasons, innovations and improvement in ‘Inland navigation, port, and harbour’, and ‘Highway and turnpike’ are also underrepresented (6% of the grand total, 21% of natural resource management). Innovations in new maritime trade and inland navigation often consisted less of the development of new technology than of the application of available techniques and resources. T. S. Willan

Industries of London, 1500-1700 (Aldershot: Ashgate, 2005).

⁶⁸ *AHEW* Vii, p. 588. See also MacLeod, *Inventing the Industrial Revolution*, p. 98.

⁶⁹ MacLeod, *Inventing the Industrial Revolution*, p. 97.

has observed that the remarkable extension of navigable rivers from the latter half of the seventeenth century was ‘not due to any great advance in technical knowledge’, but rather was due to the wider application of ‘pound locks, which were already known and used.’⁷⁰ Taken together, therefore, the proportion of natural resource management projects (in comparison with schemes in other economic sectors) was conceivably greater than the 31% that the patent records suggest. In the ensuing chapters, we shall look beyond the realm of patenting to explore projecting activities in natural resource management.

From Policy Options to Commercial Enterprises: The Evolution of Economic Projects

Now I shall turn to the chronological development of projecting activities, drawing again upon the patent records. I will demonstrate that whereas in the early seventeenth century economic projects were often examined by early Stuart statesmen and even by their kings as fiscal and economic policy options, in the later seventeenth and early eighteenth centuries, they came to be severed from government fiscal experiments, operating in the emerging stock market as commercial ventures.

Figure 6 shows the annual total of patents for invention for 100 years from 1617. The first peak in the figure is between 1634 and 1638. But as I have noted in the Introduction, the decades after the 1570s saw a remarkable degree of projecting activity that extended far beyond the realm of technical inventions included in the patent database. Jacobean statesmen examined no less than 150 projects, and they included not only economic schemes like ‘Fen drainage, fishing busses, dyed and

⁷⁰ T. S. Willan, *River Navigation in England 1600-1750* (London: Frank Cass, 1964), pp. 79, 133, at p. 133. See Chapter Four for more discussion.

dressed cloth, mulberry trees and silkworms', but also comprised other projects like ones for raising profits from custom-farms, erecting new offices, discovering the crown land (for which arrears were due), and much more.⁷¹ By 1620, James had issued no less than fifty proclamations on a wide range of schemes, including ones for the making of tin, starch, tobacco, and gold threads, and the licensing of alehouses and buildings.⁷² This is why John Chamberlain complained in 1620 that 'proclamations and patents' had 'become so ordinary that there is no end, every day bringing forth some new project or other.'⁷³

There was a temporary backlash in 1621. A group of MPs led by Sir Edward Coke scrutinised a wide range of monopolies upon receiving petitions against almost one hundred 'projects'.⁷⁴ Whereas Exeter merchants had been able to obtain a *de-facto* monopoly of overseas trade in 1606, Bristol's Society of Merchant Venturers failed to do the same in 1621.⁷⁵ It is therefore hardly surprising that 1621 saw only one industrial patent, that granted to the MP and goldsmith Hugh Myddelton for 'a newe invenc[i]on or way for the wyninge and drayninge of anie grounds overflowen with water'. It was probably an uncontroversial grant that would

⁷¹ This estimate is based on John Cramsie's extensive survey of the papers of Robert Cecil, Julius Caesar, Robert Cotton, Thomas Egerton, and Lionel Cranfield. See Cramsie, *Kingship and Crown Finance*, pp. 29-35, 50-61, (quotation from p. 35). Cf. Joan Thirsk, 'The Crown as Projector on its Own Estates, from Elizabeth I to Charles I', in R.W. Hoyle (ed.), *The Estates of the English Crown, 1558-1640* (Cambridge: CUP, 1992), p. 300.

⁷² Cramsie, *Kingship and Crown Finance*, p. 165, fn. 89.

⁷³ William Hyde Price, *The English Patents of Monopoly* (Boston: Mifflin & Co, 1903), p. 30. Cf., Cramsie, *Kingship and Crown Finance*, pp. 165-66, 177; Joan Thirsk, *Economic Policy and Projects: The Development of a Consumer Society in Early Modern England* (Oxford: Clarendon, 1978), p. 100.

⁷⁴ Linda Livy Peck, *Court Patronage and Corruption in Early Modern England* (London: Unwin Hyman, 1990), p. 34; Cramsie, *Kingship and Crown Finance*, pp. 168-79. See also Scott, *Joint-stock*, vol. 1, pp. 173-77, which argues that a patent for making silver and gold threads 'first re-awakened' the Commons' interest in monopolies (*ibid.*, p. 176).

⁷⁵ Sacks, *Widening Gate*, pp. 216-17.

aid the New River Company under Myddelton's supervision.⁷⁶ So, even one of the lowest points in the early Stuart patent records testifies to the intensity of projecting activity that preceded it.

Figure 6 suggests that the 1624 Statute of Monopolies (21 Jac. 1, c. 3), which stemmed from the criticism of 'projects' in the 1621 Commons' debate, had no tangible long-term impact on the granting of patents for invention. Due to provisos the Lords added to the bill, the resulting Statute neither invalidated those grants that had already been granted, nor prohibited grants of monopolies in the future in vital economic sectors such as printing, the licensing of taverns, and the production of saltpetre, gunpowder, alum, and glass. Monopolies for inventions (not extending to a whole industry) remained also legal as long as a grant was for no more than fourteen years, and so were, crucially, grants for new offices and corporations.⁷⁷ 'Instead of one man assuming the monopoly and sharing the privilege with his nominees and agents, as hitherto, associations of the more substantial men in the trade were formed, who agreed to pay James [and shortly afterwards Charles] an annual sum for the privilege.'⁷⁸

Fifty-seven patents for inventions were enrolled between 1634 and 1638, a five-year total that was not to be matched until the 1690s. Defoe would later declare his age to be the '*Projecting Age*' in 1695; the 1630s could deserve a similar name. 'Here are abundance of new Projects on Foot upon Sea-Coal, Salt, Malt, Marking[?] of Iron, Cutting of Rivers, Setting up a new Corporation in the Suburbs of *London*

⁷⁶ Patent no. 19. For the New River Company and Myddelton who was conferred baronetcy in 1622, see J. W. Gough, *Sir Hugh Myddelton: Entrepreneur and Engineer* (Oxford: Clarendon, 1964), esp. pp. 20-21.

⁷⁷ 21 Jac. 1, c. 3, (sections 5 to 12). See p. 13 (above) for other conditions for exemption.

⁷⁸ Thirsk, *Economic Policy and Projects*, pp. 99-100. See also Cramsie, *Kingship and Crown Finance*, p. 178.

[. . . and] many others', George Garrard, the master of the Charterhouse, reported in March 1637.⁷⁹ As he noticed, 'Discontinuance of Parliaments brings up' a surge in patenting by which 'Profit may come to the King'.⁸⁰ So, the conspicuous rise in patents for invention was part of the systematic attempt to raise revenues without parliament, something comparable to the levying of ship money and the exploitation of forest laws.⁸¹

This pursuit became increasingly desperate, pushing the king's claim of prerogative 'to land beyond the limits of reason and credibility'.⁸² In addition to those mentioned above, a number of patents were granted after 1634 to raise revenue from such commodities as soap, tobacco, beer, and wine. Custom farms and other kinds of economic regulation were devolved to courtiers for similar ends.⁸³ An Elizabethan statute against cottages without four acres of ground (31 Eliz. 1, c. 7) was enforced vigorously. Even prisoners were allegedly mobilised 'as principal Commissioners to call people before them and compound with them'.⁸⁴

⁷⁹ Thomas Wentworth, *The Earl of Strafford's letters and dispatches*, ed. W. Knowler (2 vols, 1739), vol. 2, p. 55, Garrard to Wentworth, 23 Mar. 1636. See a list of industrial and agricultural patents excerpted from the papers of Charles's Attorney-General, Sir John Bankes (Bankes MS) at Bodleian, in Peck, *Court Patronage*, pp. 266 (n. 18), 267 (n. 19).

⁸⁰ Wentworth, *Strafford's letters*, vol. 2, p. 55, Garrard to Wentworth, 23 Mar. 1636.

⁸¹ See Frederick C. Dietz, *English Public Finance, 1558-1641* (2nd ed., London: Frank Cass, 1964), pp. 234-45, 242, 262-65, 282-84; Kevin Sharpe, *The Personal Rule of Charles I* (New Haven: Yale U.P., 1992), pp. 120-24, 249-62. For ship money and the forest laws, see Dietz, *English Public Finance*, p. 274; Michael Braddick, *The Nerves of State: Taxation and the Financing of the English State, 1558-1714* (Manchester: Manchester U.P., 1996), pp. 83-84, 140-43; Thirsk, 'Crown as Projector', pp. 339-347.

⁸² Thirsk, 'Crown as Projector', p. 310.

⁸³ Ronald G. Asch, 'The Revival of Monopolies: Court and patronage during the Personal Rule of Charles I, 1629-40', in Ronald G. Asch and Adolf M. Birke (eds.), *Princes, Patronage, and the Nobility: the Court at the Beginning of the Modern Age* (Oxford: OUP, 1991), pp. 370-74.

⁸⁴ Thirsk, 'Crown as Projector', pp. 345-46, 348; Valerie Pearl, *London and the Outbreak of the Puritan Revolution: City Government and National Politics, 1625-43* (Oxford: OUP,

We need not conclude that ‘Charles and his advisers had wholly lost touch with real life’. Men like Thomas Lord Wentworth sought to reform prevailing abuses.⁸⁵ It is also possible, as Kevin Sharpe has argued, that Charles’s government began some of the controversial economic schemes like the draining of the Great Level and the soap monopoly as ‘well-intentioned efforts to reinvigorate the English economy’.⁸⁶ Yet whatever the original intention of the monarch and his ministers, public distrust of the ‘projector’ had surely built up by the end of the 1630s. In his 1637 pamphlet that listed coach services to and from London, John Taylor complained that his effort to gather information ‘was suspected for a projector, or one that had devised some tricke to bring the Carriers under some new taxation’.⁸⁷ The intense printed attacks upon projects and projectors between 1641 and 1642, as has been revealed by the *ESTC* search results, were the most spectacular manifestation of this mounting distrust. Shortly after the outbreak of the Civil Wars, the future earl of Clarendon, now in exile, reflected upon the Personal Rule:

Unjust projects of all kinds, many ridiculous, many scandalous, all very grievous, were set on foot; the envy and reproach of which came to the King, the profit to other men, in so much as of £ 200,000 drawn from the subject by these ways in a year, scarce £ 1,500 came to the king’s use and account.⁸⁸

Of course, some schemes, notably some of the inland navigation schemes led by

1961), p. 21, citing Wentworth, *Strafford’s letters*, vol. 2, p. 117.

⁸⁵ Thirsk, ‘Crown as Projector’, p 347. For the comparative case study of Wentworth and the marquis of Hamilton, see Asch, ‘Revival of Monopolies’, pp. 378-88.

⁸⁶ Sharpe, *Personal Rule*, pp. 121-22.

⁸⁷ John Taylor, *The carriers cosmographie* (1637), sig. [A2v], [A direction to the Reader]. See also Wentworth, *Strafford’s letters*, vol. 2, p. 71, the earl of Northumberland to Wentworth, 28 Apr. 1637.

⁸⁸ Edward Hyde, Earl of Clarendon, *A history of the rebellion and civil wars in England* [published in 1702-1704, but composed from the 1646 onward] (8 vols, Oxford, 1826), vol. 1., pp. 119-20.

local Commissioners of Sewers, could operate more independently from the Stuart court.⁸⁹ But, Clarendon's remark indicates that Garrard's hope that 'projects' might profit the king was in the end utterly betrayed, an assessment with which many historians agree.⁹⁰ More importantly for our discussion, Clarendon's assessment of the money that 'came to the king's use and account' demonstrates that, primarily, early Stuart projects for economic innovations and improvement were 'pervasive instruments of [crown] policy'.⁹¹

Like the *ESTC* search results, the patent record makes it look as if the 1640s and 1650s saw a relative lull in projecting activities. This was because the Chancery mechanism by which patents had been granted was discontinued, and the legal protection of economic innovations and improvement took place only intermittently through the Council of State and parliament.⁹² However, the overturning of monarchical government provided renewed religious impetus, as well as fresh opportunities, for trying new schemes. Half of the eighteen patents issued without the royal assent between 1643 and 1659 were backed by the German émigré Samuel

⁸⁹ Local Commissioners consisted of local gentlemen who undertook inland navigation as well as the maintenance of rivers and dikes. Frank A. Sharman, 'River Improvement Law in the Early Seventeenth Century', *Journal of Legal History*, 3 (1982), p. 223-27, esp. p. 224. See Chapter Four for more discussion.

⁹⁰ See for example, Thirsk, 'Crown as Projector', p. 352; MacLeod, *Inventing the Industrial Revolution*, p. 15. Kevin Sharpe's sympathetic account of the monarch's good intentions seems by no means incompatible with this line of interpretation.

⁹¹ Cramsie, *Kingship and Crown Finance*, p. 35. For the discussion of the inefficiency of early Stuart Crown finance in terms of 'corruption' and 'rent-seeking', see Peck, *Court Patronage*, pp. 151-60. See also Michael Braddick, *State Formation in Early Modern England c. 1550-1700* (Cambridge: CUP, 2000), pp. 250-251.

⁹² Rhys Jenkins, 'The Protection of Inventions during the Commonwealth and Protectorate', *Notes & Queries*, 11th ser., 12 (1913), 162-63. It is unclear whether the sources Jenkins drew upon represent the majority of legal protection during this period. These are *CJ*, *LJ*, *CSPD*, reports of the *HMC*, Scobell's 'Collection of Acts', and nine extant patent rolls for the Protectorate.

Hartlib.⁹³ Activities of his circle marked a distinct flourishing of a kind of projecting activities in the post-Civil War period.⁹⁴

The next peak in the patent records was in the middle of the post-Restoration era, with forty patents for invention enrolled between 1673 and 1678 (see Fig. 6). They were related to different economic sectors, ranging from apiculture, river navigation, paper manufacturing, to linen manufacturing, metallurgy, and naval salvage. It is difficult to pin down precisely what stimulated patenting across those sectors. If anything, the surge was probably linked in part to a spell of economic prosperity during the decade. The declining price of staple commodities, the fall of rents, and the increasing return in the excise and a sales tax levied on such consumer goods as beer, cider, tea, and coffee indicate that people below middling strata could purchase more consumer goods during the 1670s.⁹⁵ Patents for an improved beehive, paper making, and the making of point-lace probably indicate that patentees were seeking to take advantage of this increasing purchase power.⁹⁶ Some patents seem to have reflected the rivalry with the United Provinces that continued after the Second Anglo-Dutch War had ended in 1673. A patent for a desalination engine that William Walcot obtained in 1675 was intended not only to help merchant vessels making long voyages, but also to support the navy, a crucial actor in the European rivalry.⁹⁷ Two

⁹³ Greengrass, 'Projecting Culture', no pagination.

⁹⁴ See Chapter Two.

⁹⁵ Henry Roseveare, *The Financial Revolution* (Harlow: Longman, 1991), p. 23; John Spurr, *England in the 1670s: 'This Masquerading Age'* (Oxford: Blackwell, 2000), pp. 122-23. See also Scott, *Joint-stock*, p. 293.

⁹⁶ Patent nos. 180, 178, 182.

⁹⁷ Patent no. 184. His patent was revoked eight years later when Richard Fitzgerald, a nephew of Robert Boyle, obtained a similar patent. See MacLeod, *Inventing Industrial Revolution*, p. 36. See also my discussion in Chapter 5.

patents granted in 1675 and 1676 were related to dyestuff and earthenware that had been formerly produced and imported from Holland.⁹⁸ Producing them at home would in the long-run help England compete against the Dutch economic power.

These economic and international factors are important because they highlight that the surge was not due to the government's attempt to use patents for raising revenues. Figure 7 graphically demonstrates the point, revealing the annual total of the patents that promised to pay fees to the Crown. Whereas under Charles I, the increase in annual total of patents accompanied a surge in the grants that promised to pay fees to the Exchequer, the patent boom during the 1670s had little to do with fiscal policy.⁹⁹ This is significant especially given the liability of the Crown had risen from £925,000 in 1660 to nearly £3 million by 1670.¹⁰⁰ By the end of 1671, the Third Anglo-Dutch War (which would be declared in the next March) was imminent, and a great deal of military expenditure was required. Exchequer Orders, which had by then 'precluded other forms of credit', could not be relied upon, as their repayment had to be automatic and could not be deferred like other securities. So Charles II's government could have raised much-wanted revenues as his father had done by issuing monopolistic patents that would pay fees to the Crown. Yet, this crisis was handled instead by defaulting 'the honouring of outstanding [Exchequer] Orders'. This was the so-called 'Stop of Exchequer', declared in December 1671.¹⁰¹

The separation of patents for invention from fiscal policy, and by implication,

⁹⁸ Patent nos. 181, 191.

⁹⁹ This confirms MacLeod, *Inventing the Industrial Revolution*. See also my discussion in Chapter Three.

¹⁰⁰ Roseveare, *Financial Revolution*, p. 21.

¹⁰¹ C. D. Chandaman, *The English Public Revenue, 1660-1688* (Oxford: Clarendon, 1975), pp. 224-27, at p. 227.

from monarchical authority is even more pronounced in the third peak between 1681 and 1685. In 1684, thirteen patents for inventions were enrolled, and none of them offered a fee to the crown (see Fig. 7). Like the boom in the mid 1670s, a wide range of patents were issued between 1681 and 1685, including those for strong liquor (no. 231), earthenware, (no. 234), and the finishing of cloths (nos. 237, 241). The reason for this increase is unclear. If we exclude 1684, the average number of annual grants between 1681 and 1685 (6.5 grants annually) was the same as the previous boom between 1673 and 1678. So it is possible that more patents were granted during 1684 by chance. This is feasible given that, as we have seen, the modest rise in the *ESTC* result for the 1680s does not represent a rise in new economic schemes.

Yet again, the absence of patents contributing to the Exchequer is significant given the ongoing financial strain, and more significantly, Charles II's new ambition to extend his authority. In March 1681, Charles dissolved the Oxford Parliament. The amount of floating debts was above £2 million, and, without the aid of parliament, the royal government could expect to raise little more than £1.2 million.¹⁰² The Duke of York, the future James II, wished to see his brother assert his prerogative in order 'to subsist upon his own revenu[e], without the help of a Parliament'.¹⁰³ Charles was indeed extending his authority elsewhere. Between 1682 and 1684, some 134 corporations were compelled to surrender their charters and receive new ones, terms of which were often beyond their control. By this means, Charles 'now took on a complete power to remove any corporation member at any time' so that he could 'control corporate membership and decision making as well as magistracy.'¹⁰⁴

¹⁰² Chandaman, *English Public Revenue*, p. 249.

¹⁰³ Quoted in Roseveare, *Financial Revolution*, p. 29.

¹⁰⁴ Paul D. Halliday, *Dismembering the Body Politic: Partisan Politics in England's Towns*,

Despite the momentum towards greater monarchical authority, Treasury Commissioners secured the royal budget without having recourse to monopoly grants and other potentially controversial trade regulations. According to Chandaman, the ‘dangerous unrest and instability created by the Exclusion struggle of 1679-81 demanded a policy of the utmost caution in the financial, no less than in the political, sphere’.¹⁰⁵ The Commissioners drew upon retrenchment and the yield of ordinary revenues that increased markedly once the prohibition of trade with France expired in 1681. James II was the last king of England who raised revenue independently from parliament. But as Figure 7 suggests, even in his reign, patents for inventions did not become part of public finance.¹⁰⁶

The last and the most dramatic rise of patents for inventions took place between 1691 and 1693 (see Fig. 7). The unprecedented 62 patents were enrolled during this three-year period. Half the number of patents granted during the whole of Charles II’s and James II’s reigns (120 patents) were enrolled within these three years. The annual average of 21 patents was nearly double the average at the height of Charles I’s Personal Rule (12 grants yearly between 1635 and 1638). The Nine Years War, which followed the 1688 Revolution, obstructed overseas trade, and this accounts for a wide range of grants concerned with domestic industries such as mining, water supply, and the making of items including brass, calicoes, paper, and tapestry (e.g.

1650-1730 (Cambridge: CUP, 1998), chap. 6, (quotation from pp. 191-92) See also John Miller, *James II: A Study in Kingship* (Hove: Wayland, 1978), pp. 112-13; Tim Harris, *Restoration: Charles II and his Kingdom, 1660-1685* (London: Allen Lane, 2005), pp. 293-300. See also Grant Tapsell, *The Personal Rule of Charles II, 1681-1685* (Woodbridge: Boydell, 2007).

¹⁰⁵ Chandaman, *English Public Revenue*, pp. 249-51, (quotations from p. 249).

¹⁰⁶ Roseveare, *Financial Revolution*, pp. 29-30; Chandaman, *English Public Revenue*, pp. 256-61. We know relatively little about ‘projects’ for imposing new taxes launched under James II.

patent nos. 273, 276, 284, 296).¹⁰⁷ The ongoing war also helps explain why several inventions were directly concerned with the improvement of artilleries (patent nos. 274, 303, 316). There were other grants that could be highly relevant to military and naval supplies, such as those concerned with the production of saltpetre, pitch and tar (patent nos. 266, 329, 330). Taken together, about one fifth of patents granted during the boom could serve military and naval supply.¹⁰⁸

The Nine Years War increased governmental expenditure to £4.9 million per year, more than double the average expenditure of the 1680s. From 1702, England fought the War of Spanish Succession for thirteen years. During this period, expenditure rose to a staggering £7.8 million, nearly three quarters of which went to military purposes. None of the patents either during or after the boom paid fees to the Exchequer. While in the early 1680s financial exigencies were met primarily by retrenchment, the 1690s saw a torrent of proposals for introducing new taxes.¹⁰⁹ The decade also saw the introduction of a series of innovative methods for raising revenues and funding the wars, most famously the founding of the Bank of England, the Great Recoinage, and national credit, the crux of what P. G. M. Dickson has called the financial revolution. These fiscal experiments were complemented by efforts to improve, albeit patchily, the efficiency of the bureaucracy and of local tax collection, a process that buttressed the emergence of Britain as the fiscal-military

¹⁰⁷ For the impact of the war on economy, see MacLeod, 'The 1690s Patent Boom', p. 559; Samuel Jeake, *An Astrological Diary of the Seventeenth Century: Samuel Jeake of Rye 1652-1699*, eds. Michael Hunter and Annabel Gregory (Oxford: Clarendon, 1988), p. 233; Anne Murphy, 'Lotteries in the 1690s: Investment or Gamble?', *Financial History Review*, 12 (2005), p. 230. See also D. W. Jones, *War and Economy in the Age of William III and Marlborough* (Oxford: Blackwell, 1988).

¹⁰⁸ MacLeod, 'The 1690s Patents Boom', pp. 558-59.

¹⁰⁹ Colin Brooks, 'Taxation, Finance and Public Opinion, 1688-1714' (Cambridge, Ph. D thesis, 1971), chaps. 7-8; idem, 'Projecting, Political Arithmetic and the Act of 1695', *English Historical Review*, 97 (1982), 31-53.

state.¹¹⁰

The 1690s thus saw the flourishing of three distinct types of projecting activities: new economic schemes (as reflected in the patent records), new taxation schemes that sought to raise revenue by devising new taxes or by improving bureaucracy, and new financial schemes like the Bank of England that would later consolidate public deficit finance in the coming century. These different types of projecting activities shared some of the key characteristics like the assertion of their public service (as we shall see below), and not least the very act of *projecting* new schemes. So wherever critics fancied, they could jumble these different kinds of schemes together and criticise them under the same negative stereotype. One of the best examples is an anonymous pamphlet, *Angliae tutamen* (1695), which decried schemes of all kinds as ‘pernicious projects’:

Banks National, Land, Money, Paper or Notes, Orphans, &c. now on foot, and more preparing; Companies for Mines of Gold, Silver, Copper, Tin, Lead, Iron, Antimony, Lapis Calaminaris, &c. Coals, Salt-Rock, and other Engines innumerable; Diving of many sorts, to fish up Wreck, Guns, Tackle, Treasure, Merchandize, &c. Dipping, Japanning, Glass-Bottles, Venetian-Metal, Leather, Linen English, Scotch, New Jersey; Paper White, Blue, English, Irish; Japann’d, Printed-Hangings, Pearl-fishing, Salt-Petre, Sword-Blades; Waters of the New River, Conduit, Thames, Hampstead, Shadwell, &c. Wrecks, South-Sea, Coasts of Spain, Portugal, France, England, Scotland, Ireland, and Holland; Lifting-Engine, Drawing-Engines, of several kinds, for Mears, Marshes, Inundations, Mines of all sorts, &c. Lutestring Company, Lotteries for Money or Merchandize; New Settlements in Carolina, Pensilvania, and Tobago, and other Parts; Convex-Lights, and others; Fisheries Royal and Private; Corporation or Companies of many kinds; Patents, Leases, Grants, &c. With some few more Projects now in Agitation.¹¹¹

Despite such blunt jumbling, patents for inventions were now used as a means to

¹¹⁰ For the ‘financial revolution’, see P. G. M. Dickson, *The Financial Revolution in England: A Study in the Development of Public Credit, 1688-1756* (London: Macmillan, 1967); Roseveare, *Financial Revolution*; John Brewer, *Sinews of Power: War, money and the English state, 1688-1783* (London: Unwin Hyman, 1989), esp. chap. 4.

¹¹¹ *Angliae tutamen*, pp. 4-5. For stereotyping of tax raising schemes as ‘projects’, see Harley’s and Swift’s remarks quoted above.

float new commercial enterprises.¹¹² In fact, unincorporated joint-stock companies boomed along side patenting, increasing from eleven companies before 1688 to ninety-three in 1695. John Houghton's remark in June 1694 captured not only the role the Nine Years War played in this surge, but also how schemes for economic innovations and improvement operated increasingly as joint-stock companies:

a great many stocks have arisen since this war with France; for trade being obstructed at sea, few that have money were willing to it should lie idle, and a great many that wanted employment studied how to dispose of their money [. . .] which they found they could more easily do in joint-stock, than in laying out the same in lands, houses or commodities, these being more easily shifted from hand to hand[.]¹¹³

As Defoe noticed, schemes (including the Penny Post and a host of others) had prospered in the 1680s too.¹¹⁴ In 1685 and 1687, William Phips ventured to the Caribbean and fished up treasures from a sunken Spanish ship, resulting in his being knighted and being awarded £11,000 out of £250,000 worth of silver that went to the government. Yet, given the spectacular vogue of patenting, joint-stock companies, and fiscal experiments, the 1690s stands as a salient period in the history of projecting, what Defoe called the '*Projecting Age*'.¹¹⁵ So the promotion of economic innovations and improvement, which was an integral part of governmental fiscal options under Elizabeth and the early Stuarts, became by the end of the seventeenth century a central feature of the emerging stock market, joint-stock companies.

¹¹² See Chapter Five for further discussion.

¹¹³ John Houghton, *A collection for improvement of husbandry and trade* (4 vol., 1727-1728), vol. 1, no. 98, p. 261.

¹¹⁴ Daniel Defoe, *An essay upon projects* (1697), pp. 24-28.

¹¹⁵ MacLeod, 'The 1690s Patent Boom'; Scott, *Joint-stock*, vol. 1, pp. 328-9; Julian Hoppit, 'Attitudes to Credit in Britain, 1680-1790', *The Historical Journal*, 33 (1990), pp. 308-9; K. G. Davies, 'Joint-Stock Investment in the Later Seventeenth Century', *Economic History Review*, new ser., 4 (1952), p. 292; Richard Grassby, *The Business Community of Seventeenth-Century England* (Cambridge: CUP, 1995), pp. 409-10.

Public Finance, Poor Relief, and Public Service:
Significance of Projecting Activities

This historical development warns us that projecting activities cannot be fully understood as a kind of straightforward ‘economic’ activity operating independently from social and political contexts.¹¹⁶ I argue that the incapacity of the early modern state apparatus to raise revenues and provide welfare provisions is crucial for our analysis. Many new schemes for raising taxes and relieving the poor were proposed. And crucially, even schemes primarily concerned with economic innovations and improvements were presented as potential means to raise revenues and employ (and thus relieve) the poor.¹¹⁷ Only by situating economic projects and promoters’ self-presentation in this broader context, can we hope to delineate the enduring characteristics of projecting culture: contribution to public finance, employment of the poor, and the justification of both as godly public service.

Raising revenues was one of the pervasive tasks of the early modern English government. According to Michael Braddick, ‘pressure rather than successful adaptation’ characterised early Stuart public finance. As we have seen in the chronological survey of patents for invention above, ‘well-established prerogative rights were pushed in new directions and a series of *ad-hoc* measures was used to meet particular spending needs.’¹¹⁸ After the 1640s, the total amount of

¹¹⁶ That economic activities were often ‘embedded’ in political and social contexts is the central contention of Bruce G. Carruthers, *City of Capital: Politics and Markets in the English Financial Revolution* (Princeton: Princeton U.P., 1996), esp. pp. 7-8, 26, 206-207; Mark Bevir and Frank Trentmann, ‘Markets in historical contexts: ideas, practices and governance’ in Mark Bevir and Frank Trentmann (eds.), *Markets in Historical Contexts: Ideas and Politics in the Modern World* (Cambridge: CUP, 2004), 1-24 (esp. p. 4).

¹¹⁷ Proposals for economic innovations thus often looked like schemes for raising taxes and relieving the poor. While they were all criticised as ‘projects’, I will distinguish them as analytically distinct. My focus will be on economic schemes.

¹¹⁸ Braddick, *State Formation*, pp. 235, 234.

governmental revenue increased dramatically in large part due to the rising military spending for the domestic Wars, and it was procured by parliamentary taxation because of the collapse of a functioning royal government. This mode of taxation continued to dominate public finance even after the Restoration. By the 1670s, 90% of the revenue was controlled by parliament, a significant shift from 24% during Charles I's reign.¹¹⁹

While parliamentary taxation came to assume 'considerable political, social and economic significance' by the later seventeenth century, it was not immune from problems. Local administration remained highly controversial and its rapidly expanding apparatus was often slow to realise its full fiscal potential. The broadening of taxation – necessary for meeting the demands of wars and other exigencies – continued to be difficult as well. MPs after the Restoration often feared that setting up too autonomous a revenue source like general excise might allow the crown to be fiscally independent from parliament, thereby precipitating the emergence of an 'arbitrary government'.¹²⁰ Moreover, although tax collection became more professionalised and standardised towards the later seventeenth century, few commentators or administrators raised 'questions of [effective] administration'.¹²¹ As a result, there was virtually no attempt to improve 'the functioning of a department or of a profession from day to day', or to set specific revenue boards for individual taxes.¹²²

¹¹⁹ Braddick, *Nerves of State*, p. 9; Braddick, *State Formation*, pp. 233-34.

¹²⁰ Braddick, *Nerves of State*, pp. 99, 115, 148.

¹²¹ Braddick, *State Formation*, pp. 263, 285; Stephen B. Baxter, *The Development of The Treasury, 1660-1702* (London: Longman, 1957), p. 171 (quotation).

¹²² The observation is based on Treasury Papers and later seventeenth-century writings on Exchequer. Baxter, *Development of The Treasury*, p. 171. See also Brooks, 'Taxation, Finance and Public Opinion', pp. 225-27.

This is why, even after the Restoration (let alone the early Stuart period), the governmental apparatus left a considerable ‘vacuum into which external, unofficial, [fiscal] advice poured’.¹²³ As we have seen, patents for invention and other grants provoked controversies under Elizabeth and the early Stuarts because these grants began to raise revenue by imposing fines and assessments upon ordinary subjects. So, raising revenues without imposition soon became a common slogan. As early as in about 1604, for example, Richard Fiennes, seventh Baron Saye and Sele, argued that theatre goers and performances ‘are as unnecessary [as tobacco] & yet yelde noe penny to his Maiesty’.¹²⁴ Taxing theatre goers would be ‘no monopole, noe nor imposition’, Fiennes claimed, ‘for the party may choose whether he will come in or noe.’¹²⁵ During the 1640s and the 1650s, Hartlib and Dury were attracted to an ambitious ‘universal trade’ project that would raise £300,000 ‘without any tributarie taxation’.¹²⁶ In 1693, Sir Edward Harley was informed that ‘Many Projectors are preparing proposals, for raiseing vast Summs without Burdening the people’.¹²⁷ Helping public finance remained so prominent an element of projecting that Swift found it worth mocking. In his *Gulliver’s Travels*, Gulliver met ‘the school of political projectors’ in Lagado, one of whom offered ‘the most commodious and effectual ways and means of raising money without grieving the subject’, namely, to

¹²³ A phrase is borrowed from Brooks, ‘Taxation, Finance and Public Opinion’, p. 223.

¹²⁴ Peter R. Roberts, ‘The Business of Playing and the Patronage of Players at the Jacobean Courts’, in Ralph Houlbrooke (ed.), *James VI and I: Ideas, Authority, and Government* (Aldershot: Ashgate, 2006), pp. 95-102 (quotation from p. 96). The discussion also contains another project for taxing theatre performances by an Irish war veteran Francis Clayton.

¹²⁵ Roberts, ‘Business of Playing’, p. 96.

¹²⁶ HP 25/8/1A-2B. See the discussion in Chapter Two.

¹²⁷ Brooks, ‘Taxation, Finance and Public Opinion’, p. 258 (quoting BL, Loan MS 29/187, fol. 185, 17 Oct. 1693).

tax women's 'beauty and skill in dressing' as well as men's 'Wit, valour, and politeness' according to 'every person's giving his [or her] own word for the quantum of what he [or she] possessed.'¹²⁸

Schemes for economic innovations and improvement, too, often promised to raise revenues. In his new fishing scheme published in 1615, one J. R. ostentatiously promised to present a 'sweete fountaine of profite' of more than £50,000 p.a. which 'runneth into the sea of the Kings custome'.¹²⁹ The similarly grandiose promise of the mid-seventeenth century 'universal trade' has been mentioned above. John Smith suggested in 1670 that if his readers planted timber across the nation according to his advice, 'his Majesty might be readily furnished with [. . .] a considerable sum paid into his Exchequer' by means of sales tax.¹³⁰ It was reported in 1679 that Yarranton's proposal for 'Methodising of the fleet a new way' would 'save in the standing expense 60,000*l* per an[um]'.¹³¹ Sir Robert Southwell suggested in 1675 that his canal scheme would save nearly £2 million in the long run by lessening the amount of coals shipped to London.¹³² Patentees and joint-stock companies, as we shall see below, advanced similar claims. If *taxation* schemes were primarily and directly concerned with the raising of revenues, then *economic* schemes – ranging from a fishing scheme, husbandry manuals, the exploitation of patents for inventions, to a

¹²⁸ Jonathan Swift, *Gulliver's Travels*, eds. Peter Dixon and John Chalker with an Introduction by Michel Foot (London: Penguin, 1985), pp. 232-35 (quotations from pp. 232, 235).

¹²⁹ J. R. *Trades increase* (1615), p. 46. For background see, John Cramsie, 'Commercial Projects and the Fiscal Policy of James VI and I', *Historical Journal*, 43 (2000), pp. 348-53. For more early Stuart examples, see below.

¹³⁰ John Smith, *England's improvement reviv'd* (1670), p. 104.

¹³¹ Bodl., Carte MS 233, fol. 293, Mr Goodwin to [Thomas Wharton?], 9 Jul. 1679.

¹³² Thomas Birch, *History of the Royal Society of London [1757]* (4 vols, Bruxelles: Culture et Civillisation, 1968), vol. 3, p. 210. See also Willan, *River Navigation in England*, p. 12.

secret method in naval affairs and joint-stock companies – shared the same concern indirectly.

Although we may take taxation and economic innovations as separate entities, for early moderns, the overlap between the two was unmistakable. In 1662, Petty observed ‘When the people are weary of any one sort of Tax, presently some Projector propounds another’:

As for example, if a Land-tax be the present distasted way, and the people weary of it, then he offers to do the business without such a Land-tax, and propound either a Poll-money, Excize [sic], or the institution of some new Office [to regulate certain trades or commodities] or Monopoly [over an industry or an invention]; and hereby draws some or other to hearken to him; which is readily enough done by those who are not in the places of profit relating to the way of Levies in use, but hope to make themselves Offices in the new Invention.¹³³

Petty’s comment warns us against treating economic innovations and public finance in isolation. In fact, early Stuart statesmen considered both financial and economic schemes as ‘projects’, while later Stuart promoters like Thomas Neale, Samuel Weale, Dalby Thomas, and Humphrey Mackworth promoted both kinds of schemes.¹³⁴ Like proposals for introducing new taxes, those concerned primarily with economic innovations were also promoted with ostensible claims to enrich the country by raising revenues.

The second common feature of schemes for economic innovations and improvements was the promise to relieve the poor chiefly through employment. The emphasis on labour was frequently repeated in late medieval, Tudor, and early Stuart sermons as epitomised in Thomas Becon’s admonition issued in about 1550: ‘thy godly pleasure

¹³³ William Petty, *A treatise of taxes & contributions* (1662), pp. 62–63. For his discussion of office and monopoly in their various forms, see *ibid.*, pp. 54–57.

¹³⁴ For Neale, Weale, and Thomas, see J. H. Thomas, ‘Thomas Neale, A Seventeenth-century Projector’ (Ph. D thesis, University of Southampton, 1979), chaps. 6–7, pp. 395, 396 (Appendix E, Neale’s business associates). For Mackworth, see Chapter Five below.

is that no man be idle, but everyman labour according to his vocation and calling'.¹³⁵ Accordingly, in the Elizabethan poor law (39 Eliz. 1, c. 3), the early Stuart Books of Orders, and in other decrees and legislations, 'labour discipline loomed larger than the parish pension in the prevention of beggary'.¹³⁶ By the end of the seventeenth century, the number of the poor who suffered near starvation (or *deep* poverty) declined and the living standard generally improved, thanks in part to demographic stability, declining grain prices, and the specialisation and integration of regional economies. But because the number of those who suffered *shallow* poverty, those who were on the verge of requiring poor relief and doles, did not decline, the concern for employing the poor persisted despite the overall economic improvement.¹³⁷

This explains why 'putting the poor to work' remained one of the central social issues throughout the late Tudor and Stuart periods. Recent studies have shown, however, that local poor relief schemes (many of which depended upon money raised in localities) were generally unsuccessful. According to Paul Slack, schemes launched after the Restoration were 'only patchily translated into action'.¹³⁸ Walter Morrell's 'New Drapery' scheme did go beyond the planning stage under the early Stuarts. But because of the local gentry's non-compliance the scheme failed to

¹³⁵ David Harris Sacks, 'The Greed of Judas: Avarice, Monopoly, and the Moral Economy in England, ca. 1350 – ca. 1600', *Journal of Medieval and Early Modern Studies*, 28 (1998), pp. 290-96, at p. 295 (quoting Thomas Becon's *The flower of godly prayers*).

¹³⁶ Steve Hindle, *On the Parish?: the Micro-Politics of Poor Relief in Rural England, 1550-1750* (Oxford: Clarendon, 2004), p. 172. See also Thirsk, *Economic Policy and Projects*, p. 51.

¹³⁷ Paul Slack, *Poverty and Policy in Tudor and Stuart England* (London: Longman, 1988), pp. 38-40, 53-55. The prevailing fear of downward mobility during the seventeenth century seems to lend support to Slack's overall assessment, see Michael Mascuch, 'Social Mobility and Middling Self-identity: the Ethos of British Autobiographers, 1600-1750', *Social History* [Hull], 20 (1995), 45-61.

¹³⁸ Paul Slack, *From Reformation to Improvement: Public Welfare in Early Modern England* (Oxford: Clarendon, 1998), p. 92.

employ the 'many thousands which now live in idleness' in Hertfordshire as Morrell had promised.¹³⁹ Even where schemes were put into practice for years, as in parishes of Cowden (Kent), Kempton (Bedfordshire), and Frampton (Lincolnshire) in the early seventeenth-century, many of them ultimately failed to run at profit and thus ended up burdening local ratepayers.¹⁴⁰ Consequently Anthony Fletcher has concluded that parochial work schemes were 'the most impractical aspect of the whole corpus of Tudor legislation'. Even a more modulated assessment of Steve Hindle has been that they 'appear to have been successful only intermittently, if at all' during the seventeenth and early eighteenth centuries.¹⁴¹

The widespread shallow poverty and the pressure to relieve the poor were only partially met, therefore. This is why even schemes for economic innovations and improvements (that were not poor relief based on local assessments) frequently claimed that their schemes would relieve the poor by employing them. In 1660, in a typical projector-like fashion, Thomas Bushell promised Charles II that his Welsh mining scheme would relieve 'many whole families' now 'starving for want' of bread and alms. His scheme would 'now be most gratefull and acceptable to all good men' because 'such poor Souls may be completely relieved, without any charge at all to the publick'.¹⁴² Sir Edward Ford publicised in a broadsheet in 1666 that he was

¹³⁹ Michael Zell, 'Walter Morrell and the New Draperies Project, c. 1603-1631', *Historical Journal*, 44 (2001), p. 665 (quoting from Henry E. Huntington Library, San Marino, CA, MS 53,654, p. 99).

¹⁴⁰ Hindle, *On the Parish?*, pp. 178-79, 183-84. For similar difficulties encountered during the later seventeenth and early eighteenth centuries, see Stephen Macfarlane, 'Social Policy and the Poor in the Later Seventeenth Century', in A. L. Beier and Robert Finlay (eds.), *London 1500-1700: The Making of the Metropolis* (London: Longman, 1986), 252-77; Slack, *From Reformation to Improvement*, chaps. 5-6; Hindle, *On the Parish?*, pp. 185-86.

¹⁴¹ Anthony Fletcher, *Reform in the Provinces: The government of Stuart England* (New Haven: Yale U.P., 1986), p. 213; Hindle, *On the Parish?*, pp. 173, 191, at p. 191.

¹⁴² Thomas Bushell, *An extract by Mr. Bushell of his late abridgment of the lord chancellor*

ready to propose a 'Herring Trade [. . .] to the Breeding up and Maintaining Plenty of Mariners [. . .] employ[ing] our Poor from their Childhood.'¹⁴³ Cressy Dymock claimed in 1668 that 'I know divers honest, beneficial and not enslaving ways which [. . .] may set [to work] not only all the Poor in *England*, but five times more', and even raise several millions of pounds within several years.¹⁴⁴ In 1714, the poet and projector Aaron Hill did not forget to mention that his oil extraction company would not only 'supply all *Europe* with [beech-mast] *Oil*' and raise vast profits for shareholders, but also tend to 'a general Good to the *Poor*'. The 'Country *Poor*, when they are furnish'd with Course Cloaths to spread under the Trees', may pick up 'millions of Bushels'.¹⁴⁵ Applicants for patents, too, often stated that their inventions would help employ the poor.¹⁴⁶ When convincingly presented, the slogan of employing the poor could help increase the acceptability of schemes for economic innovations that could be rejected as dubious 'projects'. So it became one of the fundamental features of the presentation of economic innovations and improvements.

The third underlying character of economic and technological schemes during the early modern period was the way promoters of those schemes presented themselves

Bacons philosophical theory of mineral prosecutions (1660), sig. A2, p. 3.

¹⁴³ Edward Ford, 'Experimented Proposals how the King may have Money to pay and maintain his Fleets, with Ease to his People' [1666], in *Harleian Miscellany* (8 vols, 1744-1746), vol. 4, p. 187.

¹⁴⁴ [Cressy Dymock], *The new and better art of agriculture* (1668) one-page handbill.

¹⁴⁵ Aaron Hill, *Proposals for raising a stock of one hundred thousand pounds; for laying up great quantities of beech-mast for two years* (1714), pp. 19, 10. The project was vilified by Thomas Baston, *Thoughts on trade, and a publick spirit* (1716), p. 11: 'the *Devil* was resolv'd for the future to appear more like a Gentleman, and now has begun to *liquor his Boots*, and sets up for an *Oil Projector*'.

¹⁴⁶ See, for example, patent nos. 89, 225, 246. Labour-saving invention existed, but as MacLeod finds, there was 'an overwhelming capital-saving bias in the goals evinced by patentees'. MacLeod, *Inventing the Industrial Revolution*, pp. 159-73 (quotation from p. 159).

with frequent emphasis on (godly) public service. As we have seen in the Introduction, such self-presentation became common during the sixteenth century. For example, in his proposal for manufacturing sail cloth from locally grown flax, Trollop suggested that his scheme would be capable of ‘inriching [. . .] our realme and common weale’.¹⁴⁷ In 1586, Robert Payne, a yeoman of Buckinghamshire, promoted a scheme for planting woad in Wollaton (Nottinghamshire) with the backing of Sir Francis Willoughby:

the two hundered thowsande poundes a yere in wares and mony whiche is bestowed beyonde the sseas upon the saide woade, might rather be heare employed to the releeffe of our poore native people[.]

Thus, Payne declared, ‘this simple weede [i.e. woad] maie do goode to a great number without hurte to any.’¹⁴⁸ Tobias Gentleman claimed that his 1614 fishery scheme ‘will bring plenty unto his Majesties kingdoms, and be for the generall good of the Common-wealth, in setting of many thousands of poore people on worke, which now knowe not how to live’ and in ‘increasing of shippes and Fisher-men’, of ‘Marriners’ for stronger navy, of export of fish, ‘and also for the the bringing in of gold, and money’.¹⁴⁹ Morrell’s New Drapery project was expected, in his words, to bring ‘the great benefit [. . .] unto your highness and the commonwealth’.¹⁵⁰ In 1655 Francis Mathew dedicated his river navigation scheme to Cromwell for ‘*the true advancement of the Publick good*’.¹⁵¹ The rhetoric of public service, we shall see in

¹⁴⁷ Muchmore, ‘Project Literature’, p. 481.

¹⁴⁸ R. S. Smith, ‘A Woad Growing Project at Wollaton in the 1580s’, *Transactions of the Thoroton Society of Nottinghamshire*, 65 (1961), pp. 40, 41.

¹⁴⁹ Tobias Gentleman, *Englands vway to vvin wealth, and to employ ship and mariners* (1614), pp. 7-8.

¹⁵⁰ Zell, ‘Walter Morrell’, p. 659.

¹⁵¹ Francis Mathew, *Of the opening of rivers for navigation the benefit exemplified by the two Avons of Salisbury and Bristol* (1655), sig. [A2v].

the following chapters, continued to set the tone for the promotion of economic innovations and improvement for subsequent decades and well into the early eighteenth century.

For many, the assertion of public service was not a selfless call for philanthropy. A degree of honest gain was permitted, and even an element of profiteering was present in many schemes. Trollop suggested that his scheme would ‘make your owne [London major’s and Aldermen’s] gaine certain in all sorts of cloth betwixt xxx and lx in the hundred’.¹⁵² Patents for inventions granted patentees the power to raise profit by licensing so that they could recompense inventors’ charges and industry. As Elizabeth put it in her Golden Speech in response to the denunciation of monopolies and other grants in the 1601 parliament, there was nothing unlawful in that her patents conferred ‘a private profitt to some of my auntient servants whoe had deserved well’ as long as these grants were ‘both good and beneficyall to the subiecte in generall’.¹⁵³ As the reference to ‘auntient servants’ suggests, courtiers and statesmen, as well as promoters from middling and humble strata, often rewarded themselves when engaging in economic schemes.¹⁵⁴ In a bid to differentiate themselves from stereotypical projectors, some promoters like Gabriel Plattes and Walter Blith of the mid-seventeenth century did highlight their financial

¹⁵² Muchmore, ‘Project Literature’, p. 483.

¹⁵³ Hartley (ed.), *Proceedings*, vol. 3, pp. 290, 293, 295, 413, at p. 413. There are four different records of her speech. For a close analysis of the speech, see David Harris Sacks, ‘The Countervailing of Benefits: Monopoly, Liberty, and Benevolence in Elizabethan England’, in Dale Hoak (ed.), *Tudor Political Culture* (Cambridge: CUP, 1995), pp. 277-91 (esp. p. 283).

¹⁵⁴ Examples are numerous, but see, for example, the earl of Huntingdon and the earl of Stanford arranging to receive one tenth of clear profits from Thomas Skipwith’s patent for the navigation of the river Soare. Thomas Rymer, *Foedera, conventiones, literae, et cujuscunque generis acta publica* [. . .] (20 vols, 1704-1735), vol. 19, pp. 597-600 (a transcription of the patent), at p. 599. See also Peck, *Court Patronage*, chap. 6.

disinterestedness.¹⁵⁵ Yet the admission of private profit was an enduring feature of projecting activities that promised to serve the public.

On the other hand, for some, the assertion of public service was more than a convenient publicity tool. Some innovative economic schemes did employ many poor labourers. In the 1580s, at Wollaton in Nottinghamshire, Robert Payne employed about four hundred poor a day spinning jersey wool for stockings, and cultivating woad.¹⁵⁶ In the early 1620s, John Stratford of Winchcombe, Gloucestershire, employed about 200 poor labourers growing flax on 40 acres of land.¹⁵⁷ Some others did more than give a grandiose, but vague, prospect of employing thousands. For example, in 1639 Gabriel Plattes declared that the possibility of complementing the poor relief had 'moved me to' publish his husbandry manual. An explicit parallel between his publication and parish poor relief is striking. The manual, Plattes argued, 'will be almost as charitable and good, as if I should build an Almes house in every Parish, and give perpetuall maintenance to the same'.¹⁵⁸ Writing his diary at the end of the seventeenth century, Sir Humphrey Mackworth repeatedly expressed his wish to relieve the poor through his mining business, and later proposed to donate its profits to Corporations for the Poor.¹⁵⁹ Thus, the idea of employing the poor not only defined how promoters *presented* their

¹⁵⁵ See Chapter Two.

¹⁵⁶ The scale of the employment was three times larger than the average population of a single village in the region. See Smith, 'Woad Growing Project', p. 30; Thirsk, *Economic Policy and Projects*, pp. 5, 19.

¹⁵⁷ Thirsk, *Economic Policy and Projects*, p. 19, 20. For more detail, see Thirsk, *Rural Economy of England*, chap. 15, esp. pp. 297-300.

¹⁵⁸ Gabriel Plattes, *A discovery of infinite treasure, hidden since the worlds beginning* (1639), sig. [C4]. In Chapter Two, we will see that Plattes was at pains to help his reader improve their methods of husbandry.

¹⁵⁹ See Chapter Five.

schemes, but in some cases also influenced how they actually *conceptualised* and *executed* them.

It is also worth noting that promoting innovative schemes did not mean that promoters were abandoning the old to celebrate the new. Rather, they often presented their schemes as means to maintain or restore the traditional, harmonious social order. This was how Trollop promoted his hemp-manufacturing scheme by presenting it as a promotion of the godly duty to labour:

by the lawes of god, humanity, and reason, governours ought to procure their owne people to be vertuously occupied and inryched by theyr travaile, rather then straungers, for therby they winne the love of the pore nedy people, & therby the blessing of god to them and their posteritie, they also encorage the subjectes to love their prince and magestrates.¹⁶⁰

Similarly, in his manuscript treatise that summed up the benefits arising from the introduction of flax growing and other novelties in his localities, John Stratford argued that his schemes employed the poor and thus enabled them to live ‘according to God’s ordinance by the sweat of their face in a more religious order’.¹⁶¹ William Cecil’s promotion of industrial innovations also displayed a similar view that ‘Innovation must serve the public weal, the stable health of the whole body politic.’ Thus Cecil’s patronage did ‘not fit comfortably into a set of policy categories labelled conservative, pragmatic, innovatory or radical’.¹⁶² Even a century later, John Houghton would draw upon an existing ideal to defend a new hotbed of innovative schemes, the stock market. As Natasha Glaisyer has argued, the stock market was ‘defended and promoted by being integrated within existing priorities’ of ‘a Bacon-inspired programme of improvement’, which had had almost an

¹⁶⁰ Muchmore, ‘Project Literature’, p. 480.

¹⁶¹ Thirsk, *Economic Policy and Projects*, p. 104.

¹⁶² Heal and Holmes, ‘Economic Patronage of William Cecil’, pp. 223, 222.

indisputable authority by the end of the seventeenth century.¹⁶³ Promoters introduced innovative schemes by drawing, paradoxically, upon the familiar rhetoric of godly public service and other pre-existing structures of beliefs.

Conclusion

Neither history of crown policy nor that of joint-stock companies alone can capture the history of projecting activities, for it straddled the fence between economic policy, welfare provision, and commercial undertakings. In this respect, it is worth highlighting that even seemingly 'private' enterprises of the late seventeenth century asserted public service. For example, Richard Haines obtained a patent for his method of strengthening 'cider, perry, and the juice or liquors of wildings, crabbs, cherries, goosberries, currants, & mulberries' in 1684 (patent no. 231), and members of the Royal Lustring Company¹⁶⁴ procured one in 1688 for 'severall blacke palaine sorts of silkes', called 'alamodes, ranforcees, & lustrings' (no. 261). Their patents made no formal arrangements to pay fees to the Exchequer. Significantly, however, Haines claimed that, if widely practiced under his supervision, his patented cider production would 'raise hereby 800,000 Pounds *per Annum* [. . .] to the Publique Exchequer', without 'Raising any Burthensome Taxes, or putting their Subjects to heavy Charges'.¹⁶⁵ The Royal Lustring Company similarly claimed that it would

¹⁶³ Natasha Glaisyer, *Culture of Commerce in England 1660-1720* (Woodbridge: Boydell, 2006), pp. 145, 186, at p. 186.

¹⁶⁴ I have followed Scott, *Joint-stock* in calling it the Lustring (rather than Lutestring) Company.

¹⁶⁵ Patent no. 231; Richard Haines, *Aphorisms upon the new way of improving cyder* (1684), sig. [Bv], pp. 8, 14 (quotations from p. 14, sig. [Bv]). He proposed, however, to impose a penny excise tax upon a quart of his patented cider. See *ibid.*, p. 9.

'promote the said Work to the Honour and Common Good of this Nation, by Employing many Thousands of Poor People [. . .] as also by saving the vast Expences of Money that used to be sent Yearly into *France* for [importing] the said Commodities'.¹⁶⁶ Patentees were thus no longer *obliged to raise fees* (for which former monopolists oppressed economic competitors). But promoters of economic innovations and improvement continued to suggest *beneficial implications* of their schemes for public finance and the nation at large.

The remaining four chapters will explore aspects of projecting culture this chapter has outlined. So far, my discussion of projecting activities has focused primarily on the realm of patenting and juxtaposed them with other kinds of schemes, such as those for raising revenues and for poor relief. But because patenting was by no means the only available channel for launching schemes for economic innovations and improvement, we should now move beyond the realm of patenting to obtain a wider picture of projecting culture.

While this chapter has perhaps made it seem as if the history of projecting activities had been that of a uniform, linear development, the following chapters will revisit it as the evolution of projecting activities and stereotypes about them. The notion of evolution is here intended to highlight that the change in projecting activities came about not as a result of a single coherent programme or by promoters' intention alone, but as part of social processes that shaped, and were shaped by, a host of contemporary economic, social, and political developments. The idea is similar to the one Michael Braddick has sought to convey by avoiding the term *state building* (which conveys a sense of intentional, programmatic development), in

¹⁶⁶ *The charter of the Royal Lustring Company* (1697), p. [3]. For a general account, see Scott, *Joint-stock*, vol. 3, pp. 73-89.

favour of the notion of state *formation* (which was often unintended).¹⁶⁷ Like that of *formation*, the concept of *evolution* also illuminates the history of projecting as ‘a hesitant progression, sometimes long in gestation, unplanned or improvised and possibly even unperceived by its participants, with unclear boundaries to mark its beginning or its end.’¹⁶⁸

Examples of individual promoters have been used in this chapter as particular instances to illustrate long-term changes about the projecting activities and stereotypes about them. But in reality, immigrants, courtiers, virtuosi, middling sorts of people, and others were drawn to projecting activity in part because of the allure of profit, and in part because they could also pursue (or at least present themselves as pursuing) godly public service. Individual episodes will enable us to recover a sense of human choice, showing how promoters adopted different strategies in order to promote their schemes without being dismissed as unreliable ‘projectors’. Only by doing so, can we demonstrate the pervasiveness of both distrust and the assertion of the public good within transforming circumstances.

¹⁶⁷ Braddick, *State Formation*, p. 1.

¹⁶⁸ Roseveare, *Financial Revolution*, p. 3.

CHAPTER TWO

‘Counted a Subtill Projector’?:
Promoting Husbandry in the Hartlib Circle, c. 1639-1651

I find by experience that if any mans particular forewardnesse transporte him from all privat endes to such purposes as these bee [i.e. millenarian reforms], hee becommeth for the most part a publick object of worldly mens derision & contempt, of partiall mens astonishment & obloquie [. . .]; thus of all hee is neglected; of many hee is counted a subtill projector & practitioner & of some an inconsiderate & presumptuous foole.

John Dury to ?, 31 March 1634, HP 1/9/5A

Pursuing ambitious reform of mankind could make Dury and other reformers look like a sort of ‘projector’, or ‘presumptuous foole’. But that did not deter them. In October 1641 an anonymous tract entitled *A description of the famous kingdome of Macaria* appeared. Its main author was the practitioner of husbandry and inventor, Gabriel Plattes, who published books on husbandry and mining in 1639.¹ *Macaria* was written in order to ‘doe good to the publick’, and was dedicated to the Long Parliament which was just beginning its second session.² The tract depicted the ideal kingdom in order to inspire a campaign for religious moderation and wholesale social and economic reform. *Macaria* had five councils that supervised and regulated husbandry, fishing, domestic and overseas trade, and plantations. It also had a ‘College of Experience’ in which all those who could ‘demonstrate any experiment for the health or wealth of men, are honourably rewarded at the publike charge’.³ Religious sectarianism was virtually absent in *Macaria*, and peace and justice prevailed. So ‘the King and the Governours doe live in great honour and riches, and

¹ The authorship of the tract has been established by Charles Webster, ‘The Authorship and Significance of *Macaria*’, *Past & Present*, 56 (1972), 34-48.

² Gabriel Plattes, *A description of the famous kingdome of Macaria* (1641), sig. [A2v].

³ Plattes, *Macaria*, p. 5.

the people doe live in great plenty, prosperities, health, peace, and happinesse, and have not [raise?] so much troubles as they have in these European Countreyes'.⁴ The pamphlet called for reforms in the manner of *Macaria*: 'let us pursue our good intentions, and bee good instruments in this worke of Reformation.'⁵

As Charles Webster put it in his landmark *The Great Instauration*, 'One legacy of *Macaria* was a flood of proposals for general social reform' during the Civil War and Interregnum period.⁶ The key persons in this process were Dury and, above all, the German Calvinist émigré, Samuel Hartlib, who was closely involved in the preparation of *Macaria*. Many manuscript proposals were exchanged, modified and developed through Hartlib's extensive correspondence network, and they were often printed and published for a wider audience. Some directly took up the issues raised in *Macaria* and published proposals for erecting a college for supporting innovations and learning,⁷ while others worked on ones for establishing the state-run 'Office of Adresse and Correspondencie for matters of religion, learning and ingenuities', whose purpose was to serve as 'a center [sic] and meeting place of advices, of communications, and of informations; which shall bee freely given and received, by and for, to and from all such as shall thinke themselves concerned'.⁸

⁴ Plattes, *Macaria*, p. 2.

⁵ Plattes, *Macaria*, p. 13.

⁶ Charles Webster, *The Great Instauration: Science, Medicine and Reform 1626-1660* (2nd ed. with new Preface, Oxford: Peter Lang, 2002), p. 369.

⁷ See for example, William Petty, *The advice of W. P. to Mr. Samuel Hartlib* (1647); Cressy Dymock, *An essay for advancement of husbandry-learning; or propositions for the erecting a colledge of husbandry* (1651).

⁸ 'A motion of the Public good of Religion and Learning', quoted in G. H. Turnbull, *Hartlib, Dury and Comenius: Gleanings from Hartlib's Papers* (London: University Press of Liverpool, 1947), pp. 78-79. For works published on this topic, see John Dury, *Considerations tending to the happy accomplishment of Englands Reformation in church and state* (1647); Samuel Hartlib, *Further discoverie of the office of publick adresse for*

The underlying millenarian or ‘pansophic’ worldview that drove such a reforming zeal has been well studied.⁹ The millennium was approaching, or so it was believed, based on a reading of Daniel 12: 4 and other biblical sources; the universal reform of mankind was deemed possible and necessary. Religious unification, the improvement of learning, and all other forms of social and economic advancement were given religious significance. Francis Bacon’s programme for developing experimental knowledge reinforced the ideal of bettering the human condition through the restoration of learning and the application of technology. These sources of inspiration did not generate a single, well-defined movement, but stimulated a multitude of reforming initiatives.¹⁰ ‘A diverse and self-selecting group of enthusiasts or “ingenui”’ not only vigorously pursued the issues raised in *Macaria*, but also promoted reform proposals on virtually every aspect of social life, including religious and lay education, medicine, alchemy, poor relief, and inventions for industry and agriculture.¹¹

The central purpose of this chapter is to reconsider the activities of the so-called Hartlib circle from a perspective of a long-term history of projecting activities and stereotypes about them. I will document a wide range of strategies they employed in

accommodations (1648).

⁹ Webster, *Great Instauration*, chap. 1. See also Turnbull, *Hartlib, Dury and Comenius*; Michael Walzer, *Revolution of the Saints: A Study in the Origins of Radical Politics* (Cambridge, Mass.: Harvard U.P., 1965), chaps. 2, 5; H. R. Trevor-Roper, ‘Three Foreigners: The Philosophers of the Puritan Revolution’, in H. R. Trevor-Roper, *Religion, the Reformation and Social Change and Other Essays* (New York: Harper & Row, 1968), 237-93; Paul Slack, *From Reformation to Improvement: Public Welfare in Early Modern England* (Oxford: Clarendon, 1998), chap. 4.

¹⁰ Thomas Leng has warned that Webster has placed too much emphasis on the unity of the puritans, see Thomas Leng, *Benjamin Worsley (1618-1677): Trade, Interest and the Spirit in Revolutionary England* (Woodbridge: Boydell, 2008).

¹¹ A phrase is borrowed from M. Greengrass, ‘Hartlib, Samuel (c. 1600–1662)’, *Oxford DNB*, vol. 25, p. 625.

order to promote their ambitious schemes as credible and worth supporting. In doing so, I argue that the negative stereotypes about projects generated under the early Stuarts fundamentally affected their arguments, and that the contemporary distrust of the projector helps explain the remarkable ambiguity and uncertainty with which Hartlib and his allies communicated their proposals.

This chapter also seeks to enhance our understanding of the so-called Hartlib circle, arguably one of the most eclectic and prolific communities of reformers in the seventeenth century. Although many historians would distance themselves from Webster's phrases like 'values which were basic to the modern scientific movement' or 'an emancipation from scholastic values',¹² a good number seem to agree with his interpretation that the defining character of this movement for the 'Great Instauration' was the shared commitment to free and open communication. This is because many historians have tended to draw upon projections of contemporary ideals, such as proposals of the 'Office of Adresse', contemporary praise of Hartlib, and unfavourable comments on attempts to exploit secrecy and monopoly.

George Turnbull, for example, pointed to Hartlib's unfavourable memorandum about George Starkey's partial concealment of his method of producing cochineal, and thereby argued that Hartlib 'criticized those who kept their knowledge secret, hoping thereby to make money or profit for themselves'.¹³ Turnbull's argument has been taken up by William Eamon. In the chapter ambitiously entitled 'From Secrets

¹² Webster, *The Great Instauration*, passim (quotations from p. 510).

¹³ G. H. Turnbull, 'Samuel Hartlib's Influence on the Early History of the Royal Society', *Notes and Records of the Royal Society of London*, 10 (1953), p. 127. The section Turnbull quotes runs as follows: 'He [Starkey] intimated also that he could make an excellent Luciferus to make him[self] rich by it if he would retire which was by making of Cochineal out of the roote and leaves of the Prickly Peares of Bermudas which grow there in abundance. E[rgo] let him discover it to the Publick seeing he doth not retire, as the young lady hath done the Experiment of Silke worms to the Virginians' (HP, *Ephemerides*, 1652).

to Public Knowledge' Eamon gives the Hartlib circle a prominent role in his narrative of the changing organization of knowledge about nature. Referring to Turnbull's argument, he contends that Hartlib 'denounced those who withheld secrets out of a desire for profit.' 'Moreover,' Eamon adds, 'contemporary descriptions of Hartlib do not convey the impression of a mystic or an occultist, but of a utopian and philanthropist who advocated and practiced open communication of knowledge.'¹⁴

In her authoritative survey of agricultural innovations in seventeenth- and eighteenth-century England, Joan Thirsk suggests that 'Visitors to Hartlib's house and correspondents were all given the same sympathetic hearing, and their ideas and problems were freely discussed with the next visitor. In this circle of men the secretive spirit was fiercely denounced.'¹⁵ More recently, Mark Greengrass has advanced a similar argument by drawing upon contemporary descriptions of Hartlib, on the wide subject-coverage by him and his correspondents, and on critical comments on certain kinds of monopoly expressed by Hartlib, Culpeper and others. According to Greengrass, Hartlib and his associates shared a 'viewpoint in which the potential of free and "real" knowledge to benefit the commonwealth [or 'free information flows' as Greengrass puts it elsewhere] was contrasted with the greed of individual monopolists and the obfuscation of old institutions and learning.'¹⁶

Studies of alchemists of this period have offered some important revisions. In particular, William Newman has shown that George Starkey's skilful partial

¹⁴ William Eamon, *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture* (Princeton: Princeton U.P., 1994), p. 332 (see also p. 424, fn. 52).

¹⁵ *AHEW* Vii, p. 548.

¹⁶ Greengrass, 'Hartlib', *Oxford DNB*, vol. 25, p. 625. See also Mark Greengrass, 'Samuel Hartlib and the Commonwealth of Learning', in John Barnard, D. F. McKenzie (eds.), *The Cambridge History of the Book in Britain, vol. IV, 1557-1695* (Cambridge: CUP, 2002), pp. 315-16.

concealment of alchemical ‘secrets’ fascinated (as much as frustrated) people like Hartlib, Boyle, and subsequently Newton.¹⁷ There is, however, a danger of depicting the reformers as a clan of manipulative adepts. In a recent survey of alchemical and ‘chymical’ practices in the mid-seventeenth century, Newman and Principe have concluded that ‘Factionalism, manipulation, and appropriation seem notable attributes of many of the Hartlibians’. ‘Driven by the seventeenth-century’s passion for “projecting,” the overheated world of the Hartlib circle was scarcely a model of harmony or disinterest.’¹⁸

We need to develop a more balanced picture. On the one hand, we must prevent ourselves from overemphasising the uniqueness of the millenarian reformers of the mid-seventeenth century. David Harris Sacks has recently shown that the writings of Richard Hakluyt prefigured a ‘simultaneously apocalyptic and pragmatic vision’ based on a reading of Daniel 12: 4.¹⁹ C. E. McGee has suggested that the royalist and ‘projector’ Thomas Bushell praised Bacon and adopted Bacon-inspired idioms during the 1630s.²⁰ Elizabethan pursuit of natural knowledge were characterised by ‘joint authorship and collaboration’, Deborah Harkness has argued; these elements were no novelty of the mid-century puritans.²¹ On the other hand, we need to be

¹⁷ See William R. Newman, *Gehennical Fire: The Lives of Gerorge Starkey, an American Alchemist in the Scientific Revolution* (Cambridge, Mass.; Harvard U. P., 1994). See also John T. Young, *Faith, Medical Alchemy, and Natural Philosophy: Johann Moriaen, Reformed Intelligencer and the Hartlib Circle* (Aldershot: Ashgate, 1998); William R. Newman and Lawrence M. Principe, *Alchemy Tried in the Fire: Starkey, Boyle, and the Fate of Helmontian Chymistry* (Chicago: University of Chicago Press, 2002).

¹⁸ Newman and Principe, *Alchemy Tried in the Fire*, p. 268.

¹⁹ David Harris Sacks, ‘Richard Hakluyt’s Navigation in Time: History, Epic, and Empire’ *Modern Language Quarterly*, 67 (2006), p. 61.

²⁰ C. E. McGee, ‘The Presentment of Bushell’s Rock: Place, Politics, and Theatrical Self-Promotion’, *Medieval and Renaissance Drama in England*, 16 (2004), 31-80.

²¹ Deborah E. Harkness, *The Jewel House: Elizabethan London and the Scientific*

careful not to impose the image of relentless ‘projecting’ upon the reformers. As we have seen at the beginning of this chapter, Dury was fully aware of the danger of being seen as the ‘projector’, and such awareness could shape activities of some of the reformers.

We need to move beyond the discussion of Hartlib’s and his allies’ *ideals* about intellectual communication to an analysis of the ways in which they *conceptualised* and then *actually promoted* their schemes. Negative stereotypes about the projector – something historians of the Hartlib circle have rarely explored – are the key here. As we have seen in Chapter One, the negative stereotype about the projector first developed around abuses of monopolistic patents, and began to impinge upon other spheres of public action towards the end of Charles’s Personal Rule. Furthermore, after the collapse of press censorship by the end of 1640, the unprecedented number of pamphlets hurled diatribes at the projectors. For example, Thomas Haywood praised the ‘bright English Sunne (The Parliament)’, and declared that ‘I thought it a point of my duty (worthy Reader) to expand in its right colours [of the parliament] some of the fatall clouds that occasioned our darknesse: Projectors being principall vapours that dimm’d both our quietts and our profits’.²² The operation of the Hartlib circle gathered momentum precisely when condemnations of ‘the projector’ reached their height.

Hartlib’s and others’ proposals were in no way immune from such suspicion. As Mark Jenner points out, many Hartlibean proposals of social reform (e.g. *Macaria*) looked like the dubious projects satirized by authors like John Shirley, Richard

Revolution (New Haven: Yale U.P., 2007), chaps. 1, 6 (quotation from p. 241).

²² Thomas Haywood, *Machiavel. As he lately appeard to his deare sons, the moderne projectors* (1641), sig. B-[Bv].

Brome, Ben Jonson and other lesser writers. They were ‘in danger of collapsing under the weight of their own grandiloquent pretensions’.²³ So Hartlib’s and his allies’ emphasis on public service may well have been subject to the kind of criticism that had been aimed at Caroline projectors:

Who can convert your meanings for the good
Oth’ publike weale to bad? since what you would
Have bravely acted was to increase the store
Oth’ kingdom, & your own wealth ten times more.²⁴

Such, Haywood suggested, was the projectors’ veneer; they were not ‘content to devoure for satisfaction of their hungers’, but took ‘mischiefe [to be] their sport’.²⁵ As we shall see, moreover, some of Hartlib’s and his allies’ schemes resembled Caroline monopolies that had proved socially divisive. As Adrian Johns has noted, therefore, there was a serious question about credibility: ‘Why should anyone have believed any of Hartlib’s [and others’] promises?’²⁶ The negative stereotype of the ‘projector’ was particularly problematic for Hartlib and his allies because they were associated with, and seeking support from, the Long Parliament which had denounced Caroline projectors. So we can reformulate Johns’ question: how did Hartlib and others respond to (or fail to respond to) the negative stereotypes?

In this chapter I will look closely at schemes for promoting policies,

²³ Mark Jenner, ‘“Another *epocha*”? Hartlib, John Lanyon and the Improvement of London in the 1650s’, in Mark Greengrass, Michael Leslie and Timothy Raylor (eds.) *Samuel Hartlib and Universal Reformation: Studies in Intellectual Communication* (Cambridge: CUP, 1994), esp. pp. 352-56, at p. 353.

²⁴ Haywood, *Machiavel*, sig. [A3v].

²⁵ Haywood, *Machiavel*, sig. B.

²⁶ Adrian Johns, ‘Identity, Practice, and Trust in Early Modern Natural Philosophy’, *Historical Journal*, 42 (1999), pp. 1134-38 (quotation from p. 1138). A similar point is also raised by Mark Greengrass, ‘The Projecting Culture of Samuel Hartlib and His Circle’, (unpublished conference paper for ‘Publicists and Projectors in Seventeenth-Century Europe’, Wolfenbüttel, 1996), no pagination.

technologies, and know-how related to husbandry proposed by Cressy Dymock, Le Pruvost, Gabriel Plattes, and Walter Blith. I will first survey the significance of husbandry to the Hartlib circle and point out that different conceptions of knowledge underlay different strategies of promoting improved husbandry. I will then explore the case studies that are deliberately chosen to exemplify a wide range of strategies (including both uses of secrecy and open-communication). First we will explore Dymock's schemes that could be mocked as spurious 'innovations', and Le Pruvost's 'universall trade' scheme that looked like a Caroline monopoly (that had abused political authority). The discussion of Plattes's and Blith's promotion of improved husbandry will follow, which will explore how they carefully calibrated their schemes in order to avoid being stereotyped as grandiose or monopolistic 'projectors'.

This chapter will reveal that the adoption of open communication was just one way of promoting improved husbandry, and that Hartlib and his close allies had strong reasons to consider, and even support, project-like schemes which drew upon secrecy or the imposition of governmental authority. I will demonstrate that both open communication and partial concealment played important roles in the promotion of improved husbandry, but that neither was the definitive feature of the reforming activities of Hartlib and others. Even those who practiced secrecy stressed their piety and public service, and doing so was perhaps a basic requirement for sustained collaboration within the network. More importantly, what all shared was the burden of distrust. The Hartlib circle collectively displayed remarkable ingenuity and aspirations with which distrust could be handled or put aside.

Husbandry: the 'Approved Medicine' of the Body Politic

Reforming husbandry encapsulated major preoccupations of the Hartlib circle. 'Husbandry' was an early modern category that denoted cultivation and management of the land in a broad sense. It embraced a set of agricultural practices and related know-how (like methods of pasture farming and apiculture) on the one hand, and the theoretical explanation (e.g. for fertility and barrenness of the soil) of this know-how on the other. So it was no coincidence that Plattes declared that his husbandry knowledge would not only help 'Plow-men' with better equipments and methods of farming, but also turn them 'into Philosophers; and to make them excel predecessors, even as a learned Physician excelleth an Emperick.'²⁷ Moreover, improvement in husbandry meant improvement in related technologies such as ploughs, corn-setting devices, mills and draining engines (sometimes including the invention of perpetual motion engines). Proposals for improving husbandry thus involved technical ingenuities, philosophical inquiries, and their application for the bettering of public welfare.

Examination of seventeenth-century English economy also confirms the importance of husbandry. Much of its national income derived from trades and industries that were 'themselves based on agriculture or landed property'. As Charles Wilson has put it, the 'cloth industry used wool, the linen industry flax, beer was made from malt and malt from barley'.²⁸ With its related sectors in forestry, mining, trading and transportation, husbandry constituted the central source of wealth and employment over the century. Not only peasant farmers, independent yeomen and

²⁷ Plattes, *Discovery of infinite treasure*, sig. [(a)v].

²⁸ Charles Wilson, *England's Apprenticeship 1603-1763* (2nd ed., Harlow: Longman, 1984), pp. 20-22.

copyholders, but also men of letters and of large estates, took a direct interest in managing and cultivating land.²⁹ Husbandry was, thus, the dominant feature of the economy of the period.

Accordingly, millenarian reformers gave utmost importance to husbandry and its associated concerns in chemistry, natural philosophy, and mechanical philosophy. This was because husbandry seemed to offer a vital means to deal with the problems of dearth, poverty, and the perceived threat of over-population. Despite the long-term economic and urban growth, the period 1570-1650 marked a heightened perception of 'the relative deprivation of the poor'. Moreover, the years 1637-38 saw 'the worst barley harvest of the whole period 1590-1700'.³⁰ So it was perhaps no coincidence that in 1639, prior to the publication of *Macaria*, Plattes first published a book on husbandry.³¹ Speaking of the introduction of lime and marl as fertilizers, Plattes argued that husbandry innovations would have a greater impact on the welfare of the country than other forms of reforms like building 'all the Hospitals in *England*'. '[F]or the one feedth and cloatheth a few hungry and naked persons, the other enableth an infinite number both to *feed and cloath themselves and others*.'³² His

²⁹ Mayling Stubbs, 'John Beale, Philosophical Gardener of Herefordshire Part II. The Improvement of Agriculture and Trade in the Royal Society 1663-1683', *Annals of Science*, 46 (1989), p. 328. Landed gentlemen's increasing concern in cultivating their estates by themselves is discussed by Joan Thirsk, 'Making a Fresh Start: Sixteenth-Century Agriculture and The Classical Inspiration', in Michael Leslie and Timothy Raylor (eds.), *Culture and Cultivation in Early Modern England: Writing and the Land* (Leicester and London: Leicester U. P., 1992), 15-34.

³⁰ See respectively, Paul Slack, *Poverty and Policy in Tudor and Stuart England* (London: Longman, 1988), pp. 53-55 (quote from p. 54); R. B. Outhwaite, 'Dearth and Government Intervention in English Grain Markets, 1590-1700', *Economic History Review*, 2nd ser., 34 (1981), p. 398.

³¹ In *Macaria* Plattes also promised to 'propound a book of Husbandry to the high Court of Parliament, whereby the Kingdome may maintaine double the number of people, which it doth now, and in more plenty and prosperity, than now they enjoy.' Plattes, *Macaria*, p. 11.

³² Plattes, *Discovery of infinite treasure*, sig. [(a)v] (my emphasis). See also *Ibid.*, sig.

husbandry manual could therefore have far-reaching consequences: 'there is no approved medicine but this, in an over-peopled Commonwealth, to wit, good improvement of the earth; which may be effected by the new inventions contained in this Book'.³³ Many associates of Hartlib highlighted such an aspiration for public service. They lacked, however, coherent ideals or ideologies that historians often ascribe to them. The promoters responded to the stereotypes about the projector with remarkable ambiguity and ambivalence, and accordingly they negotiated credibility of their schemes with a wide range of (often conflicting) strategies.

Conditions and Conceptions of Husbandry Knowledge

For the rest of this chapter, I shall examine a few individual cases arranged roughly in chronological order.³⁴ However, before we go on to explore how Hartlib and other promoters sought to promote their husbandry knowledge as trustworthy, we need to know how they understood the knowledge that they were seeking to improve. The production of husbandry knowledge was, in many respects, dependent upon empirical observations derived from a given set of material circumstances and practices. So Thomas Tusser, the author of the influential *Five hundred points of good husbandry* (1573), dwelled in his estate in Suffolk, and wrote with his

[C4v] for a similar assertion.

³³ Plattes, *Discovery of infinite treasure*, sig. [A3v].

³⁴ For the comprehensive treatment, see Webster, *Great Instauration*, esp. pp. 465-83; Joan Thirsk (ed.), *The Agrarian History of England and Wales, Volume IV 1500-1640* (Cambridge: CUP, 1967), chap. 3; *AHEW VII*, chap. 19 (esp. pp. 542-59); R. E. P. Ernle, *English Farming Past and Present* (New 6th ed. London: Heinemann, 1961), pp. 103-29; G. E. Fussell, *The Old English Farming Books: From Fitzherbert to Tull, 1523-1730* (London: Crosby Lockwood & Son, 1947), pp. 36-55; Eric Kerridge, *The Agricultural Revolution* (London: Allen and Unwin, 1967), pp. 81-325; E. L. Jones, *Agriculture and Economic Growth in England 1650-1815* (Oxford: Blackwell, 1974), Intro., chap. 3-4.

particular knowledge based on practices in that region.³⁵ Similarly, John Norden's popular *Surveyor's dialogue* (1607) contained an amalgam of his local knowledge gathered through his experience as an estate surveyor of crown forests and estates of the duchy of Cornwall.³⁶ Sir Richard Weston, who recommended his son to try clover cultivation in the 1640s, sought to transfer what he had seen in Flanders to his family estates at Sutton in Surrey.³⁷ So husbandry knowledge was similar to other technologies such as ship-building, architecture, and glassmaking, which gathered know-how through local practices.

In husbandry, as in other fields of technical knowledge, it was often hard to isolate reliable principles that would guarantee the same result in every other setting.³⁸ Many practitioners around Hartlib, including Robert Wood, were aware of this problem and sought improvement. Hartlib found Wood's manuscript 'Vindication of the decaying clover-grass' to be 'very fit', and asked him to publish it in order to dispel 'prejudice that is of late against' the plant. Wood, however, declined because he could not confirm his hypothesis when he travelled to Ireland and compared practices in clover fields there. Thus he wrote to Hartlib that 'till I have further satisfied myself, I thought it better to leave men to their own experience, than to endeavour to persuade them unto that which might possibly mislead and betray

³⁵ *AHEW* VII, p. 534; Andrew McRae, *God Speed the Plough: the Representation of Agrarian England, 1500-1660* (Cambridge: CUP, 1996), p. 146, fn. 30.

³⁶ F. Kitchen, 'Norden, John (1547-1625)', *Oxford DNB*, vol. 41, p. 5.

³⁷ Richard Weston, *A discours of husbandrie used in Brabant and Flanders* (1650). Its second and third editions appeared in 1652 and 1654.

³⁸ For difficulties encountered in transferring architectural and other knowledge, see Stephen R. Epstein, 'Transferring Technical Knowledge and Innovations in Europe, c. 1200 – c. 1800', Working Papers on The Nature of Evidence: How Well Do 'Facts' Travel? No. 01/05 (2005), '<http://www.lse.ac.uk/collections/economicHistory/pdf/FACTSPDF/FACTS1-Epstein.pdf>' (27 March 2006), pp. 32-33.

them.³⁹ He saw, as others did, husbandry knowledge as subject to error and limited validity, and sought improvement through experiments.

While many of them embraced this view of husbandry knowledge as based on the gradual sophistication of bundles of know-how (derived from particular contexts) into generalized principles, such a view often coexisted with the aspiration for the perfect husbandry knowledge and technology. It was partly because in late medieval and early modern Europe there was little agreement as to what would be possible and plausible.⁴⁰ In this respect, the pursuit of husbandry knowledge resembled the pursuit of perfections in mechanical philosophy, medicine and alchemy. While astrologers sought to find hidden rules behind the regular movement of stars, alchemists carried out experiments to discover the 'key' for the transmutation of base metals, inventors sought the laws that would enable the perpetual motion of a wheel, physicians pursued a recipe that would enable a man to live forever, and reformers of husbandry sought to discover the artificial manure that would infinitely increase fertility of the soil.⁴¹

We cannot underestimate the attraction of such pursuits. Hartlib paid close attention to George Starkey's alchemy; when Hartlib was disillusioned with him in

³⁹ See *AHEW* vii, pp. 554-55; A. R. Michell, 'Sir Richard Weston and the Spread of Clover Cultivation', *Agricultural History Review*, 22 (1974), 160-61.

⁴⁰ See Steven Shapin, *Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: University of Chicago Press, 1994), pp. 194-202.

⁴¹ For the discussion of plausibility in the circulation of political, commercial, financial, agricultural and natural philosophical knowledge, see Simon Schaffer, 'A Social History of Plausibility: Country, City and Calculation in Augustan Britain' in Adrian Wilson (ed.), *Rethinking Social History: English Society 1570-1920 and its Interpretation* (Manchester: Manchester U.P., 1993), 128-57. For alchemical traditions in early modern period, see for example, Newman, *Gehennical Fire*. For perpetual motion, see Simon Schaffer, 'The Show that Never Ends: Perpetual Motion in the Early Eighteenth Century', *British Journal for the History of Science*, 28 (1995), 157-89. For the prolongation of life, see David Boyd Haycock, *Mortal Coil: A Short History of Living Longer* (New Haven: Yale U.P., 2008).

early 1653, his attention turned to the experienced alchemist Frederick Clodius, who, having moved to England in mid-1652, married Hartlib's daughter the next year.⁴² Likewise, from 1646 Hartlib supported Benjamin Worsley's project of establishing a 'perpetual mine of salt petre', which could be used both as ingredient for gun-powder and as fertilizer.⁴³ From the mid 1640s, Hartlib also supported Cressy Dymock's search for perpetual motion as well as his experiment of using it for arable farming. In 1654, speaking of Dymock's perpetual motion engine, Hartlib wrote that he was 'no more so fond as I was wont to be'. He immediately made it clear that this was because 'perfection' of the art seemed likely to be achieved elsewhere: 'Not that there is any defect in the said invention, but [. . .] there appearing a far greater beauty and perfection in some other inventions of the same kind, which are going through my hands at this present'.⁴⁴ In the later seventeenth century too, husbandry writers like John Beale and John Worlidge were fascinated by what John Evelyn called a 'Philosophical Discourse of Earth', which sought to isolate some subterranean power which, if properly managed, could increase fertility of the soil tremendously.⁴⁵ In this way Hartlib and his fellow reformers embraced two different registers of husbandry knowledge: *prima facie* rules of thumb derived from particular observations, which could be overridden as a result of further experiments; and an

⁴² Newman, *Gehennical Fire*, pp. 82-83. Before Clodius came to England, he served Frederick III, duke of Holstein-Gottorp, as an alchemist. See Newman and Principe, *Alchemy Tried in the Fire*, pp. 257-59.

⁴³ Leng, *Benjamin Worsley*, pp. 20-21; Charles Webster, 'Benjamin Worsley: Engineering for Universal Reform from the Invisible College to the Navigation Act', in Greengrass, Michael Leslie and Timothy Raylor (eds.) *Samuel Hartlib and Universal Reformation*, 213-35; Newman, *Gehennical Fire*, p. 87.

⁴⁴ Robert Boyle, *The Correspondence of Robert Boyle*, eds. Michael Hunter, Antonio Clericuzio, Lawrence M. Principe (6 vols, London: Pickering & Chatto, 2001), vol. 1, p. 160, from Hartlib to Boyle, 28 Feb. 1654.

⁴⁵ Schaffer, 'A Social History of Plausibility', pp. 144-46.

effective means of approaching, if not demonstrating, perfection of the knowledge. Whoever the audience, these different views underlay different ways of promoting improved husbandry and related technologies.

Selling Divine Secrets:
Cressy Dymock's Self-fashioning, c. 1646-1651

Cressy Dymock, the farmer inventor of a Lincolnshire family,⁴⁶ has been only sporadically mentioned by scholars like Webster and Thirsk.⁴⁷ This is probably because Dymock's activities do not readily fit into the interpretation of the Hartlib circle as advocating quasi-scientific communication of knowledge. As we shall see, Dymock publicised his 'secrets' and 'mysteries'; he made grandiloquent promises about them without fully proving efficacy; in doing so he attracted investment and made his living. In these respects, he looked like early Stuart 'projectors', in particular those who profited through advancing impractical (and possibly even fraudulent) schemes. Intriguingly, however, he attracted, at least for several years, a great deal of attention and support from Hartlib and many others around him. Dymock's career thus offers an ideal window through which to illuminate the projecting culture of the mid-century, one in which even a projector-like promoter of innovations had an important role to play.

⁴⁶ *AHEW* *Vii*, p. 547.

⁴⁷ Webster, *Great Instauration*, pp. 365-66, 473, 475, 481, 511; *AHEW* *vii*, pp. 549, 551-59, 562, 582-83 (esp. pp. 552-53). Dymock has also been marginal in Leslie and Raylor (eds.), *Culture and Cultivation in Early Modern England*; Greengrass, Leslie, and Raylor (eds.) *Samuel Hartlib and Universal Reformation* (except pp. 323-26, 331-32 where his farming schemes were discussed in terms of landscape design).

Dymock first came into contact with Hartlib and his allies probably in 1645.⁴⁸ Thereafter, Dymock actively exchanged letters with them. Dymock's interests included, but went beyond, arable cultivation and technologies related to husbandry. For example, he became involved in improving a corn-setting engine with Petty and others;⁴⁹ he also took part in mining and the smelting of ores in county Durham with his cousin and asked Benjamin Worsley to provide a furnace of his invention.⁵⁰

One of Dymock's schemes that commanded great attention from the circle of Hartlib was his controlled experiment on arable cultivation. In August 1648, at the height of the dearth between 1646-1651, Dymock proposed to try his new methods of cultivation, presumably utilising the corn-setting engine he had improved. The yield of wheat, barley, and other crops from the estate under his supervision was to be compared with three other farms nearby that were to use the same seeds but follow the conventional method.⁵¹ Intriguingly, Dymock declared in the same letter that 'itt is not my meaning to giue away or make common' the detail of this controlled experiment. It was 'the secret', and Dymock stipulated that 'I bee allowed fully & freely to vse all meanes to keepe the knowledge of the experiment [. . .] from all men whatsoever intire to my selfe'.⁵² He hinted that his secret method was

⁴⁸ Cheney Culpeper, 'The Letters of Sir Cheney Culpeper (1641-1657)', eds. M. J. Braddick and M. Greengrass, *Camden Miscellany* 33, 5th ser., vol. 7 (1996) Culpeper to Hartlib, 21 Jan. 1644/5 [HP 13/65-8], p. 213 [henceforth abbreviated as 'Culpeper Letters']. All letters cited below are from Culpeper to Hartlib unless otherwise stated.

⁴⁹ Samuel Hartlib et al., *Samuel Hartlib his egacy of husbandry* (3rd ed., 1655), p. 183; HP 62/50/17A-18B, Petty, 'An abstract of Mr Demmocks Husbandry-Designe', n.d.. For correspondence between Dymock and Petty, see HP 66/23/1; *AHEW* *Vii*, 551.

⁵⁰ Royal Society Archives, London, Boyle Letters, RB 3/7/1, [Worsley] to Hartlib, 18 May 1649 (including a transcription of a letter from Dymock to Worsley).

⁵¹ HP 62/50/1A, Dymock to [Hartlib?], 15 Aug. 1648.

⁵² HP 62/50/1A, Dymock to [Hartlib?], 15 Aug. 1648.

extraordinary. Without proving the efficacy of his method, he argued that it would achieve ‘extraordinari benifitt’, ‘a worke’ that would be ‘soe mutch conducing to the Glorye of God’.⁵³

Grandiose it might have been, but practical arrangements seem to reveal that the scheme was as much for Dymock himself as for others and God’s glory. Dymock did not own land,⁵⁴ so he proposed to use the lands of others ‘provided itt bee fitt for my purpose’. He demanded the land be no less than 160 acres; the landowner was to use ‘his owne cattle, servants seed etc’, and pay thirty pounds ‘for the providing of new instruments’ invented by Dymock; he was to be fed daily, and allowed to keep these instruments as well as half the difference in yield ‘in recompence for my care paines & skills’.⁵⁵ As we saw in the last chapter, grandiose promises and underlying private interests were common characteristics of dubious ‘projects’. Secrecy – something Jonson’s *Lady Tailbush* practiced to realise her ‘ambition’ – was satirised in Brugis’s *Discovery of the projector* (1641), and was again to be dramatised by John Wilson’s play *The Projectors* (1665).⁵⁶ In these respects, then, Dymock’s experimental scheme might well have appeared an unreliable ‘project’.

Within a matter of a week, one of Hartlib’s close allies, the Kentish gentleman Sir Cheney Culpeper, gave a revealing ‘answere to mr Demmockes proposition’.⁵⁷ In his view granting ‘160 acres of plowed lande’ to ‘any one mans hande’ was utterly unprecedented. He admitted that ‘a man may try a little’, yet using such a vast field,

⁵³ HP 62/50/1A, Dymock to [Hartlib?], 15 Aug. 1648.

⁵⁴ M. Greengrass, ‘Dymock, Cressy (fl. 1629–1660)’, *Oxford DNB*, vol. 17, p. 500.

⁵⁵ HP 62/50/1A, Dymock to [Hartlib?], 15 Aug. 1648.

⁵⁶ Thomas Brugis, *Discovery of a projector* (1641), p. 22; John Wilson, *The projectors. A comedy* (1665), pp. 10–11. For Tailbush, see my discussion in Chapter One.

⁵⁷ ‘Culpeper Letters’, 23 Aug. 1648 (HP 13/239–40), p. 342.

demanding thirty pounds for making instruments, and Dymock's taking half the difference in yield as a reward, would be too much a burden for any potential collaborators. So 'none will be induced to hazarde his whole yeeres croppe, being the producte not onely of his lande but of his stocke & paynes'. Thus, in his view, Dymock's scheme was 'a projecte' that promised only 'an incerteine gaine'.⁵⁸ Culpeper neither explicitly questioned the promoter's integrity, nor used the term 'project' in a clearly negative sense, at least on this occasion. It could be that he was using the term to highlight the ambivalence of Dymock's scheme, which may, or may not, succeed. Alternatively, by disapproving a scheme on practical grounds, Culpeper may have politely tried to reject a scheme that was potentially fraudulent.⁵⁹ In any case, his overall judgement was explicitly negative: the scheme was at best an improbable one that 'very fewe will soe farre believe, as to manifeste their faythe by their woorkes'.⁶⁰

However, Dymock's project-like scheme enjoyed a degree of support. In May 1649, Boyle, Culpeper, Hartlib and others contributed ten pounds each to support Dymock's experiments, and in the same year Hartlib gave extra cash upon Dymock's request.⁶¹ A year later, possibly connected to the same experiment, Boyle, Dury, Hartlib and three others urged Dymock to keep working on the 'Experiments of those particulars which wee desire and expect from you, both in your Manure and Engines

⁵⁸ 'Culpeper Letters', 23 Aug. 1648 (HP 13/239-40), p. 342.

⁵⁹ The importance of not causing a controversy will be discussed in the concluding section of this chapter.

⁶⁰ 'Culpeper Letters', 23 Aug. 1648 (HP 13/239-40), pp. 342-43.

⁶¹ HP 62/48/1A-2B, 'Contribution for advancing of agriculture', 22 May 1649; *AHEW* *Vii*, p. 558.

of Motion.’⁶² Probably these men invested in, and awaited the results of, Dymock’s agrarian experiments. Dymock later published *Reformed husband-man* (1651) and *A discoverie for division or setting out of land, as to the best form* (1653), calling for investors for his cultivation schemes. Hartlib wrote prefaces to them, and probably helped publish them too.⁶³

Dymock’s ‘Engines of Motion’, mentioned in the letter mentioned above, also attracted a good deal of attention. Before or during 1650, he had ‘erected one little Engine or great Model’ at Lambeth, which, he later claimed, would be ‘able to give sufficient demonstration to either Artist or any other person, that my Invention is as useful and beneficial [. . .] as any other way of working hitherto known or used.’⁶⁴ This was a multi-purpose engine and Dymock indicated nearly thirty different applications it was capable of, such as grinding corns, raising water, drawing metal-plates, sawing timber and stones, and variations of these functions.⁶⁵

The model erected at Lambeth became the basis for an agreement between Dymock, and Hartlib and one Alexander Tracye of London. A copy of an indenture made in 1650 between the two parties stated that Dymock had received ‘a competent sum of money’ from them. In return, he agreed for three years to set up his engines in places where Hartlib and Tracye appointed, ‘according to the moddle or example now extant in Lambeth’.⁶⁶ Dymock went on working, presumably bringing in more

⁶² Boyle, *Boyle Correspondence*, vol. 1, p. 88, Boyle and others to Dymock, 15 Mar. 1650. The remaining supporters were John Sadler, Benjamin Worsley, and Henry Robinson.

⁶³ The contents of these pamphlets will be briefly discussed below.

⁶⁴ Cressy Dymock, *An invention of engines of motion lately brought to perfection* (1651), p. 2. See also reference given to the same engine ‘now extant att Lambeth in the county of Surrey’ in IIP 58/8A, 8B, ‘Agreement concerning Dymock’s engine’, 1650.

⁶⁵ Dymock, *Invention of engines of motion*, pp. 8-9.

⁶⁶ IIP 58/8B, ‘Agreement concerning Dymock’s engine’, 1650.

investors. In the same year, for example, he obtained support for his engine from one London merchant Richard Egleston. Dymock received initial investment of £30 from him and contracted further investment covering one eighth of the subsequent expenses.⁶⁷

Significantly, the engine was a prototype of a ‘Perpetual Motion’ engine. As Dymock declared in his *An invention of engines of motion* (1651), perpetual motion was something ‘all humane learning have sought, but not yet found’.⁶⁸ Throughout, Dymock’s promotion of the engine strikingly resembled the projector stereotype; he earned a living by selling shares in the invention.⁶⁹ While again keeping his knowledge secret,⁷⁰ Dymock was more than happy to hint how his new engine excelled existing ones. His claims were grandiose again. In his letter to Hartlib, Dymock first warned that he had not yet ‘fully obtained the thing it self [perpetual motion]’. But he added: ‘yet I have advanced so near it, that already I can with the strength or help of 4 men, do any work which is done in *England*, whether by wind, water, or horses, as the grinding of *Wheat*, *Rape*, or raising of waters’.⁷¹ He suggested that the best existing watermill in England ‘will not grind above foure bushels in an hour; whereas a good Mill of mine (as is aforesaid) grind a quarter or more’.⁷² As Hartlib noted in his working diary, ‘Mr Dymock is confident, whether his *Invention* for Motion succeed yea or not, to bee able to doe very great service’ by

⁶⁷ HP 58/10B, A copy of agreement between Dymock and Egleston, 6 Nov. 1650.

⁶⁸ Dymock, *Invention of engines of motion*, p. 1.

⁶⁹ HP 58/8B, ‘Agreement concerning Dymock’s engine’, 1650; HP 58/10A, A copy of agreement between Dymock and Egleston, 6 Nov. 1650.

⁷⁰ HP 58/9A, ‘Agreement concerning Dymock’s engine’, 1650.

⁷¹ This latter was published as part of Dymock, *Invention of engines of motion*, p. 1.

⁷² Dymock, *Invention of engines of motion*, p. 6. See also Samuel Hartlib [Cressy Dymock], *The reformed husband-man* (1651), p. 9.

it.⁷³

Dymock's claims were precisely the kind of ostentation Brugis caricatured: 'Projectors, men of the best forecast, utterly disclaiming all their former Trades, Professions, Arts, Sciences, Mysteries, Crafts, and Occupations, to all intents and purposes whatsoever.'⁷⁴ In *Volpone*, Jonson also poked fun at the confident Sir Politic who had bellows and watermills that purportedly worked in 'Perpetual motion | (Which is the easi'st matter of a hundred)'.⁷⁵ Hartlib and others (including Boyle, Dury, and others mentioned above) therefore invested in the man whose grandiose display of confidence, along with his secrecy and elements of private gain, very much resembled the stereotype of the projector. Despite the resemblance, Dymock (and his schemes for husbandry and perpetual motion engines) enjoyed more than a spell of support from Hartlib and his circle at least from about 1648, if not from their first encounter in the mid-1640s.

There were probably several reasons why Dymock managed to win some support for his project-like schemes. First of all, while Dymock might have looked like a typical projector in the generic sense, that is to say, the promoter of wild impractical schemes, his schemes did not require a monopoly over agricultural practices or the imposition of fines. So Dymock was at least different from the kind of projectors who proved most controversial under the early Stuarts.

Dymock's promise of profits and skilful self-promotion more generally might have impressed some of the supporters. When Dymock asked Worsley to provide his

⁷³ HP 28/1/42A, *Ephemerides*, 1650.

⁷⁴ Brugis, *Discovery of a projector*, p. 20.

⁷⁵ Ben Jonson, *Ben Jonson*, eds. C.H. Herford and Percy Simpson (11 vols, Oxford: Clarendon, 1925), vol. 5, p. 93 (Act IV, Sc. i, 119-20). See also Brugis, *Discovery of a projector*, pp. 21-22.

new furnace for extracting silver, for example, Dymock quoted his uncle as saying ‘that nothing is wanting to make you and him rich, but the use of such a furnace’ with ‘the more exact way of refining’.⁷⁶ Such a promise might have helped draw in investors. Dymock also presented his schemes as divine gifts. The agreement with Egleston was upon ‘the perfecting of an Invention w[hi]ch I [Dymock] have by G[ods] assistance almost finished, and expect by his blessing to finish very shortly.’⁷⁷ Such self-promotion probably helped inflate the value of his schemes. Like George Starkey who adeptly promoted alchemical secrets to Boyle, therefore, Dymock attracted supporters by presenting his schemes as ‘special secrets’.⁷⁸

Piety and public service were something of which Hartlib and his allies approved, and highlighting these elements should have helped Dymock to win support. As we have seen, Dymock presented his arable cultivation scheme as ‘conducting to the Glory of God’. He also asserted that his perpetual motion engine would advance ‘the universal good of the whole Nation’.⁷⁹ As he was earning money from his schemes, he explicitly argued for the compatibility of the public good and his private interests. He declared:

my *desires* being chiefly for the *Publique good* (though that cannot, nor will not justly exclude my private benefit, but rather advance it) I must and will to the uttermost of my power seek the advancement of that *Publique good* [.]⁸⁰

⁷⁶ Royal Society Archives, London, RB 3/7/1, [Worsley] to Hartlib, 18 May 1649 (including a transcription of a letter from Dymock to Worsley).

⁷⁷ HP 58/10A-B, A copy of agreement between Dymock and Egleston, 6 Nov. 1650. For more examples see Dymock, *An invention of engines of motion*, p. 1; Hartlib [Dymock], *Reformed husband-man*, pp. 5, 6, 9, 10; Samuel Hartlib [Cressy Dymock], *A discoverie for division or setting out of land, as to the best form* (1653), p. 2.

⁷⁸ For Starkey’s selling of secrets, see Newman, *Gehennical Fire*, pp. 62-78.

⁷⁹ Dymock, *Invention of engines of motion*, p. 3.

⁸⁰ Hartlib [Dymock], *Reformed husband-man*, p. 10.

As Thomas Leng has suggested, Benjamin Worsley also emphasised the public benefits of his saltpetre scheme, and in so doing won initial approval of the scheme from aldermen of London. Emphasising the public benefit allowed promoters like Worsley and Dymock to stand a better chance of winning their ‘bargaining process[es]’.⁸¹

Dymock also appealed to piety, and more specifically, aspirations to realise the millennium. In his letter to Hartlib, Dymock first hinted the necessity of ongoing investment, and then went on:

I may encourage you through the love of God to every good and laudable purpose, not to grow weary in your mind [. . .] but to continue still as hither you have done in a course of patient well-doing [. . .] for assuredly of this seed you will reap an abundant Harvest in due time, if you faint not[.]⁸²

From our perspective, it may be tempting to see this as a conman cajoling a pious reformer into believing him. Yet, from Hartlib’s perspective, Dymock’s appeal was to be seriously dealt with. Dymock’s reference to the ‘seed’ was an allusion to Ecclesiastes 11: 6.⁸³ As we shall see below, millenarian reformers like Hartlib and Dury understood this passage as a reminder that they should not discourage new ambitious schemes. In the preface to Dymock’s *Reformed husband-man* (1651), Hartlib in fact noted that the ‘Author presumes not to have exhausted all that may be found out in nature: But by that which God hath imparted unto him beyond others, he perceives that a greater perfection of knowledge may be gained’.⁸⁴ This is not to say

⁸¹ Leng, *Benjamin Worsley*, p. 24.

⁸² Dymock, *Invention of engines of motion*, pp. 2-3.

⁸³ ‘In the morning sow thy seed, and in the evening withhold not thine hand: for thou knowest not whether shall prosper, either this or that, or whether they both shall be alike good.’

⁸⁴ Hartlib [Dymock], *Reformed husband-man*, sig. [A2v].

that Hartlib equally backed any promoters. For example, William Wheeler and Thomas Bushell seem to have gained notoriety among Hartlib and his fellow reformers, Wheeler for his excessive secrecy, and Bushell for his lack of technical competence.⁸⁵ But when men like Dymock were capable of displaying their skill and knowlegeability well, emphasising piety and public service probably added to their credentials and increased the chance of winning the support they needed.

The last element worth considering is related to Dymock's engine: the construction of a model. As I have indicated earlier, the model erected in Lambeth was referred to both in letters and in prints. Displaying models and drawings was one of the ways in which craftsmen and inventors tried to demonstrate their skills and the feasibility of their schemes.⁸⁶ So while Dymock never glossed the knowledge he claimed to possess, displaying and referring to an actual engine he had erected surely served to enhance the impression of Dymock's technical competence. Equally importantly, from Hartlib's perspective, the model probably did more than the demonstration of competence. In 1650, in his work-diary *Ephemerides*, Hartlib commented on 'the rare Water-engine for quenching of fire' that had been installed 'in all the Wards of London'. Dymock was probably the inventor of this engine, and in Hartlib's view, it helped 'stop the mouth of railers against new inventions every body being too prone to observe their miscarriage, but very few when they are [. . .] serviceable'. His note of Dymock's confidence in his perpetual motion engine

⁸⁵ Webster, *Great Instauration*, pp. 366-67, 372-73; HP 28/1/19B, *Ephemerides*, Apri.-Aug. 1649.

⁸⁶ Harkness, *Jewel House*, pp. 145-158; McGee, 'Presentment of Bushell's Rock', pp. 46-47; Chandra Mukerji, 'Demonstration and Verification in Engineering: Ascertaining Truth and Telling Fictions along the Canal du Midi', in Lissa Roberts, Simon Schaffer, and Peter Dear (eds.), *The Mindful Hand: Inquiry and Invention from the Late Renaissance to Early Industrialisation* (Amsterdam: Koninklijke Nederlandse Akademie van Wetenschappen, 2007), pp. 173-74.

immediately followed this entry.⁸⁷ As Jenner has shown, Hartlib keenly followed the development of a London street-cleaning scheme that was put into practice by John Lanyon. Hartlib did so because he was ‘aware of the need to find examples with which to demonstrate the feasibility of his ambitious schemes.’⁸⁸ Given this, it is also likely that Hartlib (and others) supported Dymock’s quest for the perpetual motion engine, hoping that, like the fire engines, it would soon be erected as a tangible achievement, something that could clearly demonstrate the viability of technological innovations, and by extension, the possibility of the millenarian reformation of which they were part. This, then, gave another reason not to dismiss Dymock despite his projector-like behaviour.

We do not know what exactly happened to Dymock’s cultivation scheme and perpetual motion engine. His agricultural experiment probably did not go well. In September 1650, he excused the poor result. He declared that he would have been able to produce ‘double, treble, or quadruple to what it is’ had he ‘used all the Art and Care’ he was capable of, and had he ‘not been otherwise taken off’ from the experiment by other businesses.⁸⁹ Dymock requested (probably Hartlib) to wait ‘till I shall by Gods assistance be able next year to produce you more abundant examples of Gods wonderful power and bounty that offers [. . .] the truest and most justly gotten humane wealth, honour, and happiness.’⁹⁰

⁸⁷ HP 28/1/42A, *Ephemerides*, 1650.

⁸⁸ Mark Jenner, “‘Another *epocha*’? Hartlib, John Lanyon and the Improvement of London in the 1650s”, in Mark Greengrass, Michael Leslie, and Timothy Raylor (eds.), *Samuel Hartlib and Universal Reformation: Studies in intellectual communication* (Cambridge: CUP, 1994), p. 354.

⁸⁹ Samuel Hartlib, *Samuel Hartlib his legacy of husbandry* (3rd ed., 1655), p. 104, Dymock to [Hartlib?], 26 Sep. 1650.

⁹⁰ Hartlib, *Legacy*, p. 105, Dymock to [Hartlib?], 26 Sep. 1650.

It seems that by 1654, a year after his three-year contract with Hartlib and Tracye on the perpetual motion engines had expired, Dymock had come to fall out of favour. Culpeper now barely mentioned him in his letters to Hartlib. In February that year, Hartlib wrote to Boyle: 'Mr. *Dymock* [. . .] is forsaken, in a manner, by all'.⁹¹ Three months later, Hartlib observed that 'Honest Mr. *Dymock* is blamed almost by every body'.⁹² Even Hartlib admitted that 'I cannot any longer assist either his person, family, or inventions'.⁹³ Yet Hartlib remained highly ambivalent. He still demanded that Dymock's 'publick and private usefulness' be reappraised and his schemes be 'supported, than hither it hath been', and recommended that Dymock 'should superintend a college of husbandmen' or that of 'artisans', should they be erected in Vauxhall as planned.⁹⁴ Thus, for some at least, Dymock was no longer a reliable promoter. Surely Dymock was aware of the danger of being distrusted. In September 1649, when he was busy promoting both the arable cultivation scheme and his perpetual motion engines, he complained of 'the exceeding antipathy that almost all men have in them against engenuitye which causes them to reject all new inventions, how probably, possible, or excellent soever under the name & notion of projects'.⁹⁵ Dymock's career suggests that the practice of secrecy and the admission of material rewards to himself did not automatically incapacitate him from winning trust of Hartlib and others. These reformers were ready to offer some support despite

⁹¹ Boyle, *Boyle Correspondence*, vol. 1, p. 159, Hartlib to Boyle, 28 Feb. 1654.

⁹² Boyle, *Boyle Correspondence*, vol. 1, p. 178, Hartlib to Boyle, 8 May 1654.

⁹³ Boyle, *Boyle Correspondence*, vol. 1, p. 159, Hartlib to Boyle, 28 Feb. 1654.

⁹⁴ Boyle, *Boyle Correspondence*, vol. 1, p. 160, Hartlib to Boyle, 28 Feb. 1654; *ibid.*, vol. 1, p. 178, Hartlib to Boyle, 8 May 1654. For the Vauxhall scheme, see Webster, *Great Instauration*, pp. 347-48, 363-66.

⁹⁵ HP 2/50/5A. Dymock commended John Wilkins's *Mathematicall magick* (1648) as a potential antidote to distrust.

Dymock's projector-like behaviour.

Le Pruvost's Proposal 1645-48: Promoting the 'Universall Trade' Scheme

Now we shall explore a scheme that the French Huguenot Peter Le Pruvost promoted with Peter L'Amy. The scheme attracted considerable attention of the Hartlib circle from about 1645, the time when Dymock was introduced to the network. It looked like one of the most controversial Caroline 'projects', in that its detail was concealed and in that it sought to impose economic 'improvement' under the slogan of public service. Discussions of this proposal among the correspondents reveal, however, that underlying concerns of the Hartlib circle – such as the unification of private and public interests, the universal reform led by a strong state, and the importance of religious piety and revelation – led Hartlib and his closest allies to take seriously, if not actively promote, a scheme that looked like a monopolistic 'project'.

The Frenchman's proposal was ambitious. It combined fishery, colonial plantation and husbandry, and promised to 'encrease their constant Revenues to the valew at least of 12 hundred thousand lb. Sterling yearly, whereby the State may reap to it selfe for public uses without any sesments, taxations, customes or subsidies to bee imposed upon the Subject, the worth of 300000 lb.'⁹⁶ The proposal seems to have derived in part from a long standing interest in establishing a colony of Huguenots in America. Hugh L'Amy appeared as Receiver General of Rents in an abortive project setting up a 'Caroline' colony proposed in 1629, and he seems to

⁹⁶ HP 53/14/2A, extracts from the Proposal of Le Pruvost and L'Amy, 30 Nov. 1645.

have helped promote Le Pruvost's scheme too.⁹⁷ Little is known as to the personal backgrounds of these two Frenchmen.⁹⁸ Yet, as we shall see below, Le Pruvost was, in John Dury's opinion, a merchant of considerable wealth and credit. He was acquainted with Dury, who promoted Le Pruvost's scheme to Hartlib and to the wider circle of supporters in the parliament. The proposal and correspondence on this subject suggest that Le Pruvost only described his scheme in most general terms, and this led Webster to depict it as 'rather inscrutable'.⁹⁹ Yet as Dury once described, the proposal was imparted as a scheme of 'universall Trade' or a 'mystery', an elaborate piece of secretive social policy which, by giving 'men hints of things imperfectly', sought to achieve an uncanny convergence between subjects' 'owne advantages' and 'the Rules of Righteousnes for a public aime'.¹⁰⁰

Because the proposal took this form, one of the moot points was how the scheme could distance itself from the stereotypical Caroline project which abused monopoly grants. Initial discussion seems to have taken place in the summer of 1645 between Dury and Hartlib, and between Hartlib and Culpeper to whom Hartlib forwarded the Frenchman's proposals. Culpeper was initially not very keen on the proposal and made some sceptical comments about it.¹⁰¹ Later he suggested to Hartlib that Le Pruvost was 'best to take a patente of priviledge for 14 yeares to his owne use'.¹⁰² Heated debates emerged as Dury responded to Culpeper's suggestion.

⁹⁷ Webster, *Great Instauration*, p. 371.

⁹⁸ 'Culpeper Letters', p. 227, fn. 45.

⁹⁹ Webster, *Great Instauration*, p. 371.

¹⁰⁰ HP 53/14/24A-B, Copy letter, Dury to Hartlib, 10 Nov. 1646.

¹⁰¹ 'Culpeper Letters', 17 Jul. 1645 (HP 13/90-1), pp. 226-27; 'Culpeper Letters', n.d. [Autumn 1645] (HP 13/292-3), pp. 233-34.

¹⁰² 'Culpeper Letters', [Late Autumn/ December 1645?] (HP 13/279-83), p. 239.

In an undated letter written probably in late 1645, Dury directly opposed Culpeper's idea.¹⁰³ Besides pointing out that a patent 'will not reach his aime of a Plantation', Dury suggested that seeking a patent was not feasible because early Stuart scandals had barely subsided. If Le Pruvost sought a patent to regulate agricultural practices based on his (purported) possession of the 'mystery' and its partial disclosure, his proposal 'would seeme a project indeed and a kind of Monopolie in Trade'.

Such monopolies, Dury continued, were something Le Pruvost 'whollie is averse from'. Moreover, because Le Pruvost and his collaborators were foreigners, it would be very difficult for them 'to come amongst Natives to drive a trade by virtue of patent which others understand not to bee beneficiall to the public'. Moreover, Dury went on, seeking a patent seemed plagued with problems. It could easily expire if Le Pruvost happened to die or the government withdrew the grants as Elizabeth and early Stuarts had done to some monopolies in 1601, 1603, 1610, 1624, and 1639.¹⁰⁴ And even worse, 'there would bee soe much opposition of Envie & jealousie against him; that [he] hardly should be ever able to proceed.' Dury therefore concluded that seeking a patent would be abortive. He instead maintained that Le Pruvost should obtain an ordinance from the government to make sure that the 'Authoritie of the State' should 'be principally concerned'. Only this would be able to overcome the 'opposition of Envie & jealousie' and give sufficient security to the French promoter.¹⁰⁵

Dury further developed his argument in his letter to Hartlib of 30 November

¹⁰³ 'Culpeper Letters', Dury to Culpeper, n.d. [Autumn 1645] (HP 55/10/11-14), p. 235.

¹⁰⁴ See Introduction.

¹⁰⁵ 'Culpeper Letters', Dury to Culpeper, n.d. [Autumn 1645] (HP 55/10/11-14), pp. 235-36.

1645 that accompanied the Frenchman's proposal to be submitted to the parliament. After giving his English translation of the original (written in French), Dury explained that Le Pruvost's proposal was *not* that of a pernicious projector because it was free from spurious inventions, taxation, and undue privileges. 'I did conceive them [i.e. his proposals] to bee possible', Dury told Hartlib, because it did not draw upon 'the advantage of any inventiones, which looke like projects'. It rather consisted in his secret way of regulating husbandry, fishing and plantation, by which public revenue as well as private return would be obtained 'without taxes', one of the means which projectors typically exploited for gaining private profit.¹⁰⁶ Moreover, what the proposal requested from the government was primarily 'the countenance of authoritie' to prevent injustice. This, Dury added, was 'nothing but that which all superiours are bound to give'. As for himself, Le Pruvost never 'demands any speciall priviledge as Monopolists or projectores use to doe, but hee will bee content to partake of the ordinarie regulated profit' equal to others' financial return.¹⁰⁷

Despite Dury's efforts to promote the scheme as credible, and despite Hugh l'Amy and Le Pruvost's visit to London between 1645-1646 to have the proposal examined by a parliamentary committee,¹⁰⁸ the proposal apparently encountered considerable suspicion and no committee seems to have formed. At the time, parliament faced vehement opposition to a proposed excise tax on soap and potash. The proposal was denounced as a nefarious plot of 'projecting Monopolers' who would, 'now by the Authority of Parliament, as heretofore they have done, by the Authority of the Kings Majesty', oppress other soap boilers by forcefully collecting

¹⁰⁶ HP 53/14/8A, extracts from the proposal of Le Pruvost and L'Amy, 30 Nov. 1645.

¹⁰⁷ HP 53/14/9A-B, extracts from the proposal of Le Pruvost and L'Amy, 30 Nov. 1645.

¹⁰⁸ See 'Culpeper Letters', p. 355, fn. 23.

taxes, even ‘breaking open’ their houses, ‘taking away their goods’, and by ‘imprisoning their persons’.¹⁰⁹ The row continued, and in 1650 a group of soap-boilers published a complaint and presented it to parliament, giving ‘Answer to the Proposals of certain unworthy Trade and Liberty-destroying Projectors’.¹¹⁰

It is no wonder, therefore, that the examination of the ‘universal trade’ scheme also focused on whether it would hinder and oppress existing courses of trade and husbandry as the nefarious, monopolistic ‘projector’ would do. In this respect, one of the articles proposed in the scheme was particularly controversial. In the husbandry and fishery part of the scheme, Le Pruvost demanded parliamentary ordinances that could enforce ‘strict prohibition’ to ensure that ‘none practise or cause to be practised’ his methods without permission. He went on to demand that offenders be punished by a £1,000 fine and confiscation of their land. He claimed these regulations were necessary for preventing free-riders and ensuring the revenue to the government.¹¹¹ Yet, in October 1647, Culpeper argued that Pruvost should first ‘quitte that resolution of takinge mens estates & disposinge of them without their consente’. Culpeper argued that ‘a state never yet acted suche a thinge synce the worlde began’, and suggested that this particular proposal was a recipe for failure:

I am confident this [Parliament] (after soe many pressures & noe satisfactory accownte) will not thincke themselves in case to do it; & in truthe, if soe much good be like to be effected, to every particular man in his owne private concernements, every body will see that there will be noe neede of constrainte – An inseparable companion of moste former monopolies.¹¹²

¹⁰⁹ *A looking-glasse for sope-patentees* (1646), pp. 4-5.

¹¹⁰ *The soap-makers complaint for the losse of their trade* [. . .] (1650), title-page. For the soap monopoly, see Kevin Sharpe, *The Personal Rule of Charles I* (New Haven: Yale U.P., 1992), pp. 121-23.

¹¹¹ HP 53/14/4A-B, extracts from the proposal of Le Pruvost and L’Amy, 30 Nov. 1645.

¹¹² ‘Culpeper Letters’, 13 October 1647 (HP 13/194-5), pp. 307-8

Negative stereotypes about Caroline projects clearly still shaped this debate in the later 1640s. Even more striking is the fact that the reformers' advocacy of this scheme persisted. When Le Pruvost failed to attract the patronage of the Duke of Brandenburg, reformers regained the hope of inviting him to England to implement his schemes. There must have been a great deal of enthusiasm in inviting him. So in August 1648, Culpeper had to repeat the same message to Hartlib and to argue that he should press the promoter to 'renownce his resolutions of puttinge the [Parliament] upon that hygheste of Impositions of disposing of every private mans lande', a power which during the reigns of James and Charles was deemed a 'monster', and 'moste hatefull to this nation'.¹¹³ It is also remarkable that Dury's and others' support for the proposal was not primarily based on detailed scrutiny of its detail. 'I have not beene curious to know particulars of him', Dury wrote to Hartlib in November 1645. Dury (and by extension others) initially accepted Le Pruvost's desire for secrecy when promoting his scheme as a potentially beneficial scheme. What for Culpepper (and probably many Parliamentarians) looked like a secret 'project' for implementing a monopoly, therefore, continued to attract Dury's and some others' attention.

There were several reasons for this. Elements of Le Pruvost's scheme (excepting its article on confiscation) echoed some of the central concerns of the reformers. Moreover one aspect of their millenarian aspirations allowed them to support the scheme without primarily scrutinizing its detail.

First, Dury found Le Pruvost's scheme to be worth considering because of the example of other countries. In his letter to Hartlib, Dury mentioned successful

¹¹³ 'Culpeper Letters', 30 August 1648 (HP 13/241-2), pp. 343-44 (at p. 344). See also 'Culpeper Letters', 20 October 1648 (HP 13/196-7), p. 308; 'Culpeper Letters', copy letters, Dury to Culpeper and Culpeper to Dury, 25 September 1648 (HP 12/23-6), pp. 334-47.

state-led reforms in Holland and Sweden:

i have some small insight & experience of the usefulness of such like wayes & advices which have raised Holland to that height, wherein now it standeth & have (by the meanes of a man whom you know) raised Sweden in the space of lesse then 20 yeares to a perfection of trade & manufactures, which will from henceforth (seeing Peace with Denmarck is concluded) increase the Revenue of the Kingdom with the benefitt of particulars tenne times above that which it hath bene a few yeares agoe.¹¹⁴

Dury had reasons to claim his 'small insight & experience'. Through his European tour for negotiating the unification of the protestant religion, he had become acquainted with Swedish political and ecclesiastical leaders. And in the first half of the 1640s, he was often based in Holland. In May 1642, he was made chaplain at The Hague to the Princess Mary, Charles I's daughter, who had just been married to William of Orange. From May 1644, moreover, he was minister to the English Merchant Adventurers in Rotterdam.¹¹⁵ As Joyce Oldham Appleby argues, European commercial prowess, especially that of Dutch, 'acted more forcefully upon the English imagination than any other economic development of the seventeenth century.'¹¹⁶ This was surely the case for Dury.

Second, and more specifically, the scheme's claim to reconcile subjects' 'owne advantages' and 'the Rules of Righteousnes for a public aime' seems to have captured one of the underlying concerns of the Hartlib circle.¹¹⁷ In the history of projecting activities, the unification of private and public interests was an old ambition. It had been given a critical treatment in Sir Thomas Smith's *Discourse of*

¹¹⁴ HP 53/14/8B, extracts from the proposal of Le Pruvost and L'Amy, 30 Nov. 1645.

¹¹⁵ J. T. Young, 'Dury, John (1596-1680)', *Oxford DNB*, vol. 17, p. 428.

¹¹⁶ Joyce Oldham Appleby, *Economic Thought and Ideology in Seventeenth-Century England* (Princeton: Princeton U. P., 1978), chap. 4, at p. 73.

¹¹⁷ Dury explained Le Pruvost's 'secret' as 'the thing which hee calls in his Letter to mee in greeke words kalon doran & pan doran [i.e., good gift, all gifts]'. See HP 53/14/24A.

the commonweal of England in the middle of the sixteenth century.¹¹⁸ The theme came to assume a central role in early Stuart and Interregnum economic projects, contemporary theories of trade and commerce, and controversies on depopulation and enclosure.¹¹⁹ As we have seen, Dymock's husbandry pamphlet, for which Hartlib wrote a preface, discussed how his method of arable farming could bring *both private and public benefits*.¹²⁰ In a theological work, Dury contended that 'a Publique good is nothing else but the universall private good of every one'.¹²¹ In this light, Le Pruvost's policy proposal chimed with both the Hartlib circle's interest in state social regulation, and the tradition of projecting activities in which it operated.

Third, its typically millenarian promise of discovering the 'universall' law of social regulations must have appealed to Hartlib and his allies because, under the influence of the German 'second reformation', they were fascinated by the possibility of using 'the state [. . .] as an instrument for social, religious and intellectual change.'¹²² As we have seen, *Macaria* proposed to establish state-run councils for the five basic economic sectors and to set up a state-run 'College of experience'.¹²³ Combining husbandry, fishing, and plantation schemes with the

¹¹⁸ For a brief discussion of Smith's *Discourse*, see Keith Wrightson, *Earthly Necessities: Economic Lives in Early Modern Britain, 1470-1750* (London: Penguin, 2002), pp. 154-55. McRae, *God Speed the Plough*, pp. 52-57.

¹¹⁹ Michael Zell, 'Walter Morrell and the New Draperies Project, c. 1603-1631', *Historical Journal*, 44 (2001), 651-75; John Cramsie, 'Commercial Projects and the Fiscal Policy of James VI and I', *Historical Journal*, 43 (2000), 345-64, esp. p. 346. More broadly, see Appleby, *Economic Thought and Ideology*; J. A. W. Gunn, *Politics and the Public Interest in the Seventeenth Century* (London: Routledge, 1969).

¹²⁰ Hartlib [Dymock], *Reformed husband-man*, pp. 7-8.

¹²¹ John Dury, *A motion tending to the publick good of this age, and of posteritie* (1642), p. 6.

¹²² Mark Greengrass, 'Samuel Hartlib and International Calvinism', *Proceedings of the Huguenot Society*, 25 (1993), p. 466.

¹²³ Plattes, *Macaria*, passim (quotation from p. 12).

domestic and Atlantic trade of related goods, Le Pruvost's proposal exactly matched with the central concerns of the five councils in Macaria. The scheme perhaps looked like a first step to realize a Macarian utopia.

Fourth and last, Dury, Culpeper and possibly some other reformers were able to promote Le Pruvost's scheme partly because their millenarian views enjoined them not to discourage undertakings whenever they appeared to promote godliness. This religious idea overrode concerns about secrecy. In the opening of the letter attached to the translated proposal Dury declared that 'First I judge [. . .] the man to bee a sound & honest Christian, well principled in Pietie, in Faith, in Charitie'. Le Pruvost seemed, he wrote, 'free from partialitie', 'free from vanitie of appearing', and well-experienced 'in matters of Trade [. . .] cheifly of State Relations in that respect' and 'a truly public Spirit Zealous for the Protestant cause'. Dury quickly added that 'although hee bee a man of trade yet I perceive no great love of money in him'.¹²⁴ Dury explained why he gave considerable 'credit' to Le Pruvost without examining details of the scheme:

I have not beene curious to know particulars of him [. . .] because I am satisfied first in the mans behaviour towards me & in all his wayes which I find discret, reall, & rationall. [. . .] if i did beleeve the man to bee honest & found him rationall, mee thinkes I could grant him soe much credit as to beleeve that hee speakes truth; & if hee doth promise noe more then what hee can performe, I could not bee able to deny the consequence which is the effect of his Propositions namely that a great benefitt will arise from thence both unto the public & particulars.¹²⁵

So Dury's support for the proposal discussed above was based primarily on his approbation of Le Pruvost's character, not the detail of the scheme.

It is still not clear why Dury and some others supported this particular scheme that looked like an early Stuart monopoly. His exchange with Culpeper reveals that

¹²⁴ HP 53/14/7B, extracts from the proposal of Le Pruvost and L'Amy, 30 Nov. 1645.

¹²⁵ HP53/14/9A, extracts from the proposal of Le Pruvost and L'Amy, 30 Nov. 1645.

millenarian aspirations played an important role. Initially, Culpeper did not give the scheme as much credit as Dury had done. In a letter to Hartlib sent in July 1645, he alluded to Hartlib's engagement with workhouse and educational schemes and questioned whether it is appropriate and necessary for Hartlib to 'interfaire' with the Frenchmen's scheme at all when he had been working hard on others.¹²⁶ Soon Dury wrote to Culpeper reminding him of the importance of embracing a wide range of schemes with what he called 'spirituall discretion'. One of Dury's letters to Culpeper precisely warned against his scepticism with a direct reference to Ecclesiastes 11: 6:

wee are bid sow our seed in the morning, and not [to] withhold our hand in the Evening, because wee know not whither shall prosper whether this or that, or both. I conceive that constancie and diligence is recommended to us in this resolution with a purpose to resign ourselves up to God by depending upon his providence for a blessing, and not trusting to much to our owne prudencie to doe thinges sometime at an adventure[.]¹²⁷

Dury further suggested a 'possibility of some good event' from the project, such as raising revenue to the state, employing 'the poor & the idle people', and bringing in foreign fortunes 'to procure the good of this State'.¹²⁸

Culpeper was apparently convinced by Dury. He wrote to Hartlib that he was 'now fully satisfied by Mr Dury-s letter', and that he now agreed that the 'universall trade' scheme 'cannot be demanded and advanced excepte the intereste as well as the authority of a State be engaged in it'. He went on:

if it please God to rowze the mindes of men in other nations as He hathe done in Hollande [Sweden *MS edge*] & may doe in this [nation] [. . .] Then shall the earthe increase And truly, that [. . .] men may come to live accordinge to the simplicity of the Patriarchs in the olde worlde as it is the prayers of all good men[.] soe I muste confesse it is my hopes, *whoe seeke as muche as I can to inlarge my thowghts that as I doe or showld wishe* that God might be glorified throwhout the whole worlde, so I might

¹²⁶ 'Culpeper Letters', 17 Jul. 1645 (HP 13/90-1), pp. 226-27.

¹²⁷ 'Culpeper Letters', Dury to Culpeper, n.d. [Autumn 1645] (HP 55/10/11-14), p. 235.

¹²⁸ 'Culpeper Letters', Dury to Culpeper, n.d. [Autumn 1645] (HP 55/10/11-14), pp.235-36.

[. . .] indeauor the propugation of those meanes that might effecte that ende [.]¹²⁹

Note that Culpeper and a manuscript annotation (probably by Hartlib) suggest that they understood the precedence of economic reform in the United Provinces and Sweden – something we may consider mundane evidence – as evidence of providential reformation of mankind. Note, also, how Culpeper aspired, as Dury entreated him, to exercise spiritual discretion by ‘inlarg[ing] my thowghts’ so that he could envision the prospective reformation of mankind, and support what he knew was a scheme which looked like a controversial, monopolistic ‘project’.

We need not assume that spiritual aspiration of this kind was very widespread or that Culpeper and Dury shared exactly the same kind of millenarian aspirations. Dury probably appealed to a more basic ideal of spreading the gospel. As he wrote elsewhere, one way to spread the gospel was by ‘giving good example, by going before others in godlinesse.’ Hence ‘*all manner of endeavours and undertakings, which tend directly to advance and perfect*’ this aim, ‘should be counted truly good endeavours, and fit to be supported in this Age, and transmitted to Posterity.’¹³⁰ That was why ambitious economic initiatives like the ‘universall trade’ could be worth promoting. But Dury (and Hartlib) failed to convince MPs to back the scheme, an indication, perhaps, that there was no consensus as to whether reformers should embrace even monopoly-like schemes. Yet, equally significantly, Dury managed, at least in this instance, to persuade Culpeper to exercise spiritual discretion to support the Frenchman’s scheme. The promotion of the ‘universall trade’ thus demonstrates not only the underlying suspicion of monopolistic ‘projects’, but also a remarkable spiritual flexibility with which some millenarian reformers identified promoters’

¹²⁹ ‘Culpeper Letters’, n.d. [Autumn, 1645] (HP 13/294-5), p. 243, 244 (my italics).

¹³⁰ Dury, *A motion tending to the publick good*, pp. 17-18 (my italics).

piety and public-spiritedness, and thereby embraced even a secretive, monopolistic scheme as a (potential) instrument for achieving the millennium.

**Gabriel Plattes's Tracts 1639-1644:
Tentative Communication and the Withholding of Experimental Knowledge**

Plattes, the author of the utopian *Macaria*, advanced a grandiose claim in his agricultural tracts. One of the two pamphlets he published in 1639 was entitled *A discovery of infinite treasure*, and its ultimate goal was to 'make this Countrey the Paradise of the World'.¹³¹ Unlike Dymock and Le Provost, however, Plattes did not claim to possess perfect or universal knowledge. Distancing himself explicitly from such a pretension, Plattes instead issued cautions about the limit of his knowledge derived from local experience. This prevented him from calling investors for divine secrets, and led him to emphasise his financial independence. In his *A discovery of infinite treasure* and *A discovery of subterranean treasure* (1639), Plattes sought to communicate the result of his experiments to the reading public and encouraged them to test his recommendations by themselves. Nevertheless, Plattes was fundamentally ambivalent about the practice of open communication. He died without publishing his magnum opus, because he later came to believe that he could not manage distrust of the projector without first lending credibility to his recommendations by mobilising state authority. Now I will turn to Plattes's promotional strategies outlined above. By doing so, I will demonstrate that open communication was a pragmatic means to manage distrust, a course of action that could be compromised when it would not help propagate new knowledge about

¹³¹ Gabriel Plattes, *A discovery of infinite treasure hidden since the worlds beginning* (1639), sig. [A3v]-[A4].

husbandry.

Little is known about Plattes's personal background except his own statement that his predecessors 'lived well upon a small farme'.¹³² But for at least six years he was a servant of William Englebert, a 'poore' 'inventor or projector' in John Aubrey's words, who proposed a plan for building a canal to bring water to London under James I.¹³³ The two pamphlets he published in 1639 were influential. One continental writer reported that there was a plan to translate *A discovery of infinite treasure* into Dutch, and that he was 'told it is out of print' in England.¹³⁴ *A discovery of subterranean treasure* went through at least nine editions and was even published in Philadelphia in the later eighteenth century.¹³⁵ These books quickly drew the attention of Hartlib who praised them as 'two profitable treatises concerning husbandry and mining.'¹³⁶ The first of them, *A discovery of infinite treasure*, began with a short dedication to Englebert, Plattes's master, and an exceptionally long preface that contained a discussion of the nature of knowledge about husbandry. Its body consisted of twelve chapters on 'good husbandry', including discussions of the planting of timber, the composition of fertilizer, and the sowing of corn.

¹³² Webster, *Great Instauration*, p. 47.

¹³³ HP 71/4A-B, copy petition of Gabriel Plattes, n.d.; John Aubrey, 'Brief Lives', *Chiefly of Contemporaries, set down by John Aubrey, between the Years 1669 & 1696*, ed. Andrew Clark (2 vols, Oxford: Clarendon, 1898), vol. 2, p. 1. For Englebert (often spelt Ingelbert) and his link with Sir Hugh Myddelton's New River Company, see J. W. Gough, *Sir Hugh Myddelton Entrepreneur and Engineer* (Oxford: Clarendon, 1964), p. 32-33.

¹³⁴ Hartlib, *Legacy*, p. 111, an extract of a letter from the Low Countries.

¹³⁵ Gabriel Plattes, *A discovery of subterranean treasure* (1639). Editions in *ESTC* are: 1639, 1653, 1679, 1684, [1715?], 1784, 1792 (twice), 1796. Four editions in the later eighteenth century were published in Philadelphia.

¹³⁶ *CSPD 1640*, p. 568 (quoted in Webster, 'The Authorship and Significance of *Macaria*', p. 38).

The central goal of his book was to persuade his reader of the utility of his knowledge about husbandry. The title-page encapsulates the role Plattes assigned the reader: 'A DISCOVERY OF INFINITE TREASURE, HIDDEN SINCE THE WORLDS BEGINNING / Whereunto all men, of what degree soever, are friendly invited to be sharers with the Discoverer, G[abriel]. P[lattes].'¹³⁷ Accordingly, his intended audience included husbandmen, poor workmen, the clergy, the gentry, the king, tradesmen, and even such groups as the old, lame, blind, widows, orphans, foreigners and prisoners.¹³⁸ Yet his main audience was gentlemen: 'If Gentlemen of quality would be pleased to begin first, and to lay the corner Stone of this building, all would follow without question'.¹³⁹ The principal aim of the pamphlet was thus to 'satisfy' these gentlemen and all others 'so fully before hand, that they might joyn together with one consent to accomplish the work [of implementing improved husbandry] more speedily for the generall good of all'.¹⁴⁰

Plattes did not explicitly complain about widespread distrust of the projector in his 1639 tracts; yet his strategy of persuading his reader was such that he could avoid being seen as the ostentatious, or the monopolistic, projector. In *A discovery of subterranean treasure*, he briefly touched upon common causes of 'great losse' and 'manifold complainings' in husbandry. They came about 'partly through ignorance, and partly through negligence'. Perhaps alluding to the imposition of spurious

¹³⁷ Plattes, *Discovery of infinite treasure*, title page (original capitals). See also, *ibid.*, sig.[C4]. The pamphlet was published again in 1656 as *Practical husbandry improved: or, a discovery of infinite treasure*.

¹³⁸ Plattes, *Discovery of infinite treasure*, sig. [C4]-[C4v].

¹³⁹ Plattes, *Discovery of infinite treasure*, sig. [A4]. It is difficult to see if he meant to exclude from 'Gentlemen of quality' all 'husbandmen' who he described were 'most worthie'. See *ibid.*, sig. [C4].

¹⁴⁰ Plattes, *Discovery of infinite treasure*, sig. B-[Bv].

‘improvement’ of Crown land that had been taking place under Charles, Plattes opined that ‘many people of indifferent vertuous dispositions, for very want of meanes’, pursued ‘some actions which were not laudable’.¹⁴¹

Plattes promoted his knowledge about husbandry in ways that were in direct opposition to this ‘ignorance’, ‘negligence’, and these ‘indifferent vertuous dispositions’. The first step was to give a very detailed account of his experiments and recommendations so that his ‘worke is plainly made manifest’ to the reader.¹⁴² Throughout his books of 1639, Plattes sought to expound his experiments and the thinking behind them in very great detail in order to ‘investigate the cause, thereby gaining facilitie, to acquire the remedie’ for common problems.¹⁴³ This is exemplified in his extensive discussion of corn – one of the crucial staple commodities of the seventeenth century. Plattes’s aim was to rectify ‘common opinion’ or ‘vulgar’ views of what contemporaries called ‘corn blasting’, by deploying the notions of fatness and moisture as explanatory tools.¹⁴⁴ He started by reviewing the state of art.¹⁴⁵ Wheat usually suffered blasting when sown on fallow land, because fallow was fat and wheat could not bear this fatness. Many farmers introduced rotation cropping since it helped avoid blasting by reducing the fatness of

¹⁴¹ Plattes, *Discovery of subterraneall treasure*, sig. [Bv]. For the controversial ‘improvement’ of Crown land under early Stuarts, see Joan Thirsk, ‘The Crown as Projector on its Own Estates, from Elizabeth I to Charles I’, in R.W. Hoyle (ed.), *The Estates of the English Crown, 1558-1640* (Cambridge: CUP, 1992), 297-352.

¹⁴² Plattes, *Discovery of infinite treasure*, sig. [C4].

¹⁴³ Quote is from Plattes, *Discovery of infinite treasure*, p. 64, where he starts analyzing the ‘rotting of Sheepe’.

¹⁴⁴ *OED*, blast v. II.7, to blight. Plattes spoke of ‘corn’ as a generic term; in the main analysis, he referred to wheat as a particular crop.

¹⁴⁵ Relevant quotes in the following paragraphs are taken from Plattes, *Discovery of infinite treasure*, pp. 47-49.

fallow. Yet blasting frequently happened even in rotation cropping. To this, common farmers knew no remedy; they attributed it to thunder and lightning. Plattes took this to be a sign of the erroneous 'deficiency of the Husbandmens knowledge'.

Plattes pointed out that lightning – if it had been the cause – should have blighted not only wheat but also other crops 'growing so near it'. He assumed it was not the case.¹⁴⁶ So, he argued, there must have been some causes of blasting which the rotation cropping could not prevent. He proposed two independent causes. One was 'immoderate raines' coupled with the fatness of the soil. The other was the fatness carried down by 'great rain' into 'the lower places of the land'; this explained why even wheat growing in furrows of a rotation cropping often suffered from blast while 'letting the other escape unblasted, that grew upon the ridges'. Plattes in this way suggested his explanation for (what he saw as) the widely observed phenomenon. He concluded by giving a prescription. He argued that hops and wheat required some rain but not exceeding amounts; and it did harm when combined with excess 'fatnesse' of the land. Just like hops, therefore, wheat needed to be 'hilled' so that 'they may draw moisture at pleasure, and not have it forced upon them'. In short, Plattes's discussion was based on open communication of detailed evidence and the explanation of a theory behind it. This is the kind of evidence Charles Webster uses to suggest that 'Plattes may be regarded as a pioneer exponent of a scientific approach to agriculture.'¹⁴⁷

Admittedly, portions of Plattes's writings may give us an impression of being recognizably modern. Indeed in 1638, in his dedication to Englebert, Plattes noted

¹⁴⁶ Of course, it is logically possible to infer that wheat is particularly vulnerable to thunder and lightning. But Plattes seems to have dismissed this course of logic as pointless.

¹⁴⁷ Webster, *Great Instauration*, pp. 465-83, esp. pp. 471-72 (quote from p. 472).

that ‘my time being spent in practicall experiments may well deny mee Scholasticall Oratorie’. Yet Plattes’s use of experimental method and open communication took place at a time when distrust of the projector had intensified. As we shall see below, his seemingly ‘scientific approach to agriculture’ needs to be understood as part of his attempts to manage this distrust.

Indeed, Plattes stressed the limit of his knowledge, and in doing so implicitly dissociated himself from the image of the grandiose projector. Plattes repeatedly warned the reader. In the preface of *A discovery of infinite treasure* he signalled:

as for my owne Inventions and experiments, I would be loath, that having pretended to give men so much wealth and treasure, I should bring any man into losse and damage of that which he had before. Therefore in regard that no certaine rule can be given for so variable a worke; I wish that every man may trie the truth in a few Perches of Land; and when he hath found out his fit seed, his fit composition of manure, his fit depth of planting and setting, and hath discovered all inconveniences, and knoweth how to avoid them; then to goe to worke in greater quantities.¹⁴⁸

This set the tone of the books that appeared in 1639. After offering his preventative measure against corn blasting, Plattes was quick to warn against assuming the perfect effectiveness of his recommendation. He thus repeated the warning: ‘I would have every one to try a few perches of ground, which he may doe for so little quantitie’.¹⁴⁹

Such caveats seem to have derived from Plattes’s grasp of the pervasive difficulty of improving technical know-how. His analysis of corn blasting in fact drew heavily upon ‘a generall practise in the Vale of *Belvoire*’ in Lincolnshire.¹⁵⁰ Apart from saying that the best wheat in Europe grew there, he did not justify using this particular set of experience for general recommendation. So how far his theory of fatness and moisture was contingent upon particulars (like a certain type of soil

¹⁴⁸ Plattes, *Discovery of infinite treasure*, sig. D.

¹⁴⁹ Plattes, *Discovery of infinite treasure*, p. 52.

¹⁵⁰ Plattes, *Discovery of infinite treasure*, p. 47.

and chemical components of rain) was open to question.¹⁵¹ *A discovery of subterraneall treasure* suggests that Plattes was aware of this kind of problem. Although he set out to ‘give Rules and Directions’ for a range of mining skills like discovering coal underground, he cautioned his reader not to ‘consume his Estate in the pursuite of this designe; deeming them to bee impossible ever to fail’.¹⁵² Had he not warned about this, he would have been little different from typical projectors who caused ‘great losse’ and ‘manifold complainings’ due to their ‘ignorance’ and ‘negligence’.

Plattes’s awareness of the limit of his experimental knowledge prevented him from calling for investors. In the long preface of *A discovery of infinite treasure*, Plattes frankly admitted the difficulty of carrying out experiments and confessed that he had ‘sometimes marvelled at my owne folly’.¹⁵³ Plattes emphasized that it was a very expensive business. Crucially, he stressed that he chose to ‘part with my money, rather than to suffer another to be oppressed with extreme want and miserie’. Plattes defined his position against the unscrupulous ‘parties’, which probably alluded to Caroline patentees and monopolists:

for the chiefe cause [of the financial loss] was my pronenesse to part with my money, being a thing I so little care for, finding a delectation rather in laughing at the parties mistaking, in thinking he [i.e., they] had absolutely Tantalized me with hope of some great advantage[.]¹⁵⁴

Precisely because it proved difficult and expensive to develop credible knowledge,

¹⁵¹ Problems of this kind can also be found in treatises which seek to import multi-crop cultivation from the Continent. See, for example, Weston, *Discourse of husbandrie*.

¹⁵² Plattes, *Discovery of subterraneall treasure*, sig. [B2v]-B3. See also his discussion of a method for finding out pit-coal, where he heeded the reader to try every way to make ‘sure that the experiment is true and unfailable’ before ‘he trye his fortunes by digging or boaring’, *ibid*, pp. 47-49.

¹⁵³ Plattes, *Discovery of subterraneall treasure*, sig. [B3v].

¹⁵⁴ Plattes, *Discovery of infinite treasure*, sig. [B3v].

Plattes avoided drawing in others. Instead, he discussed how much a parish would increase its revenue if his suggestions were ‘generally put in practice’.¹⁵⁵ Plattes in his dedication to Englebert drew attention to ‘the paines and charges being mine, and the profit being to redound to the Readers’.¹⁵⁶ This emphasis on his financial independence, therefore, was another element that separated him from the reckless projector, who would have, as exemplified in Brugis’s parody, sought investment ‘with hope of some great advantage’.¹⁵⁷

Plattes’s other much shorter pamphlet on husbandry, *The profitable intelligencer*, was published in 1644. This contained a short discourse on a method of making manure, and, more importantly for my discussion, his letter to Hartlib that explained why he had to postpone the publication of his magnum opus, *The treasure house of nature unlocked*, on which he had been working from about 1639. The letter reveals that Plattes had prepared his book based on the ideal of spreading knowledge through open communication; ‘knowledge that concernth the publick good, ought not to be concealed in the breasts of a few’, he argued. So he told Hartlib that he intended to give a copy of the book to ‘every publick Library in the Kingdome’ and circulate copies as widely as possible.¹⁵⁸

Yet at the same time, the letter also reveals that, after the unprecedented criticism of Caroline projectors after the opening of the Long Parliament, the level of distrust was such that it severely constrained Plattes’s attempts of spreading his

¹⁵⁵ Plattes, *Discovery of infinite treasure*, sig. [B2v].

¹⁵⁶ Plattes, *Discovery of infinite treasure*, sig. (a2)-[(a2)v].

¹⁵⁷ Brugis, *Discovery of a projector*, p. 8.

¹⁵⁸ Gabriel Plattes, *The profitable intelligencer, communicating his knowledge for the generall good of the common-wealth and all posterity* (1644), sig. [Av], A2. He intended to sell a copy for five shillings and make it available for one-week loan for two pence, *ibid.*, sig. A2.

improvements in husbandry:

As for the Large Book, to which this little one hath relation, there is no thinking of publishing of it, till we have obtained a Committee [in the Parliament] to examine witnesses, and to print their Deposition in it: for Projectors have cast so many bitter things into the publick Fountain, whereof all have drunk, and their minds are so poisoned, that there is no other way to unpoison them, but to win their beleef and willingness to practise, by such depositions of Gentlemen of qualities, which know the same [husbandry skills] as well as I my self.¹⁵⁹

This confirms that distrust of the projector was not just about monopolists; it could affect promoters of new knowledge more generally. What Plattes had done in the 1639 tracts, conducting experiments at his own expense and giving the reader both details of his knowledge and repeated caveats about possible errors, was not enough to persuade readers to try experiments themselves. Publishing a book would be of little significance, he assumed, unless he won the public's 'beleef and willingness to practise'. Plattes even went on to suggest that imparting information to a suspicious public would damage the credibility of the knowledge itself. 'The reason why it [i.e. the book] is not printed' was, he explained, because his relations would 'seem so strange, and incredible to most men, that they will be likely to slight it, to the great prejudice of the Common-Wealth.'¹⁶⁰

Plattes's way of managing this situation, the reliance upon the institutions of government and 'Gentlemen of qualities', if executed, could have been highly problematic, for it blurred the distinction between the *authentication of events* and the *validation of explanation for them*. As we have seen earlier, Plattes himself had cautioned in 1639 that one should never assume that knowledge based on local experiments would be 'unpossible ever to fail' in other places. If that was the case,

¹⁵⁹ Plattes, *Profitable intelligencer*, sig.[Av].

¹⁶⁰ Plattes, *Profitable intelligencer*, sig.[Av]. To slight meant 'to treat with indifference or disrespect; to pay little or no attention or heed to; to disregard, disdain, ignore'. *OED*, slight, v., 3.a.

the deposition of ‘Gentlemen of qualities’ should only be seen as a means to authenticate what had happened, but never as a means to validate the explanation. It could not guarantee that the set of practices being communicated would yield reported results elsewhere. Taking such depositions as a kind of holy writ would have disappointed credulous followers. Even worse, if testimonies of failed experiments were taken as indicating that these sets of practice would fail elsewhere, then they would have hindered the progress of husbandry by preventing others from finding out whether or not the same innovations would yield different outcomes under different circumstances.

Thus, this reliance upon depositions was at odds with Plattes’s previous belief in experiments that ‘no knowledge [could be] perfect till it was thereby confirmed’. He now hoped that ‘the Depositions being printed in the same Book, every Subject in the Kingdon [. . .] may be satisfied concerning the truth thereof, and so be more apt to yeeld unanimous consent, which is all that is wanting for the full accomplishment of this laudable work [of improving husbandry].’ Plattes’s reference to ‘the truth’ in the gentlemen’s depositions that could ‘yeeld unanimous consent’ is evidence of his jumbling of the authentication of reports and the validation of knowledge. By vaguely associating the depositions of ‘Gentlemen of qualities’ with ‘the truth’, Plattes came dangerously close to ‘Scholasticall Oratorie’ which he originally set out to reject. *The treasure house of nature unlocked* was never published, and Plattes died toward the end of 1644, the year *The profitable intelligencer* appeared, reportedly ‘in the street for want of food’.¹⁶¹ Together with his tentative communication of his experimental knowledge in his husbandry books of 1639, we should take the absence of Plattes’s magnum opus as silent, yet powerful, testimony

¹⁶¹ ‘Culpeper Letters’, 4 Jan. 1644/5 [HP13/59-60], p. 208, n. 1.

to the persistent distrust of the projector, not only in the sense of monopolists and patentees, but also in the sense of promoters of novelties for the public good.

‘English Improver Improv’d’:
Walter Blith’s Incremental Sophistication of Knowledge, 1649-1653

Both Le Pruvost’s proposal and Dymock’s inventions looked like dubious projects in different ways. Plattes’s endeavours, despite his effort to the contrary, were affected by the distrust of the projector. Now, I wish to consider Blith’s husbandry writing, which adopted an intriguingly different way of managing distrust. He presented an explicitly incremental and evolutionary conception of knowledge, by combining some of the strategies Plattes had used, and by planning successive editions of his writing. In doing so, Blith avoided Le Pruvost’s and Dymock’s ‘grandiloquent pretensions’ to universal knowledge, as well as Plattes’s problematic confirmation of ‘truth’ of his experiments by depositions of ‘Gentlemen of qualities’.

A son of a Warwickshire yeoman, Blith served as a captain in the Parliamentary army during the Civil War and purchased some sequestered royal estates in Potterspury, Northamptonshire.¹⁶² He published his husbandry tracts from the end of the 1640s, of which two survived. His earliest known publication, *English improver, or a new survey of husbandry* (1649) discussed six sets of issues, including the managing of different kinds of soil with fertilizers, enclosure and drainage.¹⁶³ While Blith suggested that he was trying to teach the skill to the poor, his main audience,

¹⁶² For his biographical details, see Joan Thirsk, ‘Plough and Pen: Agricultural Writers in the Seventeenth Century’ in T. H. Ashton et al. (eds.), *Social Relations and Ideas: Essays in Honour of R. H. Hilton* (Cambridge: CUP, 1983), pp. 310-11.

¹⁶³ For a brief account of the contents, see Thirsk, ‘Plough and Pen’, pp. 307-308.

like that of Plattes, was the landed class. Blith suggested that improved husbandry would achieve ‘Thine and the Kingdoms great Advantage’, if ‘thy owne Ingenuitie, and the Labour, Paines, and Exercise of the poore Labourer’ were combined together.¹⁶⁴ The third edition (which was perhaps his last publication) showed significant developments. The lengthy ‘Epistle to the Ingenuous Reader’ became much clearer, while new dedications were added, addressing lawyers, scholars and soldiers, and inviting them to join his scheme of improvement along side the gentry.¹⁶⁵ Blith added six new forms of improvement, covering topics including the cultivation of clover, sainfoin, liquorice, rape, coleseed, hemp and the planting of orchard and garden fruits.

Like Plattes’s *A discovery of infinite treasure*, Blith’s *English Improver* also aired some grandiose claims. Its title-page advertised that ‘some Land, both Arrable and Pasture, may be Advanced [. . .] to a Twenty fold Improvement’.¹⁶⁶ Such a promise could have appeared dangerously close to the projector’s vain promise much satirized in the period: ‘I will put you in the way that shall make you for ever, and bee worth no less than thousands yearly into your purse’.¹⁶⁷ Perhaps mindful of such a danger, Blith explicitly distanced himself from the projector stereotype, and stressed that he was communicating his husbandry experience openly. In the ‘Epistle to the Ingenious Reader’ Blith discussed his methodologies and repeatedly mentioned ‘by way of Caution’ the scandals caused by ‘projectors’:

¹⁶⁴ Walter Blith, *The English improver, or a new survey of husbandry* (1649), sig. [av].

¹⁶⁵ Walter Blith, *The English improver improved, or the survey of husbandry surveyed* (1652), sig. b2-[e4v]. He also wrote dedications to ‘Husbandman, Farmer, or Tenant’, and ‘meanest Commoners’.

¹⁶⁶ Blith, *English improver*, title-page.

¹⁶⁷ Thomas Brugis, *The discovery of a projector* (1641), p. 8.

That some Pretending great things [. . .] and held forth Wonders, but ever upon the Charge and Expence of others. And have produced little but to themselves. [. . .] Others also pretend great Discoveries they can make, *if they might have a Publique Stock to worke it, and a Patent for it*, otherwise the Publique shall not share of their Inventions[.]¹⁶⁸

Blith thus disparaged Dutch fen-projectors, and patentees of ‘Oyling seeds’ and fertilizers. Significantly, his method of open communication of his experiments was a deliberate strategy. He argued that doing so would enable him to differentiate his proposals from scandalous ‘new Projects and devises’, and prove them to be more than mere ‘Conjectures’:

He findes so much Abuse offered by many, in holding forth strange Affirmations proving but Conjectures, and Heare-sayes, as hath brought Ingenuity under greatest Scandall, and the Usual stile of new Projects and Devices, which None dare scorne when they are made Experiments.¹⁶⁹

The assertion of financial independence followed. Blith argued that knowledge contained in his book was designed to ‘*Incourage thee to the tryall of them; and is only to hold out some later Discoveries [. . .] Experimented at the onely proper cost of the Author*’. ‘All which are’, Blith declared, ‘therefore somewhat the more Credible’.¹⁷⁰ So Blith, like Plattes, sought to demonstrate the credibility of his particulars by inviting the reader to test his work by giving details of his experiments and experience.

As Plattes had done, Blith’s also acknowledged the limited validity of his empirical observations: ‘thou wilt finde it in the Practise more Ambiguous then in the

¹⁶⁸ Blith, *English improver*, sig. [av] (my emphasis). Blith later complained that ‘those men that now cry down all devices or ingenious discoveries, as projects’ tended to ‘thereby stifle, and choak Improvement’. See Blith, *English improver improved*, p. 234 [recte p. 236].

¹⁶⁹ Blith, *English improver*, sig. [a3v]. See also Blith, *English improver improved*, sig. c2.

¹⁷⁰ Blith, *English improver*, sig. [a2v]-a (my emphasis).

discourse, notwithstanding all my applications to my owne Experiences'.¹⁷¹ However, unlike Plattes who ultimately sought parliamentary authority to quench distrust of the projector and solicit unanimous consent upon his recommendations, Blith sought to invite the reader to contribute their knowledge and discoveries so that knowledge about husbandry could be advanced through a kind of collaboration. For Blith, differences rather than unanimity were the driving force. By exposing his experiments 'to publique view' he hoped:

to give either Incouragement to some deeper and solid Practitioners to hold out their Experienced Principles, or else to Exasperate or provoke the offended, or Gaine-sayer, rather to reprove it [. . .] desiring a most Cleare, Plaine, and Cordiall Information, to himselfe and Kingdome, by whom soever.¹⁷²

His discussion of drainage was, for example, meant to reveal 'the open face of that Experience I have made, be it beautifull or deformed; in pittie to move others to cover the deformities thereof, or put more beauty thereon.'¹⁷³ Blith used the subsequent editions of *The English Improver* precisely to solicit others' useful 'Information' and incorporate it into his body of knowledge. Interestingly, Blith had withdrawn his attack upon the fen-projectors in the third edition, but not the assertion of his financial independence. So Blith remained convinced of the importance of distancing himself from the projector stereotype.¹⁷⁴ Reporting that 'a Gentleman of art and worth' had told him a new way of sowing corn, Blith announced to the reader that 'I hope to brought into substantiall experience upon my own lands by the next edition,

¹⁷¹ Blith, *English improver*, sig. [a3v]-[a4].

¹⁷² Blith, *English improver*, sig. a2, a.

¹⁷³ Thirsk, 'Plough and Pen', pp. 309-310; Blith, *English improver improved*, p. 45.

¹⁷⁴ Blith, *English improver improved*, sig. [C4v]

and then expect the faithful communication thereof.'¹⁷⁵ Speaking of a French fodder plant called 'lucern', Blith likewise reported that the plant was 'advantageous to dry and barren lands, and hath been lately discovered there, and is now of great credit amongst them'. Yet, acknowledging his lack of experience on the plant, he went on to call for further research:

but for my own particular experience, I can say little, and therefore say thus much only to provoke the Ingenuous both unto the search, experimenting, and communicating to publick view, nor one man being sufficient for the experimenting of all discoveries that may be made here, and elsewhere, I am confident every Age, nay every day will bring forth something or other worth our embracements.¹⁷⁶

His plan for publishing successive editions was cut short by his death in 1652, the year in which *The English improver improved* just appeared. But by proposing something similar to an evolutionary vision of husbandry knowledge mediated through open-communication of different outcomes, Blith seems to have distinguished his writings both from the pretension of 'universal' knowledge, and from the problematic withholding of new knowledge.

Conclusion

The fierce denunciation of Caroline projectors in plays, songs, pamphlets, and in parliament did not put an end to projecting activities. On the contrary, beyond the collapse of the Personal Rule, schemes for economic innovations and improvement emerged in remarkably diverse forms. This flourishing of reforming initiatives must be understood as a chapter in the history of projecting activities and stereotypes about them. Only by doing so have we begun to discover the burden of distrust under

¹⁷⁵ Blith, *English improver improved*, p. 221.

¹⁷⁶ Blith, *English improver improved*, p. 187.

which Hartlib and his fellows pursued improvements in husbandry as part of their wider reforming agendas. From the vantage point of Restoration England, John Houghton noted:

Hartlib's Legacy is never to be forgotten, having done so much good in all kinds of good husbandry all over *England* in the former imperfect editions, when scarce any one durst offer for improvements, lest he should be called a *projector*, as if he came from the *fens* to borrow five shillings to purchase five thousand pounds yearly, so averse were our *English* then from all care of improvements.¹⁷⁷

His remark neglected the more specific distrust of the monopolistic projector; but it confirms that we can no longer assume that 'Hartlib had grown uncomfortably close to the "projectors"' only after the Restoration.¹⁷⁸

We have found a wide range of strategies by which promoters sought to negotiate credibility. Significantly, in order to avoid being stereotyped, Plattes and Blith chose not to call for investors, but instead adopted open-communication of experimental results, encouraging reading publics to try improved methods of husbandry themselves. This uncannily anticipated the incremental improvement of useful knowledge that the Royal Society would advocate after the Restoration. Yet we should not highlight Plattes's and Blith's modes of projecting to conclude that the Hartlib circle collectively embodied the triumph of values 'basic to the modern scientific movement' or 'an emancipation from scholastic values'.¹⁷⁹ First of all, men like Le Pruvost and Dymock were actively supported by Hartlib and others. If Plattes declared that 'my time being spent in practicall experiments may well deny mee Scholasticall Oratorie' and Blith approved of Bacon's natural history, then

¹⁷⁷ John Houghton, *Collection for the Improvement of Husbandry and Trade*, (4 vols, 1727-1728), vol. 4, p. 80. The article was originally published in 24 Nov. 1681.

¹⁷⁸ Greengrass, 'Samuel Hartlib and the Commonwealth of Learning', p. 309.

¹⁷⁹ Webster, *Great Instauration*, p. 510.

Dymock too positioned himself at the forefront of ‘new philosophy’, using as a preface a passage from Bacon’s *Novum Organum* which argues for the universal ‘benefits of new Inventions’.¹⁸⁰ More importantly in the context of this thesis, even Plattes had to consider restricting open communication because of the prevailing distrust of the projector. Furthermore, given Hartlib’s and other’s readiness to accept secrecy as a political expedient (to be applied in the ‘universal trade’ scheme and the Office of Address), then the advocacy of open-communication was but *one of the available strategies* that reformers adopted in order to promote improvements in husbandry.¹⁸¹

Significantly, Dymock’s and Le Pruvost’s schemes that drew upon secrets were supported as potentially publicly beneficial. While not all the Hartlib’s collaborators were millenarians or Puritans, what Dury called ‘spirituall discretion’ and enduring interest in state-led reformation spurred a few reformers like Dury and Culpeper to back the scheme for ‘universall trade’. As Culpeper made clear, however, there was distrust of the imposition of state authority that might ‘trample upon the liberties, livelihoods, and estates’.¹⁸² The failure of Le Pruvost’s scheme to attract parliamentary support thus underlines the fact that millenarian aspirations for state-led reformation did not create a wider consensus.

Viewed chronologically reformers probably oscillated between different modes of projecting. For five years after Plattes died without publishing his *The treasure*

¹⁸⁰ Plattes, *Discovery of infinite treasure*, sig. [(a2)]; Blith, *English improver*, sig. a2; idem, *English improver improved*, sig. [C3v]; Dymock, *Invention of engines of motion*, sig. A2-[A2v].

¹⁸¹ For Hartlib’s approval of partial concealment in the operation of the Office of Address, see Samuel Hartlib, *Further discovery of the Office of Address for accommodations* (1648), p. 28.

¹⁸² The phrase is from *A looking-glasse for sope-patentees*, p. 4.

house of nature unlocked (i.e. 1645-1649), there is little evidence to suggest that Hartlib sought to spread husbandry (and other experimental) knowledge through print.¹⁸³ As if Plattes's demise symbolised the failure of publication as a means of promoting improvement, most of the discussion thereafter circulated in manuscript and addressed the government. Only after 1650, a few years after the failure of the 'universal trade' scheme, did writings on husbandry (with which Hartlib was clearly involved) begin to appear in print again. Hartlib often wrote prefaces to these pamphlets, but most of them were addressed to 'the Reader', not to the government, as *Macaria* did in 1641.¹⁸⁴ We need not assume that only one kind of promotional method was adopted at any one time. More importantly, this chronological trend should remind us that the Hartlib circle embraced remarkably different ways of promoting reformation of husbandry, and that their activities did not embody a clear cut shift 'from secrets to public knowledge'.¹⁸⁵

The diversity we have found was not something that provoked controversies among Hartlib and his allies. The reformers rarely wrote about them in any depth.¹⁸⁶ It seems difficult to know whether or not the subject was consciously avoided. Yet it is important to remember that the period of the Civil War and the Interregnum was

¹⁸³ I have used the following sources: *EEBO*; a bibliography in Turnbull, *Hartlib, Dury and Comenius*, pp. 88-109; Hartlib's Agricultural Publications, 1650-1659, in Leslie and Raylor (eds.), *Culture and Cultivation in Early Modern England*, pp. 223-24 [Appendix I].

¹⁸⁴ This revises Eamon, *Science and the Secrets of Nature*, chap. 10.

¹⁸⁵ Note that *Macaria* also contained populist appeals for the reformation, asking the reader 'Why should not all the inhabitants of England joyne with one consent, to make this country to bee like to *Macaria*, that is numerous in people, rich in treasure and munition'? See Plattes, *Macaria*, p. 12.

¹⁸⁶ But there was a rivalry between William Petty and Benjamin Worsley. See Webster, 'Benjamin Worsley', in Greengrass, Leslie and Raylor (eds.) *Samuel Hartlib and Universal Reformation*, 213-35. See also Newman and Principe, *Alchemy Tried in the Fire*, p. chap. 5, esp. p. 268.

one of unprecedented political upheavals and shifting and contesting political allegiances, where unequivocal ideological positions could provoke open dissent and controversies. So there was an ample advantage for the promoters of the public works to remain uncontroversial. In fact, John Lanyon and his associates, who came to be in charge of the public cleanliness in Interregnum London, couched their rhetoric in deliberately uncontroversial terms, although some of them were royalist in sympathy.¹⁸⁷ Hartlib's tracts on beekeeping published after the fall of Charles I also show his deliberate excision of the traditional literary association of a beehive with a monarchical polity.¹⁸⁸ Indeed, Blith's claim in his *The English improver improved* (1652) that good husbandry is the sinew 'that holds together the joynts of common good' was an alteration from the first edition (1649) which stated that husbandry was the sinew 'holding together the joynts of Monarchie'.¹⁸⁹ These promoters of improved husbandry thus operated within this milieu with an immediate need for developing an uncontroversial rhetoric that would have wide-spread appeal. Emphasising piety and the public good helped elide the underlying diversity in the conceptualisation and promotion of husbandry schemes.¹⁹⁰ After the Restoration, too, religious idioms and the rhetoric of public service continued to play important roles. Yet there were subtle, but significant, changes in what was publicly acceptable. This will be the central theme of the next chapter.

¹⁸⁷ Jenner, "Another *epocha*?", p. 351.

¹⁸⁸ Timothy Raylor, 'Samuel Hartlib and the Commonwealth of Bees', in Leslie and Raylor (eds.), *Culture and Cultivation in Early Modern England*, 91-129 (esp. pp. 116-18).

¹⁸⁹ Blith, *English improver*, sig. [a2v]; idem, *English improver improved*, sig. [cv].

¹⁹⁰ Of course, I do not mean to assume that the differences we have discovered in approaches to husbandry corresponded neatly with political and/or theological divisions of the time.

CHAPTER THREE

Post-Restoration Projecting Cultures:
From Reformation to Improvement Revisited

On the eve of the Restoration a complaint arrived from York to Sir Thomas Widdrington, the Recorder of that city. ‘The body of York is so dismembered’, it declared, ‘no person cares for the [sic] being the head of it [. . .] our whole body is in weakness and distemper, our merchandise and trade, our nerves and sinews are weakened and become mean and inconsiderable.’¹ Royalists were all too happy to exploit such a complaint. Blaming republicans for the ‘decay of trade’ and much more, an anonymous author argued that the health of the body politic would not be restored without the restoration of its ‘head’: ‘our Trades are generally lost, [. . .] we are lessened in our Manufactures [. . .] because, alas, we have no *King*.’² Upon the king’s return, John Evelyn argued, ‘the Merchant [sic] will be secure, Trades immediately recover’.³

As Steve Pincus and Blair Hoxby have suggested, supporters of the Rump and of the exiled king blamed each another for the economic slump of the late 1650s. By the end of the Interregnum, economic prosperity had clearly become a crucial foundation for a legitimate government.⁴ By sending letters and issuing proclamations to encourage new beneficial economic schemes, the king and his

¹ *T&C*, p. 374.

² ‘Awake o England: or the people’s invitation to king Charles’ (1660), in *Harleian Miscellany*, ed. William Oldys (8 vols, 1744-1746), vol. 1, p. 269.

³ John Evelyn, *An apology for the royalist party* (1659), p. 11.

⁴ Compare Steve Pincus, ‘Neither Machiavellian Moment nor Possessive Individualism: Commercial Society and the Defenders of the English Commonwealth’, *American Historical Review*, 103 (1998), pp. 729-32; Blair Hoxby, ‘The Government of Trade: Commerce, Politics and the Courtly Art of the Restoration’, *ELH*, 66 (1999), pp. 597-99.

government would try to portray the regime as the legitimate protector of economic improvement and prosperity. Such an image, moreover, would soon be strenuously disseminated in royal panegyrics, poems, plays and architectural designs.⁵

Proclamations, panegyrics, and building designs may have been skilfully mobilised to lend legitimacy to the restored regime, but translating the ideal into action was problematic. The letter to Widdrington concluded by asking for money for a set of schemes for economic improvement for reviving York's fortune. These, if written more provocatively, would have looked like a typical projector's proposal aired under the early Stuarts or during the Interregnum:

Give us leave for conclusion to tell you that a good purse is more useful to us than a long story, which might enable us: (1) To make our river more navigable; (2) To re-edify the decayed parts of the city; (3) To raise a stock to set up some manufacture in the city; (4) To relieve our poor, into which number we may all of us fall if some timely course be not taken[.]⁶

The letter thus reveals the paradoxical status of projecting activity under the restored monarch. On the one hand, projecting activities could provide a means to achieve commercial prosperity, and encouraging them would lend legitimacy to the Restoration regime. However, projecting was simultaneously something which early Stuarts (especially Charles I) had abused so scandalously, and which Hartlib and his fellows had pursued with millenarian aspirations under the auspice of the regicides. The restored regime could not be associated with either of them.

This chapter offers the first systematic examination of post-Restoration

⁵ See Hoxby, 'The Government of Trade', pp. 592, 600. He contrasts the Restoration panegyrics with those of earlier periods: 'explicit attempts to align the monarchy with trade had been absent [. . .] from the well-known verse panegyrics of Samuel Daniel, Ben Jonson, Michael Drayton, William Drummond, Edmund Waller, and Abraham Cowley to the early Stuarts' (*ibid.*, p. 600).

⁶ *T&C*, pp. 374-75.

projecting culture. This is not to suggest that little has been done to explore post-Restoration schemes for economic innovations and improvement, however. Paul Slack and John Spurr have recently shown that there was a stream of economic and welfare schemes under the slogan of 'improvement'.⁷ Slack has suggested, for example, that the thirty years after Charles II's return was 'the first, pioneering phase of improvement' in which promoters conceptualised innovative economic schemes more in terms of piecemeal improvements than of a grandiose, once-and-for-all reformation.⁸

Promoters' emphasis shifted towards improvement, Slack and Spurr suggest, because schemes for grandiose reformations were plagued by failure. 'Restoration England notably failed to produce that "propitious and wise authority" to which Hartlib and his successors looked for reconciliation' between public and private interests.⁹ Slack emphasises that the 'restoration of the monarchy had not restored confidence in the prerogative'; 'a greater genius than that of Charles II' would have been needed 'to deal adequately with the circumstances of the 1660s'.¹⁰ Admirers of grandiose projects for the public good failed also because they did not grasp 'the reality' of post-Restoration England: 'the cut-throat competition between different economic interests'.¹¹

I would agree that 'improvement' was an important slogan for the period. I

⁷ Paul Slack, *From Reformation to Improvement: Public Welfare in Early Modern England* (Oxford: Clarendon, 1998), chap. 4; John Spurr, *England in the 1670s: 'This Masquerading Age'* (Oxford: Blackwell, 2000), chap. 5.

⁸ Slack, *From Reformation to Improvement*, pp. 2, 81-84, 100 (quotation from p. 100). Of course, he is cautious not to imply that there were clear-cut phases.

⁹ Slack, *From Reformation to Improvement*, p. 100.

¹⁰ Slack, *From Reformation to Improvement*, p. 88.

¹¹ Spurr, *England in the 1670s*, p. 144.

would also admit that many of the schemes aired after the Restoration were perhaps little more than feeble gestures. The restored king did not carry out the ambitious proposal for improving London's air John Evelyn dedicated to him. When London suffered the Great Fire in 1666, John Evelyn, Valentine Knight, Robert Hooke and Christopher Wren failed to convince public authorities to implement their geometrically ordered city plan, and speculative builders sprang up instead.¹² It is not inconceivable that Charles II's lack of confidence (i.e., failure from above) and fierce economic competition (failure from below or structural failure) might have played some role in the failure of these ambitious schemes.

As we have seen in the last chapter, however, the slogan of 'improvement' had been used by Hartlib and his associates from the later 1630s, and many of their schemes failed too. So neither the slogan nor the failure of those schemes that employed the slogan distinguished the post-Restoration culture of innovation and improvement from its predecessors. Explaining failure either from above or from below would be too simple, and, in particular, cannot explain why certain schemes attracted more attention and support than others.

That projecting activity could buttress, but could at worst discredit, the legitimacy of the restored regime is the key here, for the restored government would have been careful to choose what kind of schemes to back, and likewise some perceptive promoters would have realised what they had to avoid if they were to win trust. I argue that we must explore the presentation of schemes for economic improvement within a broader context of what was politically and religiously

¹² Slack, *From Reformation to Improvement*, p. 88-89; Mark Jenner, 'The Politics of London Air: John Evelyn's *Fumifugium* and the Restoration', *Historical Journal*, 28 (1995), 535-51; T. F. Reddaway, *The Rebuilding of London after the Great Fire* (London: Jonathon Cape, 1940), chap. 2.

acceptable after the Restoration. Doing so will enable us to explore complex interactions between the government, the Royal Society, promoters of economic improvement, their opponents and wider print culture, interactions through which certain *dirigiste* idioms that had been perfectly acceptable under the early Stuarts and attracted much attention during the Civil Wars and the Interregnum became less credible and less publicly acceptable.

The chapter has six sections. We shall begin with a brief survey of post-Restoration projecting activities. In the second section, I will explore the self-presentation of promoters of economic improvement in the first years of the Restoration in order to demonstrate that the promotion of economic improvement became a means to express support for the restored monarch. The third and fourth sections will explore how certain kinds of millenarianism and the imposition of governmental authority fell out of favour and how men like Cressy Dymock and William Petty, who clung on to either of these elements, failed to find patrons for their schemes. In the fifth section, I will turn to a group of promoters (including John Evelyn and Andrew Yarranton) who presented their schemes in ways that were more publicly acceptable. They opted for encouraging private initiatives with varying emphasis on godliness, and were able to solicit sustained support. The final section concludes by suggesting that, like Hartlib and other promoters in the mid-century, even these more successful promoters could be laughed at and dismissed as 'projectors'. So we shall see that there were continuities as well as changes in post-Restoration projecting culture. The changes we will explore were primarily qualitative, and were neither simply imposed from above nor derived from below. The process was by no means inevitable or self-evident either. If the restoration of the monarchy sometimes felt insecure, there was at least an equal measure of

uncertainty as to how one could best present their schemes for economic improvement. Promoters like Dymock and Petty failed to solicit the support they needed because they did not recognise the changes that were occurring.

Channels and Stimuli for Post-Restoration Projects

Hartlib was deprived of his state pension in 1660; some of his papers were lost in a fire, and he died two years later in penury. Although some of his reformist agendas survived after his demise, the state-funded 'Office of Address' he hoped to establish was never realised. As we have seen in the Introduction, the studies that touch upon projecting activities and stereotypes about them have tended to focus on the early Stuarts' reigns and the financial revolution, a tendency that is understandable given the higher visibility of projecting activities in these periods (See Figs. 1, 6). Yet there were traces of new economic schemes, stimulated by a range of factors such as economic trends, legal and political settlements, and war. In order to explore the evolution of projecting culture in relation to broader political and religious contexts of post-Restoration England, we must first go beyond the *ESTC* and the patent records, and map out clusters of projecting activities.

Within half a year of his return, Charles II had ordered the setting up of a Council of Trade,¹³ sponsored a street clean-up campaign,¹⁴ and encouraged the Lord Mayor and Aldermen of the City of London to employ the parish poor in

¹³ In August, the king invited merchants in incorporated trading companies to discuss with Privy Councillors 'such articles and clauses as should render the nation more prosperous and flourishing in trade and commerce'. See *Analytical Index to the Series of Records Known as the Remembrancia* (London: E. J. Francis, 1878), p. 530. See also *CSPD 1660-1661*, pp. 319, 353.

¹⁴ Slack, *From Reformation to Improvement*, p. 88.

making fishing-nets and wooden barrels.¹⁵ The king further urged the City to ensure the uninterrupted operation of ‘a corporation for the relief and employment of the poor’ that ‘caused many hundreds to be employed and relieved’.¹⁶ Responding perhaps to such encouragement, a stream of proposals emerged as petitions and addresses to the king.¹⁷ In April 1661 Balthazar Gerbier, styled as Baron D’Ouvilly, presented to the Privy Council a series of proposals to raise revenues, including a land bank and projects for ‘cleansing and beautifying London’ and improving Devonshire and Cornish tin mines.¹⁸ Sir Edward Ford and his partners in the waterworks at Strand Bridge petitioned the Treasury in November 1661 for a one hundred-year lease of the site.¹⁹ In December 1661 Sir Samuel Morland successfully petitioned the king for a patent for his water-raising engine ‘by the force of powder and air conjointly’.²⁰ About a year later, one James Street procured a patent for his corn-grinding mill that would operate without using wind, water, horse or men.²¹ It is worth noting that, unlike early Stuart ones, few of these patents granted monopoly power over the industry to which the patented inventions were related.²²

If many people submitted petitions and addresses to the king, others dedicated

¹⁵ *Remembrancia*, pp. 143-44.

¹⁶ *Remembrancia*, p. 364.

¹⁷ The following cases are not included in Woodcroft’s *Chronological Index*, and hence in my patent database. This is because these cases are culled from the State Papers and the Treasury Papers, both at the National Archives. Woodcroft used ‘docket books’ (now at TNA, C233) and did not consult these sources when he compiled the *Index*.

¹⁸ *CSPD 1661-1662*, p. 78-79. His French lineage had been questioned and his reputation was somewhat blotched. See *CSPD 1660-1661*, pp. 589-90.

¹⁹ *CTB*, vol. 1, 1660-1667, pp. 167-68.

²⁰ *CSPD 1661-1662*, pp. 175, 199. See also a patent granted to Tim Fulthorpe, *ibid.*, p. 178.

²¹ *CSPD 1661-1662*, pp. 247, 425, 465.

²² We shall come back to this later in the chapter.

books to him that contained ambitious projects. To give but a few examples: Thomas Bushell, who financed the king's army during the Civil War, dedicated his mining proposals to Charles II. An obscure engineer Francis Mathew dedicated his inland navigation proposals to the monarch. John Evelyn presented to him *Fumifugium* (1661), which contained proposals for improving London air and cultivating fruit trees across the metropolis.²³

Parliament also offered a channel for launching new schemes. 'In the midst of many and great Undertakings let not a Settlement for the *Poor* be forgotten', one pamphlet appealed to parliament in 1660.²⁴ Many inventors who applied for patents also tried to obtain private acts for extra protection. Under the early Stuarts, Commissions of Sewers and patents had been the main methods of authorising inland navigation schemes, and only three acts of parliament were passed for the purpose between 1600 and 1660. In contrast, after the Restoration, promoters sought parliamentary backing.²⁵ There was probably no concerted policy to determine what types of projects were to be considered by parliament and what by the royal prerogative. But, as we shall see below and in the next chapter, the ways in which parliament authorised new schemes reflected the broader shift from reformation to improvement.

Chartered in 1662, the Royal Society also attracted and promoted various schemes for economic and technological improvement. In 1663 the Society set up a committee to consider the Somerset gentleman John Buckland's project for

²³ For Bushell and Mathew, see my discussion below. For *Fumifugium*, see Jenner, 'The Politics of London Air', passim.

²⁴ *An appeal to the parliament concerning the poor that there may not be a beggar in England* (1660), p. 1.

²⁵ See Chapter Four for more discussion.

‘preventing famine, by dispersing potatoes throughout all parts of England’. Other committees were also formed to consider Thomas Toogood’s water raising engine and John Beale’s proposal for promoting cider production.²⁶ Upon the direction of the Society, Evelyn published his influential *Sylva* (1664) to redress the perceived decay of timber supply.²⁷ In early 1665 Ralph Austen sought to petition parliament with a proposal for encouraging the planting of fruit and timber trees.²⁸ From June 1664 to July 1665, the ‘Georgicall Committee’ was convened to help improve agriculture. In order to collect information from gentlemen in different counties about local practices and novelties, the committee published its ‘Enquiries concerning Agriculture’ in *Philosophical transactions* in July 1665.²⁹ The Mechanical Committee also met in these years in an ‘attempt to use the skills of its members to produce inventions which might be of immediate utility.’³⁰ There were some attempts to compile ‘history of trades’ too.³¹ The Society did not have the power to sanction promoters, or the ready purse to fund ambitious projects. Yet through various committees, some Fellows very actively engaged in promoting

²⁶ Michael Hunter, *Establishing the New Science: The Experience of the Early Royal Society* (Woodbridge: Boydell Press, 1989), pp. 77-78, 76.

²⁷ Lindsay Sharp, ‘Timber, Science, and Economic Reform in the Seventeenth Century’, *Forestry*, 48 (1975), pp. 51-52, 63-68.

²⁸ Hunter, *Establishing the New Science*, p. 87. See also my discussion of Austin’s writings below.

²⁹ *Philosophical transactions* (1665-1678), 1 (1665 - 1666), pp. 91-94; Reginald Lennard, ‘English Agriculture under Charles II: the Evidence of the Royal Society’s “Enquiries”’, *Economic History Review*, 4 (1932), pp. 23-45; Hunter, *Establishing the New Science*, pp. 84-101, 105-114 (Agricultural Committee (a) Minutes).

³⁰ Hunter, *Establishing the New Science*, pp. 87-91, at, p. 89.

³¹ Walter E. Houghton Jr., ‘The History of Trades: Its Relation to Seventeenth-Century Thought: As Seen in Bacon, Petty, Evelyn, and Boyle’, *Journal of the History of Ideas*, 2 (1941), 33-60; K. H. Ochs, ‘The Royal Society of London’s History of Trades Programme: An Early Episode in Applied Science’, *Notes & Records of the Royal Society*, 39 (1985), 129-58.

schemes for economic innovations and improvement up to 1665, when the Great Plague interrupted their transactions.³²

A range of factors stimulated the schemes for economic innovations and improvement that emerged in the 1660s. We have already seen the king's and the Royal Society's initiatives. In addition, the Restoration political settlement fostered projecting activities despite the criticism and resentment they attracted. Purchasers of sequestered crown and royalist lands during the Interregnum had made a handsome profit by selling and/or investing in the land. The Restoration settlement did not force these owners to return their gains or compensate the original owners for profit so raised, and this enabled Parliamentarians of lesser means to launch small-scale enterprises. The 1660 Statute of Tenure (12 Car. 2, c. 24) ruled that great landowners no longer had to pay feudal incidents to the crown, a policy that afforded aristocrats some extra revenue.³³ Furthermore, lucrative governmental posts and grants were offered to ex-royalists. For example, Thomas Bushel was granted £2,000 for his role in royalist war finance and was made a gentleman of the Privy Chamber.³⁴ In August 1660, the royalist earl of Bristol obtained grants to sell off or enclose Broyle Park in Sussex, Lancaster Great Park and Ashdown Forest.³⁵ Another royalist, Thomas Windsor, future earl of Plymouth, had his barony restored in 1660. He was also made lord-lieutenant of Worcestershire and appointed the Governor-General of Jamaica, a

³² See Lennard, 'English Agriculture', pp. 37-38; Hunter, *Establishing the New Science*, pp. 94-95, 98-101.

³³ For background, see Joan Thirsk, 'The Restoration Land Settlement', in *idem*, *The Rural Economy of England: Collected Essays* (London: Hambledon Press, 1984), chap. 8.

³⁴ *CTB*, vol. 1, 1660-1667, pp. 512, 528; *CSPD 1663-4*, p. 90.

³⁵ *CSPD 1661-1662*, p. 78.

lucrative post with an annual salary of £2,000.³⁶ These lucrative posts and privileges conferred after 1660 help explain why Bristol and Windsor could afford to pour their money into the Stour river navigation project that we will examine in the next chapter.

Fires and wars stimulated certain kinds of schemes too. The Great Fire of 1666 not only triggered a series of projects for surveying, planning and re-building London, but also stimulated the fire insurance industry and further improvement in water supply.³⁷ The mounting tension with the United Provinces, which culminated in the Second Anglo-Dutch War from March 1665, encouraged a series of initiatives within the Royal Society. Within several weeks, committees on ‘the improvement of artillery’ and ‘experiments for improving chariots’ were set up. The first meeting of the Society’s Mechanical Committee after the outbreak of the War focused on gunnery,³⁸ and more generally the post-Restoration period saw a series of attempts to improve naval vessels and military weapons.³⁹

If the 1660s saw a good deal of projecting activities, the surge of patenting in the 1670s should warn us that there was perhaps a similar development outside the realm of patenting. One indication is a surge of writings on economic improvement

³⁶ Stephen Sanders Webb, *The Governors-General: The English Army and the Definition of the Empire, 1569-1681* (Chapel Hill: University of North Carolina Press, 1979), pp. 214, 478.

³⁷ Scott, *Joint-stock*, vol. 3, p. 372; Reddaway, *Rebuilding of London*, pp. 168, 282-83.

³⁸ Hunter, *Establishing the New Science*, pp. 88, 117-18 (Mechanical Committee minutes).

³⁹ See, for example, Sarah Barter Bailey, *Prince Rupert's Patent Guns* (Leeds: Royal Armouries Museum, 2000); Marika Koblusek, “‘Keeping It Secret’: the Identity and Status of an Early-modern Inventor”, *History of Science*, 43 (2005), 37-56. For the Ordnance Office and its relation to expert knowledge, see Frances Willmoth, *Mathematical Science and Military Technology: The Ordnance Office in the Reign of Charles II*, in J. V. Field and Frank A. J. L. James (eds.), *Renaissance and Revolution: Humanists, Scholars, Craftsmen, and Natural Philosophers in Early Modern Europe* (Cambridge: CUP, 1993), 117-31.

in the decade. The number of books and pamphlets with the words ‘improve’ and ‘improvement’ in their titles doubled from the 1660s. Among them were the reprint of Samuel Fortrey’s *England’s interest and improvement* (2nd edition 1673), Roger Coke’s *England’s improvement* (1675), and Andrew Yarranton’s *England’s improvement by sea and land* (1677).⁴⁰ These authors advised the king and politicians to learn from the Dutch and compete against them, and for that purpose offered a variety of recommendations, some concentrating on the ‘balance of trade’, others covering specific industries and ways to improve them.⁴¹

Especially from the mid-1670s the Royal Society’s journal, *Philosophical transactions*, also promoted proposals for national economic improvement by publishing book reviews.⁴² Although the Fellows’ attitudes towards inventions and useful knowledge were never homogeneous, they wished to see themselves (as a review in the *Transactions* put it) as ‘concerned to take notice of those [. . .] who shew their Love to their Country by devising, proposing and soliciting the best Expedients for the Improvement of *England* and other his Majesties Dominions, by

⁴⁰ The increase is from 23 to 44 for ‘improvement’, and from 76 to 145 for ‘improve’ and its derivatives. In particular, the three years after the Dutch War ended in 1674 saw an unusual concentration of 60 titles, a three-year total that was not to be matched until at the height of the early financial revolution (67 titles; 1692-1694). The figures are based on the *ESTC* search results with title keywords ‘improvement’ and ‘improv?’. Note that the results are slightly distorted as they include books that were not strictly concerned with economic improvement.

⁴¹ Spurr, *England in the 1670s*, pp. 135-41.

⁴² Reviews, many of them celebratory, included: *Philosophical transactions* (1665-1678), 7 (1672), p. 5002, on Richard Sharrock’s *History of the propagation and improvement of vegetables* (1660, 1666, 1672); *Philosophical transactions* (1665-1678), 9 (1674), p. 252, on Richard Haines, *Prevention of Poverty* (1679); *Philosophical transactions* (1665-1678), 10 (1675), pp. 320-26, on John Blagrave, *Epitome of the whole art of husbandry* (1669, 1670, 1675, 1685). Mayling Stubbs suggests that John Beale penned many of these reviews. Mayling Stubbs, ‘John Beale, Philosophical Gardener of Herefordshire Part II. The Improvement of Agriculture and Trade in the Royal Society (1663-1683)’, *Annals of Science*, 46 (1989), pp. 349-52.

Trade, Agriculture, or any Commerce, Artifice, or Manufacture.’⁴³ In the 1670s and 1680s, as we shall see later, its Fellows also backed various promoters of economic innovations and improvement outside the Society by soliciting political support for them.

Therefore, the patent booms in the 1670s and 1680s must be seen as tips of an iceberg of post-Restoration projecting activities that, from the very early 1660s, clustered around the restored king and his government, parliament, the Royal Society, and other places.⁴⁴ Now I will examine the ways in which promoters presented themselves and their schemes for economic innovations and improvement upon the king’s return. Doing so will illuminate some of the political and ideological circumstances that affected post-Restoration projecting activities and distinguished them from their early Stuart and post-Civil War counterparts.

Projecting and the King’s Return

As economic prosperity came to be seen as a vital element for legitimating the restored regime, both ex-Cromwellians and former royalists presented themselves as public-spirited subjects, willing to join the king in pursuing economic improvement. For example, in dedicating his mining scheme to the king, Bushell ranked himself among ‘*persons of known integrity, abhorring all self-interest, and aiming soly at the Glory of God, promoting great designs for the publick good*’.⁴⁵ ‘There is’, Francis

⁴³ *Philosophical transactions* (1665-1678), 9 (1674), p. 19, brief ‘recommendation’ of Fortrey’s *England’s interest and improvement*, and Roger L’Estrange’s *A discourse of the fishery* (1674, 1695). See also Thomas Sprat, *The History of the Royal Society* [1662] (London: Routledge 1959), pp. 401-402.

⁴⁴ Coffeeshouses also played an important role as venues in which innovative schemes were promoted and discussed. See Chapter Five.

⁴⁵ Thomas Bushell, *An extract by Mr. Bushell of his late abridgement of the Lord Chancellor Bacons Philosophical Theory in mineral prosecutions* (1660), sig. A2-[A2v], ‘Dread

Mathew declared, 'nothing of greater advantage to a Land, than the opening of Rivers'. By dedicating a pamphlet to the king, then, Mathew presented himself as a champion of 'such great and publick Works'.⁴⁶ When Ford petitioned the Treasury, he stressed his 'great expense in inventing, contriving, and maintaining the waterworks for the public good, to serve the inhabitants with water and the prevention of fire'.⁴⁷ In offering proposals, then, projectors highlighted how they would contribute to the public good as coteries of Hartlib had done during the 1640s and 1650s.

The promotion of economic improvement also reflected more specific political circumstances. Many royalists had had some association with the Rump and the Cromwellian regime. So, upon the king's return, many of them chose to highlight whatever relation they had had with the royalist cause, passing over their associations with the previous regime. Although a royalist, Bushel had sought support from the Cromwellian government for his Welsh mining enterprise during the 1650s. So, when dedicating his proposals to the restored king in 1660, he was careful to highlight that he was 'loyal to Your Royal Father'. In June, a surveyor of the Bedford Levels, Jonas Moore (1617-1679), presented an edition of his *Arithmetick* to prospective new patrons. He had to do this even more cautiously than Bushel because, shortly after the execution of Charles I, Moore dedicated an earlier edition of the book to three parliamentarians, showing '*thankfullnesse* of their great

Sovereign'.

⁴⁶ Francis Mathew, *Of the opening of rivers for navigation the benefit exemplified by the two Avons of Salisbury and Bristol* (1660), 'To the Most High and Mighty Monarch' [no signature], p. 2.

⁴⁷ *CTB*, vol. 1, 1660-1667, pp. 167-68.

Curtesies'.⁴⁸ Now, Moore dedicated the new one to Charles II's brother, the Duke of York, and Sir Edward Mountague (whose switch of allegiance ensured the navy's support for the king's return), and recounted a story he had not mentioned in the 1650 edition. Recalling an earlier encounter with Charles I in Durham, Moore suggested that he would not have devoted himself to mathematics and engineering without the king's encouragement.⁴⁹ During the 1650s, Mathew dedicated to Cromwell and the Rump his proposals for inland navigation, obeying '*divine Providence thus advancing you and your affairs*'.⁵⁰ Upon the king's return he put all this aside. An engraving of Charles II and a dedication to him accompanied the 1660 proposal. Mathew now emphasised his support of the royalist cause during the War, presenting himself as a '*Captain of a Troop of Horse in His late Majesties Service; as by his Commissions doth appear*'.⁵¹ As late as 1668, Cressy Dymock, a protégé of Hartlib, styled himself 'a *Gentleman* [. . .] a Col. of Horse in his late Majesties Armies [who]; Hath been several times undone by, or for his Fidelity'.⁵²

It was not as though having had some connections with Cromwell, the Rump or

⁴⁸ Jonas Moore, *Moore's arithmetick discovering the secrets of that art, in numbers and species* (1650), sig. A3, 'To the Honourable Sir William Persall, Kt. Edmund Wild, Esq. and Nicholas Shuttleworth, Esq.'.

⁴⁹ Jonas Moore, *Moore's arithmetick in two books* (1660), sig. A4-[A4v], 'To the Illustrious Prince James Duke of York'. Here, my discussion owes much to Frances Willmoth, *Sir Jonas Moore: Practical Mathematics and Restoration Science* (Woodbridge: Boydell Press, 1993), pp. 78, 122.

⁵⁰ Francis Mathew, *Of the opening of rivers for navigation the benefit exemplified by the two Avons of Salisbury and Bristol* (1655), sig. [A2v]. See also the 1656 edition with an additional preface, idem, *Of the opening of rivers for navigation the benefit exemplified by the two Avons of Salisbury and Bristol* (1656), sig. A2.

⁵¹ Mathew, *Of the opening of rivers* (1660), 'To the Most High and Mighty Monarch' [no signature].

⁵² [Cressy Dymock], *The new and better art of agriculture* [1668], one-page handbill. My account of Dymock's activities after the Restoration rectifies Mark Greengrass's comment that Dymock 'apparently died shortly thereafter'. M. Greengrass, 'Dymock, Cressy (fl. 1629–1660)', *Oxford DNB*, vol. 17, 500–501 (at p. 501).

with Hartlib seriously jeopardised promoters' reputation in post-Restoration England. After all, even royalists like Evelyn and Ford had had contacts with Hartlib, Cromwellians, and Parliamentarians. As Mark Jenner has shown, in the 1650s the business networks of one-time Cavalier projectors like Ford and John Lanyon cut across religious and ideological boundaries.⁵³ The Act of Free and General Pardon Indemnity and Oblivion, which was passed by the Convention parliament in 1660, declared that criminal or treasonous deeds committed between January 1637 and June 1660 were to be 'Pardoned Released Indemnified Discharged and put in utter Oblivion', making any evocation of the issue (in speech or in print) subject to fines.⁵⁴ Yet, for those who witnessed the dramatic return of the king in May 1660, the threat of retribution still seemed imminent and the future of the Restoration settlement hardly predictable.⁵⁵ For the first few years after the king's return, then, highlighting ones' public-spiritedness and 'royalist' past was a pragmatic, commonplace, occurrence. It was probably a means to safeguard one's reputation and to promote potentially beneficial economic schemes.⁵⁶

Promoters of innovations and improvement were not alone in rapidly adjusting themselves to the new political landscape. Defaulting accountants, sued by the Crown for their alleged role in tax collection after the Civil War, often denied

⁵³ Mark Jenner, "'Another *epocha*'? Hartlib, John Lanyon and the improvement of London in the 1650s', in Mark Greengrass, Michael Leslie and Timothy Raylor (eds.) *Samuel Hartlib and Universal Reformation: Studies in intellectual communication* (Cambridge: CUP, 1994), pp. 351-52; Mark Jenner, 'Liquid Schemes, Solid Gold' (unpublished manuscript, n.d.), no pagination.

⁵⁴ 12 Car. 2, c. 11.

⁵⁵ As we shall see in the next section, there were harsh reactions to alleged 'fanatics'.

⁵⁶ One's personal reputation and economic performance were often mutually dependent. See Craig Muldrew, *Economy of Obligation: The culture of credit and social relations in early modern England* (London: Macmillan, 1998).

charges by stressing their 'royalist' past.⁵⁷ During the 1650s literary figures like John Dryden and Edmund Waller eulogised Cromwell; after the Restoration they eulogised the king. In adjusting themselves to the new setting, therefore, writers carefully trimmed the Cromwellian tropes.⁵⁸ During the Interregnum, the alchemists George Starkey and Henry Stubbe dedicated tracts to regicides, and wrote against monarchy and the established Church. Starkey later published two pamphlets to support the king's return, whereas Stubbe somehow managed to serve as His Majesty's physician in Jamaica.⁵⁹ Like poets, alchemists adjusted aspects of their rhetoric. 'During the Interregnum, regal language in an alchymical treatise was [present, but] ideologically muted'. After the Restoration, however, the 'latent politics of the royal language of chymistry' reached its climax, and the vast economic potential of alchemy was promoted as a means to strengthen the monarchical power.⁶⁰

Promoters of other projects also adjusted their rhetoric. In a tract that promoted the cultivation of timber, the ex-parliamentarian soldier John Smith argued that successful timber cultivation would 'maintain above Double the Number of People in a better Condition' and 'encrease his Majesties Revenues, and be more strength and safety to the Kingdome', a claim that strikingly resembled that of Gabriel Plattes

⁵⁷ Doing so allowed them to present themselves as loyal, obedient and pardonable subjects. See Matthew Neufeld, 'Restoration Remembrances: Recollections of a Pardonable Past in the Answers of Defaulting Accountants, 1662-1664' (unpublished paper, 2008).

⁵⁸ For an interesting discussion of the similarities between Cromwellian and monarchical tropes, see James Grantham Turner, 'From Revolution to Restoration in English Literature', in David Loewenstein and Janel Mueller (eds.), *The Cambridge History of Early Modern English Literature* (Cambridge: CUP, 2003), esp. p. 796.

⁵⁹ J. Andrew Mendelsohn, 'Alchemy and Politics in England 1649-1665', *Past & Present*, 135 (1992), pp. 63, 70 (fn. 175), 71.

⁶⁰ Mendelsohn, 'Alchemy and Politics', pp. 60-64, 74, (quotations from pp. 64, 63).

some thirty years earlier.⁶¹ Yet Smith's writing was not for the glory of the Republic, but that of the 'Kingdom'.⁶²

Highlighting the promoters' politic adjustment is not to suggest that they were mere opportunists. The self-fashioning of promoters like Bushell and Mathew instead indicates that they could switch allegiances with a degree of 'perceived naturalness' by manipulating part of the rhetoric they were using.⁶³ More importantly, their promotional strategies demonstrate that schemes for economic innovations and improvement were entangled with the regime's search for legitimacy. Historians have suggested that 'popular' support for the king's return was not so much spontaneous as the result of deliberate royalist effort to forge consensus.⁶⁴ In a similar fashion, the post-Restoration projecting activities began by fabricating an impression of 'One Harmony, one Mirth, one Voice' for the restored monarchy.⁶⁵ We must explore other facets of post-Restoration projecting culture precisely in this political and ideological context.

⁶¹ John Smith, *England's improvement reviv'd* (1670), p. 11; Gabriel Plattes, *A description of the famous kingdome of Macaria* (1641), 11.

⁶² For a similar adjustment, see Royal Society Archives, London, Cl.P. x(3)7, Ralph Austen, 'Proposalls & Reasons for the improving, & advancing of Planting; Humbly tendered to the Lords & Com[m]ons in Parliament assembled', read 14 Dec. 1664.

⁶³ See, for example, Bushell, *An extract by Mr. Bushell*, sig. A2-[A2v]; Mathew, *Of the opening of rivers* (1660), 'To the Most High and Mighty Monarch' [no signature]; Moore, *Moore's arithmetick*, sig. A4. The phrase 'perceived naturalness' is borrowed from Mendelsohn, who points out that 'the [rhetorical] flexibility' enabled alchemists to undergo similar conversion with 'the perceived naturalness.' See idem, 'Alchemy and Politics', p. 76.

⁶⁴ Phil Withington, 'Views from the Bridge: Revolution and Restoration in Seventeenth-century York', *Past & Present*, 170 (2001), p. 123; Mark S.R. Jenner, 'The Roasting of the Rump: Scatology and the body politic in Restoration England', *Past & Present*, 177 (2002), p. 109.

⁶⁵ The quotation is Charles Cotton's 'To Alexander Brome' as in Turner, 'From Revolution to Restoration', p. 791.

Changing Faces of Millenarianism

Promoters' adjustment changed the ways in which they expressed religious aspirations in public. There are somewhat competing accounts of the relation between religion and economic activities in the seventeenth century, so some overview is due in order to contextualise my findings. Joyce Appleby viewed economic writings of the later-seventeenth century as a step towards the essentially secular economic liberalism that (she suggests) culminated in Adam Smith.⁶⁶ Charles Webster also suggested that Whig radicals and their reforming allies precipitated 'a world of Leviathan political economy' in which provision to the poor was conceptualised less in religious terms than 'in terms of economic exploitation.'⁶⁷ While Spurr's recent account of post-Restoration culture of improvement is much more nuanced, he also suggests that "Improvement" had lost some of its Utopian and religious associations' after the Restoration.⁶⁸ Steve Pincus has also argued that the language of 'interest' and 'reason of state had replaced promotion of the true religion as the idiom of public political discourse' in the later seventeenth century.⁶⁹ Contrary to these accounts that argue for some fundamental (secularising) changes in ideology, Paul Slack and Jonathan Barry have found a revival of puritan social welfare movements in Bristol and elsewhere from the end of the seventeenth century, initiatives that echoed 'similar Protestant and civic ideals as animated Samuel

⁶⁶ Joyce Oldham Appleby, *Economic Thought and Ideology in Seventeenth-Century England* (Princeton: Princeton U.P., 1978), pp. 257, 278. See also J.A.W. Gunn, *Politics and the Public Interest in the Seventeenth Century* (London: Routledge, 1969).

⁶⁷ Charles Webster, *The Great Instauration: Science, Medicine and Reform 1626-1660* (2nd ed. with new preface, Oxford: Peter Lang, 2002), p. 244-45.

⁶⁸ Spurr, *England in the 1670s*, p. 135.

⁶⁹ Steve Pincus, 'From holy cause to economic interest: the study of population and the invention of the state', in Alan Houston and Steve Pincus (eds.), *Nation Transfigured: England after the Restoration* (Cambridge: CUP, 2001), p. 292.

Hartlib's circle'.⁷⁰ Separately, historians of post-Restoration religion have also shown that millenarian thinking hardly died out after the Restoration. On the one hand, as Richard Greaves has put it, much of the radical discussions about the millennium went 'underground'.⁷¹ Some of them even took arms, and the Fifth Monarchist revolt broke out in January 1661. Its leader, Thomas Venner, assumed that 'it was the duty of the saints to overthrow the old order in church and state preparatory to the coming of the millennium.'⁷² Crucially, however, not all the puritans were millenarians; nor were all believers of the millennium against the restored regime. As Warren Johnston has shown, Anglican divines (such as Henry More and Gilbert Burnet) continued to express apocalyptic ideas while fully endorsing 'the re-establishment of the post-1660 civil and ecclesiastical governments'.⁷³

Venner and the Anglican theologians represented different ends of what we might call an orthodox-heterodox continuum. There was probably a grey area in this, both in terms of how to interpret the coming of the millennium, and how far one should profess their belief in public fora. I argue that we need to examine the promotion of economic improvement in this context. I will demonstrate that

⁷⁰ Slack, *From Reformation to Improvement*, chaps. 5-6; Jonathan Barry, 'The "Great Projector": John Cary and the Legacy of Puritan Reform in Bristol, 1647-1720', in Margaret Pelling and Scott Mandelbrote (eds.), *The Practice of Reform in Health, Medicine and Science, 1500-2000* (Aldershot; Ashgate, 2005), pp. 185, 197-98 (quotation is from p. 185).

⁷¹ Richard L. Greaves, *Deliver Us from Evil: The Radical Underground in Britain, 1660-1663* (Oxford: OUP, 1986), pp. 49, 61, 207; Richard L. Greaves, *Enemies under His Feet: Radicals and Non-Conformists in Britain, 1664-1667* (Stanford: Stanford U.P., 1990), passim.

⁷² Greaves, *Deliver Us from Evil*, p. 10, 49 (quotation from p. 10). See also Ronald Hutton, *The Restoration: A Political and Religious History of England and Wales, 1658-1667* (Oxford: Clarendon, 1985), pp. 150-51.

⁷³ Warren Johnston, 'The Anglican Apocalypse in Restoration England', *Journal of Ecclesiastical History*, 55 (2004), pp. 467-68, 475-83, 501 (at p. 501).

promoters took various positions: some withheld from the public their millenarian (or other potentially suspicious religious) views all together; others did express their millenarian convictions, but in a way that explicitly endorsed the authority of the restored king; some promoters even expressed their beliefs by elaborating the spiritual/symbolic significance of instruments like the microscope or activities like planting trees. Some writers therefore published writings on economic improvement that may appear secular and concerned with ‘political economy’. But, incidental lack of religious language in some published writings tells us more about the changing ‘rules of thumb’ in print culture than the decline of religious aspirations in general. The change we are concerned with is more specific: millenarian aspirations for state-led reform – something Hartlib, Dury and others expressed in many pamphlets – became less publicly acceptable after the Restoration.

According to Thomas Fuller, men like Venner ‘were frightened with *Spectra* or Apparitions, which they either saw or fancied themselves to have seen’, and were deemed ‘*FANATIC*’: ‘in their fits and wild raptures [they] pretended to strange predictions’.⁷⁴ This image of the ‘fanatic’ is important for my discussion as it affected non-radicals. It was sometimes difficult to distinguish ‘between genuine [millenarian] militants on the one hand and peaceful Nonconformists and ex-military men on the other’.⁷⁵ Being seen as millenarian fanatics could be dangerous. In the aftermath of Venner’s rising, Benjamin Worsley, a protégé of Hartlib, suffered imprisonment with other alleged members of ‘this Rebellious and bloody Crew’ and considered moving to New England to secure employment and to escape religious

⁷⁴ Thomas Fuller, *Mixt contemplations in better times* (1660), p. 78.

⁷⁵ Greaves, *Deliver Us from Evil*, p. 228.

tension.⁷⁶ Andrew Yarranton, a Worcestershire jack-of-all-trades and Presbyterian who had fought for the Long Parliament, was also imprisoned in November 1660 for allegedly plotting a rebellion with other local Presbyterians including, possibly, Richard Baxter.⁷⁷ The hostility survived well into the later 1660s. In 1668, when the Bawdy House Riots broke out in London, the government was convinced that rioters were not apprentices, but ex-Cromwellian soldiers ‘nursed in the late rebellion’, still longing for the coming of the new millennium.⁷⁸

The accusation of ‘fanaticism’ did not irreparably damage the credibility of promoters of economic improvement. Thanks to his knowledge of colonial affairs, Worsley eventually secured an official post. Likewise, as we shall see, Yarranton’s proposals for national improvement, published in the 1670s, were taken very seriously. However, like the projector stereotype, the figure of the ‘fanatick’ was used as a satirical weapon. In fact, a mock utopian tract was dedicated to Hartlib immediately after the Restoration. Hartlib wrote: ‘I confess I was not well pleased’, for the book made it seem ‘as if I were a refined Quaker, or a fanatick’.⁷⁹ Samuel Butler’s *Hubridas* (1663-1664) contained parodies of ‘fanatick’, and as Michael

⁷⁶ Thomas Leng, *Benjamin Worsley (1618-1677): Trade, Interest and the Spirit in Revolutionary England* (Woodbridge: Boydell, 2008), pp. 139, 141. Worsley’s former Parliamentary patron Sir Henry Vane was arrested in July 1660 and was executed in June 1662.

⁷⁷ TNA, SP 29/21/87. For details, see Greaves, *Deliver Us from Evil*, pp. 72-77. Greaves suggests that the alleged plot ‘had no solid evidential foundation’ (ibid., p. 77).

⁷⁸ Tim Harris, ‘The Bawdy House Riot of 1688’, *Historical Journal*, 29 (1986), p. 550. For legislative and ‘popular’ responses, see Turner, ‘From Revolution to Restoration’, p. 793; Hutton, *Restoration*, chap. 2 (esp. pp. 162-63). Those who sat in the Cavalier Parliament had conflicting and heterogeneous views on toleration and indemnity. See Paul Seaward, *The Cavalier Parliament and the Reconstruction of the Old Regime, 1661-1667* (Cambridge: CUP, 1989), chaps. 7-8.

⁷⁹ John Worthington, *The Diary and Correspondence of Dr. John Worthington*, eds. James Crossley et al., Camden Society Old Ser., 13, 36, 114 (3 vols, 1847, 1855, 1886), vol. 1, pp. 250-51, Hartlib to Worthington, 17 Dec. 1660.

Hunter has suggested, works like this helped shape 'what was publicly acceptable' if men like Boyle 'did not want to be the victim of disapproval according to contemporary norms.'⁸⁰

This was the religious context in which promoters of economic improvement operated. They responded to the circumstance differently, but many of them were circumspect. The publicity of the Royal Society's 'Georgicall Committee' epitomised the clear dissociation from millenarian idioms. When the *Philosophical transactions* advertised 'Enquiries concerning Agriculture' in 1665, the Committee's aim was to encourage readers to 'impart their knowledg [sic] herein, for the *common* benefit of their Countrey', a goal closely resembling that of Hartlib, whose books the Committee consulted.⁸¹ Nothing was mentioned of the spiritual significance of husbandry or of communicating information. In his letter to Evelyn, Oldenburg described the Buckland potato scheme as 'new propositions tending to universall good', a depiction reminiscent of millenarian aspirations of Hartlib and his close allies. But no similar phrase was recorded in the minutes of the Georgical Committee in which the scheme was discussed.⁸² Collectively, this was a significant shift. Just 14 years before, Hartlib introduced Dymock's secret method of husbandry by telling the reader that husbandry was '*the most profitable Industry unto Humane Society; wherein the Providence, the Power, the Wisdom and the Goodness of God, appears*

⁸⁰ Michael Hunter, *Robert Boyle (1627-92): Scrupulosity and Science* (Woodbridge: Boydell, 2000), pp. 223, 236-37, 238.

⁸¹ *Philosophical transactions* (1665-1678), 1 (1665 - 1666), pp. 91-94 (quotation from p. 92).

⁸² Compare Henry Oldenburg, *The Correspondence of Henry Oldenburg*, eds., trans. A. R. Hall and M. B. Hall (9 vols, Madison: University of Wisconsin Press, 1965-73), vol. 2, p. 30, Oldenburg to Evelyn, 9 Mar. 1663; Hunter, *Establishing the New Science*, pp. 102-103 (minutes of the Buckland Committee).

unto man more eminently then in any other way of Industry whatsoever.’⁸³

Worsley and the Somerset clergyman John Beale continued to conceptualise their intellectual and economic pursuits in somewhat unorthodox millenarian terms, but refrained from expressing them publicly.⁸⁴ Boyle, too, refrained from expressing in public some of his convictions about ‘the reality of witchcraft and other phenomena in which God’s or the Devil’s immediate intervention in the world was made manifest’.⁸⁵ Millenarian thinking and demonology were not the same thing, but these cases together highlight some common ‘Discretion’ (as Boyle put it) as to what one may express in public.⁸⁶

The royalist and Anglican Evelyn did not publish his ‘Elysium Britannicum, or the Royal Gardens’, an ‘encyclopaedic history of gardens and gardening practices’ that embodied his ‘fascination with an imminent restoration of paradise’ and ‘occupied him for most of his life’ from the 1650s.⁸⁷ But Evelyn did express some of his religious visions in public. In the 1670 edition of *Sylva* Evelyn interpreted the current want of timber trees in England as the evidence of degeneration since Adam’s Fall; he thus ‘track[ed] the Religious esteem of *Trees and Woods*’ in ‘*Holy Writ*’, and argued that ‘from the very Infancy of the *World*’, Abraham ‘receiv’d his Divine

⁸³ Samuel Hartlib [Cressy Dymock], *The reformed husband-man* (1651), sig. [A2v], ‘To the reader’.

⁸⁴ See Leng, *Benjamin Worsley*, pp. 182-84; Michael Leslie, ‘The Spiritual Husbandry of John Beale’, in Michael Leslie and Timothy Raylor (eds.), *Culture and Cultivation in Early Modern England: Writing and Land* (Leicester: Leicester U.P., 1992), pp. 156, 158-62, 168-69; P. Woodland, ‘Beale, John (bap. 1608, d. 1683)’, *Oxford DNB*, vol. 4, pp. 514-15.

⁸⁵ Hunter, *Scrupulosity and Science*, p. 226.

⁸⁶ Hunter, *Scrupulosity and Science*, p. 231.

⁸⁷ D. C. Chambers, ‘Evelyn, John (1620–1706)’, *Oxford DNB*, vol. 18, 770-775, at p. 772; Graham Parry, ‘John Evelyn as Hortulan Saint’, in Michael Leslie and Timothy Raylor (eds.), *Culture and Cultivation in Early Modern England* (Leicester and London: Leicester U.P., 1992), p. 144.

Guests, not in his *Tent*, but under a *Tree*, an *Oak*'.⁸⁸ In the 1702 edition, Evelyn even referred to Apocalypse and mused about the coming of the time when God would be pleased 'to transplant me into those glorious Regions above, Coelestially Paradise, planted with Perennial Groves, bearing Immortal Fruit'.⁸⁹ Forestry was thus presented as a potential means to restore Adam's Innocence. Even in this published treatise, as Graham Perry has argued, 'the earthy business of forestry is carried on in a highly imaginative atmosphere'.⁹⁰

Similar millenarian idioms can also be found in pamphlets related to other technological and economic innovations. In his *Micrographia* (1665), Hooke presented his innovative microscopes as 'artificial organs', 'a means, albeit imperfect, of seeking to recover that natural view of the world God intended for man in his innocence in Eden.'⁹¹ Matthew Stevenson, the minor Yorkshire-born poet, used the prospective liberation from Original Sin as a motif to praise the 'Inimitable, Water-Commanding Engine' of the Marquess of Worcester:

With the expence of Purse, and Brain, both great
He buyes off from Mans brow the curse of sweat;
His study travels to procure us rest,
And gives a Sabbath to the weary Beast [Breast?];
In what more could he Mortals gratifie,

⁸⁸ John Evelyn, *Sylva, or a discourse of forest-trees, and the propagation of timber in his majesties dominions* (2nd ed., 1670), chap. 35 (at p. 227). Subsequent references to *Sylva* are to this edition.

⁸⁹ Quoted in Parry, 'John Evelyn', pp. 144-43.

⁹⁰ Parry, 'John Evelyn', p. 142. As will be seen below, Evelyn did not present this millenarian vision as something to be imposed upon the public; it was something his readers might pursue by planting trees by themselves.

⁹¹ Jim Bennett, 'Instrument and Ingenuity', in Michael Cooper and Michael Hunter (eds.), *Robert Hooke: Tercentennial Studies* (Aldershot: Ashgate, 2006), pp. 66-67, 72, 76 (quotation from pp. 66-67).

Ease to the hand, and pastime to the eye?⁹²

Yarranton, whose schemes we shall examine in detail, also stressed both spiritual and temporal benefits of clover cultivation: ‘With what delight and pleasure have I seen | The barren pasture cloathed all in green! [. . .] It fills each Sense with Joy, our Purse with Money | Our Land (like *Canaan*) flows with milk and hony’.⁹³

Other promoters of economic improvement used religious idioms, but provided reassurance that their schemes would buttress king and country. In offering his mining project to Charles II, for example, Bushell related (as Bacon’s opinion) that ‘*such hidden [mineral] Treasures [. . .] may, and will most probably be recovered*’ when ‘*being freely devòted by Religious Princes, to holy and charitable uses and ends [. . .] for the publick good of his Church and People*’.⁹⁴ The Baptist Richard Haines’ proposal for building poorhouses was designed to exploit his patented ‘Spinning Engine’ in order to provide the idle poor and street children with jobs, bibles, and a place to live. The scheme was, he declared, to advance ‘the Glory of God, the Prosperity of the whole Nation, and the Welfare and happy Reformation of all poor distressed People.’⁹⁵ Rather than presenting individual schemes as part of the universal reformation of mankind (through strong state-led action), promoters now focused on the spiritual virtue of the king, or the spiritual improvement of

⁹² Matthew Stevenson, *Poems* (1665), pp. 2-3. Cf. Jenner, ‘Liquid Schemes’, no pagination. For Worcester’s life and inventive activities in general, see somewhat Whiggish account of Henry Dircks, *The Life, Times, and Scientific Labours of the Second of Worcester* (1865).

⁹³ Andrew Yarranton, *The Improvement improved, by a second edition of the great improvement of lands by clover* (Worcester, 1663), sig. [A7].

⁹⁴ Bushell, *An extract by Mr. Bushell*, pp. 2-3.

⁹⁵ Richard Haines, *A model of government for the good of the poor and the wealth of the nation* (1678), pp. 2, 8; Patent no. 202, granted on 18 April 1678. For his life and writing see Charles R. Haines, *A Complete Memoir of Richard Haines (1633-1685), A Forgotten Sussex Worthy* (London: Harrison, 1899). On another dissenter projector Thomas Firmin, see H. W. Stephenson, ‘Thomas Firmin, 1632-1697’, (Ph. D thesis, University of Oxford, 1949).

sections of society (like the poor), or the spiritual benefit of technological innovations.

Some promoters deliberately excised spiritual themes to follow the changing sense of propriety. The writings of the Oxford horticulturalist Ralph Austen (c. 1612-1676) show that, after the Restoration, this millenarian reformer chose not to present his economic scheme as part of the all-encompassing national spiritual reformation. Austen, a puritan, whose mother was a cousin of the parliamentarian Henry Ireton, was well known for his fruit tree cultivation and cider making, and published *A Treatise of Fruit-trees* in three editions (1653, 1657, and 1665). Although not university educated, he was connected with virtuosi like Boyle and Hartlib.⁹⁶

Austen dedicated the first edition of *A treatise* to Hartlib and presented it as an addition to Hartlib's *Legacy of Husbandry* and the *Improvement of husbandry* by 'our deceased friend Mr *Blith*'. In the first two editions, Austen presented plant cultivation as part of the pansophic reform.⁹⁷ Under government supervision, fruit-tree cultivation was to be spread across the country. Enclosing land, planting fruit trees in '*Fields and Hedges*' and producing cider would bring a range of social and economic benefits, from 'setting on worke, very many *Poore People*', to preventing English money from being wasted on French wines.⁹⁸ The project would confer spiritual benefit too, Austen argued. 'Adam in time of his Innocency *was employed in this part of Husbandry*', but 'when he had sinned, he was put away from

⁹⁶ James Grantham Turner, 'Ralph Austen, an Oxford horticulturalist of the seventeenth century', *Garden History*, 6 (1978), pp. 39, 42; J. G. Turner, 'Austen, Ralph (c. 1612-1676)', *Oxford DNB*, vol. 2, p. 979.

⁹⁷ For the tradition of state-led pansophic reform, see Chapter Two.

⁹⁸ Ralph Austen, *A treatise of fruit-trees* [. . .] (1653), sig. [¶v]

this worke to till the ground'. Thus, Austen began the project as a millenarian attempt to reverse the Fall of Adam by turning England into 'another *Canaan*', a place with '*Fruit-trees in abundance*' (Nehemiah 9: 25).⁹⁹

In the much-expanded second edition, Austen developed the spiritual part of his argument into a separate tract, *The spirituall use of an orchard, or garden of fruit-trees*. Here Austen suggested that '*Fruit-trees* are a TEXT from which may be raised many profitable *Doctrines*, and *Conclusions*, which may be proved by Scripture, and Experience.'¹⁰⁰ The use of 'similitude', he argued, was not a form of esoteric knowledge, but rather 'the most plaine way of Teaching', 'obvious and familiar to every mans Capacity'.¹⁰¹ The teaching was radical. By juxtaposing the high productivity of small trees with the barrenness of bulky old trees, Austen concluded that the young and the poor would bear more 'Fruits of Faith, Love, Joy, Peace, and other Fruits of the Spirit' when taught by 'mechanic preachers' of lower social strata. In contrast, when young believers were grafted on to an old tree, that is, the established Church, they would yield few fruits.¹⁰² Austen was thus promoting a radical political agenda by means of 'plaine, and pregnant SIMILITUDES, of things which we are daily coversant with'.¹⁰³

The third edition, dedicated to Boyle, appeared in 1665. Austen had been working with the Royal Society, and though not a Fellow, he was invited in 1664 to

⁹⁹ Austen, *A treatise of fruit-trees* (1653), sig. [¶4], [¶2v].

¹⁰⁰ Ralph Austen, *A treatise of fruit-trees* (2nd ed., 1657); idem, *The spirituall use of an orchard, or garden of fruit-trees* (1657), sig. [†4v], 'A Preface to the Reader'.

¹⁰¹ Austen, *Spirituall use of an orchard*, sig. [†3], ††.

¹⁰² Austen, *Spirituall use of an orchard*, sig. [†4v], 'A Preface to the Reader'; Turner, 'Ralph Austen', p. 43. See also *AHEW VII*, p. 560.

¹⁰³ Austen, *Spirituall use of an orchard*, sig. [††3].

sit in its 'Georgicall Committee' which read and considered his proposals.¹⁰⁴ Prior to publication, Austen wrote to Boyle, and asked his 'advice upon the whole matter'. He particularly asked Boyle's opinion about his view that he 'now intend[ed] [to publish] only the first part' of his *Treatise*:

As for the [second] spirituall part [. . .] I conceive it best, upon some Accompts, to let it rest (*at present*) both what hath beene made publique formerly, & what I have prepared to add thereunto[.]¹⁰⁵

Thus, like Boyle and others who withheld aspects of their religious views, Austen also exercised deliberate circumspection when considering what was to be 'made publique'. Austen did not recant his religious beliefs, but made a temporal adjustment 'at present', an indication that he may have hoped to publish the second part with his additions one day. As Boyle told Oldenburg, the excision went further than Austen had originally intended. Perhaps with a slight exaggeration, Boyle claimed he had 'easily perswaded him [Austen] both to leave out many things w[hi]ch though for ought I know good in themselves were of a Theologicall not a rurall nature, & to adde divers Exp[erimen]ts & Observations'.¹⁰⁶

As a result the 1665 edition of Austen's *Treatise* became a curious remnant of millenarian aspirations, which omitted most obvious calls for universal reform. It first of all dropped *The spirituall use of an orchard* with its discussion of similitude as 'the most plaine way of Teaching'. It retained the schematic 'Analysis' in the text

¹⁰⁴ Hunter, *Establishing the New Science*, p. 87, Transcription of the 'Georgicall Committee' (pp. 107, 111-14). Austen was to gather information for the 'history of agriculture' along with other Fellows like Evelyn and Lord Brereton.

¹⁰⁵ Robert Boyle, *The Correspondence of Robert Boyle*, eds. Michael Hunter, Antonio Clericuzio, Lawrence M. Principe (6 vols, London: Pickering & Chatto, 2001), vol. 2, p. 450, Austen to Boyle, 14 Jan. 1665 (my italics).

¹⁰⁶ Oldenburg, *Correspondence*, vol. 2, p. 509, 16 Sep. 1665.

that combined four ‘Humane’ arguments (from ‘Presidents’, ‘Praise’, ‘Profit’, and ‘Pleasures’) with ‘Eight Divine Arguments of the dignity & value of Fruit-trees and Art of Planting.’ But it dropped the conspicuous frontispiece used for the two previous editions that visualised the idea that the fruit-tree cultivation was the means to restore the ‘Garden inclosed’ depicted in the *Solomon’s Song* (Solomon 4: 12-15). It also omitted the original dedication to Hartlib. The 1665 edition continued to highlight that ‘*Adam in time of his Innocency* was employed in this part of *Husbandry*’.¹⁰⁷ But its new dedication to Boyle no longer spoke of ‘making a *Spirituell use of Natural things*’ in order to ‘turne Earth (as it were) into heaven’,¹⁰⁸ or turn England into ‘another *Canaan*’. So the previous emphasis on the imminence of universal reformation and its significance in the present was muted. The role of the government was modified accordingly. In the first edition, Austen explicitly depicted the Cromwellian government as an instrument for achieving universal reformation; in enforcing appropriate laws, it was to help ensure the arrival of ‘the times of the Gospell prophesied’.¹⁰⁹ The post-Restoration parliament was expected to do little more than to set out rules and regulations for compulsory cultivation, to set a penalty against non-compliance and obstruction, and to prescribe a system of supervision by ‘Overseers’ in every county.¹¹⁰

Thus, in the 1665 edition of *A treatise*, Austen’s scheme lost some of the features that most clearly had made it a pansophic manifesto. The new preface unpacked the manifold social and economic significance of his ‘Planting’ project,

¹⁰⁷ Ralph Austen, *A treatise of fruit-trees* (3rd ed., 1665), sig. [A8], ‘To the Reader’.

¹⁰⁸ Austen, *Spirituell use of an orchard* (1657), sig. [†2v], ‘A Preface to the Reader’.

¹⁰⁹ Austen, *A treatise of fruit-trees* (1653), sig. ¶2.

¹¹⁰ Royal Society Archives, London, Cl.P. x(3)7, Ralph Austen, ‘Proposalls’.

stressing how the scheme would uphold the Restoration regime:

a work Pregnant with Profits, Real and Substantiall to all people all their life long [. . .] A Work that will enrich the Poor, and adorn the Rich: A Work that will Encrease the Kings Revenues, and the Substance of all his Subjects: [. . .] In a word, It is a Royal Work, and worthy [of] the most serious Considerations and Endeavours of the Royal Society.¹¹¹

Assiduous readers would have surely deciphered evidence of millenarian aspirations in other parts of the book. But for inattentive readers, the new preface of *A treatise* read like a mundane agricultural proposal by a pious would-be royalist.

Neither apocalyptic idioms nor religious expressions in general lost currency in post-Restoration projecting culture, therefore. Like Starkey and Stubbe who adeptly continued to practice alchemy by adjusting their idioms, economic reformers like Austen promoted their economic schemes by carefully choosing what to express in public. If More and other Anglican clergy expressed millenarian views by assuring their readers ‘that the prophecies of Revelation presented no challenge to the government of the English State or Church’,¹¹² then by the same token promoters of economic improvement took care to imply that their schemes would not affect, let alone challenge, the precarious political status quo after the Restoration. In the process, one of the most significant aspects of the mid-century millenarianism, state-led universal reform in the manner of German second-reformation, lost its pre-eminence as a public discourse. As Edmund Ludlow observed, many arguably ‘thought it prudence [sic] to swim with the stream’.¹¹³

¹¹¹ Austen, *A treatise of fruit-trees* (3rd ed., 1665), sig. [A6v]-[A7].

¹¹² Johnston, ‘Anglican Apocalypse’, p. 481.

¹¹³ Quoted by N. H. Keeble, *The Restoration: England in the 1660s* (Oxford: Blackwell, 2002), p. 47.

Monopolistic Patents and the Imposition of Sweeping Reform

So one of the key characteristics of projecting activities during the Civil Wars and the Interregnum was not publicly acceptable after the Restoration. Was it a step towards an early Stuart mode of projecting, one in which absolutist political authority was frequently deployed to impose (often spurious) economic ‘improvement’? As Christine MacLeod has found, that was not the case as far as the administration of patents was concerned. The Restoration regime ‘held rigidly to the principle that a patent for an invention should not confer monopoly power over the whole industry to which it related.’¹¹⁴ I will argue that this was symptomatic of the post-Restoration projecting culture more broadly. Distrust of monopolistic projectors persisted, and the restored regime was anxious to present itself as the legitimate protector of economic prosperity. For these reasons, the sweeping imposition of governmental authority became publicly unacceptable both within and outside the realm of patenting.

Analysis of post-Restoration patents suggests that the government ceased to have a large financial stake in granting them. Out of 82 patents for invention granted in the 1660s and the 1670s, only 10 promised to pay the Exchequer on a fixed sum or pro-rata basis (See Fig. 7). The change was not as dramatic or automatic as the figure implies. In fact, some tried to obtain monopoly grants from the restored monarch. Bushell had been granted a patent ‘for reforming abuses in dyeing of silks’ from Charles I, and was one of the patentees of the controversial Caroline soap monopoly. Upon his son’s return, Bushel was again seeking similar grants.¹¹⁵ Richard Bagnall,

¹¹⁴ Christine MacLeod, *Inventing the Industrial Revolution: The English Patent System, 1660-1800* (Cambridge: CUP, 1988), p. 27.

¹¹⁵ *CSPD 1629-1631*, p. 466; *CSPD 1660-1661*, pp. 384, 391; *CTB, vol. 1, 1660-1667*, p. 31. See also J. W. Gough, *The Superlative Prodigall: A Life of Thomas Bushell* (Bristol: Bristol

gentleman usher to Charles I, also petitioned his son for a grant of ‘the sole making of saltpetre’, something that Thomas Brugis had attacked in 1641 as the ‘stinking business’.¹¹⁶ The goldsmith John Garill sought a monopoly for drawing gold and silver into wires. The wiredrawing monopoly was one of the controversial monopolies that sparked outrage in the 1621 parliament.¹¹⁷

The restored regime did not grant monopolies like these partly because of the bitter memory of early Stuart precedents. Copies of Ben Jonson’s *The Devil is an Ass* remained in circulation, while John Wilson published a play provocatively titled *The projectors* in 1665.¹¹⁸ These plays ridiculed greedy monopolists. An anonymous 1662 broadsheet, *The new projector*, satirised monopolists who procured patents for ‘discovery of all that I knew [. . .] with Dice, Drink, and Drabb [Salt-making]’. It depicted the holder of a monopolistic patent as ‘The Priviledged CHEAT: Who when Men do come to receive Satisfaction, Doth answer them all, *I have got a PROTECTION*’.¹¹⁹

More importantly, the restored king was also explicitly counselled against granting monopolies. In 1664, for example, an anonymous writer warned Charles against ‘dissolute and covetous courtiers who sell places of trust, ingross grants and hunt after patents and new inventions until the kingdom is improverished and the

U.P., 1932), pp. 19-20, 22.

¹¹⁶ *CSPD 1660-1661*, p. 385; Thomas Brugis, *The discovery of a projector* (1641), p. 20 [recte p. 26].

¹¹⁷ MacLeod, *Inventing the Industrial Revolution*, p. 32; Scott, *Joint-stock*, vol. 1, p. 176.

¹¹⁸ Samuel Pepys, *The Diary of Samuel Pepys*, eds. Robert Latham and William Matthews (11 vols, London: Bell, 1970), vol. 4, p. 240, 22 Jul. 1663; John Wilson, *The projectors. A comedy* (1665).

¹¹⁹ *The new projector; or the privileged cheat* [1662?]. Compare this with John Taylor, *The complaint of M. Tenter-hooke the projector, and Sir Thomas Dodger the patentee* (1641).

prince hated'.¹²⁰ As Paulina Kewes has suggested, 'from the early 1660s onward the slightest hint of political unrest immediately provoked cries from loyalists that "1641 is come again"'.¹²¹ Critics of monopolistic patents also alluded to 1641. Even a royalist propagandist did not shrink from reminding Charles II of the 'Cries' his father had caused by breaching what was believed to be 'our free-born Interest':

We remember, that in the Beginning of our late transcendent [Long] Parliament [. . .] how high the Cries went against Ship-money, Patents, Monopolies, illegal Imprisonments, and such other Breaches into our free-born Interests [. . .]¹²²

Others went further. In a meeting in opposition to Garill's motion to obtain the wiredrawing monopoly, one Simon Urlin was reported to have 'said in passion that the late king lost his head by granting such patents'.¹²³ *Vox et lacrimae anglorum; or the true Englishmen's complaints to their representatives in parliament* made even more explicit the problematic link between the granting of controversial patents and the outbreak of 'that Domestic War':

Tread all monopolies into the earth
And make provision that no more get birth,
In this a prince's danger chiefly lies,
That he is forced to see with others' eyes,
From hence our troubles rose in Forty One
When that Domestic War at first began.

A copy of this pamphlet is in the State Papers, suggesting that it was perhaps sent to the government as a potentially subversive libel.¹²⁴ Disturbingly echoing distrust of

¹²⁰ TNA, SP 29/99/12, - to Sir Edward Cartwright, enclosing letter to the king, 2 Jun. 1664. This and the next paragraph draw much upon the findings of MacLeod, *Inventing the Industrial Revolution*, p. 16.

¹²¹ Paulina Kewes, 'History and its Uses: Introduction', in idem (ed.), *The Uses of History in Early Modern England* (California: University of California Press, 2006), p. 18.

¹²² 'Awake o England', p. 269.

¹²³ TNA, SP 29/103/60, 61 (quoted by MacLeod, *Inventing the Industrial Revolution*, p. 16).

¹²⁴ TNA, SP 29/234/85, *Vox et lacrimae anglorum; or the true Englishmen's complaints to*

the Caroline projectors,¹²⁵ such allusions reminded Charles II that his government could not afford to restore the patent policy characteristic of his father.

The new regime appeared to have heeded such warnings. Despite its potential fiscal benefit, the government chose, upon receiving the provocative complaint, not to grant the wire-drawing monopoly to Garill. Similarly, when the government received a petition complaining of the abuse of a patent on steel-making, it summoned and questioned the patentees. As a result, the patent was revoked.¹²⁶ There were exceptions, of course. The Restoration government restored, and upon request even extended, monopolies and other privileges granted to trading companies for overseas trade. But the government rarely granted monopoly power in sectors where vocal opponents existed.¹²⁷ As Brian Weiser has suggested, the restored monarch was ready, or at least keen to appear ready, to consider petitions and grievances, and to reassure the country that ‘the king would not sacrifice economic well-being to the whims and pockets of his courtiers.’¹²⁸

So those who sought monopolies that could jeopardise the government’s position as a legitimate protector of economic prosperity failed to obtain grants. The

their representatives in parliament (1668), p. 11.

¹²⁵ Compare with the earl of Northumberland’s remark in July 1638: ‘The People thorough [sic] all *England* are generally so discontented, by reason of the Multitude of Projects daily imposed upon them, as I think there is reason to fear that a great Part of them will be readier to join with the *Scots*, than to draw their Swords in the King’s Service.’ Thomas Wentworth, *The Earl of Strafford’s Letters and Dispatches*, ed. W. Knowler (2 vols, 1739), vol. 2, p. 186. See also *ibid.*, vol. 2, pp. 71, 77.

¹²⁶ MacLeod, *Inventing the Industrial Revolution*, pp. 32, 27. See also a case of framework knitters and the importation of laxative sena in Brian Weiser, *Charles II and the Politics of Access* (Woodbridge: Boydell, 2003), pp. 128-29; Leng, *Benjamin Worsley*, pp. 143-45.

¹²⁷ See Weiser, *Politics of Access*, pp. 126-27, *passim*. See also MacLeod, *Inventing the Industrial Revolution*, p. 28.

¹²⁸ Weiser, *Politics of Access*, p. 121.

former protégé of Hartlib, Cressy Dymock, did not seek monopolistic patents, but failed for a similar reason. After the Restoration, he was no longer well connected. In 1661 he helped Lord Brereton, later a member of the Royal Society's 'Georgicall Committee', to survey his estate in Cheshire, but Dymock did not become a Fellow or a frequent contributor to the Committee's activity.¹²⁹ In 1668, he printed and distributed a handbill, appealing for investors for his 'New and better ART of AGRICULTURE'. It was probably his first publication after the Restoration. He still seemingly remained convinced of his capacity to achieve *cornu copia*. If his method was applied nationwide, he proclaimed, 'in all Submission to Gods Will [. . .] the Kingdom would be enriched [£] 24,000,000 every year more than in the common way.'¹³⁰

In order to realise this vast profit from his 'new invention', Dymock would have had to enforce his method upon all the tilled land in the country, something that might have put him in the danger of being stereotyped as a 'destructive projector'. As has been seen in the last chapter Hartlib and Dury might have risked backing such a scheme because of their pansophic ideal. But Harlib was dead, and Dury in exile. The signs of Dymock's relative isolation were unmistakable. He did not dedicate it to any 'expert' in the field. Instead, he addressed the handbill to the king and parliament. But he also appealed 'To all the *Nobility, Knights, and Grand Gentry*', to 'Lord *Bishops*, and all the *Inferior Clergy* of England', to the Mayor and aldermen of the City of London, to 'all the *Merchants and Grand Citizens*' there, and also 'of all other Cities and Towns Corporate'. Finally, he appealed to 'all others whatsoever that

¹²⁹ *AHEW* *Vii*, p. 562.

¹³⁰ [Dymock], *New and better art of agriculture*. Compare with his writings during the Interregnum discussed in the previous chapter.

shall think fit to be concerned therein any way'. Betraying a sense of frustration, he instructed 'whosoever' interested 'in any way' to leave 'a Note sealed for me, appointing some certain time and place' at his temporary London lodging at White-Friars. For 'it would be equal to *Hercules* his Labours, for me, among such vast Numbers and various Humours, to seek and find, fit, and willing Persons to be concerned with me in this great business.' He ended his appeal by complaining of 'his undeserved Ruins' because of his repeated attempts to 'Advance a publick good'. He apparently signed all copies of the bill, perhaps to raise its credibility.¹³¹ For all his effort, however, little is, and perhaps was, known as to what became of this scheme. It seems difficult not to conclude that, unlike Boyle, Austen, and many others, Dymock failed to 'swim with the stream'.

The 1666 Great Fire of London necessitated the extensive rebuilding of the City, and the fate of Valentine Knight's proposal shows not only another revealing failure of an ambitious promoter, but also the care with which the government handled potentially controversial schemes. His plan was ambitious.¹³² Instead of restoring narrow streets that had spread across the city, he proposed to rebuild the City 'stately with large Streets, [and] the Houses not in danger of Fire'. Moreover, Knight proposed to raise £223,517 'towards the maintenance of his [majesty's] Forces by Sea and Land' by imposing fines from defaulters.¹³³ Thus in both town planning and

¹³¹ The *ESTC* lists three extant copies, two of which clearly bear Dymock's signature. The other one held in the Chetham's Library has been trimmed but shows part of his signature. BL, 806.k.15.(32.); TNA, SP 20/251B, fol. 76; Chetham's Library, Manchester, H.P. 2619. I thank Mr Michael Powell of the Chetham's Library for answering my queries. For the importance of the signature in the early modern business transactions, see Natasha Glaisyer, 'Calculating Credibility: Print Culture, Trust and Economic Figures in Early Eighteenth-Century England', *Economic History Review*, 60 (2007), pp. 704-709.

¹³² For background see Walter George Bell, *The Great Fire of London in 1666* (London: John Lane, 1920), pp. 241-42.

¹³³ Valentine Knight, *Proposals of a new model for re-building the City of London* (1666),

the imposition of penalties, he would have required an extensive authority. Knight showed this proposal to Privy Councillors. They apparently 'seemed to like the same' and Knight was 'encouraged to print some of them for his friend.'¹³⁴

The fortune of this proposal plunged when one stationer 'Unadvisedly' published it, perhaps very widely.¹³⁵ As a result, Knight was imprisoned for his 'misdemeano[u]rs'.¹³⁶ Probably being aware of the wide circulation of the proposal, the official *London gazette* publicised Knight's imprisonment, and thereby distanced the king from the proposal. Knight was punished, the paper announced, because his proposal promised 'considerable advantages to His Majesties Revenue', and thereby made it seem

as if [. . .] his Majesty would draw a benefit from so public a calamity of his people, of which his Majesty is known to have so deep sense, that he is please to seek rather by all means to give them ease under it [i.e. his reign].¹³⁷

In a way, then, Knight was made a scapegoat. The Privy Councillors had shown interest, perhaps because of the royal debts piling up from Charles I's reign.¹³⁸ But such an interest ought not to be made public, for the restored king had to be 'known to have so deep sense' of his people's concern. Knight's imprisonment thus tells us more than his personal disaster. As in the administration of royal patents, the king and his government could not afford to be seen as imposing their authority, let alone

one-page handbill. Knight was to collect rent and fines and keep an eight percent premium for himself.

¹³⁴ TNA, PC 2/59, fol. 189.

¹³⁵ The *ESTC* suggests that more than ten copies have survived, a large amount for this type of handbill.

¹³⁶ TNA, PC 2/59, fol. 189.

¹³⁷ *London gazette*, 91, 27 Sep. 1666.

¹³⁸ See Chapter One.

for extracting revenues.

William Petty, one of the best-known virtuosi and, in Evelyn's view, an incomparable 'superintendent of Manufactures, & improvement of Trade', did not face imprisonment. But he too encountered similar difficulty.¹³⁹ As Ted McCormick has shown, Petty's well-known 'political arithmetic' was originally conceived as an ambitious scheme for 'transmuting' the Irish (into the English). It was a plan that involved the forced migration of poor English Protestant women to Ireland, who, through marriage with poor Catholic Irish men, would turn every new Irish generation into a more civilised English one.¹⁴⁰ While aspects of this and other projects excited the earl of Essex and Samuel Pepys, others remained sceptical and the scheme failed to become 'the instrument of government that Petty wanted it to be'.¹⁴¹ Ormond, for example, admitted the genius of the projector, but was doubtful about the accuracy of Petty's information as well as of the practicality of his scheme.¹⁴²

The way Petty addressed different audiences after the Restoration highlights his struggle to find supporters. In March 1661, when he began to solicit backing from the Duke of Ormond for his scheme for setting up a 'Registry', Petty considered publication to be the best method for the successful promotion of his ideas: 'as for

¹³⁹ John Evelyn, *The Diary of John Evelyn*, ed. E.S. de Beer (5 vols, Oxford: Clarendon, 1955), vol. 4, p. 58. My discussion of Petty's activities owes much to Ted McCormick, 'Sir William Petty, Political Arithmetic, and the Transmutation of the Irish, 1652-1687' (Unpublished Ph. D thesis, Columbia University, 2005).

¹⁴⁰ The most recent discussion of the Irish project is Ted McCormick, 'Alchemy in the Political Arithmetic of Sir William Petty (1623-1687)', *Studies in History and Philosophy of Science*, 37 (2006), 290-307.

¹⁴¹ McCormick, 'Sir William Petty', pp. 166-67.

¹⁴² McCormick, 'Sir William Petty', pp. 156, 163 (fn. 347), 174.

debating the feasibility and usefulness of the thing, let it be done most publicly'.¹⁴³ This resulted in *Treatise of taxes and contributions* (1662), in which he reasserted the importance of the 'publick examination' of new economic and fiscal projects.¹⁴⁴ He was to recant his view later. In 1678, when asked for 'the Reprinting the booke of Taxes', Petty answered that 'I will not meddle with it': 'I never had thanks for any publick good I ever did nor doe I own any such booke [that had received thanks]'.¹⁴⁵ Petty would publish few of his vast body of writings during the rest of his prolific career. He instead opted to circulate manuscript proposals through his friends to a handful of powerful politicians. His strategy was to attract their attention by a few-page 'heads' of topics, which he would expound at length upon the request of his potential patrons.¹⁴⁶ Even this change of strategy did not, as noted above, win him sustained support for his forced migration scheme (in the form of political arithmetic). When he first approached Ormond, he predicted his potential patron's suspicion:

I do not appear a projector to shirk for my necessities nor because the newness of my thoughts hath intoxicated me, but because I have so often slept with them [. . .] I have the courage to venture being laughed at once more.¹⁴⁷

Unlike Dymock or Knight, Petty was well connected to powerful patrons, and therefore could choose to seek patrons without printing and publishing his proposals.

¹⁴³ HMC, *Calendar of Manuscripts of the Marquis of Ormonde*, New Sers. (vols. 3-7, London: HMSO, 1905-1912), vol. 3, p. 11.

¹⁴⁴ William Petty, *A treatise of taxes and contributions* (1662), sig. [A3].

¹⁴⁵ BL, Egerton MS 2331, fol. 90, Petty to Aubrey, 20 May 1678 (quoted by McCormick, 'Sir William Petty', 141). As for his manuscript *A treatise [. . .] concerning the use of duplicate proportion*, he wrote he had 'doubt of its acceptance in the world.'

¹⁴⁶ For the 'scribal publication of political arithmetic', see McCormick, 'Sir William Petty', chap. 4.

¹⁴⁷ HMC, *Calendar of Manuscripts of the Marquis of Ormonde*, vol. 3, p. 11.

Even so Petty knew all too well the danger of 'being laughed at' as a 'projector'. Petty's career therefore raises the possibility that, after the Restoration, it was becoming difficult to win support for draconian schemes even if one operated discreetly outside the print culture.

'Incentives and Constraints': An Alternative Mode of Projecting

Not all promoters of economic improvement continued to conceptualise their schemes based on the imposition of government authority. As has been seen in the previous chapter, some husbandry writers like Plattes and Blith were interested in promoting economic innovations by encouraging initiatives of their readers. After the Restoration, some promoters gave a fresh emphasis on the importance of such private initiatives as a potentially useful way of achieving economic improvement and advancing the public good.

I will now explore this mode of projecting by comparing the promotion of husbandry schemes during the 1670s with their advocates during the Interregnum. I shall pay close attention to timber and fruit-tree cultivation because during the Interregnum promoters like Austen sought draconian governmental measures to reform this branch of husbandry.¹⁴⁸ The fruit tree was given spiritual as well as economic significance, while timber was 'one of the most basic requirements of human existence' that had 'the economic and technological functions of oil, steel, and man-made plastics'.¹⁴⁹ I will focus on writings by Evelyn, by Smith, and by Yarranton, a group of men whom Beale named as promoters of 'real

¹⁴⁸ Webster, *Great Instauration*, pp. 546-48; *AHEW VII*, pp. 309-311.

¹⁴⁹ Sharp, 'Timber, Science, and Economic Reform', p. 51.

Improvem[en]t'.¹⁵⁰ Their writing will reveal that the change we have found in the realm of patenting took place in other kinds of projecting activities, in the dissemination of useful knowledge by print, and when presenting policy proposals in the hope of winning patronage. In addition, because Evelyn, Smith, and Yarranton were from different social strata, analysing their writing will allow us to explore whether the avoidance of sweeping reform was taking place across social strata.

Evelyn's *Sylva* (first published in 1664), and *Pomona* (which accompanied it, and was co-authored by Beale), were arguably among the most influential books on horticulture in the early modern period. The bulk of these books was devoted to practical information for planting timber and fruit trees, which would enable readers to take initiatives and teach others how to grow timber and fruit trees and make ciders. Accordingly, these books have been discussed as examples of Baconian science after the Restoration, while literary aspects of *Sylva* have attracted some literary analysis.¹⁵¹ The books' discussion of the role of government deserves fuller consideration. Evelyn surveyed laws and regulations for the preservation and improvement of woods in ancient civilisations as well as in contemporary Spain, France and Germany.¹⁵² He also briefly commented on the Henrician and Elizabethan statutes which required that a proportion of timber to be fenced and protected, and prohibited the conversion of wood into tillage: these statutes were 'diligently to be consulted, revived, put in execution, and enlarg'd where any defect

¹⁵⁰ Royal Society Archives, London, EL/B1/72, Beale to [Evelyn?], 10 Feb. 1677.

¹⁵¹ Sharp, 'Timber, Science, and Economic Reform', pp. 63-68, 80 (n. 79); Michael Hunter, *Science and Society in Restoration England* (Cambridge: CUP, 1981), pp. 91, 93, 99-101, 104, 109; Parry, 'John Evelyn', pp. 141-42; Douglas Chambers, 'Wild Pastoral Encounter': John Evelyn, John Beale and The Renegotiation of Pastoral in the Mid-seventeenth Century', in Leslie and Raylor (eds.), *Culture and Cultivation*, 173-94.

¹⁵² Evelyn, *Sylva*, chap. 33.

is apparent'.¹⁵³ In *Pomona* Evelyn mentioned that parliamentary legislation might be devised to improve fruit-tree cultivation, 'if already there be not effectual provision for it'.¹⁵⁴

Evelyn could have elaborated on how to enforce plant cultivation. But, significantly, he instead opted for 'commendable emulation'. Even though Evelyn called the statutory regulations 'the prudent *Sanctions* of our own *Parliaments*', he suggested that 'according to the old and best Spirit of true *English*, we ought to be more powerfully led by his *Majesties* Example, than have need of more cogent and violent *Laws*'.¹⁵⁵ Beale, the co-author of *Pomona*, had a similar view. Commenting on Austen's attempt to 'promote Cider [production] by lawes', he wrote that 'I hope there is noe neede of such enforcement.'¹⁵⁶ Fruit-tree cultivation would become widespread among public-spirited gentlemen, *Pomona* argued, 'when his Majesty shall once be pleas'd, to command the Planting but of some Acres, for the best Cider-fruit, at every of his Royal Mansions, amongst other of his most laudable Magnificencies'.¹⁵⁷ In order to 'incite our Industry to its utmost effort' for the improvement of fruit-tree and timber cultivation, both *Sylva* and *Pomona* were embellished by hyperbolic literary style and delightful anecdotes.¹⁵⁸ The invocation of millenarian aspirations in *Sylva*, which we have discussed earlier, probably played

¹⁵³ Evelyn, *Sylva*, p. 206.

¹⁵⁴ John Evelyn, *Pomona; or an appendix concerning fruit-trees in relation to cider* [. . .] (2nd ed., 1670), p. 2. Subsequent references to *Pomona* are to this edition.

¹⁵⁵ Evelyn, *Sylva*, p. 206. See also *ibid.*, p. 208 where he sceptically commented on the penal statues for preventing the conversion of woods to pasture.

¹⁵⁶ Boyle, *Boyle Correspondence*, vol. 2, p. 579, Beale to Boyle, 9 Nov. 1665.

¹⁵⁷ Evelyn, *Pomona*, pp. 5, 2.

¹⁵⁸ For example, see Evelyn, *Pomona*, pp. 4-5.

a similar role in exciting like-minded readers. Thus, it may not be untrue to suggest that Evelyn 'supported a programme of firm government action and the implementation of new and existing laws',¹⁵⁹ but we must add that he preferred the 'commendable emulation' to 'cogent and violent *Laws*'. The latter was for him a complementary measure to ensure the compliance of tenants whose '*expectation* [of benefit]' would seldom hold out '*above a year or two at most*'.¹⁶⁰ Instead of elaborating how economic improvement might be enforced across the country, Evelyn chose to invite public-spirited 'Noblemen, wealthy Purchaser, *and* Citizens' to lead improvement through their private initiatives. That was how he conceptualised plant-cultivation as a means to advance the 'Publique Good' as well as to provide private profits.¹⁶¹

Giving a greater role to private initiatives was not unique to privileged writers like Evelyn. Smith dedicated his *England's improvement reviv'd* (1670, 1673) to William Brouncker, the first president of the Royal Society, a Commissioner of the Navy and Comptroller of the Treasurer's Accounts. Smith boasted of his thirty years of experience in forestry and plant cultivation, and Evelyn offered a eulogy to the book, commending Smith as 'a Person of so great a Talent and Experience beyond me'.¹⁶² For experienced men like Smith who earned their living from their expertise, possible governmental support would have been attractive, for it could have given them employment opportunity as official supervisors. Indeed, Smith suggested that

¹⁵⁹ Sharp, 'Timber, Science, and Economic Reform', p. 67.

¹⁶⁰ Evelyn, *Pomona*, p. 2.

¹⁶¹ Evelyn, *Pomona*, p. 5.

¹⁶² Smith, *England's improvement*, sig. [A3], 'To the Reader', sig. [A2v], 'The Report of John Evelyn Esquire'.

‘Authority should Constrain some men’ where ‘Wit and Providence will not’.¹⁶³

Nevertheless, Smith did little more than mention the role of the state in passing. For example, he claimed that the preservation of timber ‘is a thing to be regarded and of great Concernment, for the abuses of Woods are Infinite and intolerable, notwithstanding the words of the Statute[s]’, made during the reigns of Henry VIII and Elizabeth.¹⁶⁴ Yet, he only briefly acknowledged the importance of the existing statutes and proposed to tighten them up so that no one would ‘be permitted to Cut down’ timber less than 3 foot in diameter, and that all owners of woods would be ‘injoynd’ to leave ‘20 of the best thriving young Trees, in each or every acre of Wood’ when cutting timber.¹⁶⁵ Thus Smith concluded his discussion by issuing a familiar warning: ‘if Provision be not made to prevent that [wasteful consumption of timbers], and to put the true intention of the Statute in more force, there can be no encrease of Timber trees expected.’¹⁶⁶ These suggestions were scarcely more elaborate than Evelyn’s.¹⁶⁷

In contrast, Smith took advantage of his first-hand knowledge in discussing the cost and profit of different methods of timber cultivation. Smith’s discussion was ‘unusually competent and thorough’,¹⁶⁸ and he devoted a quarter of the book to it.¹⁶⁹

¹⁶³ Smith, *England’s improvement*, p. 8.

¹⁶⁴ Smith, *England’s improvement*, p. 8.

¹⁶⁵ Smith, *England’s improvement*, pp. 7-8.

¹⁶⁶ Smith, *England’s improvement*, p. 8.

¹⁶⁷ Evelyn suggested that ‘an Act of Parliament might be procur’d for the Setting but of two, or three Trees in every Acre of Land that shall hereafter be enclosed, under the Forfeiture of Six pence per Tree, for some publick and charitable Work, to be levy’d on the Defaulters.’ Evelyn, *Pomona*, p. 2.

¹⁶⁸ Sharp, ‘Timber, Science, and Economic Reform’, p. 61.

¹⁶⁹ Smith, *England’s improvement*, pp. 82-103, 106-159. The book has 270 pages excluding

He would not have done this had he been interested in enforcing his schemes through legislation. It could be that Smith was trying to convince his readers of the relative advantage of timber cultivation over widespread arable husbandry.¹⁷⁰ Like Evelyn, therefore, the man of practical experience placed diminishing emphasis upon the importance of governmental enforcement.

Yarranton's writing shared this attitude. But rather than seeking to invite readers to plant timber for themselves, he argued that his local knowledge could help establish a policy that could be implemented without imposition. He pointed out that 'within the several Counties of *Worcester, Gloucester, Salop, Stafford* and *Warwick*', there were '10,000 Acres of Coppices Woods'.¹⁷¹ He admitted that 'at this present time there is not one hundred Tuns of good Shipping Timber' in these woods. Yet he argued that once the Elizabethan statute was 'amended with some small Addition' to rectify the wasteful cutting of young trees, these coppices would produce sufficient timber 'for building and repairing all Ships that *England* can ever want either for Men of war, or for Merchants'.¹⁷²

Unlike Evelyn and Smith, who spent much space giving practical information for the reader, Yarranton paid closer attention to who participated in the wasteful cutting of timber woods in the Midland forests, and tried to explain why.¹⁷³ His conclusion was that the 'interests' of landlords, bailiff, clerk of ironworks, tanners,

prefaces.

¹⁷⁰ Sharp, 'Timber, Science, and Economic Reform', p. 78, n. 61.

¹⁷¹ Andrew Yarranton, *England's improvement by sea and land. The second part* (1681), pp. 71-72.

¹⁷² Yarranton, *England's improvement. The second part*, pp. 76, 72-73.

¹⁷³ Like Petty, Yarranton only outlined his recommendations, perhaps in a bid to excite the interest of his readers and potential patrons.

colliers, and woodsmen, 'all ends in the destruction and cutting down the Standals'.¹⁷⁴ Significantly, Yarranton did not propose to introduce a punitive measure. If legislators studied the 'evil combinations' of local private interests and altered them prudently, Yarranton suggested, Midlands coppice woods would bring huge economic benefits without having to persuade, let alone compel, the reader to take up horticulture. These post-Restoration writers on plant-cultivation therefore acknowledged that the state had to play some (and often a vital) role in achieving economic improvement. Crucially, however, they suggested that improvement should be carried out not so much by imposing sweeping measures as by encouraging private initiatives.

Authors of pamphlets on other economic issues also expressed similar views. Samuel Fortrey, a merchant of Flemish descent, and at one time an investor and surveyor for the Bedford Levels, wrote about issues surrounding the balance of trade in his *England's interest and improvement* (1663, 1673).¹⁷⁵ His writing sometimes betrayed views similar to Evelyn's distaste for 'cogent and violent *Laws*'. For example, he suggested that the excessive consumption of foreign luxuries, which he thought had worsened the balance of trade, might be redressed if the king 'would be pleased to commend to his people, by his own example, the esteem and value he hath of his own commodities'. 'This alone, *without further trouble*, would be at least ten hundred thousand pounds a year to the advantage of his people'.¹⁷⁶ The author likewise suggested that forgery might be remedied without new legislation or

¹⁷⁴ Yarranton, *England's improvement. The second part*, p. 75.

¹⁷⁵ See his entry in *Oxford OED*.

¹⁷⁶ Samuel Fortrey, *England's interest and improvement* (2nd ed., 1673), pp. 25-26 (my italics).

enforcing punitive measure. The abuses, he argued, stemmed from ‘the imperfection of our mint’, so they ‘might easily be prevented, by a more exact and curious stamp [. . .] especially if care be taken, to make the pieces large and thin’.¹⁷⁷ Edward Ford articulated a similar inclination in 1666. He proposed to reveal ways of raising money by credit for the rebuilding of London, assisting poor merchants, and developing herring fishery. All this, he proclaimed at the outset of his proposal, ‘without Altering, Straining, or Thwarting any of our Laws or Customs now in Use.’¹⁷⁸

This is not to argue that there were more promoters who preferred encouraging private initiatives to enforcing draconian schemes. Rather, my argument is concerned with the declining *plausibility* of sweeping reform. As we have seen, attempts to impose monopolies or other forms of imposition attracted criticisms, and the restored regime did not dare to back these controversial schemes. As a result, Evelyn, Smith, Yarranton and others who offered possibilities of economic improvement *without imposition* were much better off winning support compared to men like Knight, Dymock, and Petty.

For example, in February 1677, shortly after the first part of Yarranton’s *England’s improvement by sea and land* was licensed, John Beale urged Evelyn to help circulate ‘substantiall Breviats’ of Yarranton’s book among MPs, claiming that ‘all those who have done excellently well for any maine branch of reall Improvem[en]ts’ as well as ‘the Favouring patrons’, were now ‘engaged in their

¹⁷⁷ Fortrey, *England’s interest and improvement*, pp. 35-36.

¹⁷⁸ Edward Ford, ‘Experimented proposals how the king may have money to pay and maintain his fleets, with ease to his people; London may be rebuilt [. . .] (1666), *Harleian Miscellany*, vol. 4, pp. 186-87 (quotation from p. 186). A manuscript version is at the TNA, SP 29/171/127. Ford later obtained a patent for coining tokens in Ireland. See Jenner, ‘Liquid Schemes’, no pagination.

Reputations, to embrace a fitt opportunityis to drive it on afresh':

Sir y[o]u are concerned. [. . .] His Ma[jes]ty is engaged as the Graicious Patron to the S[a]m[uel] Fortoryes Adresses. Pr[ince] Rup[ar]t to [Richard] Hayns Adresse. Lord Brouncker & y[ou]r self for John Smith. [. . .] If substantiall Breviats [of Yarranton's proposals] be handsomely put into y[ou]r hands, I presume y[o]u can dispose them for the best advantage.¹⁷⁹

Fortrey was made the office of clerk of deliveries of the ordnance in November 1680. In the same month, an anonymous correspondent recommended Evelyn, Smith, Yarranton, and Fortrey along with other 'worthy persons' whom Commons MPs might wish to consult when setting up a 'Committee [. . .] for the advancement of foreign commerce, domestic manufacturers and good culture'.¹⁸⁰ Yarranton's schemes were so well received in London that he started giving 'weekly lectures' from about 1678.¹⁸¹ If we contrast the frustration and the failure of those who continued to seek monopolistic patents and propose ambitious schemes for sweeping economic reform, with the relative success of these writers, then we can see that perceptive promoters were less likely to call for the imposition of economic 'improvement'. It is perhaps significant that neither Petty nor Dymock was mentioned in these lists of 'worthy persons'.

Equally significantly, however, even successful promoters remained vulnerable to other kinds of distrust. By exploring them, the final section of this chapter will first reveal that the promotion of economic improvement became an integral part of the struggle for non-conformity and religious toleration. It will also demonstrate that men like Yarranton could still be dubbed as dubious, unreliable 'projectors'.

¹⁷⁹ Royal Society Archives, London, EL/B1/72, Beale to [Evelyn?], 10 Feb. 1677. For identification, see Sharp, 'Timber, Science, and Economic Reform', p. 60.

¹⁸⁰ *CSPD 1680-1681*, pp. 92-94, an anonymous letter to an MP. John Reynolds and John Worledge were also mentioned.

¹⁸¹ Bodl., Carte MS 233, fol. 293, Mr Goodwin to [Thomas Wharton?], 9 Jul. 1679. A quotation from this letter will be given at the beginning of Chapter Four.

The Persistence of Distrust

At the time of political and religious crises, even promoters of seemingly bipartisan schemes for economic improvement could become subject to polemical attacks. For example, in 1679 it was reported that Yarranton had a proposal for 'Methodizing of the fleet a new way [. . .] to build [battleships] two 3ths cheaper than now: to save in the standing expence 60,000L per anno'.¹⁸² The Duke of York (future James II), former lord high admiral, sent agents to learn the details of the proposal. Yarranton, however, 'kept off from discovering the great secret' of his scheme, because 'the times [were] so uncertain' that entrusting his proposal to the Catholic Duke would make it 'more licky to make of this advantage to go the French'. Yarranton instead imparted his project to the mastermind of the Exclusion Bill, the earl of Shaftsbury.¹⁸³ About this time *A coffee-house dialogue* attacked Yarranton as an Exclusionist. The author did not refer to Yarranton's refusal to reveal his scheme to York; but the connection is possible. The author argued that the Exclusionists' attempt 'to punish His [i.e., the Duke's] particular person only, or that he should be condemn'd unheard, are things [. . .] to be Dissentaneous [sic] both to right Reason and Justice.' The author thus reproached 'you [Yarranton] and all the Fanatic Crew' for their 'blind Zeal'.¹⁸⁴ An anonymous pamphlet defended Yarranton as an 'honest Gentleman', and suggested that the author of *A coffee-house dialogue* 'has been tram'd up for *French* Government, to bring Popery into Church, slavery upon the

¹⁸² Bodl., Carte MS, 233, fol. 293, Mr Goodwin to [Thomas Wharton?], 9 Jul. 1679.

¹⁸³ Bodl., Carte MS, 233, fols. 293-94, Mr Goodwin to [Thomas Wharton?], 9 Jul. 1679.

¹⁸⁴ *A coffee-house dialogue: or a discourse between Captain Y— and a Young Barrester of the Middle-Temple; with some reflections upon the bill against the D. of Y.*, [1679], pp. 3-4, 2. See also *A continuation of the coffee-house dialogue* [1680?].

Nation'.¹⁸⁵ York's approach to Yarranton, Yarranton's contact with Shaftsbury, and the extant letter that reported those incidents suggest an intricate network in which the ex-parliamentary soldier had become well integrated by the end of the 1670s. More importantly, the attack Yarranton attracted reminds us that non-conformist promoters of economic improvement could be attacked on religious grounds.

Studies on post-Restoration politics suggest that Yarranton's case was symptomatic of an underlying tension in the politics of toleration. Soon after the Clarendon code was loosened, Samuel Parker published *Discourse of Ecclesiastical Polity* (1669). As Richard Ashcraft has suggested, Parker ferociously attacked dissenters as 'fanatics', portraying the improvement of trade as a pathway to the spread of sedition and political instability.¹⁸⁶ Parker was not alone, and such attacks persisted.¹⁸⁷ This was in part because dissenting writers like Fortrey and William Penn highlighted the economic contribution of dissenting communities in order to argue for a greater toleration for Protestant dissenters.¹⁸⁸ As William Letwin has shown, the Catholic Duke of York suspected the Council of Trade of 'being part of a conspiracy organised by Buckingham and Shaftesbury' to promote religious dissent and 'make Parliament master over the King, by first depriving him of money and

¹⁸⁵ *A coffee-house dialogue*, p. 2; *England's Improvements Justified; and the author thereof, Captain Y. vindicated from the scandals in a Paper called a Coffee-house dialogue* [1679?], pp. 1, 2.

¹⁸⁶ Richard Ashcraft, *Revolutionary Politics and Locke's 'Two Treatises of Government'* (Princeton: Princeton U.P., 1986), p. 72.

¹⁸⁷ See, for example, Roger North, *Examen: or an enquiry into the credit and veracity of a pretended complete history* [. . .] (1740), pp. 461-62. See also William Letwin, *The Origins of Scientific Economics: English Economic Thought 1660-1776* (Strand: Methuen, 1963), pp. 21-24; Leng, *Benjamin Worsley*, p. 170-171.

¹⁸⁸ Fortrey, *England's interest and improvement*, 4-13; Ashcraft, *Revolutionary Politics*, pp. 507-508.

then doling it out only for purposes of which they approved'.¹⁸⁹ Dissenters' involvement in national economic improvement was particularly vulnerable to distrust and polemical attacks.

More generally, and more importantly for the purpose of my thesis, post-Restoration promoters of improvement were often stereotyped as laughable and despicable fraudsters. In his *The History of the Royal Society*, Thomas Sprat complained of 'the ill *Treatment* which has bin most commonly given to *Inventors*' in England. Contrasting the successful accommodation of profitable '*Projects*' by the Dutch with 'the fatal mistakes' of English people, Sprat lamented that 'the *English* avers from admitting of new *Inventions*, and shorter ways of labour, and from naturalising New-people':

the *Discoverers* themselves have seldom found any any [sic] other entertainment than contempt and impoverishment. [. . .] The Common titles with which they are wont to be defam'd, are those of *Cheats* and *Projectors*.¹⁹⁰

This feeling was shared by Yarranton who dedicated his *England's Improvement* to the earl of Anglesey Lord Privy-Seal, and Sir Thomas Player, Chamberlain of the City of London. Their patronage was indispensable, he wrote, for it 'might not only obtain for it [his book] a free Access to his Majesty, but such also whose very smilings on its Design might be a sufficient Shield to guard it against all the Arrows of Obloquy and Envy, that are usually shot at the Projector'.¹⁹¹ Richard Haines also complained of the distrust, ironically counting himself among 'Projectors':

¹⁸⁹ Letwin, *Origins of Scientific Economics*, p. 21.

¹⁹⁰ Sprat, *History of the Royal Society*, pp. 401-402 (italics are original). See also Petty, *Treatise of taxes and contributions*, p. 55.

¹⁹¹ Andrew Yarranton, *England's improvemnet by sea and land* (1677), sig. [a3v].

I above all Projectors, have been most discouraged: And I know whoever will attempt any thing for publick Benefit, may expect these Three things. [. . .] viz. To be the Object of wise mens Censure, other mens Laughter, and [. . .] Envies implacable displeasure [. . .]¹⁹²

Yarranton and Haines used the word ‘projector’ rather neutrally in these contexts. Nevertheless, like their predecessors, they were fully aware that promoters of economic improvement were very badly looked upon. Even those who did not seek draconian imposition, therefore, were prone to the generic stereotype of the ‘projector’ as the conman or the promoter of impractical schemes.

Their anxiety was probably not unfounded. The Oxford antiquarian and historian, Anthony Wood had an extensive private library. He organised it meticulously with ‘elaborate care in bringing together items on similar topics’,¹⁹³ and complained about the Bodleian librarian Dr. Thomas Lockey’s practice of ‘binding severall together not of a [single] subject’.¹⁹⁴ In his collection Wood bound into one volume his collection of post-Restoration tracts on economic improvement including Evelyn’s *Fumifugium* (1661) and Haines’ *A method of government for [. . .] publick working almshouses* (1670).¹⁹⁵ Strikingly, he placed at the beginning of this volume Thomas Brugis’s *Discovery of the projector* (1641), one of the most articulate attacks upon the projector’s alleged cheating and nefarious pursuit of private gain.¹⁹⁶ It is not to suggest that schemes of Haines and Evelyn were as much

¹⁹² Richard Haines, *Proposal for building in every country a working-almshouse or hospital* [. . .] (1677), p. 4.

¹⁹³ Nicholas K. Kiessling (ed.), *The Library of Anthony Wood* (Oxford: Oxford Bibliographical Society, 2002), p. xxv.

¹⁹⁴ Quoted in Kiessling, *Library*, p. xxiv.

¹⁹⁵ Bodl., Wood D 27(5), Anthony Wood’s bound pamphlets. Pamphlets about the Forest of Dean was also bound in the same volume. I am grateful to Dr. Mark Jenner for drawing my attention to this volume. See also Kiessling, *Library*, p. 678.

¹⁹⁶ Bodl., Wood D 27(5).

publicly unacceptable as those of, say, Dymock and Knight. There were different degrees of plausibility and acceptability. Yet Wood's binding practice does suggest that even promoters who stayed away from governmental imposition of economic improvement could still be viewed with caution and scepticism, and at worst be dismissed as unreliable 'projectors'.¹⁹⁷ If the changes in what was publicly acceptable distinguished the post-Restoration culture of improvement from its early and mid-century counterparts, this ongoing influence of the projector stereotype should remind us that there was also a fundamental continuity before and after 1660: the necessity to present oneself carefully, and thereby negotiate generic distrust of the projector.

Conclusion

Dymock, who had unsuccessfully called investors for his agricultural secrets in 1668, continued his endeavour. His activities were not limited to the promotion of secretive schemes. In fact, from 1665 he had been operating as one of the patentees for the licensing of peddlers and petty chapmen.¹⁹⁸ In December 1673, he presented a proposal on behalf of his partners for electing 'an Office of Assurance' for merchant vessels, by which 'the Merchants Trade & consequently the Kings Customes and the Nationall Advantage will be mightily encreased.'¹⁹⁹ The bid probably failed, but it indicates that, in these business spheres, Dymock could at least find some partners.

He was rather less successful when he again promoted a divine-inspired secret

¹⁹⁷ In Chapter Five, we shall see how this type of distrust shaped the ways in which emerging joint-stock companies came to be stereotyped.

¹⁹⁸ *CSPD 1672*, p. 350.

¹⁹⁹ SP 29/338/167-168, 'The proposall of an Office of Ensurance'. The proposal offered to pay one fifth of the profits or £20,000 to the Duke of Monmouth towards the maintenance of an hospital.

in January 1678. This time Boyle was the addressee. Emphasising ‘37 yeares faithfull services’ to ‘my King and Country’, Dymock appealed that he had ‘by the blessing of God attained to divers Arts, more than ordinary usefull, advantageous & proffitable to the pubblique’.²⁰⁰ Without revealing more than brief headings of these arts (including ‘Engines of Motion for all uses’ and ‘a better management of all Rurall affaires to greate proffitt’), Dymock asked for ‘Money and fitt materials’ along with ‘good authority, power, & Command’ to try and execute his schemes. He underlined the ‘great wrongs and oppressions and long and fruitlesse attendances’ he had suffered for decades:

Now if after all this it bee the will of God, any my Soveraigne & my Native countrye, that the reward of all my ever faithfull services [. . .] must bee *not to bee understood and believed*, but to bee lost to perish and [sterve?], God will be done, I must submitt thereto[.]²⁰¹

Here, then, was the somewhat exaggerated grievance of a man who had lost his millenarian supporters for his ambitious schemes.

In the last chapter, we saw that Le Pruvost’s ‘universal trade’ scheme failed to win parliamentary support because of its projector-like demand for the power to confiscate defaulters’ properties. Petty’s political arithmetic also required forced transportation, and Dymock too would have had to enforce his method upon all tilled land in the country in order to raise the vast profit out of his ‘new invention’ of 1668. Petty’s and Dymock’s ambitions remind us that changes in projecting culture were not always perceived by contemporaries. The search for elixir and *cornu copia*, grandiose ‘projects’ that would impose sweeping change, remained an alluring

²⁰⁰ Royal Society Archives, London, Boyle Papers, RB/1/40/28 (previously BP 40, fol. 92), Dymock to Boyle, 16 Jan. 1678.

²⁰¹ Royal Society Archives, London, Boyle Papers, RB/1/40/28 (previously BP 40, fol. 92), Dymock to Boyle, 16 Jan. 1678 [my emphasis]. No response has been found to this appeal.

possibility. Yet such schemes, for which extensive political authority was indispensable, were becoming less credible and less acceptable. The restored monarchy could not afford to lose its popular support. Granting monopolistic patents that would lead to a sweeping imposition of governmental authority was too risky a fiscal option. And in part due to the suspicion of 'fanatics', some millenarian language declined in pre-eminence as public discourse.

The horticultural writings of Evelyn, Smith, and Yarranton suggest that these more successful writers opted to emphasise private initiatives. In this respect, my argument was not concerned with the number of such writers, but with the fact that these promoters tended to attract more constructive support. Indeed, studies of Restoration politics and economic policy also seem to confirm this broader qualitative change. As J. P. Sommerville notes, prior to the Civil War, 'lawyers and clerics in the king's service often vindicated His Majesty's right to take his subjects' goods without their consent'. But after the 1640s and then the Restoration, even royalists 'wrote circumspectly on the question of property' and the legitimacy of impositions upon them.²⁰² The Restoration political settlements were in fact negotiated with the same caution. The re-establishment of a court similar to the Star Chamber was debated in the Cavalier parliament but foundered. MPs were 'reluctant to have a court with wider powers' to force imprisonment and fines.²⁰³ In negotiating with the Cavalier parliament, the royal administration also 'refrained, whenever possible, from direct appeals for money; when large demands were essential, it took

²⁰² J. P. Sommerville, 'Absolutism and royalism', in J. H. Burns and Mark Goldie (eds.), *The Cambridge History of Political Thought 1450-1700* (Cambridge: CUP, 1991), p. 367.

²⁰³ Seaward, *Cavalier Parliament*, pp. 133-34. Note that the initiative failed even though the new court was to be much more restricted in its jurisdiction and the power of imposition than the old Star Chamber.

pains that it should not seem to be imposing them [. . .] allowing the house to come to its own decision, rather than demand a particular [fiscal] solution.’²⁰⁴ The ‘new regime could not be seen as similarly oppressive [like its early Stuart predecessors], if it was not to jeopardise its popular support’.²⁰⁵ Clearly, this was also the case for projecting culture. Moreover, discussing parliamentary agricultural policies in the later seventeenth century, Joan Thirsk noted that ‘rather than passing sweeping acts’ that would require an extensive machinery for compulsion, parliament preferred to introduce ‘inducements and encouragement’.²⁰⁶ Mr Swinfen, an MP for Stafford, spoke for many when he commented on a draconian measure proposed to encourage hemp and flax cultivation. ‘The sowing of it goes out because people make no profit of it. If it were for their advantage, men would turn all their lands to it’.²⁰⁷

Of course, encouraging private initiatives was no novelty of the post-Restoration period; men like Plattes and Blith chose not to seek investors and instead encouraged their readers to try new methods of husbandry. Yet, while many of the millenarian adherents were attracted equally to the possibility of pansophic reform led by the enlightened state, such an option seems to have lost its credibility after the Restoration. Now we shall explore in detail how ‘projects’ for economic improvement could be implemented without the imposition from above.

²⁰⁴ Seaward, *Cavalier Parliament*, pp. 129-30 (see also pp. 105, 107).

²⁰⁵ Seaward, *Cavalier Parliament*, p. 105.

²⁰⁶ *AHEW VII*, pp. 325, 339-40, 386-88 (quotations from p. 387).

²⁰⁷ Quoted in *AHEW VII*, p. 340. See also John Houghton’s similar comment on Thomas Firmin’s poor relief in *T&C*, pp. 301-302.

CHAPTER FOUR

Economic Interests, Properties, and Credit-lines:
Turning the Stour Navigation 'Project' into Reality, 1661 – 1677

There is one Capt[ain] Yarrington a very honest person & extreamly well known, who since the late troubles hath upon the request of several gentlemen of qualities betaken himselfe to travell both abroad and att home, to observe what improvement may be made in our manufacture & trade: in which he hath made so great a profiency ass that about a yeare or sow since most of the curious and ingenuious people of qualitie in town went to heare his weekly lectures which he made upon that subject: and since he hath com[m]unicated some of his thoughts (att the rate he could then gett them licenc[e]t) in print: I have sent you one of his books [probably *England's improvement by sea and land* (1677)] if you are pleas[e]d to accept of it [. . .]

Bodl.. Carte MS 233, fol. 293, Mr Goodwin to [Thomas Wharton?], 9 Jul. 1679

Andrew Yarranton's *England's improvement* attracted much attention. A review of the book appeared in the first issue of the Society's *Philosophical tansactions* after the book's publication.¹ By the end of the 1670s, Yarranton was an 'extreamly well known' promoter of economic improvement. His 'weekly lectures', according to Mr Goodwin, attracted many 'curious and ingenuious people' in the metropolis.

Despite these positive responses, Yarranton was careful in his book to avoid being seen as a 'projector' who promoted impractical schemes. In a section in which he discussed the possibility of connecting the Thames and the Severne based on his and his son's surveys, Yarranton anticipated negative responses. He wrote: 'I hear some say you projected the making Navigable the River *Stoure* in *Worcestershire*, what is the reason it was not finished?' Carefully highlighting that he was 'willing' to finish the scheme he had proposed, Yarranton blamed 'want of Money':

I was not willing it should be Abortive; therefore I made offers to perfect it [. . .] made it completely Navigable from *Sturbridge* to *Kederminster* [. . .] and laid out near one thousand pounds, and there it was obstructed for want of Money which by Contract

¹ *Philosophical transactions*, (1665-1678), 11 (1677), pp. 795-98.

was to be paid.²

This chapter explores the parliamentary negotiation and the subsequent implementation of this Stour navigation scheme from 1661 onwards, a scheme led by Yarranton, and backed by Thomas Lord Windsor, George earl of Bristol, Thomas Smyth, and others. In particular, the chapter addresses two crucial questions about turning a ‘project’ into reality. The stereotypical projector was one who offered impractical schemes, or imposed them upon people by obtaining monopolies and similar privileges. By contrast, the reviewer of the *Philosophical transactions* highlighted that Yarranton’s schemes for improvement were based on his technical ingenuity and his previous involvement in actual schemes like the Stour navigation.³ His new proposals seemed more likely to be realised, and this probably helped raise Yarranton’s credence. His involvement in the Stour scheme thus raises an important question about the practices of innovation: how could this ‘project’ be implemented without the imposition from above?

Another question is concerned with money. Conventionally, a ‘projector’ was thought to drain money from investors’ pockets. This means that, in reality, schemes for economic improvement often required large investments over a long period. Promoters had also to make sure that contractors, workmen, and investors continued to believe not only that they would be paid, but also that the scheme could raise money and achieve its objectives. Yarranton’s emphasis on ‘want of Money’ seems to suggest that these were no easy tasks.

I argue that both in the initial stage in parliament and in the subsequent

² Andrew Yarranton, *England’s improvement by sea and land* (1677), pp. 65-66.

³ *Philosophical transactions*, (1665-1678), 11 (1677), p. 797. Robert Hooke, who first met Yarranton in 1673, also approved of Yarranton’s experience and technical ingenuity. See Robert Hooke, *Diary of Robert Hooke, 1672-1680*, eds. Henry W. Robinson and Walter Adams (London: Taylor and Francis, 1935), pp. 76-77.

implementation in the Midlands, promoters of the Stour scheme underwent tortuous negotiations, first with MPs and with regional opponents, and later with creditors and workmen and among themselves. As I noted in my Introduction, historians of technology have often followed historians of science in paying close attention to promoters' identity and self-fashioning. Building upon this approach, I have argued that promoters of economic innovations and improvement tried to avoid being perceived as 'projectors', and that those who failed to do so were probably less likely to win the support they needed. This is not to suggest, however, that self-presentation could guarantee the successful implementation of their schemes, or that promotional literature and years of cooperation can be taken as evidence of unproblematic trust between the parties involved. I will argue that we cannot fully understand the processes of turning a 'project' into reality unless we broaden our perspective.

Very little has been done to understand the history of river navigation as part of projecting culture.⁴ Therefore, I will first survey navigation schemes from the Elizabethan reign onwards. Doing so will reveal many parallels that existed between the development of river navigation and other economic sectors, and show that like monopoly grants, navigation schemes generated much social and political tension during the 1630s. This background provides us with the necessary context for understanding the parliamentary debate over the Stour navigation bill in the Cavalier parliament. I will bring together diverse sources such as petitions, committee minutes, drafts of the Stour bill, and other official records. In doing so I will show that when MPs received petitions that echoed earlier criticisms of monopolistic 'projectors', they carefully modified details of the bill in order to safeguard existing local

⁴ An exception is Keith Fairclough, 'A Successful Elizabethan Project: the River Lea Improvement Scheme', *Journal of Transport History*, 3rd ser., 11 (1998), 54-65.

economic interests. This mediatory role was markedly different from the approach of the Crown towards monopolies prior to 1640. My account will build upon the previous chapter by reconstructing how the restored regime backed potentially beneficial economic schemes without undermining its credence as the legitimate protector of economic prosperity.

I will then explore the implementation of the Stour scheme. Perfectly credible undertakers were (understandably) almost impossible to find.⁵ Backers thus exercised caution when trusting their money to undertakers like Yarranton, and this resulted in the limited liquidity of assets. Accordingly, the implementation of the scheme hinged heavily upon maintaining credit-lines and soliciting funding from careful backers. The Stour navigation scheme achieved part of its objectives although the investors did not fully trust Yarranton and other undertakers. My account will highlight that, for our understanding of the execution of a scheme for economic improvement, the backers' healthy scepticism and undertakers' struggle to secure funding were just as important as these parties' self-presentation. Because few spoke explicitly of the 'projector' during the implementation, studying this process will also help us demarcate projecting culture. At the implementation stage, it overlapped with the culture of financial credit, whereas the interaction between stereotype and the practice was generally more conspicuous during the promotion stage.

⁵ When we discuss the implementation of the scheme, I will differentiate, for convenience sake, the *backers* (like Bristol and Baldwyn) who mainly paid for its execution, and *undertakers* (like Yarranton) who carried out various technical and business tasks for their backers.

Inland navigation in the History of Projecting

The idea of making rivers navigable was not new to post-Restoration England. As early as 1424 a statute (3 Hen. 6, c. 5) was passed to authorise the work on the river Lea, and later in the century a twelve-mile waterway was made for the Nene.⁶ The condition of many unpaved highways could easily deteriorate during rainy seasons,⁷ and, once established, river transport was always cheaper than land carriage. Thus, even opponents of navigation schemes rarely denied the cost performance of water transport.⁸ Accordingly, the early modern period saw many attempts at improving river navigation.

Like many other schemes for economic innovations and improvement, river navigation schemes required support from a higher authority. In English law, public rights of navigation and its improvement existed only in tidal rivers.⁹ A great part of the two major tidal rivers, the Thames and the Severn, were navigable by the end of the sixteenth century. So during the seventeenth and early eighteenth centuries the effort to make rivers navigable was largely directed at non-tidal sections of rivers that were the private property of riparian landowners. As Frank A. Sharman put it, in

⁶ T. S. Willan, *River Navigation in England 1600-1750* (London: Frank Cass, 1964), p. 28; Alec W. Skempton, et al. (eds.), *Biographical Dictionary of Civil Engineers in Great Britain and Ireland: 1500-1830* (2 vols, London: Thomas Telford, 2002), vol. 1, p. 142.

⁷ For example, the road from Tonbridge, Kent, to London deteriorated so easily that carts carrying timbers and iron were charged under an Elizabethan statute to pay for maintenance (39 Eliz. 1, c. 19), and yet the road still became impassable to heavy carts during the winter. See Ernest Straker, *Wealden Iron* (London: Bells and Sons, 1931), p. 185.

⁸ In the early eighteenth century, transporting a ton of salt from Droitwich to Worcester (about 7 miles) cost five shillings by land, whereas the same amount of money would pay for the water transport for 77 miles from Worcester to Bristol. Carrying the same from Northwich to Frodsham Bridge would cost eight shillings by land carriage, and five shillings by water carriage via the Avon. See Willan, *River Navigation in England*, pp. 37-38.

⁹ Willan, *River Navigation in England*, p. 22. See also *ibid.*, appendix III, 'Sir Mathew Hale's Opinion on the Wye Navigation'.

places where 'the landowners were unwilling to do the work themselves by widening and deepening the river and providing towpaths, then the rivers remained unimproved until a power could be found to compel them to do it or to let others do it.'¹⁰

There were several legal methods for doing this. Commissioners of Sewers and patents were the two main methods under Tudors and early Stuarts. In Henry VIII's reign, the 1531 Statute of Sewers (23 Hen. 8, c. 5) was passed with clauses that could authorise local commissions to work on the improvement of navigation as well as drainage and sea defence.¹¹ The use of statutes became dominant after the Restoration. Between 1500 and 1660, eleven acts of parliament were passed for the purpose, while during the 1660s alone, eleven acts were passed (and twenty-five more were submitted but failed). Another fifty-four bills had been passed by 1750, and obtaining acts of parliament later became a standard method for launching canalisation schemes.¹² Significantly, unlike schemes backed by patents, those sanctioned by statutes offered no fee or revenue to the government.

Later seventeenth-century England saw the greatest flowering of river navigation schemes before the spread of canals later in the eighteenth century.¹³ Between 1600 and 1660, about 685 miles of rivers were navigable, but only 90 miles

¹⁰ Frank A. Sharman, 'River Improvement Law in the Early Seventeenth Century', *Journal of Legal History* 3 (1982), p. 223. See also Willan, *River Navigation in England*, p. 22.

¹¹ 23 Hen. 8, c. 5.

¹² See Willan, *River Navigation in England*, pp. 28, 152-155; Julian Hoppit (ed.), *Failed Legislation, 1660-1800: Extracted from the Commons and Lords Journals* (London: Hambledon Press, 1997), pp. 587-88.

¹³ There is a body of literature on the inland navigation before the canal age. General surveys include: W. T. Jackman, *The Development of Transportation in Modern Britain* (3rd ed., London: Frank Cass, 1966), pp. 157-210, Willan, *River Navigation in England*; David Hussey, *Coastal and River Trade in Pre-industrial England: Bristol and its Region, 1680-1730* (Exeter: Exeter U.P., 2000).

of them were extensions of 'naturally' navigable rivers. Over the next forty years nearly 200 miles were made navigable.¹⁴ The impression of an accelerating rate of growth might be exaggerated because more records are available for the later seventeenth century.¹⁵ But the very survival of these records seems to highlight the growing importance of river navigation schemes.

The expansion of navigable rivers stimulated the integration of regional agriculture and industrial economies, and increased efficiencies in carrying goods across regions. The Severn, for example, 'provided a direct connection between the port of Bristol and a set of interconnected subregions' from 'south Lancashire to the Forest of Dean in one direction and from Birmingham to the Plynlimon range in the other.'¹⁶ Barges carried a vast range of commodities produced or imported in different regions. They included not only coal, metalwares, ores, pot clay, grain, salt, and timber, but also 'semi-durables' like glassware and ceramics, and consumables such as soap, spices, citrus fruits, and dyewoods.¹⁷ Few of these goods 'were destined for, or had been produced' in port-towns themselves, indicating that the economic effects of navigable rivers went far beyond the river side.¹⁸

Early modern people were very well aware of the economic and strategic importance of navigable rivers. The Council of Trade in 1650 and 1688 was ordered

¹⁴ Willan, *River Navigation in England*, p. 133; Alec W. Skempton, 'Engineering of the English river navigation to 1760', in M. Baldwin and A. Burton (eds.), *Canals. A New Look* (Chichester: Phillimore, 1984), pp. 23-24.

¹⁵ Willan, *River Navigation in England*, p. 133.

¹⁶ Malcolm Wanklyn, 'The Severn Navigation in the Seventeenth Century: Long-Distance Trade of Shrewsbury Boats', *Midland History*, 13 (1988), p. 34.

¹⁷ Hussey, *Coastal and River Trade*, p. 199.

¹⁸ Malcolm Wanklyn, 'The Impact of Water Transport Facilities on the Economies of English River Ports c. 1660-c.1760', *Economic History Review*, 2nd ser., 49 (1996), p. 26.

to consider possibilities of extending inland navigation.¹⁹ Legislation concerning timber is also a good example. They stressed the importance of navigable rivers because timber – a crucial commodity for building ships – could not be hauled more than twenty miles a day on land.²⁰ So an Elizabethan statute (1 Eliz. I, c. 15) ordered that no one should make charcoal from large trees within fourteen miles of the sea and navigable rivers. Likewise, in 1649 it was ordered that timber forests within fifteen miles of navigable rivers were to be exempted from the sales of Crown lands ‘for the use and service of the Publique Navy of this Commonwealth’.²¹ Commenting upon the Elizabethan statute in his *Sylva*, Evelyn lamented that the conversion of timber into charcoal was not prohibited ‘in Kent, Sussex, and Surrey’, because these areas ‘were excepted in the *Proviso*’.²² Evelyn had reason to complain; these counties contained timber forests like the Weald and navigable rivers like the Medway and the Wey.²³ When Defoe visited Guildford in the early 1720s, he noted that the Wey (which had been made navigable up to the town) provided a cheaper route to London for ‘a very great quantity of Timber’ both from its localities and even from Sussex woodlands thirty miles away.²⁴

¹⁹ *T&C*, pp. 501-502, 524-28.

²⁰ See Willan, *River Navigation in England*, p.133 fn. 2.

²¹ *Acts and Ordinances of the Interregnum*, eds. C. H. Firth and R. S. Rait (3 vols, London: Wyman, 1911), vol. 2, p. 189.

²² John Evelyn, *Sylva, or a discourse of forest-trees, and the propagation of timber in his majesties dominions* (1670 ed.), p. 209. See also Richard Haines, *The Prevention of Poverty* (1674), p. 10.

²³ Michael Nash, ‘Barge Traffic on the Wey Navigation in the Second Half of the Seventeenth Century’, *Journal of Transport History*, 7 (1965-66), 218-24; C. W. Chalklin, ‘Navigation Schemes on the Upper Medway, 1600-1665’, *Journal of Transport History*, 5 (1961), 105-115.

²⁴ Daniel Defoe, *A Tour thro’ the Whole Island of Great Britain*, ed. G. D. H. Cole (2 vols, London: Peter Davies, 1927), vol. 1, p. 145.

River navigation was an integral part of the development of projecting activities. Under the 1531 Statute of Sewers, local Commissioners of Sewers embanked rivers, and by extension, improved the navigation of rivers including the Medway, the Dee, and the Wye.²⁵ In 1600, seeking to extend the navigation of the Medway up to Tonbridge, landowners in the Weald of Kent told the Lord Chamberlain that with it ‘your lordship’s town of Tonbridge might be made a staple of all material for the Weald of Kent, for the enriching of that poor town and the general benefit of both shires’.²⁶ Significantly, Elizabethan Privy Councillors actively intervened with the commissioners. This was clearly seen in the case of the River Lea improvement scheme. This was promoted by the ‘instant suyte of the inhabitants of Hartfordshire’, implemented by local Commissioners under sponsorship of London City merchants, and energetically backed by William Cecil.²⁷ Close interactions between local inhabitants and prominent politicians in these two proposals were similar to the promotion of other new economic schemes that Cecil oversaw, what Deborah Harkness has recently depicted as ‘Elizabethan Big Science’.²⁸

Because the authority of Commissioners of Sewers was questioned by both lawyers and local opponents of particular schemes,²⁹ the early Stuart regimes

²⁵ Willan, *River Navigation in England*, pp. 16-23.

²⁶ Chalklin, ‘Navigation Schemes on the Upper Medway’, p. 109 (quoting from BL, Add. MS 34218, fols. 37-57).

²⁷ Fairclough, ‘River Lea Improvement Scheme’, p. 55.

²⁸ Deborah E. Harkness, *The Jewel House: Elizabethan London and the Scientific Revolution* (New Haven: Yale U.P., 2007), chap. 4.

²⁹ See, for example, *The English Reports* (178 vols, 1900-1932), vol. 77, pp. 1141-42 (10 CO. REP. 142b); BL, Harley MS 2003, ‘The humble petition of the Mayor Aldermen Citizens and Inhabitanes of the Citie of Chester’, fol. 227v. For background, see Clive Holmes, ‘Statutory Interpretation in the Early Seventeenth-Century: the Courts, the Council, and the Commissioners of Sewers’, in J. A. Guy and H. G. Beale (eds.), *Law and Social*

promoted navigation schemes also by granting letters patent. At least eight patents with monopoly of carriage were issued for making rivers navigable, covering rivers such as the Bristol Avon (1619), the Great Ouse (1628), the Soar (1634), the Warwickshire Avon (1636), the Lark (1637), and the Tone (1638).³⁰ Between 1616 and 1642, ten patents were granted for protecting purported ‘inventions’ for engines for draining, cutting, and dredging rivers.³¹ As Sherman has noted, such ‘inventions’ were probably intended ‘to give a colour of legality to the monopoly’. Importantly, these monopoly grants and patents for ‘inventions’ paid fees to the crown. In 1607 one Thomas Proctor proposed to James I to bring the ‘Thames too or neare unto Severne, or from Severne to or near unto Thames’, and do the same for several other rivers, by which ‘transportation and carrying of coales, Sea-coales, wood, Lade, Iron, come and graine, Flax, Hempe, Wollen and Linen cloath’ would be facilitated.³² Crucially, Procter suggested that ‘a custome or rent may growe unto his Majesty’ by levying tolls.³³ Patentees like John Cason Arnold Spenser and Robert Chiver made similar promises.³⁴ So, as in the promotion of other kinds of ‘inventions’, issuing patents became a profitable business for the early Stuart kings.

Commissioners of Sewers and patentees *could* advance the public good. But

Change in British History: Papers presented to the British Legal History Conference, 14-17 July 1981 (London: Royal History Society, 1984), 107-17; Willan, *River Navigation in England*, p. 18.

³⁰ Sharman, ‘River Improvement Law’, p. 227.

³¹ Patent nos. 9, 13, 14, 19, 55, 64, 66, 105, 122, 125.

³² Thomas Procter, *A vvorthy vvowrke profitable to this whole kingdome concerning the mending of all high-waies, as also for waters and iron workes* (1607), sig. [D3v].

³³ Procter, *A vvorthy vvowrke*, sig. [D3v]. A search into CSPD, CTP, CTB seems to suggest that a proposal was never executed.

³⁴ Patent nos. 3, 14, 36, 105.

during the Personal Rule of Charles I they often caused controversy. River navigation schemes resembled other schemes for economic and technological innovations in three respects: the grant of monopolies, the encroachment upon (if not damage to) private rights, and the royal government's support of controversial schemes. The case of the Upper Medway navigation illustrates this well. The local Commissioners of Sewers contracted in July 1627 with one Michael Cole of Westminster. His task was to make the river navigable between Maidstone and Penshurst within three years in return for a monopoly of water carriage for 33 years.³⁵ In order to back up the questionable authority of the Commissioners to make a new navigation route, Cole, with his backers among the Wealden landed gentlemen, petitioned parliament in April 1628 to obtain an act of parliament. Yet as the bill's opponents recorded two months later, 'the project upon hearing of committ[ee] on both sides was voted a monopolie, & so reported to the house & by th[e]m recom[m]itted where it resteth to this time.'³⁶ Nonetheless, the navigation work went ahead, and Cole 'threatened some of the inhabitants' to 'make th[e]m pay 10s for ev[er]y bush growing on the banke of the River', and his workmen 'pulled down the weires' that belonged to riparian landowners.³⁷ They in turn petitioned parliament accusing 'Michael Cole a projector' of 'the great Misdemeano[u]r' and launched lawsuits against him and his supporters. Significantly, however, the Privy Council under King Charles decreed that the lawsuits be discontinued, and that the promoters keep the navigational work

³⁵ For a brief overview, see Chalklin, 'Navigation Schemes on the Upper Medway'; Sharman, 'River Improvement Law', pp. 239-40.

³⁶ BL, Add. MS 33923, 'To the right worshipful her Ma[jes]ties Commissio[n]ers of Sewers for the Countie of Kent' [n.d.], fols. 35-54, at fol. 42v; *CJ*, vol. 1, pp. 893, 895, 914, at p. 914.

³⁷ BL, Add. MS 33923, fol. 42v.

on the condition that they pay compensations to the opposing landowners.³⁸

Charles's government had good reasons to back this controversial scheme. It is probable that Cole offered a fee or a duty, a welcome addition to crown coffers.³⁹ Moreover, from the late Elizabethan period onwards, the government had been informed that connecting the Weald and Chatham via the Upper Medway would afford a cheaper timber supply for the Navy.⁴⁰ And, under the pressure of the Thirty Years War on the Continent, strengthening the navy had become an urgent issue by the late 1620s.⁴¹ In fact, soon after the river was made navigable from Maidstone to Yalding upstream, it was reported that the Treasurer of the Navy had commissioned a local purveyor in Kent to carry timber to a wharf near there, presumably, so that they could be shipped down the river under Cole's monopoly.⁴² Despite a degree of success in extending the navigable part of the river, the scheme remained highly contentious. In 1635 promoters of the navigation complained to the Privy Council that one opposing riparian landowner had arrested boatmen towing their boats upon trespass.⁴³

What happened to the Medway scheme in the early 1640s is not clear. But the

³⁸ Parliamentary Archives, London, HL/PO/JP/10/1/38, the petition of George Carpenter and Robert Scoles, 16 Feb. 1629; *CSPD 1631-1633*, p. 480.

³⁹ In addition to the cases already mentioned, William Sandys offered the duty of 12d per caldron of coal carried via the Avon; Thomas Skipwith was to pay the Exchequer a tenth of clear profit from levying tolls. See Thomas Rymer, *Foedera, conventiones, literae, et cujuscunque generis acta publica* [. . .] (20 vols, 1704-1735), vol. 19, pp. 597-600 (a transcription of a patent), at p. 599.

⁴⁰ BL, Add MS 34218, 'Reasons why the Weavers should stande [navigable]' [1600?], fol. 40; Chalklin, 'Navigation Schemes on the Upper Medway', p. 110.

⁴¹ K. R. Andrews, *Ships, Money and Politics: Seafaring and Naval Enterprise in the Reign of Charles I* (Cambridge: CUP, 1991), pp. 140-50 (esp. p. 148); Michael J. Braddick, *State Formation in Early Modern England c. 1550-1700* (Cambridge: CUP, 2000), p. 208.

⁴² TNA, SP 16/171/18.

⁴³ *CSPD 1635-36*, p. 64.

Long Parliament denounced promoters like Cole along with the ‘projectors’ of other controversial economic schemes. By a patent granted by Charles in 1636, William Sandys had engaged in a navigation scheme on the Avon, a major tributary of the Severn. Connecting Evesham to Gloucester helped reduce the coal price in Evesham. His contemporary Thomas Habington celebrated Sandys’s achievement as ‘this country’s wonder’, and Sandys was elected as an MP for Evesham in April 1640.⁴⁴ But on 9 November 1640, just before the explosion of printed diatribes against projectors in 1641 and 42, the Commons resolved:

That all Projectors and Monopolists whatsoever; or that have any Share, or lately have had any Share, in any Monopolies; or that do receive, or lately have received, any Benefit from any Monopoly or Project; or that have procured any Warrant or Command, for the Restraint or Molesting of any that have refused to conform themselves to any such Proclamations or Projects; are disabled, by Order of this House, to sit here in this House: And if any Man here knows any Monopolist, that he shall nominate him: [. . .]⁴⁵

On 21 January 1641 the Committee for Monopolists reported that Sandys was ‘not fit, nor ought to sit as a Member in the House’ because he, like three other MPs involved in things like the monopolies of tobacco and ‘the Sealing of Bone-lace’, was a ‘Monopolist, and Projector’.⁴⁶ The charge was that Charles I had granted Sandys and his partner a farm to collect the duty upon sea coal, presumably levied on ships carrying coals along the Avon. By this monopoly of carriage along the river, Sandys allegedly increased the price of coal by 12d per caldron.⁴⁷ Criticism of ‘projectors’

⁴⁴ John Amphlett (ed.), *A Survey of Worcestershire by Thomas Habington*, Worcestershire Historical Society, (2 vols, 1895, 1899), vol. 2, p. 468. See also Sandys’s own account in 1662 at TNA, SP 29/66/160, ‘Petition of William Sandys esq., against Lord Windsor’s move to make the Avon navigable’.

⁴⁵ *CJ*, vol. 2, p. 24.

⁴⁶ *CJ*, vol. 2, p. 71.

⁴⁷ *CSPD 1638-1639*, p. 507; *House of Commons 1660-1690*, vol. 3, pp. 389-90; Sharman, ‘River Improvement Law’, p. 228. John Coventry, a rival for Sandys’ seat in the Commons, particularly pressed the case against Sandys. See Mary Frear Keeler, *The Long Parliament*,

of navigation works culminated in the Grand Remonstrance presented to Charles in December 1641. It not only complained of ‘many burdensome projects’, but included the accusation that ‘Large quantities of common and several grounds hath been taken from the subject by colour of the Statute of Improvement, and by abuse of the Commission of Sewers, without their consent, and against it.’⁴⁸

The condemnation of harmful inland navigation ‘projects’ notwithstanding, the period of the Civil Wars and Interregnum saw attempts at extending river navigation. In 1641 Lewes Roberts mentioned river navigation as the first among diverse ‘points [. . .] conducing to the facilitating, ease and augmentation of Traffike’ at home and abroad, including the improvement of ports, beacons, highways and other infrastructures.⁴⁹ Sir Richard Weston, who introduced clover husbandry during this period, obtained an act of parliament for making the Wye navigable; Francis Mathew urged both parliament and the Council of State to take up his navigation projects.⁵⁰ Commentators continued to stress the vital importance of river navigation. In 1652, Henry Robinson urged the regime to learn from cities in the United Provinces that ‘have Navigable Rivers or Ditches from one to another, and so into the Sea’:

[thanks to waterways] they have not onely all manner of Victualls brought so much

1640-1641: A Biographical Study of its Members (Philadelphia: American Philosophical Society, 1954), p. 334. This episode suggests that negative stereotypes of the projector could be used as a tool in local politics. We thus have to warn ourselves against assuming that distrust of the projector at the collapse of the Personal Rule was nothing but genuine outpouring of anger.

⁴⁸ *The Constitutional Documents of the Puritan Revolution, 1625-1660*, ed. Samuel Rawson Gardiner (3rd ed., Oxford: Clarendon, 1906), pp. 221, 212, 214.

⁴⁹ Lewes Roberts, *The treatise of Traffike or a discourse of forraine trade* (1641), pp. 43-50 (quotation from p. 44).

⁵⁰ Willan, *River Navigation in England*, p. 80; Francis Mathew, *Of the opening of rivers for navigation the benefit exemplified by the two Avons of Salisbury and Bristol* (1655); idem, *Of the opening of rivers for navigation the benefit exemplified by the two Avons of Salisbury and Bristol* (1656).

cheaper unto them, but also all manner of Raw or unwrought Commodities, whereby their People are set a work, and by this meanes can afford all sorts of Manufactures, and Artificers work, so much cheaper as is the difference between Land and Water carriage.

Thus he urged the Rump Parliament ‘To make all Rivers Navigable as much as may be, and cut navigable Ditches in all places’.⁵¹ His suggestion clearly recognised the advantage of industries being set up along navigable rivers, something the Stour navigation scheme tried to exploit. By the end of the Interregnum, therefore, river navigation had a chequered history: its economic benefit was unmistakable to many, and yet schemes were prone to abuse. They were linked in many minds with the negative images of the ‘projector’ and of the Personal Rule; navigation schemes could be socially divisive; and, crucially, they could expose the government to the accusation of accepting money raised by nefarious ‘projectors’.

The Stour Navigation Scheme: An Introduction

The bill for authorising the Stour navigation scheme was submitted to the Lords on 11 May 1661, only three days after the opening of the Cavalier parliament; it received the royal assent at the end of the session on 19 May 1662.⁵² In order to secure parliamentary backing, did the promoters design the bill so as to minimise the risk of provoking controversies and grievances? How did members consider petitions for and against the scheme? We shall turn to these questions after a brief overview of

⁵¹ Henry Robinson, *Certain proposals in order to the peoples freedome and accommodation in some particulars* (1652), pp. 8, 9. See also a passing reference to inland navigation in Charles Webster, *The Great Instauration: Science, Medicine and Reform 1626-1660* (2nd ed. with new Preface, Oxford: Peter Lang, 2002), p. 357.

⁵² *LJ*, vol. 11, pp. 250, 473. Although much activity should have preceded the introduction of the bill, little evidence has survived. For the parliamentary procedure as ‘midway in the course of an economic enterprise’, see Willan, *River Navigation in England*, pp. 30-31.

the navigation scheme.

The Stour is a little stream originating in south Staffordshire. After passing through a coal producing region (the so-called Black Country), it runs into the longest river in England, the Severn, which flows through Worcester and Tewksbury. As was noted in Chapter Two, the composition of business partnerships in the mid-seventeenth century did not necessarily follow contemporary political and ideological divisions. This is also true of the Stour navigation partnership, which consisted of men of different social ranks with diverse religious and political opinions.

Yarranton claimed in 1677 that the Stour navigation scheme was ‘my projection’.⁵³ No evidence about this seems to survive. But, as we shall see below, Yarranton did play a key managerial and supervisory role in the scheme, and by the time the bill was submitted in 1661, he certainly had accumulated a wealth of local knowledge and hands-on experience in navigation and other technological enterprises. A native of the parish of Astley, Worcestershire, Yarranton became an apprentice to a Worcester linen draper in about 1632. Being a Presbyterian, he fought the Civil Wars as a captain of the New Model Army, and later served as a Worcestershire Commissioner for Sequestrations of royalist lands. Using the £500 reward he had received from the parliament ‘for his good [military] service’, he purchased coppices in places such as Wyre Forest by the Stour.⁵⁴ Having discovered ‘a vast quantity of Roman Cinders’ near the city of Worcester, Yarranton and his military colleagues purchased a right to dig them up. It was reported in 1661 that

⁵³ Yarranton, *England's improvement by sea and land*, p. 66.

⁵⁴ *CJ*, vol. 5, p. 642; Peter J. Brown, ‘The Military Career of Andrew Yarranton’, *Transactions of Worcestershire Archaeological Society*, 3rd ser., 13 (1992), pp. 196-97.

'many Thousand Tunns' of these Roman cinders had been carried up the Severn 'to be melted down into Iron, with a Mixture, of the Forest of Dean Iron-Stone'.⁵⁵ There were clear indications that Yarranton was interested in exploiting water transport for business schemes. Yarranton applied (unsuccessfully) for a patent from the Cromwellian government for the navigation of the Salwerpe, another tributary of the Severn.⁵⁶ His parish, Astley, contained blast furnaces and watermills, and Yarranton probably helped construct them, and make the Dick Brook navigable down to the Severn.⁵⁷ It is probable that he was interested in the Stour project partly because of the benefits it might bring to some of his existing business concerns.

Like inventors and enterprising merchants under Elizabeth and early Stuarts, Yarranton collaborated with professionals and aristocrats. Thomas Smyth, a Middle Temple lawyer of Norfolk origin, was probably the middleman who helped forge the link between Yarranton, and the two royalist aristocrats Thomas Lord Windsor and George Digby, earl of Bristol.⁵⁸ Windsor and Bristol were primarily financial backers. They were 'att their proper Costs and Charges to procure an Act' for the

⁵⁵ Staffordshire Record Office, Stafford, Aqualate Paper, Baldwyn Papers, [Hereafter Staff. R.O.], D(W) 1788/P59/B3, *Reasons wherefore the making the rivers of Stower and Salwerp navigable, in the county of Worcester, will be of great advantage unto the Country of Salop, but especially to Shrewsbury, Bridgenorth, Wenlock, Wellington, and all the Towns adjoining to the River of Severn* [1661], p. 1. See also Yarranton, *England's improvement by sea and land. Second part* (1681), p. 162 ; Peter J. Brown, 'The Early Industrial Complex at Astley, Worcestershire', *Post-Medieval Archaeology*, 16 (1982), pp. 4-5.

⁵⁶ T. Russell Nash, *Collections for the history of Worcestershire* (2 vols, 1781-1782), vol. 1, p. 306.

⁵⁷ Thomas Crosbee Cantrill and Marjory Wight, 'Yarranton's Works at Astley', *Transactions of the Worcestershire Archaeological Society*, 2nd ser., 7 (1929), 92-115; Brown, 'The early industrial complex at Astley', p. 7.

⁵⁸ Smyth was admitted to the Middle Temple in 1652 and was a son and heir of the namesake Thomas Smyth of Walsoaken, Norfolk, 'gent.'. H. A. C. Sturgess (ed.), *Register of Admissions to the Honourable Society of the Middle Temple* (3 vols, London: Middle Temple, 1949), vol. 1, p. 151. At least by 1665, Samuel Whyte, 'gent.' of Oldswinford, Worcestershire, took over Smyth's role. See Staff. R.O., D(W)1788/P59/B3, a note on agreements, 1665.

scheme, and also pay for its implementation.⁵⁹ According to Smyth, Bristol intended to solicit the 'Kings Comendac[i]on [. . .] by his greatnes'.⁶⁰ He may have invested during the first few years of the project (for which little evidence survives). But by the end of 1665, Bristol rented out his proprietorship to the Inner Temple lawyer Samuel Baldwyn of Shropshire.⁶¹ Baldwyn had held Stokesay Castle for Charles I during the first Civil War, and was subsequently elected in 1658 as an MP for Ludlow. Although he seems to have spent much time in London after the Restoration, Baldwyn reportedly possessed 1,500 acres of forest in Worcestershire, which perhaps was a reason why he became a partner.⁶² Unlike Yarranton, Windsor, the future earl of Plymouth, fought for the royalist cause during the Civil Wars. He was made a JP for Worcester at Charles II's return, and lord-lieutenant of Worcestershire thereafter. Yet Windsor too had local interests which seem to explain his involvement in the scheme: he had a house near Kidderminster, and extensive estates in different parts of Worcestershire, including a property by the river.⁶³

The scheme's initial plan was to make the Stour navigable from the Severn to

⁵⁹ Staff. R.O., D(W)1788/P43/B10, 'Article for the River Stower &c', May 1661. We shall later discuss the funding arrangement in detail.

⁶⁰ TNA, SP 29/44/21, Thomas Smyth to Andrew Yarranton, 7 Nov. 1661. Bristol was a big-time royalist. R. Hutton, 'Digby, George, second earl of Bristol (1612-1677)', *Oxford DNB*, vol. 16, pp. 143-45.

⁶¹ For Bristol's relation to Baldwyn see D(W)1788/P59/B3, Mr Baldwyns Case as to his lease & Farme Of the Navigation upon ye Stower and Salworp under ye right ho[nourable] George Earle of Bristoll & Proposals thereupon, [Feb.-Jul. 1667?].

⁶² Evelyn H. Martin, 'History of Several Families Connected with Diddlebury. I. The Baldwyns: Part III', *Transactions of the Shropshire Archaeological and Natural Historical Society*, 4th ser., 2 (1912), esp. pp. 334, 339; Andrew Yarranton, *England's improvement by sea and land. The second part* (1681), p. 71.

⁶³ J. W. Willis Bund et al. (eds.), *Victoria County History, Worcestershire*, (4 vols, London: Constable, 1901-1924), vol. 3, pp. 23, 225, 282, 570 (fn. 80); S. Kelsey, 'Windsor [formerly Hickman], Thomas, first earl of Plymouth (c. 1627-1687)', *Oxford DNB*, vol. 59, pp. 709-710.

Stourbridge within two years of the passing of the bill.⁶⁴ In order to maximize the benefit of water transport, wooden railways were to connect the river to coal pits, probably including a major production site in Pensnett Chase, about a mile north of Stourbridge.⁶⁵ The proprietors of the navigation work hoped to profit by levying tolls from barges passing through the river, and by selling coals down the Stour in Severn-side towns like Worcester. The partners were also involved in an attempt to set up a tinplate industry in the region, carrying iron from the Forest of Dean and tin from Cornwall up the Stour. This was the first organised attempt in England at producing tinplate in large quantities.⁶⁶ Apart from this experiment, the proposed scheme represented not so much a technical breakthrough as an application of existing hydrostatic technologies in order to open up new markets and diminish costs of transporting heavy goods.⁶⁷ No overall accounts of the scheme survive, but sporadic references to charges and profit estimates suggest that the enterprise was expected to be large. The sale of coal alone was expected to raise more than £3,000 yearly.⁶⁸

The work was put into execution by the end of 1662. There were several mills and forges along the Stour, so these impediments had to be either removed, or

⁶⁴ Staff. R.O., D(W)1788/P43/B10, 'Article for the River Stower &c', 10 May 1661.

⁶⁵ Staff. R.O., D(W)1788/P3/B78, [Andrew Yarranton?], A map of the Stour navigation work [n.d.].

⁶⁶ See P. W. King, 'Wolverley Lower Mill and the Beginnings of the Tinplate Industry', *Historical Metallurgy*, 22 (1988), 104-13.

⁶⁷ The project involved the first construction of wooden railways authorised by act of parliament, but probably this novelty was not intended. M. J. T. Lewis, *Early Wooden Railways* (London: Routledge, 1970), p. 242.

⁶⁸ Staff. R.O., D(W)1788/P59/B3, An account of the value of Stower [n.d.]. See also the same calculation give at D(W)1788/P61/B7(f), An estimate of the profits that may arise from the River Stower when the same is made navigable & locks finished with brick and stone [n.d.]

bypassed by cuts and trenches.⁶⁹ Either way, the promoters had to pay large compensations to riparian landowners.⁷⁰ Digging trenches for diversion, deepening the river, and making locks also added to the cost, which went above £1,000 within a few years.⁷¹ The partners had very limited liquid assets; as we shall see, some partners became insolvent, and the work was delayed and even disrupted.

The partners failed to finish the work within two years of the passing of the bill.⁷² Work continued, although it repeatedly failed to meet its subsequent targets. By December 1665, a wooden railway was laid alongside the river to carry the coal, but the navigation was only finished from Stourbridge down to Kidderminster.⁷³ At this point, all the previous accounts were settled (presumably for the first time), and Samuel Baldwyn joined as a major backer.⁷⁴ He paid the rent of £300 to the earl of Bristol, and invested about £1,500 within a year and half.⁷⁵ This new partnership,

⁶⁹ Skempton et al. (eds.), *Dictionary of Civil Engineers*, vol. 1, p. 810.

⁷⁰ For example, an arrear of £100 was due to a single riparian landowner by 1667. See the case of Sir Ralph Clare below. One manuscript account of expenditure suggests that £90 was spent for 'rent and damages'. This was obviously a tip of an iceberg. Staff. R.O., D(W)1788/P61/B7(f), 'A particular of the Expenses laid out in discharging of the Rents and damages due upon the River Stower', n.d..

⁷¹ See Staff. R.O., D(W)1788/P61/B7(f), 'A particular of the Expenses laid out in discharging of the Rents and damages due upon the River Stower', n.d.. 'Scouring and Enlarging Hafcut Trench', for example, cost £150; 'Hafcutt & Locks and Trench below', £90; 'Sturton Locke', £40.

⁷² Staff. R.O., D(W)1788/P43/B10, 'Article for the River Stower &c', 10 May 1661. They also hoped to, but failed to, make the Selwerpe navigable. Little evidence seem to survive about this plan.

⁷³ Lewis, *Early Wooden Railways*, p. 245.

⁷⁴ Staff. R.O., D(W)1788/P37/B8 contains many indentures and recognizances bearing the date 14 December 1665. More papers seem to survive for years after 1666, partly because most of the papers regarding the Stour navigation are kept as part of Aqualate Estate Papers which include family papers of the Baldwyn family.

⁷⁵ Staff. R.O., D(W)1788/P59/B3, 'Mr Baldwyns Case as to his lease & Farme Of the Navigation upon ye Stower and Salworp under the right ho[nourable] George Earle of Bristoll & Proposals thereupon', [Feb.-Jul. 1667?].

however, could not finish the project either. In February 1670, Yarranton proposed to complete it in two years. This attempt again failed to materialise. The work was still going on in the summer of 1673. Yarranton sold forestland to raise five hundred pounds, and engaged his son Robert to continue the work. Yarranton seems to have become active elsewhere from about this period. In July 1674 he surveyed the Dee, and later that year, also surveyed the Enniscorthy Ironworks and the river Shane in Ireland. In January 1678, Robert Yarranton and one William Farnolls were appointed as the main undertakers of the navigation scheme, and Andrew Yarranton gave up all his interest in exchange for a life annuity of thirty pounds from the scheme's profits. Yarranton died in 1684, and Windsor in 1687.

The enterprise probably soon died out, and as we shall later see, Windsor's grandson (unsuccessfully) tried to revive the scheme. Yet the scheme left some constructive legacies. In the early eighteenth century, John Hambury, a son of Capel Hanbury, who had been employed in the Stour-side tinplate experiment during the 1660s and 1670s, established 'the first commercial manufacture of tinplate in Britain' in Pontypool in Gwent.⁷⁶ When the Stourbridge canal was built in the later eighteenth century, 'a portion of the artificial "cut" which Yarranton [had] made on a difficult stretch of the river' was incorporated into the canal.⁷⁷ The scheme was thus actually implemented, and was not entirely abortive. We shall now explore the processes of negotiation through which this 'project' was turned (partially) into reality.

⁷⁶ Peter J. Brown, 'Andrew Yarranton and the British Tinplate Industry', p. 45. See also King, 'Wolverley Lower Mill', p. 110; F. W. Gibbs, 'The Rise of the Tinplate Industry – III. John Hunbary (1664-1734), *Annals of Science*, 7 (1951), 43-61.

⁷⁷ G. H. C. Burley, 'Andrew Yarranton: A Seventeenth-century Worcestershire Worthy', *Transactions of Worcestershire Archaeological Society*, new ser., 38 (1961), p. 30.

Adjusting the Stour Navigation Bill:
the Parliamentary Session, May 1661- May 1662

The Stour navigation bill, which Bristol, Windsor, and Smyth submitted in May 1661, was to authorise the undertakers to make ‘locks, weares, turnepikes, penn for water, cranes, and wharfes’, ‘to amend or alter such Bridges and Highways’, to make ‘any ways, passages, foottrayles, or other conveniences for’ carrying coal and other commodities to the said rivers, ‘and to doe all other things for the better conveniencie of the sayd Rivers’. While the bill did not promise any fees to the Exchequer, it was stipulated that the three promoters and their assignees ‘for ever and noe others’ were to use river and railways ‘from the colepitts to’ the river without paying fees to them.⁷⁸ Potentially, the bill had three adverse consequences. First, the promoters might gain a *de facto* monopoly of the coal supply by taking control of both water carriage and railways. Second, the making of cuts (which was believed to lessen the speed of water) could hinder the operation of water mills vital for the local textile and iron industries. Third, the navigation scheme might compete with, and even ruin, other coal-production regions that supplied coal to Severn-side towns.⁷⁹ It could therefore provoke opposition and controversies. Should parliament continue pushing the scheme despite local concerns, these might even spill into complaint and critique of the restored government.

⁷⁸ Parliamentary Archives, London [hereafter abbreviated as PA], HL/PO/PB/1/1662/14C2n46 [Private Act, 14 Charles 2, c. 14], An Act for making navigable of the Rivers of Stower and Salwerp, and the Rivulets and Brooks running into the same, in the Counties of Worcester and Stafford’, fols. 1, 3. This is the engrossed bill, written on a vellum roll, which underwent amendments and became the official act on 22 June 1661. I have checked this against a draft act Bristol, Windsor, and Smyth had submitted to the Lords. See PA, HL/PO/JO/10/1/303, Draft of an Act for making navigable of the rivers of Stower and Salwerpe, 11 May 1661.

⁷⁹ For examples of such oppositions, see Ben Travers, ‘Trading Patterns in the East Midlands, 1660-1800’, *Midland History*, 15 (1990), 65-82. See also Willan, *River Navigation in England*, p. 44.

The Stour navigation bill underwent more than a scrutiny from MPs; it attracted opposition and support from outside parliament. Sadly, the *Commons' and Lords' Journals* for the period give very few details about the bill. The *Journals* were generally very laconic; perhaps, socially divisive controversies had to be minimised in the 'public transcript' of the post-Restoration parliament. As recent studies of public access to the parliament have warned us, however, the *Commons' and Lords' Journals* do not necessarily tell us the whole story. To begin with, those interested in legislative processes could pressure members in the lobbies and at the very doors of the Commons and the Lords.⁸⁰ This was the strategy the fifth earl of Bedford's Fen Drainage Company took in 1653; its clerk was to 'attend at the Parliament howse dore' with a petition and a map.⁸¹ George Legh, who was not an MP, also took advantage of this accessibility when seeking parliamentary support for a river navigation bill in the 1726-1727 session. He drew up a case for passing the bill, had four hundred copies printed, and paid the doorkeepers of the Houses to distribute them to MPs and other interested parties.⁸² As Chris Kyle argues, moreover, 'whilst it is no coincidence that certain Members are named to [second reading] committees, it is unwise to assume that their nominations are particularly meaningful'.⁸³ In the case of the Stour navigation bill, the earl of Bristol attended the Lords' committee

⁸⁰ Chris R. Kyle and Jason Peacey, "'Under cover of so much coming and going": Public Access to Parliament and the Political Process in Early Modern England', in Chris R. Kyle and Jason Peacey (eds.), *Parliament at Work: Parliamentary Committees, Political Power and Public Access in Early Modern England* (Woodbridge: Boydell Press, 2002), 1-23.

⁸¹ Frances Willmoth, *Sir Jonas Moore: Practical Mathematics and Restoration Science* (Woodbridge: Boydell Press, 1993), p. 113.

⁸² Willan, *River Navigation in England*, p. 31.

⁸³ Chris R. Kyle, 'Attendance, apathy and order? Parliamentary committees in early Stuart England', in Kyle and Peacey (eds.), *Parliament at Work*, p. 54.

although he was not listed as a member of it;⁸⁴ Lord Windsor, a member of the Lords, could have taken part in the Commons' second reading committee.⁸⁵ Such interventions often took place without being recorded. For the present case, however, a draft concerning the bill, an engrossed bill, several petitions, committee minutes, and the printed act survive along with a few other contemporary references to the parliamentary debates. With them we can explore how the Stour navigation bill provoked a controversy and how it was contained.

The bill passed the Lords relatively easily. On 15 May 1661, four days after the bill was first presented, it was committed to a second reading committee of twenty peers.⁸⁶ The scanty manuscript minutes of this committee suggest that the earl of Bristol and Thomas Smyth dominated its proceedings.⁸⁷ Some Shropshire coal workers were invited and allowed to testify 'what they have to object ag[ain]st the bill'.⁸⁸ Yet Bristol dismissed their concerns by presenting 'a petition [for the bill] signed with very many hands' from Worcester, Kidderminster and elsewhere. Smyth argued that the navigation scheme would give jobs to many 'workemen live all below Bewdly', and insinuated that the scheme would only 'prejudice some proprietors whose designe [it] is to set [higher] rate on coales and so oppress the

⁸⁴ PA, HL/PO/CO/1, Manuscript Committee Minutes 1, fol. 14, compared with *LJ*, vol. 11, p. 255.

⁸⁵ Edward Maunde Thompson (ed.), *Correspondence of the Family of Hatton, vol. I, 1601-1704* (Camden Society, 1878), pp. 23-24.

⁸⁶ *LJ*, vol. 11, pp. 250, 255.

⁸⁷ PA, HL/PO/CO/1, Manuscript Committee Minutes 1, fols., 1, 14-15, 18, 22. For a similar judgement, see Andrew Swatland, *The House of Lords in the Reign of Charles II* (Cambridge: CUP, 1996), p. 67.

⁸⁸ PA, HL/PO/CO/1, Manuscript Committee Minutes 1, fols., 1, 18.

country'.⁸⁹ The bill and its potential economic impact attracted attention from outside parliament. On 25 May, the Staffordshire landowner Sir Richard Leveson received a report from Andrew Newport about the progress of the committee:

There is a bill now in the Lords House for the making a brook in Worcestershire navigable betwixt Seaverne and Shirbrige [i.e. Stourbrige], that the coals there may be brought cheaper to Worcester, Gloucester, and these Lower Countreys, which will absolutely destroy all the water-sale of coals out of Shropshire, the trade of Bridgnorth and in part of Shrewsbury[.]

Newport noted that the bill would 'certainly pass the Lords House, whatever it does that of the Commons.'⁹⁰

The committee returned the bill to the Lords with few alterations. The Lords then ordered the bill to be engrossed and passed it to the Commons.⁹¹ As Newport had predicted, more rigorous scrutiny took place there. The bill was read a second time there on 5 July, and committed to a very large committee of more than one hundred and ten members, including all members from eight midland counties including Worcestershire, Shropshire, and Staffordshire.⁹² No record of its deliberations has survived, but it certainly received petitions and addresses from Worcestershire, Staffordshire, Warwickshire, and Shropshire.⁹³ Some printed

⁸⁹ PA, HL/PO/CO/1, Manuscript Committee Minutes 1, fols., 14-15.

⁹⁰ HMC, *Fifth Report of the Royal Commission on Historical Manuscripts* (2 parts, London: HMSO, 1876), pt. 1, p. 160, Andrew Newport to Sir Richard Leveson, 25 May 1661.

⁹¹ *LJ*, vol. 11, p. 291; *CJ*, vol. 8, p. 284. This engrossed bill, which was later amended, added 'riders', and became an official act kept in PA, HL/PO/PB1/1662/14C2n46, An Act for making navigable of the Rivers of Stower and Salwerp.

⁹² *CJ*, vol. 8, p. 291. The other five are Herefordshire, Oxfordshire, Nottinghamshire, Warwickshire, and Gloucestershire.

⁹³ *CJ*, vol. 8, pp. 371, 379. Because *Lords* and the *Commons Journals* did not make strict distinction between petitions and addresses, I shall use these terms interchangeably. Some scholars distinguish petition and address, pointing out that the tone of supplication that characterized petitions under the early Stuarts was not always conspicuous in addresses

addresses for and against the bill also circulated during the discussion of the second reading committee.⁹⁴ A sequence of petitions and counter-petitions was collected and printed together as a short pamphlet and circulated among MPs and others concerned.⁹⁵

This compilation suggests that petitions for and against the bill became increasingly fierce and accusatory, and that the bill came to be amended significantly when the debate became disturbingly similar to the complaints against ‘burdensome projects’ during the Long Parliament. There were three phases in the debate: before the session adjourned for the summer on 30 July, after the session resumed on 20 November, and after the second reading committee returned the bill to the Commons. Three of the five extant addresses seem to have been submitted in the early stage of the Commons’ committee, possibly before parliament adjourned. A petition in favour of the bill, *Reasons for making Navigable the Rivers of Stower and Salwerp*, argued that the dominant trade along the Severn and its tributaries including the Stour consisted of carrying such commodities as coal, iron, lead, glass, earthenware, apples, and cider. Precisely because many of these goods were heavy, it argued, making the

presented after the Restoration. See Mark Knights, *Representation and Misrepresentation in Later Stuart Britain: Partisanship and Political Culture* (Oxford: OUP, 2005), chap. 3 (esp. pp. 111-14).

⁹⁴ These printed cases might have been based on manuscript petitions that do not survive.

⁹⁵ This compilation has been found among the business letters of Samuel Baldwyn who, from 1665, became a prominent backer of the scheme. Baldwyn was one of the witnesses to the May 1661 article of agreement. See Staff. R.O., D(W)1788/P43/B10, ‘Article for the River Stower &c’; Staff. R.O. D(W) 1788/P59/B3, *Reasons wherefore the making the rivers of Stower and Salwerp navigable, in the county of Worcester, will be of great advantage unto the Country of Salop, but especially to Shrewsbury, Bridgenorth, Wenlock, Wellington, and all the Towns adjoining to the River of Severn* [1661-2]. This pamphlet also contains two more addresses: *Further reasons for making the River of Stower navigable, or an Answer to some partial Pretences, called, Reasons against making the said River Navigable dispersed by some Shropshire Coal-Masters; Reasons against the making of the River Stower navigable from the Severn below Bewdley, to the Town of Stowerbridge in the County of Worcester*. Instead of treating them as one pamphlet, I shall treat them as three different addresses and cite them separately.

rivers adjoining to the Severn navigable would decrease the cost of transportation and encourage trade.⁹⁶ The petition suggested that Severn-side towns like Worcester and Gloucester depended heavily upon coal from Shrewsbury upstream and that its price had doubled or trebled.⁹⁷ The other address added that Shropshire coal had become very expensive because the demand for coal had risen as ‘the Woods’ were ‘so greatly wasted in *Worcestershire*, by reason of the Iron-Works’.⁹⁸ The perceived scarcity of timber provided an argument for making the Stour navigable. Precisely because the Stour ran through coal production areas, it was argued that making it navigable would ‘supply Worcester, Tewksbury, and Gloucester’ with affordable coals carried from Stourbridge, while allowing Shropshire coal masters to ‘supply their own Country more plentiful and cheaper then now’.⁹⁹

If the argument in favour of the bill at this stage focused largely on the economic benefits of making the Stour navigable, a counterargument accused the promoters of seeking a destructive monopoly. The address, *Reasons against the making of the River Stower navigable*, claimed to reveal the ‘main pretence of the Undertakers or Promoters’ of supplying ‘Coals (and some other Commodities) at

⁹⁶ Staff. R.O. D(W) 1788/P59/B3, *Reasons for making Navigable the Rivers of Stower and Salwerp, and the rivlets and brooks running into the same, in the counties of Worcester and Stafford* [1661], p. 1. It further argued that doing so would allow those employed in land-carriage to be ‘converted to the improvement of Husbandry’, thereby further increasing the production of various commodities.

⁹⁷ Staff. R.O. D(W) 1788/P59/B3, *Reasons for making Navigable the Rivers of Stower and Salwerp*, p. 1.

⁹⁸ Staff. R.O. D(W) 1788/P59/B3, *Reasons wherefore the making the rivers of Stower and Salwerp navigable* [1661]. The petition referred to the instance one Mr Walker of Astley near Worcester, who bought Shropshire coals to melt cinders discovered nearby.

⁹⁹ Staff. R.O. D(W) 1788/P59/B3, *Reasons wherefore the making the rivers of Stower and Salwerp navigable*. For the perceived scarcity of timber, see Lindsay Sharp, ‘Timber, Science, and Economic Reform in the Seventeenth Century’, *Forestry*, 48 (1975), 51-79.

easier Rates than the same can be from the Coal-Works' in Shropshire.¹⁰⁰ It asserted that 'if not forced to be neglected and destroyed by this new intended project', Shropshire coal-works could produce affordable coals 'sufficient to serve all the Cities and Towns situated upon *Severn*' and its hinterland.¹⁰¹ It then suggested that the bill would ruin the Shropshire coal-works: first, the competition with the coalfields adjacent to the Stour would inevitably reduce the former's profit from the Severn trade; and second, should its profit be so lessened 'but of a fourth or fifth part [. . .] but for one Month', the continual draining of the coal-pits would no longer be affordable and the mines would 'be drowned, and so irrecoverably lost for ever'.¹⁰² The address alleged that the result would be a *de-facto* monopoly of coal supply in the Severn region:

What ever the Undertakers [of the Stour scheme] may now pretend (the *Shropshire Works* being once destroyed) it rest in their power to sell their Coals at what Rates they please, there being then no possibility of being furnished otherwise.¹⁰³

The address further insinuated that the introduction of a competitor would trigger social and economic disasters. '[P]oor Colliers and Barge-men' who subsisted by carrying Shropshire coals would 'be utterly ruined, undone, and forced to beg for a Livelihood', creating further burdens on poor relief in 'the whole Country thereabouts'. The inland coastal trade via Severn 'from and to Bristol (as to other

¹⁰⁰ Staff. R.O. D(W) 1788/P59/B3, *Reasons against the making of the River Stower navigable*, p. 3.

¹⁰¹ Staff. R.O. D(W) 1788/P59/B3, *Reasons against the making of the River Stower navigable*, p. 3. It was claimed that one hundred thousand tons of coal would be yearly produced, the base coals sold for 4s 6d, the best coals for 6s 6d per ton.

¹⁰² Staff. R.O. D(W) 1788/P59/B3, *Reasons against the making of the River Stower navigable*, p. 3.

¹⁰³ Staff. R.O. D(W) 1788/P59/B3, *Reasons against the making of the River Stower navigable*, pp. 3-4.

parts) will be lost' in consequence, because those barges carrying Shropshire coals downstream were the principal means of bringing 'up the River all sorts of Merchandizes for the supply of the Towns of *Bridgenorh* and Shrewsbury, and all *North-Wales*'.¹⁰⁴ Thus, having presented the protection of Shropshire coal work as a major *public* concern, the address prayed that the passage of the bill be suspended until a special commission was set up and its members visited Shropshire and Worcestershire to examine the issue at first hand, 'as may most tend to the welfare and good of the Country in general, without respect to the Interest of particular persons.'¹⁰⁵ The address did not go so far as to name individual promoters as destructive 'projectors' and 'monopolists'. But, clearly, the petitioners' accusation that they would create a monopoly echoed specific stereotypes about the ultimate aims of 'projectors'.

Shortly after the parliamentary session resumed on 20 November, the second committee received 'the petitions of the several Inhabitants of the several Counties'.¹⁰⁶ These included *Further reasons for making the River of Stower Navigable, or an Answer to some partial Pretences, called, Reasons against making the said River Navigable dispersed by some Shropshire Coal-Masters*. As the title suggests, the supporters of the bill now joined the blame game. It claimed that the counter-address exaggerated the geographical spread of the inland coastal trade along the Severn, and overstated the potential damage that might incur from competition with the coal work up the Stour. It then argued that competition among coal

¹⁰⁴ Staff. R.O. D(W) 1788/P59/B3, *Reasons against the making of the River Stower navigable*, p. 4.

¹⁰⁵ Staff. R.O. D(W) 1788/P59/B3, *Reasons against the making of the River Stower navigable*, p. 4.

¹⁰⁶ *LJ*, vol. 11, p. 327. The order was made on 7 December 1661.

producers between the Stour region and Shropshire would not lead to the inevitable decline of the latter. The address maintained that ‘the great decay of Wood, [and] the now general approved use of Coal’ was such that ‘in all probability both places might finde Customers sufficient for their Coals’ as long as they were sold ‘at any reasonable rate’.¹⁰⁷ On this account, the supporters of the bill reversed the accusation and blamed the opponents of the bill for seeking to monopolise the Severn-side coal trade:

The Authors [i.e., Shropshire coal masters] have now the sole power in their hands (which they are loth to lose) to abuse the Countries, and therefore from experience of themselves conclude, that the Undertakers [of the Stour navigation] may abuse them also [. . .]¹⁰⁸

This replication to the counter-address invited a rejoinder from those who opposed the bill.¹⁰⁹ By suggesting that the allegation of overstatement and exaggeration was in itself an overstatement, the opponents of the bill now argued that the ‘persons of great worth and Honour’ who promoted the Stour scheme ‘have hitherto proceeded upon the bare information of others, who chiefly designe their own advantage more than the publique good.’¹¹⁰ Asking why the proposal from Shropshire coal masters (to send special commissioners to the competing coal production regions) had been rejected, the petitioners again generally denounced ‘the private Interest of the Undertakers thereof’. But significantly, as petitioners under

¹⁰⁷ Staff. R.O. D(W) 1788/P59/B3, *Further reasons for making the River of Stower navigable*, p. 2.

¹⁰⁸ Staff. R.O. D(W) 1788/P59/B3, *Further reasons for making the River of Stower navigable*, p. 2.

¹⁰⁹ *Answer as well to a paper, entituled Reasons wherefore the making navigable of the rivers Stower and Salwerp [. . .] As also to another paper, intituled, An answer to some partiall pretences, called, reasons dispersed by some Shropshire coal masters [1661?].*

¹¹⁰ *Answer as well to a paper, entituled Reasons wherefore the making navigable of the rivers Stower and Salwerp.*

Charles I would have done, they now named Lord Windsor as a promoter of a nefarious ‘project’:

If this project be of that benefit to the Countrey as is pretended, and doth not rather respect the private Interest of the Undertakers thereof. It had been but reason for the Lord *Windsor* and others (in stead of rejecting) to have complied with the Proposition to them made by the *Shropshire* Coal Masters before the late adjournment of the Parliament, which was, That, Commissioners being Members of Parliament of the Honourable House of Commons for the Counties concerned, might have been appointed during their adjournment, to have viewed both places, and to have reported their sense of the whole matter to the House, by whose Judgement the *Shropshire* Coal-Masters would have been content to h[ave?] stood or fallen[.]¹¹¹

By the time petitions such as this had begun attacking individuals, the bill was causing a stir in Worcestershire. Charles Lyttleton reported in September 1661 that ‘a greate many countrey men who were concerned in his [Windsor’s] water worke’ gathered in front of his house in Kidderminster, ‘cry[ing] out mightily at the prejudice they thinke they shall sustain by it’.¹¹² As studies on eighteenth-century enclosure and turnpike legislations demonstrate, responses to economic legislation could take various forms, from formal petitioning, informal lobbying to violent protests and threatening letters.¹¹³ Yet despite the local tensions and petitions against the bill, Windsor was reportedly ‘resolvd to proceede, it being a publike act, to get an act passe for it.’¹¹⁴

¹¹¹ *Answer as well to a paper, entituled Reasons wherefore the making navigable of the rivers Stower and Salwerp*. Smyth was also named earlier in the address.

¹¹² Thompson (ed.), *Correspondence of the Family of Hatton, vol. I, 1601-1704*, pp. 23-24.

¹¹³ J. M. Neeson, *Commoners: Common Right, Enclosure and Social Change in England, 1700-1820* (Cambridge: CUP, 1993), pp. 262, 272; Michael Freeman, ‘Popular Attitudes to Turnpikes in Early Eighteenth-Century England’, *Journal of Historical Geography*, 19 (1993), esp. pp. 33, 44-45. See also Willan, *River Navigation in England*, pp. 28-51; Eric Pawson, *Transport and Economy: The Turnpike Roads of Eighteenth-Century Britain* (London: Academic Press, 1977), pp. 118-19; David Lindley, *Fenland Riots and the English Revolution* (London: Heinemann, 1982), pp. 258-59.

¹¹⁴ Thompson (ed.), *Correspondence of the Family of Hatton, vol. I, 1601-1704*, pp. 23-24.

Members of parliament could have followed the early Stuart monarchs in pressing controversial schemes like this, emphasising its contribution to the public good (as Windsor seems to have done). Yet as the debate echoed earlier denunciations of ‘burdensome projects’, MPs sought to safeguard existing economic interests from the scheme’s potentially adverse impacts. Amendments to the engrossed bill reveal that the compromise came not initially from the promoters, but from others. On 22 February 1662 the committee’s report was debated in the Commons, and MPs voted on four certain provisos. One of them was dropped, one passed without amendment, and two others passed with amendment. The latter two provisos were specifically designed in response to the Staffordshire and Warwickshire petitions.¹¹⁵ Although MPs rejected the Shropshire coal masters’ call for a special committee, these provisos were designed to prevent the promoters of the navigation work from raising the price of coals ‘as they please’, which was what Shropshire coal masters feared. Such a *de-facto* monopoly of coal supply would come about only if the promoters of the Stour scheme purchased coal in bulk, sold it cheaper by using the river carriage that they controlled, and ruined their competitors. So, ‘for the better furnishing’ of these areas ‘with Coals at the usual rates as formerly’, the provisos banned the undertakers from buying coals from major local coal production sites adjacent to the Stour and Salwerpe, whenever the price went ‘above the rate that Coals are now sold at’.¹¹⁶ These provisos, prepared by the committee, did not specify who would determine the ‘normal prices’. Accordingly,

¹¹⁵ *CJ*, vol. 8, p. 371. *Commons’ Journal* does not record who exactly in these counties raised such concerns.

¹¹⁶ Staff. R.O., D(W)1788/P45/B14, An Act for the making Navigable of the Rivers of Stower and Salwerpe, and the Rivulets and Brooks running into the same in the Counties of Worcester and Stafford (14 Charles 2, c. 14) (1662), sig. E-[Ev]. This printed act is not catalogued in the *ESTC*.

MPs inserted a clause declaring that the promoters of the scheme could not decide this 'normal price'. Instead, independent commissioners 'shall from time to time have power hereby to settle and appoint' the 'usual rates' of coal in question.¹¹⁷

The second reading committee also considered a petition from Worcestershire clothiers. Although it does not survive, Shropshire coal masters mentioned the clothiers' concerns to highlight the economic disadvantages of the Stour navigation scheme: 'What prejudice may redound to the Trade Clothing in *Worcester* [. . .] if their many Fulling-Mills upon the River *Stower* shall suffer from want of Water?'¹¹⁸ After receiving these petitions, the committee added a proviso to the engrossed bill. It stipulated that the promoters 'shall not [. . .] make any Trench or River for conveying of any Water from a place called Hucks Pound', a pond which presumably played a vital role in providing sufficient water for clothiers' mills. The proviso also demanded that, 'without the [prior] consent of' the Worcester Company of Clothiers, no navigation should be done which 'may be prejudicial onto' the operation of the fulling mills by the river.¹¹⁹ As the promoters of the bill later suggested, the proviso was 'directed by the Clothiers of *Worcester*, and drawn by their Council'.¹²⁰

Parliament's safeguarding of local economic interests went further than the protection of clothiers. In the engrossed bill composed at the end of the Lords' session, the promoters were made liable to damages they caused 'by the cuttinge or

¹¹⁷ Compare *CJ*, vol. 8, p. 371 with Staff. R.O., D(W)1788/P45/B14, *An Act for making navigable of the Rivers of Stower and Salwerpe* [printed], sig. E-[Ev].

¹¹⁸ Staff. R.O. D(W) 1788/P59/B3, *Reasons against the making of the River Stower navigable*, p. 4.

¹¹⁹ Staff. R.O., D(W)1788/P45/B14, *An Act for making navigable of the Rivers of Stower and Salwerpe* [printed], sig. [Dv]-[D2].

¹²⁰ Staff. R.O. D(W) 1788/P59/B3, *Further reasons for making the River of Stower navigable*, p. 2.

other ways damnifying of their lands or tenements'.¹²¹ This clause, however, received an extensive revision by the time the Commons agreed to pass the bill. Now, thanks to the interventions from interested parties, the bill now specified a wide range of damages for which the promoters would have to pay compensation:

the cuttinge or other ways damnifying [insertion] or abating the present value profits or advantages [insertion ends] of their lands or tenements, [insertion] or farmes, cournmills, ironmills, and other mills, forges, and other things whatsoever, or in any prejudice obstruction or losses that may happen in fulling white cloathes to any person or persons whatsoever employed or trading therein [insertion ends].¹²²

These emendations indicate that the Commons were seeking to encourage the navigation scheme (that would bring manifold economic benefits), without giving the impression of neglecting or exacerbating local 'grievances'. If we recall that the Lords' overriding of local concerns, and Windsor's determination to press on with the controversial bill, it was not unthinkable that Windsor and his fellow promoters could have justified the scheme as public service. There was a real possibility in this case of repeating the imposition of controversial schemes, something early Stuart projectors had allegedly done. The new regime, however, was anxious to uphold its legitimacy by depicting itself as a defender of commercial prosperity.¹²³ Parliament's handling of the Stour bill therefore adds to the argument of the last chapter, and gives us another striking example of effort by the newly restored

¹²¹ PA, HL/PO/PB1/1662/14C2n46, An Act for making navigable of the Rivers of Stower and Salwerp, fol., 2.

¹²² I have confirmed these insertions by comparing the original roll and the printed act. See PA, HL/PO/PB1/1662/14C2n46, An Act for making navigable of the Rivers of Stower and Salwerp, fol., 2, and Staff. R.O., D(W)1788/P45/B14, *An Act for making navigable of the Rivers of Stower and Salwerpe* [printed], sig. [B2]. For a similar amendment, see the printed private act (ibid., sig. [D2]) with PA, HL/PO/JO/10/1/303, Draft of an Act for making navigable of the rivers of Stower [Stoure] and Salwerpe [Salwarpe], 11 May 1661, [Provisoe to the Bill for Salwerepe & Stower].

¹²³ See Chapter Three.

monarchical government to accommodate local economic interests when backing new economic schemes such as the Stour navigation. Importantly, because the moot point was the safeguarding of local interests from adverse impacts of the navigation scheme, the feasibility of the scheme and the trustworthiness and competence of its promoters were of secondary concern throughout the parliamentary debate. They were assumed rather than examined.

Another reason for this could be the Commons' lack of immediate financial stake in the scheme. As Eric Ash points out in his study of the rebuilding of Dover Harbour under Elizabeth, promoters' trustworthiness and competence were important for Cecil and other Councillors because the technical challenge of the rebuilding was an unprecedented task, and because there was no reliable method to identify whose technical expertise could be relied upon.¹²⁴ I would add, however, that experts' claims for credibility, competence, and the feasibility and cost-efficiency of their plans mattered because the Elizabethan statesmen assumed final authority upon the scheme and paid for its execution. In the case of the Stour navigation, by contrast, parliament had no financial stake or decision-making power upon the project; all it had to do was to authorise the promoters to carry out the scheme at their risk and charges. This is another reason why the Commons focused on the question of safeguarding. If we are to explore how large-scale undertakings came to solicit legislative approval, therefore, we need to take interest politics into account, broadening our perspective beyond the discussion of promoters' self-presentation.

¹²⁴ Eric H. Ash, *Power, Knowledge, and Expertise in Elizabethan England* (Baltimore: Johns Hopkins U.P., 2004), pp. 55-57.

Fraud, Business Failure, and the Maintenance of Credit-lines

The available evidence about the Stour case is so rich that it enables us to move beyond the discussion of the *initial negotiation* of a post-Restoration river navigation scheme, and analyse its *implementation*. What preoccupied the promoters during the scheme's implementation? Here I will use the case study to suggest that there was a pervasive concern to maintain liquidity and maintain their and the scheme's creditworthiness.

The maintenance of credit-lines was one of the most important tasks that backers and their undertakers had to handle throughout the implementation of large-scale undertakings like the Stour navigation. As Craig Muldrew has shown, the lack of specie and limited liquidity was a pervasive problem in early modern England.¹²⁵ This caused acute problems especially for large-scale enterprises because they had large overheads. The undertakers of the Stour navigation had to depend upon credit when they bought timbers and bricks from local merchants, or when they employed workmen to cut the river or make boats and wooden railways. For example, the clothiers John and Robert Willmot agreed to receive forty pounds annually for the damages to their fulling-mills at Mitton by the Stour. The same sum was to be 'raised by two pence p[er] tunne for every tunn that shall goe through the first lock below Hookes pound'.¹²⁶ Ideally, lines of credit would help make good progress and soon bring a profit, which would sustain the credit of the scheme. Yet should the partnerships fail to perform at the expected level, then confidence in the

¹²⁵ Craig Muldrew, *Economy of Obligation: The Culture of Credit and Social Relations in Early Modern England* (London: Macmillan, 1998).

¹²⁶ Staff. R.O., D(W)1788/P59/B3, A copy of the agreement with John and Robert Willmott, 2 Oct. 1666. See also Staff. R.O., D(W)1788/P61/B5, Windsor's note to Mr. Street, 1 Jul. 1670.

project would be damaged and credit-lines of investment would be lost. And should the credit-lines be so damaged, then fewer and fewer people would be willing to maintain or enter into partnerships, thereby making it more difficult to take measures to restore the project's financing to its previous level. This was exactly what happened to the Stour navigation scheme.

So far, historians of science and technology have very rarely linked their discussions about credibility and expertise to social historical accounts of financial credit. Simon Schaffer's works are notable exceptions; but his analysis assumes that credit in natural philosophy and credit in the commercial sphere were interchangeable.¹²⁷ As a result, it has not been entirely clear whether trusting experts' knowledge and ingenuity entailed trusting their probity. The implementation of the Stour navigation scheme enables us to explore the interface between the two, and clarify why maintaining credit-lines was both difficult and indispensable. Backers might have trusted undertakers' technical competence, but they could not readily trust their money to undertakers. As a result, cash reserve for an undertaking was often very limited, and consequently, it became extremely difficult to execute large-scale undertakings without piling up debts, and concerns about credit and reputation became pervasive.

Throughout the seventeenth century, river navigation schemes and other large-scale enterprises often led to financial disaster. This was one of the reasons why backers were usually reluctant to hand over their money and why the maintenance of

¹²⁷ Simon Schaffer, 'Defoe's Natural Philosophy and the Worlds of Credit', in John Christie and Sally Shuttleworth (eds.), *Nature Transfigured: Science and Literature, 1700-1900* (Manchester: Manchester U.P., 1989), esp. p. 28; idem, 'A Social History of Plausibility: Country, City and Calculation in Augustan Britain' in Adrian Wilson (ed.), *Rethinking Social History: English Society 1570-1920 and its Interpretation* (Manchester: Manchester U.P., 1993), pp. 137-41; idem, 'The Show that Never Ends: Perpetual Motion in the Early Eighteenth Century', *British Journal for History of Science*, 28 (1995), pp. 183-84.

credit-lines became an ongoing issue. While river navigation was sometimes funded by local assessments, promoters themselves often paid from their purse or borrowed upon credit to their ruin.¹²⁸ Profits from tolls were often dwarfed by the cost of removing gravel, widening the river, making trenches, and making locks and sluices using expensive timbers. In his *Worthies of England* (1662), Thomas Fuller related that John Morton, Bishop of Ely (1479-85), and later archbishop of Canterbury, ‘almost wasted his estate, by cutting a *water-passage*, (known by the name of the *New Leam*) & welnigh beggared himself’.¹²⁹ The reader was reminded that even competent and sincere promoters could fail in their projects when lacking ‘*assistants, or purses, performance of pay* to people employed therein.’¹³⁰

There were contemporary examples too. The Wey navigation, for example, was initiated by Richard Weston in the 1630s and eventually completed by his son and his associates in 1653. This was accomplished, in Willan’s words, ‘by the simple method of not paying for it.’ When Chief Justices and the Chief Baron of the Exchequer intervened to settle the disputes in the early 1670s, the total claims for unpaid debts amounted to £67,478.¹³¹

The Avon navigation work William Sandys began in the late 1630s highlighted the danger that one could waste an estate because of fraudulent agents. Sandys purportedly spent ‘above 40,000’ pounds, and borrowed ‘great part’ of it from various investors. Some of them (including the debts to the crown) had remained

¹²⁸ Willan, *River Navigation in England*, p. 66.

¹²⁹ Thomas Fuller, *The history of the University of Cambridge* (1655), p. 70.

¹³⁰ Fuller, *history of the University of Cambridge*, p. 70.

¹³¹ Willan, *River Navigation in England*, pp. 69-70 (quotation from p. 69). It is not clear who was held responsible for this huge debt. Willan gives numerous examples of financial disaster. See *ibid.*, chap. 4.

unsatisfied even after the Restoration.¹³² The unpaid debts were, Sandys claimed, partly due to the fraud of his agent who falsely claimed ‘some thousands of pounds’ more than he had actually spent.¹³³ Sandys nearly suffered ‘tedious, chargable, & unhappy processes’ of debt litigations. Lord Windsor must have been familiar with the story because he was seeking to confiscate the ownership of the Avon navigation works from the fraudulent agent.

Arguably, for some wealthy aristocrats, the loss of several hundred (if not a few thousand) pounds would not have undermined their estate. Even so, being led away to waste money was not a commendable form of conspicuous consumption. For example, a Shropshire landowner, Sir John Weld, advised his son not to ruin the family by ‘searching for coals’, and by being ‘led away by colliers or miners or projectors, whose fair speech is but to get themselves money.’¹³⁴ When negotiating the Stour navigation bill with the earl of Bristol in 1661, Thomas Smyth found ‘him [to] have a deafe care to monie and faime; hee would have them but not pay for them’.¹³⁵ Bristol was perhaps being greedy as much as being cautious. In any case, even this eminent aristocrat was not necessarily gambling his money in the Stour scheme.¹³⁶ Maintaining credit-lines could not have been easy partly because of the

¹³² TNA, SP 29/66/160, ‘Petition of William Sandys esq., against Lord Windsor’s move to make the Avon navigable’, [1662?].

¹³³ TNA, SP 29/66/160, ‘Petition of William Sandys esq., against Lord Windsor’s move to make the Avon navigable’, [1662?].

¹³⁴ Quoted in Felicity Heal and Clive Holmes, *The Gentry in England and Wales, 1500-1700* (Basingstoke: Macmillan, 1994), pp. 120-21.

¹³⁵ TNA, SP 29/44/21, Thomas Smyth to Andrew Yarranton, 7 Nov. 1661.

¹³⁶ So we must guard against bluntly equating aristocrats’ business involvement with gambling. For an influential example of such an equation, see Lawrence Stone, *Crisis of Aristocracy, 1558-1641* (Oxford: Clarendon, 1965), pp. 381-84. *Pace* Stone, historians of gambling have begun to discover that gambling was not necessarily an uncontroversial form of conspicuous consumption among gentlemen and aristocrats. See Nicholas Barry Tosney,

backers' caution.

Other factors also complicated the task of maintaining credit-lines. As Julian Hoppit has shown, in order to pay on time, it was crucial to synchronise the timing of payments.¹³⁷ But this often proved very difficult and even sound schemes and competent merchants could fail because of this. The complex nature of business partnerships and the lack of systematic accounting procedures exacerbated the situation. The Stour navigation scheme involved not only the digging up of the river and the cutting of new waterways, but also making and maintaining of locks, vessels, wooden rails and wagons. Those activities in turn entailed transactions with coal masters, timber merchants, wagon-men, carpenters, as well as with wage-labourers and those who were entitled to compensation. Such multi-faceted operations generated such a sheer amount of deeds and articles of agreements that in 1670 Yarranton proposed to tidy up the complex partnership in order 'to p[re]vent Confusion for the future'.¹³⁸ Of course, the later seventeenth century saw innovations in accounting practice, and the Foleys, who were involved in the tinplate enterprise associated with the Stour navigation, kept very extensive and systematic accounts of their extensive iron manufacturing.¹³⁹ Yet, the Stour navigation had no overall account book that would have systematically tracked the expenditure. Instead, small pieces of paper of various sizes were sent back and forth between partners as

'Gaming in England, c. 1540-1760' (Ph. D thesis, University of York, 2008), pp. 265-66. I wish to thank him for discussing the matter with me.

¹³⁷ Julian Hoppit, *Risk and Failure in English Business, 1700-1800* (Cambridge: CUP, 1987), pp. 166-68.

¹³⁸ Staff. R.O., D(W)1788/P61/B5(a), 'Cap. Yarr proposal', Mar. [1670?].

¹³⁹ R. G. Schafer (ed.), *A Selection from the Records of Philip Foley's Stour Valley Iron Works 1668-74*, 2 vols, Worcestershire Historical Society, new series, 9, 13 (1982, 1990), vol. 1, pp. xi-xv, 34-38.

receipts of money.¹⁴⁰ The task was further complicated because each partner assigned and sold off part of his agreements to others, and because, as now, legal documents were full of ambiguities and cumbersome details. So, in the absence of an organised method, backers and undertakers had to struggle to understand where and how debts were incurred, when the money had to be paid, and who should be responsible for paying them.¹⁴¹

It is useful to juxtapose trusting one's money in schemes like the Stour navigation and trusting 'matters of fact' in scientific circles. Philosophers and virtuosi in the Royal Society and the wider 'republic of letters' might have found it prudent to *avoid* questioning others' integrity or competence as much as possible.¹⁴² By contrast, those who trusted their money to business partners or accepted others' credit had stronger reasons to assess and reassess their partners' creditworthiness.¹⁴³ For example, they might prove dishonest, and equally importantly, they might not be able to synchronise their debt obligations under certain circumstances. We shall now explore how caution and healthy scepticism, rather than civility, prevailed throughout the implementation of the Stour scheme. Doing so will illuminate protracted negotiations through which the scheme was partially turned into reality.

¹⁴⁰ These receipts are now scattered across different bundles in Staff. R.O., D(W)1788.

¹⁴¹ Staff. R.O., D(W)1788/P61/B5, Dec. 2 1671.

¹⁴² Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-century England* (Chicago: University of Chicago Press, 1994), chap. 7.

¹⁴³ Muldrew, *Economy of Obligation*, chap. 7 (esp. pp. 173-85).

'The Want of Monies':
Losing Credit-lines and its Consequences

The interlocking problems of (the lack of) trust between partners and the difficulty of maintaining credit-lines was visible even before the work began. Once the scheme was put into execution, these problems became significant obstacles for the management of the scheme. When those involved failed to pay creditors and workers on time, far-reaching consequences followed. Contractors were imprisoned; new partners could not be found; local riparian landowners obstructed the passage of barges; and the reputation of those involved fell. We will explore these events as they happened, paying close attention to the two years from the end of 1665, for which we have rich evidence. We will also examine how contractors from middling social strata viewed the struggles they encountered in turning an economic 'project' into reality. We will end the case study by considering what the vast amount of money poured into this scheme tells us about the nature of the trust between backers and undertakers.

As we have seen, Windsor and Bristol were originally the financial backers, and Smyth was the manager of the scheme.¹⁴⁴ While their roles were thus clearly differentiated, they were to become equal partners to 'have, receive and take the proffitts and advantages' of the navigation, once the river was made navigable with new locks and cuts.¹⁴⁵ The available evidence does not allow us to explain why the parties chose this particular form of contract. Yet, the initial contract of 1661 clearly shows that Bristol and Windsor tried to minimise the risk of losing their money on

¹⁴⁴ Not much has been done to examine the financial *negotiations* involved in river navigation schemes. See, for example, Willan, *River Navigation in England*; Baron F. Duckham, *The Yorkshire Ouse: the History of a River Navigation* (Newton Abbott: David & Charles, 1967).

¹⁴⁵ Staff. R.O., D(W)1788/P43/B10, 'Article for the River Stower &c', 10 May 1661.

the scheme, consequently making the scheme rely heavily upon credit-lines.¹⁴⁶

First, the agreement appointed Sir John Winford, a Worcester JP and ex-royalist, as local agent for dispatching the money to the undertakers.¹⁴⁷ Winford had a manor in the parish of Astley where Yarranton was from, and had probably a close relationship with his fellow royalist Windsor.¹⁴⁸ Because investors did not always have direct control over the scheme's daily transactions, local agents could cheat them by exaggerating expenses or understating profits (as Sandys's agent had done). Employing an acquaintance living near the place where transactions took place not only lifted some burden from Smyth (who was a London lawyer), but also served to prevent embezzlement.¹⁴⁹

Second, the backers' investment was retrospective and incremental. According to the initial arrangement, Windsor and Bristol did not have to raise a farthing upfront 'to be payed issued out and disposed of to such workemen labourers and servants' working for the scheme. Once Smyth and his undertakers had made three miles of the Stour and two miles of the Selwerpe navigable, then Windsor and Bristol were to pay one sixth (£250) of the total investment of £1,500 for the first instalment. In the second instalment after two thirds of the Stour and one more mile of the

¹⁴⁶ Here the notion of risk is used simply as an *analytical* concept to aid our discussion. For the discussion of risk as an *historical entity* reflected in the history of insurances, see Lorraine Daston, 'The Domestication of Risk: Mathematical Probability and Insurance 1650-1830', in Lorenz Kruger, Lorraine J. Daston, and Michael Heidelberger (eds.), *The Probabilistic Revolution* (2 vols, Cambridge, Mass.: MIT Press, 1987), vol. 1, 237-60.

¹⁴⁷ Staff. R.O., D(W)1788/P43/B10, 'Article for the River Stower &c', 10 May 1661.

¹⁴⁸ Willis Bund et al. (eds.), *Victoria County History, Worcestershire*, vol. 4, p. 232.

¹⁴⁹ Winford played a similar role in subsequent contracts. See Staff. R.O. D(W)1788/P61/B6, 'A copy of Mr Wilmots agreem[en]t', 11 Apr. 1667; Staff. R.O. D(W)1788/P59/B3, Windsor to [neither Samuel Baldwyn nor Bristol?], [1670?].

Selwerpe were finished, each backer was to pay £500.¹⁵⁰ Smyth (or rather his agents like Yarranton) first had to demonstrate their competence and the feasibility of the scheme. They were the ones who had to proceed 'att their proper Costs and Charges' in the first instance, paying workmen by themselves or borrowing from others, upon the promise that their backers would discharge the money as arranged.

Third, Windsor and Bristol did not have to pay half of the agreed sum (£750). That was to be deducted from clear profits of the navigation project.¹⁵¹ So the backers limited the amount of cash to be disbursed from their coffers. The arrangement allowed Smyth to pool a proportion of profit raised from tolls and other transactions for further investment. This in theory would secure a degree of liquidity. Yet such an arrangement made credit-lines contingent upon steady profit. Worse, the scarcity of cash meant that men like Yarranton also forced their counterparts to pay by themselves in the first instance, and paid only part of what was due and make them 'take the rest out of the [forthcoming] proffits'.¹⁵² So when profit was not forthcoming and the backers were unwilling to invest, the credit of undertakers would be extended beyond limit and the scheme would, as we shall see, come to a standstill.

Smyth failed to complete the navigation from Stourbridge to the Severn within the two years stipulated by the initial agreement. In December 1665, the work between Kidderminster and the Severn had not yet been finished.¹⁵³ As has been

¹⁵⁰ Staff. R.O., D(W)1788/P43/B10, 'Article for the River Stower &c', 10 May 1661.

¹⁵¹ Staff. R.O., D(W)1788/P43/B10, 'Article for the River Stower &c', 10 May 1661.

¹⁵² See for example, Staff. R.O., D(W)1788/P59/B3, Yarranton to Baldwyn, 30 Dec. 1667. Such a deal was possible presumably because others needed Yarranton's experience and expertise.

¹⁵³ Lewis, *Early Wooden Railways*, p. 245.

stated earlier, Samuel Baldwyn joined as a major backer at this point. The remaining task was to complete the unfinished work by raising profits in other aspects of the scheme such as selling coal and raising tolls from the navigable part of the river.

Windsor and Baldwyn were probably requested to disburse certain sums on a regular basis so that Yarranton and other lesser partners could use them to pay for various aspects of the navigation works. Within fifteen months, however, it was reported that the undertaking had incurred debts of at least about £300.¹⁵⁴ We have already noted the widespread problems of synchronising credits and managing accounts. These tasks became even more difficult because Windsor, one of the key backers, refused to pay any more. One of the reasons was organisational. Some time in early 1667 Baldwyn reported that 'Windsor doth now refuse to lay out any more money to finish the River Stower and to make a trade upon the same unlesse the other Partners will agree to make a division & Partition of the River' so that 'each Partner may know his p[ar]ticular division upon that River'.¹⁵⁵ It could be that Windsor was becoming unwilling to invest more unless the complicated partnership was better organised.

More importantly, Windsor only partially trusted Yarranton and others; this was another reason for the stop of his payment. Windsor admitted that 'I am contented that Mr Yarrington should mannage the River';¹⁵⁶ presumably, Windsor had accepted Yarranton's technical and managerial competence, and initially paid a fixed salary.¹⁵⁷

¹⁵⁴ See Staff. R.O., D(W)1788/P61/B7, 'Mr Yarrantons note of moneys due upon the account of the navigation to workemen', 25 Mar. 1667.

¹⁵⁵ Staff. R.O., D(W)1788/P59/B3, 'Mr Baldwyns Case', [Feb.-Jul. 1667?].

¹⁵⁶ Staff. R.O., D(W)1788/P61/B7(f), Windsor to Baldwyn, 2 Feb. 1667.

¹⁵⁷ Undertakers like Yarranton paid for their transactions first, and their 'salaries' presumably included remuneration.

But, at the end of 1666 Windsor refused to pay him on a regular basis:

hee should have the conduct of the whole Trade, but I would grant no more certaine salaries, but allow him so much oute of each pound of the Cleer proffitts[.]¹⁵⁸

Windsor had discovered from one of his partners that it was likely that Yarranton had deliberately neglected his supervisory role for some time so that other partners ‘att last finde a necessity of taking him to manage the whole trade, which hee would doe for a good salary’.¹⁵⁹ Inflating the value of one’s expertise was a common strategy. (We have seen that Cressy Dymock skilfully present his ‘special secrets’ to make advantageous contracts.)¹⁶⁰ In the present case, it led Windsor to demand that Yarranton perform his duty first, a caution that Robert Cecil, for example, had exercised when backing Walter Morrell’s New Drapery scheme.¹⁶¹

Strikingly, moreover, Windsor was also unwilling to trust Yarranton’s ‘faire words’. Windsor told Baldwyn:

Sir, I have received yo[u]r letter where in you designe to incourage mee to lett Mr Yarrington mannage the River, from whence I perceive his faire words hath once more gained credit with you, but I am so consatisfied [i.e., dissatisfied?] with his Dealing[.]¹⁶²

Yarranton (and his own business partners) frequently tried to reassure investors that bearing financial ‘incumbrances’ would later lead to a healthy return. In 1670

¹⁵⁸ Staff. R.O., D(W)1788/P59/B3, Windsor [to Baldwyn?], 26 Dec. 1666.

¹⁵⁹ Staff. R.O., D(W)1788/P59/B3, Windsor [to Baldwyn?], 26 Dec. 1666.

¹⁶⁰ See Chapter Two.

¹⁶¹ Michael Zell, ‘Walter Morrell and the New Draperies Project, c. 1603-1631’, *Historical Journal*, 44 (2001), p. 658. See also William Cecil’s administration of patents discussed in Deborah E. Harkness, *The Jewel House: Elizabethan London and the Scientific Revolution* (New Haven: Yale U.P., 2007), p. 153. For similar examples from the Stour case, see Staff. R.O., D(W)1788/P59/B3, Windsor to [Baldwyn?], [1670?]; Staff. R.O., D(W)1788/P61/B7(a), George Skyppe to Baldwyn, 16 Jan. 1680.

¹⁶² Staff. R.O., D(W)1788/P61/B7(f), Windsor to Baldwyn, 2 Feb. 1667.

Windsor sceptically commented on just this kind of 'faire words':

that the river is free from all incumbrances except the rents, and the rent charges to Mr Streets Mr white and yarrington [and William] Ierego, is to[o] easy to be believed because no person as I know of would venture mony upon it but ourselves[.]

Windsor was also concerned about the possibility of being cheated. Speaking of the arrangement to divide equally the profit made out of tolls among partners, Windsor pointed out that Yarranton and his partners promised 'They will finde all boats et[c] [. . .] but who shall judge of the number'.¹⁶³ Windsor suspected that because Yarranton and his employees would be the one who levied tolls at the river, they might embezzle the profit by underestimating the number of boats. Underrating the real profit was precisely how Sandys's contractor had defrauded him upon the Avon navigation scheme. Given the parallels we have found with other cases, Windsor was arguably not unusual in exercising such caution when investing his money.

Windsor also had more specific reasons to be wary. Yarranton accused him of committing 'great erers in the management', and pointed out that 'the Countrey are not satisfied in his late Actinges and his bad pay'.¹⁶⁴ Yarranton even secretly tried to persuade Baldwyn to rearrange a contract so that he could oust Windsor from his managerial role.¹⁶⁵ Windsor had come to know about this from one of the partners.¹⁶⁶ Surely this would have reinforced Windsor's suspicion.

All this resulted in the serious lack of liquidity. Lord Windsor was, Yarranton

¹⁶³ Staff. R.O., D(W)1788/P59/B3, Windsor to [Baldwyn?], [1670?].

¹⁶⁴ Staff. R.O., D(W)1788/P59/B3, Yarranton to Baldwyn [n.d. between 30 Nov. and 8 Dec. 1666?]

¹⁶⁵ Staff. R.O., D(W)1788/P61/B7(a), Yarranton to Baldwyn, 30 Nov. 1666. A postscript by another partner 'intreat[ed]' Baldwyn to 'keepe this private by you and I will asiste Mr Yarranton'.

¹⁶⁶ Staff. R.O., D(W)1788/P59/B3, Windsor [to Baldwyn?], 26 Dec. 1666.

fumed on 30 November 1666, causing the 'great Confusion for want of monies' by 'not payinge any until yestaday and then but 60li.'¹⁶⁷ It is not clear whether Windsor was accused of not paying the agreed sum, or extra 'contingency' funds Yarranton and others found wanting. In any case, for Yarranton it was clear that the lack of cash was causing serious troubles: 'as to the erers of the Footrayle[,] it is in the bad management and I have provided the remedy and can put it into order when [. . .] there may be monies constantly to pay the Collyers.'¹⁶⁸ Yarranton predicated that the lack of cash injection and Windsor's bad management would cause Baldwyn to 'rune in dept and lost by Christmas at least 50li'.¹⁶⁹

Because Windsor was unwilling to trust his money, and Yarranton not willing at all to help him, the other partners were left to work using their own credit. A series of serious consequences followed. Two agents, William Leregoe and Francis Haycox, had some timber and ironware delivered and employed some workmen upon credit. They soon failed to meet their obligations as Windsor and others did not supply the cash they promised. So these agents were sued by their creditors, and by the end of 1666, they were in danger of arrest and detention in debtors' prison.¹⁷⁰ Samuel Whyte, who had replaced the lawyer Thomas Smyth as a treasurer for the scheme, also owed 'a great deale of mony in the country to worke men and others for land and Damages'.¹⁷¹ Whyte urged Baldwyn to 'set matters in some bett[e]r posture'. He warned that 'till it [the scheme] be in bett[e]r credit noe body will medle w[i]th it.'

¹⁶⁷ Staff. R.O., D(W)1788/P61/B7(a), Yarranton to Baldwyn, 30 Nov. 1666.

¹⁶⁸ Staff. R. O., D(W)1788/P59/B3, Yarranton to Baldwyn, 8 Dec. 1666.

¹⁶⁹ Staff. R.O., D(W)1788/P59/B3, Yarranton to Baldwyn [n.d. between 30 Nov. and 8 Dec. 1666?]

¹⁷⁰ Staff. R.O., D(W)1788/P59/B3, Windsor to Baldwyn, 4 May 1667.

¹⁷¹ Staff. R.O., D(W)1788/P61/B7(f), Windsor to Baldwyn, 2 Feb. 1667.

He hinted that he himself came to have doubts upon the future of the scheme; he would 'willingly leave it up to any th[a]t will manage it well for I knowe not howe'.¹⁷² Leregoe later told Baldwyn that some workmen were 'in disorder': 'Some are turned out of doors, [. . .] some of them begginge and intreatinge, others Swearinge and Cursing desiringe nothings may thrive until they are payde'.¹⁷³ In short, the credit of the scheme was lost and the transactions almost ground to a halt.

The impact of the loss of credit did not end in the danger of imprisonment or in complaints from unpaid workers. For one thing, even wealthy backers failed to persuade a clothier to help carry on the scheme. In early 1667 Yarranton travelled to Saxony to learn tinsplate making, and it was suggested that the Worcestershire clothier Robert Willmott might in the mean time take up his role as an overseer of the navigation scheme. A draft article of agreement suggests that the backers preferred to leave to Willmott 'the whole management of the navigation upon the River'. As in the May 1661 agreement, Willmott was to lay out his own money first for 'repaireing and amendinge of any thinge belonginge' to the river navigation, and later have his investment repaid with interest.¹⁷⁴

Willmott responded with utmost caution. The ironmaster Thomas Foley, who mediated the deal, told Baldwyn:

he [Willmott] is ready and willing to doe you the best Service he cann about the navigac[i]on on my speakeing to him[,] and what money you putt into his hands he will faithfully dispose of it According to your directc[i]ons the best he cann and give you a Just Account thereof [. . .]. But to engage to layout money in it or to Seale Article, that he will mannage it to the best advantage when there are soe many p[ar]tners concerned

¹⁷² Staff. R.O., D(W)1788/P61/B7(a), Whyte to Baldwyn, 2 Jan. 1667.

¹⁷³ Staff. R.O., D(W)1788/P61/B6, Leregoe to Baldwyn, 3 Feb. 1668; D(W)1788/P59/B3, Leregoe to Baldwyn, 7 May 1667.

¹⁷⁴ Staff. R.O., D(W)1788/P61/B6, draft article of agreement between Windsor, Baldwyn, Smith, Whyte and Willmott, 11 Apr. 1667.

in it he seys he is not willing to doe.¹⁷⁵

Note that Foley presented Willmott as an honest, competent replacement for Yarranton. This suggests that notions of personal trustworthiness and competence were not irrelevant to the implementation of schemes like the Stour navigation. Nonetheless, Foley's and Willmott's main concern lay elsewhere. According to Foley, Willmott alleged that the scheme in total owed 'great many hundres pounds more then the pr[e]sent 300li' which Badwyn had acknowledged.¹⁷⁶ So Willmott was concerned that, if he sealed the contract and became one of the proprietors, he could be sued by the scheme's creditors. Accordingly, Willmott wrote to Baldwyn that he would not agree to engage unless he 'shall not bee blamed for any abuse to bee donne by any that have been formerly hyred for any worke about the navigation'.¹⁷⁷ The draft contract was ambiguous about who would be held responsible if Willmott accumulated large debts for the navigation works. So he demanded that he be exempt from prosecution 'unlesse fraude or knavery apeare'. He explained he was being cautious because 'my secryty is small [. . .] and [I] have noe estate'. Pointing out his family's objection he concluded: 'I feare to borrowe: albeyt my Credit would doe yt'.¹⁷⁸

Windsor ultimately failed to make Willmott seal the contract. On 15 April 1667, Windsor wrote to Baldwyn: 'This morning, Mr Wilmott came to mee and truly I have pressed him very earnestly to have sealed to the agreem[en]t'. Windsor tried to

¹⁷⁵ Staff. R.O., D(W)1788/P61/B6, Thomas Foley to Baldwyn, 25 Apr. 1667.

¹⁷⁶ Staff. R.O., D(W)1788/P61/B6, Thomas Foley to Baldwyn, 25 Apr. 1667.

¹⁷⁷ Staff. R.O., D(W)1788/P61/B7(f), Willmott to Baldwyn, [Apr. 1667?].

¹⁷⁸ Staff. R.O., D(W)1788/P61/B7(f), Willmott to Baldwyn, [Apr. 1667?]. I will discuss this notion of 'credit' below.

reassure Willmott and even suggested a new advantageous contract. Yet, Windsor continued, he 'could not prevaile with him to doe it'.¹⁷⁹ Finally, in September 1667, Windsor, Baldwyn and others agreed to advance 360 pounds 'therew[i]th the Arreares of rent, wages, Charges, and other debts shalbe paid, boates built and repaired, and the said River of Stower put in order as farr as the same [sum of money] will extend.'¹⁸⁰

Even this was not enough to pay off all the debts, and Sir Ralph Clare, one of the riparian landowners, came to obstruct the traffic of the river. More than £100 had been overdue to him, and on 5 November 1667 he reportedly declared that 'hee will Chaine up the River in his owne grounde [so] that noe Barges shall passe up until hee is paid his damages'.¹⁸¹ 'This day wee cam downe with seaven Barges', reported Yarranton on the same day. '[B]ut when wee cam unto Kiderminster Sir Ralph Clare had chained up the lock nere his garden and would not let the Bargis pas'. It was 'about 12 of the Clock', and because 'the towne [was] full of Countrey people that take much Advantage by the passage of barges', Yarranton 'cause[d] the chaine to be brocke and put threw two barges'. Sir Ralph was apparently 'very angrey and threaten[e]d hard'. But, Yarranton excused, 'I thought that if I did not Clere theier passage that all would be nought.'¹⁸²

These episodes illustrate the serious repercussions of the backers' unwillingness to trust their money to undertakers. The lack of liquidity exacerbated the problems of

¹⁷⁹ Staff. R.O., D(W)1788/P59/B3, Windsor to Baldwyn, 15 Apr. 1667. Next month Willmot declared that 'he will not undertake or singe the Articles', Staff. R.O. D(W)1788/P59/B3, Windsor at Kiderminster to Baldwyn, 4 May 1667.

¹⁸⁰ Staff. R.O., D(W)1788/P61/B5, 'Articles w[i]th the Lord Windsor & Mr While', 13 Sep. 1667.

¹⁸¹ Staff. R.O., D(W)1788/P59/B3, Haycox and Leregoe to Baldwyn, 5 Nov. 1667.

¹⁸² Staff. R.O., D(W)1788/P61/B7(a), Yarranton to Baldwyn, 5 Nov. 1667.

maintaining and synchronising credit; consequently, some partners had to work to (or even beyond) the limit of their credit. Thus, the negotiation between Windsor and Willmott focused primarily on the possibility of finding a way to bring Willmott in without exposing him to liability for others' debts. The situation was so grave that even the future earl of Plymouth could not persuade the Worcestershire clothier with no estate to part with his cash. Moreover, the incident with Sir Ralph Clare reminds us that a failure to meet obligations could provoke informal resistance (as well as litigations); it also highlights that the partners had to keep using the river and taking tolls (despite obstructions) if they were to raise profit, pay for the completion of the works, and avoid cutting their losses.

How did those involved in the scheme understand their struggle to keep the work going and to turn a 'project' into reality? To answer this problem we shall explore some of the letters partners sent to Baldwyn. It is clear that recovering the scheme's (and partners' own) credit became an urgent issue. Their rhetoric reveals that the partners spoke virtually nothing of 'project', and that, in soliciting cash payment from their backers, they drew heavily upon the notion of 'credit'. Here, projecting culture intersected with the culture of financial credit.

In his letter written in spring of 1667, Whyte reported to Baldwyn how the operation halted because of the lack of liquidity. Few people were willing to work for the scheme and there were 'but 3 or 4 or 5 barges going' on the Stour. 'Because the Nav[igation] in their [i.e., workers'] debt, I see noe accompt given of any of our last moneys [.]' So the operation would remain halted until the debts were repaid. Furthermore, one of the undertakers, William Leregoe, had been 'lately arrested' due to insolvency and the backers' failure to provide funds, and 'people p[ro]test they would petic[i]on the Parliam[en]t'. As a middleman of the scheme, Whyte probably

witnessed this development at first hand. Thus, he wrote to Baldwyn, 'I am soe harrassed for money [. . .] th[a]t I am ready to run away, And you write of taking up money [i.e., to borrow at interest]¹⁸³ on [the profit from] the River'. Whyle claimed that the suggestion from the London-based lawyer was too optimistic: 'you cannot thinke any one or any Interest will lend iij d.' Whyle concluded: 'I weary my selfe with meluncholy, & shall infect you'.¹⁸⁴ An immediate cash injection, Whyle suggested, was the only way out. 'If we had one [solution] to manage[,] I thinke the best way were to borrowe to build Turnepikes, soe th[a]t we might see some end of pay or beginning of gain.'¹⁸⁵

The timber merchant Francis Haycox also gave an account of his losses to ask for more money:

now being by all of you totali neglected [. . .] there beeing not any person that will accept of Employment [. . .] so th[a]t the Busines is quite at a stand [. . .] I pray S[i]r bee pleased to let mee hear from you when you will order us some mony[.]¹⁸⁶

By March 1667 Haycox had accumulated debts of at least one hundred pounds related to the navigation scheme.¹⁸⁷ He had also been embroiled in 'several su[i]ts' and twice arrested for the money he owed. He wrote: 'I [. . .] have enlargd the reach of my credit beyond its usual extent [. . .] I beeing the possesor of continual Hazards

¹⁸³ See, *OED*, take, v. 93, take up.

¹⁸⁴ Staff. R.O., D(W)1788/P61/B7(f), Whyle to Baldwyn, [after Mar. 1667?].

¹⁸⁵ Staff. R.O., D(W)1788/P61/B7(f), Whyle to Baldwyn, [after Mar. 1667?]. Turnpikes meant flash locks in this context. See *OED*, turnpike, n. 3; Skempton, *Dictionary of Civil Engineers*, vol. 1, p. 810.

¹⁸⁶ Staff. R.O., D(W)1788/P61/B7(a), Haycox to Baldwyn, 7 May 1667.

¹⁸⁷ Staff. R.O., D(W)1788/P61/B7(a), 'Mr Yarrantons note of moneys due upon the account of the navigation to workemen'.

and disadvantages'.¹⁸⁸ Haycox argued that prominent backers like Baldwin had 'the greatest reason to defend their own Intrest' in keeping the scheme moving forward:

you knowe th[a]t proverb w[hi]ch I to my Greif see to much fullfilled (viz:) not to go forward is to goe bakward)[.] so is it with the river which having bin for theis 2 years but slenderly supported by the Masters who had greatest reason to defend their own Intrest[.]¹⁸⁹

Unless speedy action was taken, Haycox hinted, all the time and money Baldwin and other backers had poured into the scheme would come to nothing. When agents like Haycox and Whyte made transactions on credit, it was often unclear upon whose credit agreements were made.¹⁹⁰ This meant that Baldwin's and Windsor's reputation was constantly at stake, even when they did not give explicit consent to each transaction. Haycox accordingly made it clear that the 'Interest' he urged Baldwin to defend was not simply an economic one:

were you in the Contry to heer those clamors w[hi]ch are dayly dispersed it would certainly spur you on to revive the credit of yo[u]r names[.]

Alluding to the fact that Baldwin had not yet sent the money he had promised, Haycox also drew a parallel between trusting promises made in daily credit relations, and trusting God's promises: 'I think, if Christians had no better assurance of Celestial promises none could ever have liv[e]d by faith'. Overall, then, lesser partners employed a wide range of rhetorical strategies, but they shared a concern to recover credit-lines and expressed their desire to keep up their financial, and personal, 'credit'.

¹⁸⁸ Staff. R.O., D(W)1788/P61/B7(a), Haycox to Baldwin, 7 May 1667.

¹⁸⁹ Staff. R.O., D(W)1788/P61/B7(a), Haycox to Baldwin, 7 May 1667.

¹⁹⁰ See, for example, Staff. R. O. D(W)1788/P61/B5, a memorandum concerning the Stour navigation, 2 Dec. 1671.

Responses from backers varied too, but indicated strains arising from the loss of credit-lines. In 1667, Baldwyn told the earl of Bristol that he was considering withdrawing from the scheme altogether, because of ‘the very great Inconveniencies which he hath allready suffered & is like to suffer by continueinge a Farmer & lessee as aforsayd’.¹⁹¹ Windsor’s response to the situation was more striking, probably because he often stayed in, and travelled around, the Stour region: ‘all the Clamours of the whole Countrey comes to mee sayinge I wronge them and owe them great summe of money’.¹⁹² Even a deputy lieutenant of Worcestershire was not entirely immune from the adverse impacts of running up debts, and with them the danger of losing his reputation in his localities.

The navigation work continued despite those financial setbacks, and both Windsor and Baldwyn continued to support the scheme well into the next decade. It was recounted in the early eighteenth century that Baldwyn (and his brother) had spent £4,000; and including Windsor and other investors, £8,000 in total.¹⁹³ Why did backers continue to pay for the undertaking despite the fact that Yarranton and other undertakers were only partially trusted? As has been seen, in 1661 Windsor pushed the legislation over the Stour as a ‘public’ cause. In 1666, speaking of Baldwyn’s intention to withdraw from the scheme, Windsor upbraided him not to. Because, Windsor argued, ‘the country sees tis done and they Judge nothing can bee made of it, for they say If wee who aught best to understand it, can make no proffitts how should

¹⁹¹ Staff. R.O., D(W)1788/P59/B3, Mr Baldwyns Case.

¹⁹² Staff. R.O., D(W)1788/P59/B3, Windsor to Baldwyn, 4 May 1667.

¹⁹³ HMC, *House of Lords, 1692-1693*, 53 (London: HMSO, 1984), p. 389; Staff. R.O., D(W)1788/P59/B3, *The Earl of Plymouth’s Case* [early C18?], [one-page broadsheet not in the ESTC].

any other'?'¹⁹⁴ This may suggest that Windsor continued to invest in the scheme in order to demonstrate the feasibility and profitability of the scheme to the wider public.

A more mundane, and probably more plausible, reason is that backers like Windsor and Baldwyn tried to avoid cutting their losses. As Haycox warned, the backers had to keep investing their money and complete the works, or risk losing the money they had spent for nothing. In this respect, like canal builders in the eighteenth century and proprietors of gas companies in the nineteenth, the backers of the Stour navigation were essentially 'economic' investors, those who were ready to bear large overheads because they were interested in long-term returns.¹⁹⁵ As long as backers like Windsor and Baldwyn committed to the scheme in this way, they had ultimately no option but to keep supporting undertakers such as Yarranton and Farnolds who had the necessary skills to complete the scheme.

The backers opted to continue the work probably also because they could exude confidence and draw in more investors. George Skyppe of Herefordshire, a lawyer and an excise officer, invested £500 in the navigation works in the mid 1670s, but told Baldwyn in 1680 that he had 'relinquished my concerne in the River'. Skyppe's complaint reveals that Baldwyn was playing a kind of 'confidence game'. He had withdrawn because 'it was not likely to turne to that profitable account as I hoped it would by the encouragement I had from you & others before I was concerned in it.'¹⁹⁶

¹⁹⁴ Staff. R.O., D(W)1788/P59/B3, Windsor [to Baldwyn?], 26 Dec. 1666.

¹⁹⁵ J. R. Ward, *The Finance of Canal Building in Eighteenth-century England* (Oxford: OUP, 1974), p. 126; John F. Wilson, *Lighting the Town: A Study of Management in the North West Gas Industry* (London: Paul Chapman, 1991), pp. 84-91.

¹⁹⁶ Staff. R.O., D(W)1788/P61/B7(a), Skyppe to Baldwyn, 16 Jan. 1680. About Skyppe, see

It is perhaps not so fruitful to argue whether the scheme was on the whole a success or a failure. The original goal of making the river navigable in two years was not fulfilled. But the scheme led to the construction of wooden railways in the region and helped open up new markets for the coal producing regions near Stourbridge. As has been seen, it became a cornerstone for the subsequent rise of the British tinplate industry, and provided a basis for the Stourbridge canal that was completed in the 1770s. For Yarranton, the Stour navigation was not only a source of income, but also a career step through which he became involved in the tinplate experiment and travelled to the Continent. It helped him establish his credence as a competent promoter of economic innovations and improvement. Windsor did not readily trust 'fair words' from the undertakers like Yarranton. But what Shropshire coal masters once dubbed a monopolistic 'project' left some concrete achievements, thanks to the perennial struggles to solicit investment and maintain the scheme's credit.

Conclusion

Credible and competent undertakers were important for the successful execution of a large-scale project. It is indeed conceivable that the Stour navigation work might indeed have been completed up to the Severn, had Windsor and other backers been able to trust their money more efficiently to Yarranton and others. Crucially, however, the Stour scheme went ahead despite initial opposition, and despite the fact that its backers only partially trusted their undertakers. The scheme was supported by the Cavalier parliament and several thousand pounds were subsequently poured into it. I

have shown that these were the result of negotiation throughout the initial stage in parliament and the subsequent implementation. In particular, these phases were respectively pervaded by concerns about safeguarding economic interests and maintaining credit-lines. The promoters' trustworthiness and competence surely played an important role in the implementation; but these elements alone did not translate a 'project' into reality.

As Shapin has argued, while Boyle was credited as the designer and the author of his natural philosophical experiments, his laboratorial endeavours were fundamentally collaborative, ones in which some women as well as many 'laborants' and 'assistants' took part.¹⁹⁷ Boyle might have been publicly identified as *the* credible doer/relater of these experiments; but such identification meant that neither the collaborative authorship nor the negotiations that permeated such collaboration was publicly acknowledged. Intriguingly, those concerned in the Stour navigation scheme also rarely acknowledged the complex interplay between undertakers, backers, and workmen, something that was indispensable for executing the scheme.

As noted at the beginning of this chapter, in his *England's Improvement by sea and land* Yarranton blamed 'want of money' as a reason for not completing the navigation work up to the Severn. Significantly, in his publication, Yarranton accused none of the backers of failing to provide money as had been arranged; instead, he hailed Windsor as one of the dedicatees of his book. 'My Lord', declared Yarranton, 'I am emboldened to make my humble return of Thanks in this small Dedication' for 'those indefatigable Pains you have taken in the Survey of several Rivers, and contriving with me effectually which way these might be rendred so far Navigable,

¹⁹⁷ Shapin, *Social History of Truth*, pp. 361-72, 405-407.

that the Publick might thereby receive a general Advantage'.¹⁹⁸ Where both of them could be presented as champions of the public good, there was perhaps little point in highlighting the lack of trust between them and its severe consequences in the past. Moreover, presenting the book to Windsor probably helped to underline Yarranton's previous achievements and portray him as credible, competent promoter of economic improvement.

The other struggles, those concerning the safeguarding of regional economic interests, were also soon to be forgotten. 'Thomas Earl of Plymouth dyed' before the navigation scheme was 'brought to perfection', wrote his grandson, the second earl of Plymouth in the early eighteenth century. The earl petitioned parliament in order to resume the navigation scheme. For this end, he portrayed the original undertakers as unsung heroes, and the 1662 act, a credible piece of legislation. Windsor (and others) had expended about £8,000; he had died without completing the work with 'so great an Advantage' to the public. The navigation scheme could be revived 'without any alteration [to] the said former Act'. For, the second earl continued, it 'was obtained upon hearing all parties, and due consideration had of the Rights and Properties of all Persons interested'.¹⁹⁹

The second earl rightly pointed out the 'due consideration' MPs had given to the 'Rights and Properties' of many of those who were concerned with the scheme. Yet, he had no reason to discuss a wide range of conflicting perspectives that had collided in parliament. His grandfather was intent upon pressing on the original bill as a 'public act'. Others, like Shropshire coal masters, local residents and Worcestershire

¹⁹⁸ Yarranton, *England's improvement by sea and land*, sig. b.

¹⁹⁹ *HMC, House of Lords, 1692-1693: 53* (1984), p. 389; Staff. R.O., D(W)1788/P59/B3, *The Earl of Plymouth's Case*.

linen manufacturers, were more concerned with the potential damages and had attacked Windsor and others as the promoters of a destructive ‘project’. Parliament promoted many schemes for economic improvement (as we saw in Chapter Three), but MPs were probably also concerned about making sure that the government’s role as a protector of economic prosperity would not be subverted when encouraging new schemes. Thus, only after safeguarding regional economic interests, did they back the Stour scheme.

In portraying Yarranton (and Windsor) as credible and public-spirited promoters of the Stour scheme, contemporary accounts seem to conceal a great deal of the complexity and negotiation that took place when turning a ‘project’ into reality. By moving beyond the analysis of presentation and representation, we have found that the Cavalier parliament could manage distrust of the project and support the Stour scheme without necessarily assessing its feasibility or the promoters’ trustworthiness and competence. We have also explored the interface between projecting culture and culture of financial credit. We found little evidence to suggest that backers disparaged Yarranton and other undertakers as unreliable ‘projectors’. Yet the backers only reluctantly trusted their money to them,²⁰⁰ and that was why maintaining credit-lines became a pervasive concern throughout the implementation of the Stour scheme.

Of course, this case study cannot be taken to represent how other schemes for economic innovations and improvement were put into execution after the Restoration or in other periods. But it shows how we might explore similar case studies to gain further insights. Promoters of economic innovations and improvement often

²⁰⁰ Distrust of the projector and the caution and mistrust in business transactions might have overlapped and reinforced one another. Recall Sir John Weld’s distrust of ‘colliers or miners or projectors’ quoted earlier.

generated impressions of trustworthiness and harmony. They did so precisely because they were in danger of being stereotyped and dismissed, and also because the public utility of their schemes was almost always contested. Historians interested in trust and credibility in the practices of innovation must conduct more case studies to explore how far those involved trusted and mistrusted each other, and how far the actual processes of negotiation corresponded with the impressions that some of the participants tried to create for their own purposes (as Yarranton did in his *England's improvement*).

At the same time, we also need to shift focus to other aspects of such economic projects. We must investigate how groups like Shropshire coal masters expressed their dissatisfaction, how politicians and others in public arena safeguarded these local interests, and how men like Whyte, Haycox, and Yarranton could secure funding and fulfil credit obligations when they were not easily trusted. These questions are vital for our understanding of economic projects precisely because by the later seventeenth century it became increasingly difficult to implement new economic initiatives through government imposition. Indeed, by the time James II fled from England, economic innovations and improvement would flourish as joint-stock companies, a mode of projecting not so much dependent on imposition as on vigorous publicity campaign.

CHAPTER FIVE

Consuming Economic Projects in the Early Financial Revolution:
A Case of Sir Humphrey Mackworth, a Tory Gentleman

In the summer of 1698, William Digby was on his estate in Sherborne, Dorset, gathering information from a correspondent in London. Digby enquired about a new bill on gaming, the malt tax, and in September, about the Company of the Mine Adventurers of England that had started calling for investors. At the end of the month he told his London agent that the Company's 'proposal seems rationally enough' and that it merited further inquiries: 'pray tell me what you hear of it; for tis hard to judge at this distance.' He soon received more news. After a week he concluded he had 'so good an opinion of the project as to accept of 5 shares for the 100lb you [owe?] me, if you think fit'.¹ This landed gentleman became one of its numerous shareholders.

The demand of potential investors like Digby for financial information had grown unmistakably by the early 1690s, a time when patenting boomed and unincorporated joint-stock companies mushroomed to an unprecedented degree. John Houghton, FRS, knew this well when he published the issue of his *Collection for Improvement of Husbandry and Trade* on 3 March 1693, featuring Yorkshire rivers. Naming the eleven rivers including the Humber, the Don, the Trent, and the Ouse, Houghton informed readers of the distance between 'the principal Towns' on these navigable rivers, 'reckoned by strait lines from one place to the other', like 'The Ouse, which from the *Humber* bears ships by *Selby, Barleby, [. . .] Middlethorp, &c* to *York* seventeen and thirteen' miles.² 'I know these measures are not exact, neither

¹ Quoted in Howard Erskine-Hill, *The Social Milieu of Alexander Pope: Lives, Example and the Poetic Response* (New Haven: Yale U.P., 1975), pp. 149-50.

² John Houghton, *A collection for improvement of husbandry and trade* (4 vols, 1727-1728), vol. 1, no. 30, p. 85.

was the first Dictionary, [nor] the first map', Houghton wrote. Providing these figures would be particularly beneficial, he suggested, because they could be 'a ground for learning what trade already is, what may be improved upon these rivers', especially 'mines of *coal, lead, tinn, iron, copper*, or any other mineral not far from them; also for the easie carriage' of bulky goods like '*wood, charcoal, [and] corn*'.³ But Houghton went on to underline a unique reason for publishing this kind of information 'especially at this time',

when companies of men are so eager to enter into joint-stocks for improvement of anything that appears reasonable; witness our *linen* and *copper* companies, and the company that lately subscribed for *lead* mines in *Wales*, to which, to my knowledge, a subscription was made in one day of 2,500l.⁴

Here, then, is a glimpse of the new projecting culture which we shall explore in this chapter.

Like promoters of the Stour navigation in the 1660s, Houghton was trying to encourage improvement of trade and new industries that would take advantage of navigable rivers. But during the early financial revolution, a long process that accelerated in the 1690s, schemes for economic innovations and improvement became relevant to the public in ways that they had not been before. As Houghton observed, new economic schemes were now funded through 'joint-stocks'. People, including wealthy country gentlemen like Digby and many men and women below him, now sought and bought news, commentaries, and proposals about new economic schemes. They could even purchase shares in new companies and expect dividends. This was a remarkable change from monopoly-based schemes under the early Stuarts. In the early financial revolution, or what Defoe dubbed the '*Projecting*

³ Houghton, *Collection*, vol. 1, no. 30, pp. 86-87.

⁴ Houghton, *Collection*, vol. 1, no. 30, p. 87.

Age', economic innovations evolved into a sort of commodity in their own right, something to be traded on the emerging stock market.

This chapter explores this change as the climax of the history of projecting in seventeenth- and early eighteenth-century England. In doing so, it will critically engage with a group of influential accounts of the financial revolution and the joint-stock company boom in the 1690s. As Henry Roseveare has argued, the word 'revolution' is 'one of the most overworked terms in the historian's vocabulary, glibly invoked to give some spurious drama and significance to developments which could be more fairly described as "evolution"'.⁵ While Roseveare has offered a useful revision to the study of the financial revolution by tracing the complex history of *governmental finance* that goes back to Charles II's reign and earlier, few works have examined what Houghton called the new 'joint-stocks for improvement' over a long term period of history, especially that of projecting activities. As a result, historians have tended to suggest that the sudden increase of unincorporated joint-stock companies represented something new. Because this interpretation has most clearly manifested itself in the debates about the role of the landed society, I will critically engage with them, and in doing so, develop a more integrated understanding of Defoe's '*Projecting Age*'.

Studying the financial revolution from the perspective of intellectual history, John Pocock has argued that land was often taken to have 'provided the individual with power, leisure and independence', allowing them to lead the life of an active citizen 'virtuous in his devotion to the public good [. . .] but virtuous also in his independence of any relation which might render him corrupt.'⁶ From this he

⁵ Henry Roseveare, *The Financial Revolution* (Harlow: Longman, 1991), p. 2.

⁶ J. G. A. Pocock, *Virtue, Commerce, and History: Essays on Political Thought and History*,

developed an influential thesis that ‘trade, exchange, or profit’ was ‘hardly compatible with the activity of citizenship’ and the exercise of public service.⁷ Even John Brewer, who is critical of aspects of Pocock’s argument, has agreed that ‘trade, business and finance’ were not quite compatible with the ‘obligation to fulfil public duties [...] an essential component of gentility’.⁸ This assumption has been a powerful one. The historian of nineteenth- and twentieth-century Britain, Martin J. Wiener has juxtaposed ‘industrialism, technology, capitalism, and city life’ with ‘slow-changing “country” ways of life’ and ‘quasi-aristocratic lifestyles’, and characterised the latter to have been ‘less supportive of economic development’.⁹ In responding to this line of arguments, as we shall see below, social and economic historians have tended to argue that Tory-inclined gentlemen like Digby became embroiled in company business because sheer greed and opportunism induced them to put aside their ideals of public service.

These lines of interpretations downplay the fact that like earlier schemes for economic innovations, joint-stock companies also highlighted their public service when calling for subscribers. This neglect is symptomatic of a more fundamental analytical problem. Because existing studies have not taken the concepts of ‘project’

Chiefly in the Eighteenth Century (Cambridge: CUP, 1985), pp. 103, 48.

⁷ Pocock, *Virtue*, p. 103. For applications of this thesis to literary criticism, see for example, Colin Nicholson, *Writing on the Rise of Finance: Capital Satires of the Early Eighteenth Century* (Cambridge: CUP, 1994); Laura Brown, *Fables of Modernity: Literature and Culture in the English Eighteenth Century* (Ithaca: Cornell U.P., 2001), chap. 3.

⁸ John Brewer, *Sinews of Power: War, money and the English state, 1688-1783* (London: Unwin Hyman, 1989), pp. 200-210 (quotation from p. 206). See also Felicity Heal and Clive Holmes, *The Gentry in England and Wales, 1500-1700* (Basingstoke: Macmillan, 1994), p. 164; Susan Whyman, *Sociability and Power in Later-Stuart England: The Cultural Worlds of the Verneys 1660-1720* (Oxford: OUP, 1999), p. 83.

⁹ Martin J. Wiener, *English Culture and the Decline of the Industrial Spirit, 1850-1980* (2nd ed., with a new preface, Cambridge: CUP, 2004), p. xvi.

and ‘projector’ seriously, they have failed to appreciate the extent to which Defoe’s *‘Projecting Age’* built upon projecting activities and stereotypes about them in the previous decades.

I will first explore the joint-stock company boom as something that had evolved from economic innovations launched in different forms (like monopoly grants) in earlier decades. I will demonstrate that these companies were denounced by the projector stereotype, albeit in ways that were subtly adjusted to the rise of the stock market. Then we will proceed to the crux of this chapter, in which I will examine the company of which Digby became a shareholder: the Company of the Mine Adventurers led by Sir Humphrey Mackworth, one of the largest new joint-stock companies of the period, and one that ended in what was probably the most sensational financial fraud before the South Sea Bubble. By bringing together Mackworth’s diary, his letters, and the Company’s promotional literature, I will show how Mackworth conceptualised, and lent credibility to, his mining scheme that was stereotyped as a dubious ‘project’. I will demonstrate that even figures like Mackworth, who were seemingly unaccustomed to, or even critical of, the Whig wartime finance, could promote the public consumption of economic projects. But more importantly for the purpose of this thesis, I will show that Mackworth understood his mining business and even his fraud by drawing upon ideas that earlier generations of promoters had emphasised: piety, profit, and public service.

The Public Consumption of Projects

The patent boom that had begun in 1691 subsided by 1694 (See Fig. 6), and many of the joint-stock companies that had thrived in the early 1690s collapsed shortly thereafter. Out of the 93 companies that existed in 1695, only 28 had survived by

1698. Yet, various economic and financial initiatives continued to emerge thanks, perhaps, to the lapse of the Licensing Act in 1696. The Mine Adventure, launched in 1698, was one such scheme. 'T'is true', an anonymous author declared in 1699:

we live in a very Teeming Age: Never was the Press more guilty of Impertinent Productions, than since the Expiration of the Act of Licensing: The whole Nation seems to have run a Gadding, and every little Trifler sets up now for Wit, Politicks, or Projects.¹⁰

The author was criticising a proposal to set up a joint-stock company, publicised in 1698 by the merchants George Oldner and Andrew Prime. They had obtained a patent for an invention 'to preserve ships from foundering, or sinking, at sea', an invention which seems to have involved an engine for pumping water out of the vessel.¹¹ In their pamphlet, the patentees claimed that the invention would help prevent vessels from sinking in a range of situations, including the damage caused 'by great Shot' from an enemy's navy or privateers. Such an invention would have saved naval vessels and a large number of 'the King's Ships, of the *East-India*, *African*, *Levant*, and other Companies; besides great number of other rich Trading-Ships'. It was, they said, an invention 'of so extensive and universal a Good and Benefit to all mankind'.¹² Like these patentees, William Walcot also engaged in projecting activities at that time, adding yet further evidence to the continuation of these activities beyond the end of the patent boom. Walcot obtained a patent for his desalination engines in 1675, but Richard Fitzgerald, who claimed to have invented a

¹⁰ *An epistle to a member of parliament, concerning Mr. George Oldner's invention* (1699), p. 3.

¹¹ Patent no. 352, 24 Sep. 1697; George Oldner, *Mr. George Oldner's invention to preserve ships from foundering, or sinking, at sea, &c* (1698). Details of the invention were kept secret.

¹² Oldner, *Mr. George Oldner's invention*, p. 3.

better engine, revoked this in 1683. In February 1693, at the height of the patent boom, Walcot successfully reversed this revocation of his patent. Walcot died in 1699, but his scheme did not. His nephew, Humphrey Walcot, took over the privilege and sought to market the engine. In 1702, shortly after the outbreak of the War of Spanish Succession, Walcot circulated a handbill announcing that the engine would help naval ships secure fresh-water in war-zones.¹³

As Houghton observed, many of these new schemes called for investors through public subscription. Examples are numerous. When marketing his desalination engine, Humphry Walcot called for subscribers to a joint-stock company to realise a capital of £5,000, with 100 shares valued £50 each.¹⁴ George Oldner and his partners proposed to set up an unincorporated joint-stock company with a capital of £60,000 by selling 6,000 shares valued £10 each.¹⁵ The White Paper Company was launched once a patent was granted in 1687; it raised funds by issuing 400 shares of £50 per share, making the nominal total of £20,000. The Royal Lustring Company, which manufactured linens after continental methods patented in 1688, expanded its operation in 1692, issuing 2,400 shares valued £25 each, totalling £60,000 as nominal capital. The incorporated English Linen Corporation was operating in 1690 with 340 shares of £10 each, with further issues of shares at £50 each.¹⁶

While some large-scale domestic schemes, especially inland navigation and turnpikes, continued to operate and to be launched via trusts or partnerships, some

¹³ R. E. W. Maddison, 'Studies in the Life of Robert Boyle, F.R.S. Part II. Salt Water Freshened', *Notes and Records of the Royal Society of London*, 9 (1952), pp. 211-12. See also Christine MacLeod, *Inventing the Industrial Revolution: The English Patent System, 1660-1800* (Cambridge: CUP, 1988), pp. 36-37.

¹⁴ Humphrey Walcot, *Sea-water made fresh and wholesome* (1702), pp. 6, 25-28.

¹⁵ Oldner, *Mr. George Oldner's invention*, pp. 9-12.

¹⁶ Scott, *Joint-stock*, vol. 3, pp. 65, 75, 97

natural resource management schemes came also to be funded by joint-stocks. An undertaking to improve the Hampstead Aqueducts operated from 1692 with 600 shares at a nominal value of £20 each, giving it a total capital of £12,000. Similarly, in 1703, the London Bridge Water Works was operating with 300 shares at £500 each, but later converted them into 1,500 shares at £100 each, giving it a nominal capital of £150,000.¹⁷

Schemes for poor relief, hospitals and the like – some of the recurrent themes in the history of projecting – also began to adopt joint-stocks as a method of funding. Charles Davenant tried to set up a joint stock for poor relief.¹⁸ Hospitals were to be funded by public subscription to lotteries. The Greenwich Hospital carried this out, and Defoe proposed a similar scheme to fund what he called a ‘Fool-House’.¹⁹ The notorious Charitable Corporation, established by a patent in 1707, was essentially ‘a large scale corporate pawnbroker’, empowered to lend out its funds ‘for the relief of industrious poor, upon goods, wares, pawns, and pledges’. It had amassed a capital of about £50,000 by the time parliament investigated its mismanagement in 1733.²⁰ The Quaker reformer John Bellers began calling for a ‘General Subscription’ in 1695 to set up what he called the College of Industry, a scheme that had much in common with earlier Bacon- and Hartlib-inspired proposals for Solomon’s House and the colleges of husbandry.²¹ ‘A thousand Pound is easier raised where there is Profit’, he

¹⁷ Scott, *Joint-stock*, vol. 3, pp. 5, 15.

¹⁸ Paul Slack, *From Reformation to Improvement: Public Welfare in Early Modern England* (Oxford: Clarendon, 1998), p. 120.

¹⁹ Daniel Defoe, *An essay upon projects* (1697), pp. 178-91 (esp. p. 184).

²⁰ A. J. G. Cummings, ‘The York Building Company: A Case in Eighteenth-Century Corporation Mismanagement’ (Ph. D thesis, University of Strathclyde, 1980), pp. 395, 449.

²¹ See John Bellers, *John Bellers: His Life, Times and Writings*, ed. George Clarke (London: Routledge, 1987), pp. 62-63, 66.

argued. Furthermore, 'Tho' it would be Toilsome for any one Man, or a few [to raise money], yet 'tis easily done by a great Number'. Little is known about what became of this scheme, but in 1697, it was announced that forty-five fellow Quakers had subscribed to the 'joint Stock'.²² The Huguenot, Denis Papin applied the idea of joint-stock to the systematic promotion of technical ingenuity – another Bacon- and Hartlib-inspired project. He proposed to erect a 'Company or Society for New Inventions, for which Subscriptions may be made for £1,000 Stock'.²³ In short, joint-stocks companies funded by public subscription emerged as a major outlet for projecting during the early financial revolution. It was for this reason that Thomas Baston fumed that 'the Modern Mode' of projecting aimed to fleece the '*Vulgar sort of People*' by 'Opening Books, Taking in Subscriptions, dividing it into Shares'.²⁴

As we can infer from the increasing popularity of public subscription to joint-stocks, this mode of projecting drew in not only wealthy landed gentlemen like William Digby, but also investors from across the social strata. As Peter Earle has shown in his study of the London middling sort, shares in companies and public funds became the major assets (47.6%) in their personal investment assets for the three decades after 1690. This was more than a 20% increase from the previous twenty-five years.²⁵ Clergymen held shares in companies, governmental bonds, and

²² Bellers, *John Bellers*, pp. 67, 79.

²³ Larry Stewart, *The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660-1750* (Cambridge: CUP, 1992), pp. 25, 176. See also Michael Hunter, *Establishing the New Science: The Experience of the Early Royal Society* (Woodbridge: Boydell Press, 1989), pp. 89-90.

²⁴ Thomas Baston, *Thoughts on trade and a publick spirit* (1716), pp. 16, 13.

²⁵ Peter Earle, *The Making of the English Middle Class: Business, Society and Family Life in London, 1660-1730* (London: Methuen, 1989), pp. 145-48. Other investment assets in the analysis include loans and mortgages, leases, and shipping.

even lottery tickets.²⁶ Corporate bodies purchased shares too. Despite its ambiguous attitude to stock trading and economic schemes of immediate utility, the Royal Society purchased government bonds and company shares and committed their management to its Fellows and brokers.²⁷ Even charitable institutions such as the Society for the Promotion of Christian Knowledge (SPCK) and Christ's Hospital held investments in lottery tickets, public credits and company shares.²⁸ Shareholding became a fact of life. 'Several Projects about this time began to run in my mind', wrote the Sussex trader Samuel Jeake in his diary in 1694. '[T]he war having spoiled all my Trade at Rye', he hoped to 'advance my Income' by buying shares in the Bank of England, the East India Company, and the Million Adventure.²⁹

Public subscriptions could never have penetrated a society this way without intensive public relations. A plethora of pamphlets promoted, defended, commented on, or satirised them. For example, at the height of banking experiments between 1695 and 1696, this subject alone produced no less than 260 pamphlets, almost 1 in 10 books published during the period.³⁰ Specialist newspapers, mainly catering for

²⁶ For example, see C. F. Secretan, *Memoirs of the Life and Times of the Pious Robert Nelson* (London: Jun Murray, 1860), p. 283. See also a case of Thomas Bray mentioned below.

²⁷ Stewart, *Rise of Public Science*, pp. 167-68.

²⁸ For the SPCK's dealing in insurance, company shares, and lottery tickets, see Edmund McClure, *A chapter in English church history: being the minutes of the Society for Promoting Christian Knowledge for the years 1698-1704; together with abstracts of correspondents' letters during part of the same period* (London: SPCK, 1888), pp. 18-20, 31, 41, 194. For Christ's Hospital's shareholding, see my case study of the Mine Adventure below.

²⁹ Samuel Jeake, *An Astrological Diary of the Seventeenth Century: Samuel Jeake of Rye 1652-1699*, eds., Michael Hunter and Annabel Gregory (Oxford: Clarendon, 1988), p. 233.

³⁰ The source is a chronological bibliography in J. Keith Horsefield, *British Monetary Experiments, 1650-1710* (Cambridge, Mass.: Harvard U.P., 1960), pp. 289-311, which lists 269 items for 1695 and 1696. The total number of published titles for the two years is estimated 2990. See John Barnard and D. F. McKenzie (eds.), *The Cambridge History of the Book in Britain, vol. IV, 1557-1695* (Cambridge: CUP, 2002), Appendix 1, Statistical tables,

those involved in foreign trades, listed stock prices of joint-stock companies along with prices of commodities, bills of entry, and shipping lists.³¹ Stock prices were also circulated by non-specialist papers catering for wider audience. John Houghton's *Collection for Improvement of Husbandry and Trade* started listing the share prices of about a dozen companies when its publication was resumed in March 1692. Two years later it began to offer upon surcharge, the stock prices of about 40 more companies, both incorporated and unincorporated.³² *Angliae tutamen's* long list of 'pernicious projects', quoted in Chapter One, might in part have derived from Houghton's price list. The Sun Fire Office's the *British Mercury*, another non-specialist paper that took over Charles Povey's *General Remark on Trade* from 1710, also reported stock prices with other content like foreign news.³³ Publicity about new economic projects had become so widespread by 1695 that the author of *Angliae tutamen* complained that 'the *Gazettes* and Public Papers are cramm'd with Advertisements, the fourth Column is entirely theirs'.³⁴ The *ESTC* search results discussed in Chapter One, which show that the term 'project' came to be used more frequently from the 1690s as a relatively neutral term to discuss new economic and financial schemes, therefore reflect this emerging public consumption of projecting activities (See Fig. 3).

Table 1, Annual book production 1475-1700.

³¹ Natasha Glaisyer, *The Culture of Commerce in England, 1660-1720* (Woodbridge: Boydell, 2006), p. 143.

³² Larry Neal, 'The Rise of a Financial Press: London and Amsterdam, 1681-1810', *Business History*, 30 (1988), p. 167.

³³ Glaisyer, *Culture of Commerce*, pp. 156-171.

³⁴ *Angliae tutamen: or, the safety of England* (1695), p. 23. For a study of advertisement, see Jeffrey R. Wigelsworth, 'Bipartisan Politics and Practical Knowledge: Advertising of Public Science in Two London Newspapers, 1695-1720', *British Journal for History of Science*, 41 (2008), 517-40.

It is difficult to ascertain the extent and geographical scope of the circulation of these print media or readers' response to them, but as Houghton explained, he decided to list share prices for more companies because 'A great many desire[d]' them. The *British Mercury* sold about 3,000 copies or more each issue, matching the governmental *London gazette* and other major newspapers like the semi-weekly *Evening Post* and the tri-weekly *Post-Boy* and *Post-Man*. Thus, information about new schemes circulated daily and was made available to interested parties in London, and to an extent, also to those in provincial towns.³⁵

When calling for investors, promoters of new schemes for economic innovations and improvement invoked a wide range of authorities, including acts of parliament, expert testimonies and legal affidavits, letters of recommendation, and lists of prominent gentlemen who agreed to patronise the proposed undertakings. These written authorities in turn were part of an "intense mediatisation" which combined 'visual languages (public shows, experiments, exhibitions) and print resources: advertisements, posters, tracts, how-to leaflets and users' books'.³⁶ So when George Oldner and his partners called for subscribers, they carried out a demonstration of their patented marine invention on the Thames by using a miniature boat, and later published several testimonies along with the details of how to subscribe.³⁷ In a bid to market the desalination engine in 1701, Humphrey Walcot not only publicised it by circulating handbills, but also displayed engines of varying size, 'to be seen and are to be sold at his Warehouse In Wool=Pack Alley in

³⁵ Glaisyer, *Culture of Commerce*, pp. 160-61, 171-82.

³⁶ I have borrowed the phrase 'intense mediatisation' from Liliane Hilaire-Pérez and Marie Thébaud-Sorger, 'Les Techniques dans l'Espace Public: Publicité des Inventions et Littérature d'Usage au XVIIIe Siècle (France, Angleterre)', *Revue de Synthèse*, 5th ser., 2 (2006), 393-428, at p. 393.

³⁷ Oldner, *Mr. George Oldner's invention*, pp. 9-12.

Houndsditch' in London.³⁸

Letters patent became one of the main publicity tools that promoters could mobilise in order to lend credibility to their new economic schemes. The 1690s boom marked 'the development of a major new heterodox use' of patents, according to Christine MacLeod. Promoters increasingly came 'to recognize the publicity value of a patent. They liked to imply, or at least did not discourage the misconception, that a patent was a form of royal guarantee, that the product or project had been inspected and passed by officials, ministers, or even the king himself.'³⁹ In this respect, the patent boom in the early 1690s was integral to the increasing consumption of news about new enterprises, and thus needs to be distinguished from the earlier booms in the 1670s and 1680s (See Fig. 6). Of course, just like earlier ones, some patents issued during the 1690s protected smaller business partnerships, as in the case of John Lofting and his patents on fire engines and thimbles.⁴⁰ The 'heterodox' use was not unprecedented either. John Well, for instance, obtained in 1673 a patent for a 'new engine for teachinge to performe by articial hourses, the usual exercises of a complete horseman'. He circulated a handbill proudly promising the 'most curious and most profitable Engine that ever was invented' to which 'the Kings Majesty hath given leave to *John Wells* to establish thorowout all *England*, by vertue of His Letters Patents sealed with the Great Seal of *England*'. In effect, the patent helped Wells promote his horse machine and the entertainment offered for one shilling a ride in the military ground near Soho, a 'Entertainment and Divertisement' styled as the

³⁸ Humphrey Walcot, *Sea-water made fresh and wholsom* [1702], [a printed handbill], Kress, S.2260 (a handwritten note at the bottom).

³⁹ Christine MacLeod, 'The 1690s Patents Boom: Invention or Stock-Jobbing?', *Economic History Review*, new ser., 39 (1986), pp. 555-56.

⁴⁰ MacLeod, 'The 1690s Patents Boom', p. 556.

'ACADEMY by the Kings Privilege' that would teach horsemanship, 'the Noble Employs of a true Gentleman'.⁴¹ Such strategic use of patents became so conspicuous during the speculation boom of the early 1690s that, in 1695, the author of *Angliae tutamen* dismissed 'trifling Engines and Whims', and fumed that 'Oh, a Patent gives a Reputation to it, and cullies in the Company'.⁴²

The author's concern illuminates a shady side of the new projecting culture: the proliferation of rumours and false news. In 1712, *Spectator* offered a tale of a man 'who used to divert himself by telling a Lie at *Charing-Cross* in the Morning' and then enjoyed observing its manifold repercussions elsewhere:

what Censure it had at *Will's* in *Covent-Garden*, how dangerous it was believed to be at *Childs*, and what Inference they drew from it with Relation to Stock at *Jonathan's*.⁴³

Note how false news was expected to affect stocks at Jonathan's coffeehouse, a venue, along with Garraway's, well-known for stock-trading. The author of the episode was Richard Steele, who invented and patented a 'fish-pool' vessel and a carriage that would 'bring Fish alive much better than at present' with the assistance of Wiltshire mathematician Joseph Gillmore.⁴⁴ The tale indicates that those actively involved in the promotion of new schemes could be acutely aware of the damaging implications of false news about their activities. Such a concern was surely no novelty. Projecting activities of the Hartlib circle operated along side its

⁴¹ *Academy. By the Kings priviledge* [1674?]. The handbill bore an engraving of the king's great seal and French translation of the advertisement.

⁴² *Angliae tutamen*, pp. 22, 23, at p. 23.

⁴³ *Spectator*, ed. Donald F. Bond (5 vols, Oxford: Clarendon, 1965), vol. 1, no. 521, pp. 355-56. At Jonathans, the goldsmith John Casting Sr. had been buying and selling 'all Blank and Benefit Tickets [of lotteries]; and all other Stocks and Shares' (quoted in Glaisyer, *Culture of Commerce*, p. 155).

⁴⁴ Richard Steele and Joseph Gillmore, *An account of the fish-pool* (London, 1718), pp. 4, 56-60. Patent no. 419. See also MacLeod, *Inventing the Industrial Revolution*, p. 77.

news-gathering, and we have seen in Chapter Two that Hartlib's allies like Blith complained of 'heare-sayes' which had 'brought Ingenuity under greatest Scandall'. As early as in the mid 1660s, an Italian visitor wrote that in English coffeehouses 'one hears what is or is believed to be new, be it true or false.'⁴⁵ News about Francis Mathew's project to connect the Thames and the Severn attracted much attention after it was presented to Charles II in 1660 and again in 1670. Yet, 'some foolish Discourse at Coffee-house laid asleep that design as being a thing impossible and impracticable.'⁴⁶ From the end of the seventeenth century, however, the impacts of such news and of 'foolish Discourse' upon those schemes probably become more substantial due to the expansion of stock trading. Upon receiving news and rumours investors could now buy and sell stocks and exert immediate influence upon the operation of joint-stock companies.

A few examples suffice to illustrate how news about new schemes could circulate rapidly and affect (potential) stockholders. On 29 May 1711, Humphrey Mackworth wrote to his brother about the debate for setting up the South Sea Company, now 'goeing on in p[ar]liament'. He related that the 'New Corporac[i]on' was 'upon a good fund', and that it would offer six percent interest for those who accepted the Company's shares to replace 'the Navy Bills, army debentures' and other government bonds and securities. Mackworth was reporting the latest amendments which MPs had just approved the day before,⁴⁷ Being a high Tory MP

⁴⁵ Quoted in Brian Cowan, *The Social Life of Coffee: The Emergence of the British Coffeehouse* (Hew Haven: Yale U.P., 2005), p. 172.

⁴⁶ Andrew Yarranton, *England's improvement by sea and land* (1677), pp. 64-65; T. S. Willan, *River Navigation in England, 1600-1750* (London: Frank Cass, 1964), pp. 9-10.

⁴⁷ West Glamorgan Archive Service, Swansea, Royal Institution of South Wales [hereafter WGAS], Gnoll Estate Collection, RISW/Gn 4/552, Letter from Humphrey Mackworth to his brother, 29 May 1711; *CJ*, vol. 16, pp. 680-1. For background of the legislation, see Dickson, *Financial Revolution*, pp. 64-65.

himself, Mackworth was perhaps able to gather firsthand information very quickly. He also told his brother the news that a fleet was being assembled to sail 'to the rich Gold Mines in the South Sea in America' where the French and the Dutch 'raise millions every year'. He had obtained the news 'privately', and reckoned that it would circulate soon, and in doing so would 'raise the [South Sea] stock to an high degree', a comment that smacked of his interest in short selling. Mackworth also remarked that 'Investors would have '7 1/2 p[er] cent certain & very probable Expectac[i]ons of real Profit by those trades & the Stock can never fall lower [. . .] w[hi]ch makes mee & my friends resolved to adventure in it.'⁴⁸

The episode is significant, revealing not only that this High Church Tory was happy to speculate in the 'real Profit' from the Company's shares, but that news could also spread within a matter of days, could stir up 'Expectac[i]on', and trigger some 'to adventure' in a new scheme. So it is hardly surprising that the share price of the York Buildings Company rose sharply above its nominal price in 1730, even though it was hugely in debt and was in no position to distribute profits. The price increase was triggered when the expectation of much awaited dividends was fuelled by news of six ships on their way to fetch lead ore from the Company's Scottish mines.⁴⁹

Stock-jobbing was an extreme form of the manipulation of information that characterised the new projecting culture in the early financial revolution. People in the provinces as well as those in the capital became involved. Thomas Steers, engineer and freeman of Liverpool, and William Squire, once mayor of the city, submitted a bill to authorise their scheme for making the Douglas navigable in 1719

⁴⁸ WGAS, RISW/Gn 4/552, Letter from Humphrey Mackworth to his brother, 29 May 1711.

⁴⁹ Cummings, 'York Buildings Company', pp. 250, 431-33, 576.

and obtained an act in April 1720. In June 1720, just as speculation heated up during the summer that year, they issued 1,200 shares valued at £5 each. The share-price went up with other shares during the bubble of the summer and reached £70, but had fallen to £3.3s by mid-August. It was alleged that the promoters obtained a handsome profit by selling their shares when the market was at its peak. Shareholders from London and from Beaconsfield, who bought 59 shares and 26 shares respectively, alleged that the promoters only intended 'to make a Bubble thereof and to raise money from all such Unwary Persons as they could draw in'.⁵⁰ Stock-jobbing like this was repeatedly practiced from the early 1690s, during the South Sea Bubble in 1720, and thereafter.⁵¹

Jobbers and brokers were frequently associated with the Royal Exchange, Exchange Alley, and coffeehouses such as Jonathan's and Garraway's. Stock jobbery was frequently condemned as the deed of a 'beast' or 'devil'.⁵² Thomas Baston fumed: 'by *forging false News, raise and fall the Stocks*, all the Commodity they deal in, for when their Hands are full [with stocks], then they are pleas'd to afford the Nation very good News, and so raise them as high as ever they can, and then dispose of them'.⁵³ These authors even suggested that stock-jobbing was ruining the national economy.

⁵⁰ Alfred P. Wadsworth and Julia De Lacy Mann, *The Cotton Trade and Industrial Lancashire, 1600-1789* (Manchester: Manchester U.P., 1931), pp. 214-17 (quotation from p. 215); Willan, *River Navigation*, pp. 59, 70; *An answer to the reasons for making the river Douglas navigable* [1720].

⁵¹ K. G. Davies, *The Royal African Company* (London: Longman, 1957), p. 83; Scott, *Joint-stock*, vol. 1, pp. 306-308. Contrast Davies's judgement with that of Baston, *Thoughts on trade*, pp. 3-4.

⁵² *Hickelty-pickelty: or, a medly of characters adapted to the age* (1710), pp. 55-56.

⁵³ Baston, *Thoughts on trade*, pp. 7-8.

Having surveyed projecting activities in the early financial revolution, it should now be possible to identify a subtle change of emphasis that was taking place in the negative stereotypes about the projector. In previous chapters we have seen that promoters in the early and mid-seventeenth century often sought to implement their purported economic 'improvement' by imposing governmental authority upon people's lives. Consequently, the image of the 'projector' was specifically associated with one who abused authority under the slogan of the public good, thereby encroaching upon people's livelihood and private properties. Like projectors under the early Stuarts, projectors operating in the stock market would also 'have fatal and pernicious Consequences' upon the society.⁵⁴ As economic initiatives became objects of public consumption, however, the stereotype of the projector became more closely associated with an image of the dubious businessman who would, together with stockjobbers, fleece innocent and credulous investors.

Speaking of treasure hunting 'projects', for example, the author of *Angliae tutamen* marvelled: 'what abundance of People have been drawn in and abus'd, of all Qualities, Gentle and Simple, Wise and Otherwise'.⁵⁵ Other commentators tended to focus on the harm the projector did to the fool and the credulous. Defoe complained that 'projectors' so often 'advanc'd [their schemes only] in Notion, and talk'd up to great things to be perform'd when such and such Sums of Money shall be advanc'd, and such and such Engines are made':

the Fancies of Credulous People [have been thus] rais'd to such height, that meerly on the shadow of Expectation, they have form'd Companies, chose Committees, appointed Officers, Shares, and Books, rais'd great Stocks, and cri'd up an empty Notion to that degree, that People have been betray'd to part with their Money for Shares in a

⁵⁴ *Angliae tutamen*, p. 34.

⁵⁵ *Angliae tutamen*, pp. 20-21.

New-Nothing[.]⁵⁶

Thomas Baston also complained that ‘weak and unthinking Part of Mankind’, or the ‘*Vulgar sort of People*’, had been ‘gulled out of their money [. . .] ‘by *knavish and ridiculous Projects and Stock-jobbing*’.⁵⁷ One of the best illustrations would be that of Edward Ward:

All loose vain projects ought to be debarred
Which are of evil to the public known,
Wherein projectors have a large reward
For doing what had better ne’er been done. [. . .]
The knaves are vultures and the fools their prey.⁵⁸

This is not to suggest that the projector stereotype became monolithic. Ben Jonson’s *Volpone* (1607), Thomas Brugis’s *Discovery of the projector* (1641), and John Wilson’s *The projector: A comedy* (1665) poked fun at the stereotypical ‘projector’ as a deluded dreamer and an ostentatious and foolish virtuoso.⁵⁹ Similar negative images were also present, for example, in Swift’s *A Tale of a Tub* (1704) and *Gulliver’s Travels* (1726).⁶⁰ The generic stereotypes about the projector thus remained multi-faceted. Crucially, however, the more specific denunciation of the ‘Trade and Liberty-destroying Projectors’, something that could undermine the credibility of *dirigiste* schemes like Le Pruvost’s ‘universall trade’ during the Civil

⁵⁶ Defoe, *Essay upon projects*, pp. 11-12.

⁵⁷ Baston, *Thoughts on trade*, pp. 12-13.

⁵⁸ Edward Ward, *The London Spy*, ed. Paul Hyland (East Lansing: Colleagues Press, 1993), p. 261.

⁵⁹ Ben Jonson, *Ben Jonson*, eds. C.H. Herford and Percy Simpson (11 vols, Oxford: Clarendon, 1925), vol. 5, pp. 91-92 (Act III, Sc. i, 44-125); Thomas Brugis, *A discovery of a projector* (1641), pp. 20-29; John Wilson, *The projectors. A comedy* (1665), p. 5.

⁶⁰ Jonathan Swift, *A Tale of a Tub and Other Works*, eds. Angus Ross and David Wooley (Oxford: OUP, 1999), pp. 50-59; Jonathan Swift, *Gulliver’s Travels*, eds. Peter Dixon and John Chalker with an Introduction by Michel Foot (London: Penguin, 1967), pp. 223-31.

Wars and which had to be avoided under the Restoration regime, had become, by the end of the seventeenth century, less relevant to most of the economic projects operating in the burgeoning stock market.

If only certain aspects of *stereotypes* changed at the height of the early financial revolution, one should be cautious against overemphasising the degree of change in *projecting activities* too. We have already seen that promoters of economic innovations and improvement continued to stress their ability to supplement governmental revenue and to provide employment for the poor.⁶¹ Innovative economic schemes continued to face a set of enduring problems such as limited technology, and inadequate means of communication. That was the case even for businesses that seem to have been technically sound and operated without a large initial investment. For example, the unincorporated company of the 'Proprietors of an invention for Raising Water and Occasioning motion to all sorts of millwork by the impellant force of fire', established in 1716, attempted the commercial exploitation of the Newcomen steam engine, a device that later revolutionised power-supply across Europe and beyond.⁶² It was plagued with difficulties, however. Few craftsmen except Newcomen and his immediate colleagues were competent enough to assemble and install the engine in the places commissioned. The company was also troubled by ambitious but unreliable licensees who did not return much profit.⁶³ These problems rendered the profits irritatingly slow and modest. In 1721,

⁶¹ See Chapter One and the case study of Sir Humphrey Mackworth and the Mine Adventure below.

⁶² For the episode, see Alan Smith, 'Steam and the City: The Committee of Proprietors of the Invention for Raising Water by Fire, 1715-1735', *Transactions of the Newcomen Society*, 49 (1977-8), 5-20. See also Stewart, *Rise of Public Science*, pp. 115-16.

⁶³ Smith, 'Steam and the City', p. 12. Simon Schaffer observes the difficult technology transfer as 'a familiar truth' in early eighteenth-century Europe. See *idem*, 'The Show that Never Ends: Perpetual Motion in the Early Eighteenth Century', *British Journal for the*

Sir James Lowther bought one share of the company for £270. Even though a dividend of £30 p.a. had been promised, Lowther received none for six years and even after that, dividends were often below the promised sum. Seventeen years after Lowther had purchased it at £270, he received in total just £320, a sum substantially lower than the promised sum of £525.⁶⁴

Schemes like this one faced even more obstacles when operating over wider geographical areas and with larger capital. I have suggested in the previous chapter that schemes like that of the Stour, operating over numerous private properties, required large overheads for compensation and rent they had to pay the landowners. Legal and illegal opposition also continued to plague large-scale schemes. The operation of a new water company in Newcastle was hindered by legal challenges by local landowners shortly after its flotation in 1698.⁶⁵ The Company of the Mine Adventurers, which operated in the Welsh town of Neath and elsewhere, was obstructed in 1705 when local Whig opponents destroyed the Company's 'tramways' for transporting coal, and attempted to force its skilled workers into military service.⁶⁶

History of Science, 28 (1995), p. 175. Cummings suggests that York Buildings business in Scotland was far too diffused geographically to allow effective control from London. See Cummings, 'York Buildings Company', chap. 4, p. 570.

⁶⁴ Smith, 'Steam and the City', p. 15. The original capital of £4000 was divided into 80 shares of £50 each. Later additional 200 shares were issued at £60 each to bring in more shareholders and to allow greater stock.

⁶⁵ Mark S.R. Jenner, 'L'Eau Changé en L'Argent? Vendre L'Eau dans les Villes Anglaises au Dix-Septième Siècle', *Dix-Septième Siècle*, 55 (2003), p. 646.

⁶⁶ NLW, Penrice and Margam Estate Records, P&M 4A, 5555, Certificate of the Aldermen, Burgesses, and Principal Inhabitants of Neath on their recommendation to enlist the Company's disorderly workers to serve the navy, 26 May 1705; William Rees, *Industry before the Industrial Revolution* (2 vols, Cardiff: Cardiff U.P., 1968), vol. 2, pp. 538-41.

Mackworth's Mine Adventure: An Introduction

The newer aspects of projecting culture – the fashionable interest in unincorporated joint-stock companies, news mongering, stock-jobbing, and the conspicuous fluctuation of public opinion in the emerging stock market – make it appear as if projecting activities contradicted the core values of the landed society, as historians like Pocock and Brewer proposed. Other historians, however, have found unmistakable evidence to suggest that the landed class was deeply embroiled not only in trading companies like the Tory-led 'old' East India Company, but also in the financial experiments of the 1690s and in numerous industrial initiatives in the age of the financial revolution.⁶⁷ Even Pocock himself has acknowledged that there were after all 'no simple antitheses between land and trade, or even land and credit'.⁶⁸ Thus a question remains: how was it possible for so many landed gentlemen to invest and take initiatives in commercial and industrial schemes, seemingly extraneous, if not detrimental, to their values?

So far, historians have often explained landed-class involvement by stressing their 'opportunism', 'self-interest', 'greed', and their being 'ignorant' but 'eager to make a quick killing'.⁶⁹ Profit motives of sorts must surely have come into play. Yet

⁶⁷ Horsefield, *Monetary Experiment*, pp. 205, 268-73; Linda Colley, *In Defiance of Oligarchy: the Tory Party, 1714-1760* (Cambridge: CUP, 1982), pp. 9-10, 148; Philip Jenkins, 'Tory Industrialism and Town Politics: Swansea in the Eighteenth Century', *Historical Journal*, 28 (1985), 103-23; Paul Monod, 'Dangerous Merchandise: Smuggling, Jacobitism, and Commercial Culture in Southeast England, 1680-1760', *Journal of British Studies*, 30 (1991), 150-82; Stewart, *Rise of Public Science*, p. 165; Whyman, *Sociability and Power*, pp. 78-84.

⁶⁸ J. G. A. Pocock, *Machiavellian Moment: Florentine Political Thought and the Atlantic Republican Tradition* (Princeton: Princeton U.P., 1975), pp. 446, 448, 449, at p. 449.

⁶⁹ Stewart, *Rise of Public Science*, pp. 154, 161, 163, 165, 381; Brewer, *Sinews of Power*, p. 204. For a similar interpretation of revenue raising projects addressed to the Treasury, see Colin Brooks, 'Taxation, Finance, and Public Opinion, 1688-1714' (Ph. D thesis, University of Cambridge, 1970), p. 228.

the presumption of impartiality and public-spiritedness was central to the lives of landed gentlemen and others, and was expressed not only in politics, but also in such spheres as natural philosophical experiments, and literary and aesthetic judgement.⁷⁰ It is therefore unlikely that gentlemen were willing to see their social prestige blotted by 'dirtying' their hands in dubious 'projects'.

According to Peter Lake, 'as many a godly preacher complained, the profane and ungodly were only too adept at repackaging drunkenness and gluttony as good fellowship or hospitality, at relaunching greed as prudence and proud and wasteful conspicuous consumption as the fitting display of status and wealth'.⁷¹ Those in higher social strata were perhaps better placed in doing so. Exploring trials of sexual misdemeanours, Alexandra Shepard suggests that 'men of privileged social status [. . .] were better able to avoid the consequences than subordinates', repackaging their crimes as benign excess.⁷² Likewise, I argue, landed gentlemen could conceptualise their own financial and industrial activities rather approvingly, while at the same time denouncing the Whigs by invoking the Country Tory ideal (or the Neo-Harringtonian ideology as Pocock puts it), highlighting the unsavoury aspects of the financial market like stock-jobbing.

I will substantiate this argument through a case study of Sir Humphrey

⁷⁰ Steven Shapin, *Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: University of Chicago Press, 1994); John Barrell, *English Literature in History, 1730-80: An Equal, Wide Survey* (London: Hutchinson, 1983). For a recent survey of the concept of disinterestedness, see Michael McKeon, *Secret History of Domesticity: Public, Private, and the Division of Knowledge* (Baltimore: Johns Hopkins U.P., 2005), pp. 342-68, 385-86.

⁷¹ Peter Lake, 'From Troynouvant to Heliogabulus's Rome and Back: "Order" and its Others in the London of John Stow', in J. F. Merritt (ed.), *Imagining Early Modern London: Perceptions and Portrayals of the City from Stow to Strype, 1598-1720* (Cambridge: CUP, 2001), p. 219.

⁷² Alexandra Shepard, *Meanings of Manhood in Early Modern England* (Cambridge: CUP, 2003), pp. 1, 83, 172, 246-47, at p. 172.

Mackworth and his mining enterprise, the Governor and the Company of the Mine Adventurers of England. Mackworth became a Tory MP while directing the mining business, and condemned Whig monied men as corrupt ‘Knaves [. . .] who living upon Grants and Taxes, are the Off-springs of War and Confusion’.⁷³ Yet he published banking proposals before launching his mining company,⁷⁴ and, as we have seen above, he became interested in buying and short-selling the South Sea stocks. The case is richly documented: we have not only printed materials and the manuscript committee minutes (1699-1707) of the Mine Adventure, but also Mackworth’s diary (1695-1704) that covers the period before and after its flotation.⁷⁵ His mining business has attracted a number of case studies, but, with a few notable exceptions, they have tended to focus on the unfolding of the fraud in order to determine the extent to which Mackworth was to blame.⁷⁶ Yet the available evidence is so rich that the case provides us with an ideal platform for exploring ways in which landed gentlemen could draw upon a tradition of projecting activity, especially the ideal of godly public service, and thereby legitimise their involvement in a

⁷³ Humphrey Mackworth, *The principles of a member of the black list* (1702), p. xxiii.

⁷⁴ Humphrey Mackworth, *England’s glory* (1694).

⁷⁵ WGAS, RISW/GGF17, Minutes of the Select Committee of [. . .] the Mine Adventurers of England (Hereafter cited as the Mine Adventure Minutes); NLW, 14362E, Diary of Sir Humphrey Mackworth (Hereafter cited as Mackworth Diary).

⁷⁶ Grant Francis, *The Smelting of Copper in the Swansea District* (2nd ed., London: Henry Sotheran, 1881), pp. 85-86; D. Rhys Phillips, *The History of the Vale of Neath* (Swansea: published by the author, 1925), p. 278; S. Evans, ‘An Investigation of Sir Humphrey Mackworth’s Industrial Activities (MA thesis, University of Wales, Cardiff, 1953), pp. 239-45; Rees, *Industry*, vol. 2, pp. 561-562; W. P. Griffith, ‘Mackworth, Sir Humphrey (1657-1727)’, *Oxford DNB*, vol. 35, pp. 699-701. But see a rich account with emphasis on Mackworth’s political career, Eveline Cruickshanks, Stuart Handley, and David Hayton (eds.), *History of Parliament: The House of Commons, 1690-1715* (5 vols, Cambridge: CUP, 2002), vol. 4, 724-735 (Hereafter cited as Hayton, ‘Mackworth’). See also Koji Yamamoto, ‘Sir Humphrey Mackworth and the Company of the Mine Adventurers of England: Meanings of Gentlemen in Late Seventeenth- and Early Eighteenth-century England’ (MRes thesis, University of York, 2005).

speculative enterprise.

The Mine Adventure: its Flotation and the Background

On 4 October 1698, the diarist Narcissus Luttrell recorded the beginning of the scheme: 'Yesterday 26,490 l. was subscribed to sir Humphry Mackworth's mine adventure' by means of a lottery. Five months later, in March 1699, the diarist noted that the 'lottery for the mine adventure, being full for 125.000 l., is now drawing at Stationers Hall.'⁷⁷

Lottery tickets cost £5 each, and the fortunate ones who drew the prize tickets were given shares ranging from one to fifty shares (a nominal value of £20 per share). Those who drew 'blank' tickets would receive no share, but it was promised 'that both the *Fortunate* and *Unfortunate* shall receive their Principal Money, with [yearly] Interest at *6l. per Cent.* [. . .] out of the First Profits of the Mines, before any Dividend be made to the *Fortunate* alone'.⁷⁸ It was also suggested that the Company, 'with a large Stock and good Management, would yield a clear Yearly Profit' of more than £171,000.⁷⁹ The Company's lottery scheme thus appealed to investors by highlighting elements of both speculation and secure investment.⁸⁰

This venture had been vigorously promoted. Newspapers advertised the lottery,

⁷⁷ Narcissus Luttrell, *A Brief Historical Relation of State of Affairs from September 1678 to April 1714* (6 vols, Oxford: OUP, 1857), vol. 4, pp. 434, 489.

⁷⁸ [The Mine-Adventurers of England], *A new abstract of the mine-adventure* [. . .] (1698), [a handbill printed on both sides]. For more details, see Scott, *Joint-stock*, vol. 2, pp. 445-47.

⁷⁹ [The Mine-Adventurers of England], *New abstract*.

⁸⁰ In this respect, the Mine Adventure's lottery scheme was similar to other lotteries launched in the 1690s. See Anne Murphy, 'Lotteries in the 1690s: Investment or Gamble?', *Financial History Review*, 12 (2005), esp. pp. 232, 245.

and handbills explained the arrangement and the future profitability.⁸¹ There were about 700 shareholders in total, drawn from different parts of the country, with no less than 150 female investors. A list of the subscribers was published.⁸² Among them were prominent gentlemen across political spectrum. These not only included the figurehead Governor, the Tory Duke of Leeds, Sir Joseph Hearne, ex-governor of the 'old' East India Company of 1690-92, and the Tory William Baron of Digby, but also Sir Thomas Vernon with Whig sympathies, and Sir William Hedges involved in the management of the Whig led Bank of England and the Levant Company.⁸³ The investors thus straddled, to borrow Gary De Krey's phrase, 'the fence between the aggressive commercial capitalism promoted by William III's wartime whig ministry and the established world of tory investment'.⁸⁴ One pamphlet highlighted that 'Noble Lords and Gentlemen, [. . .] so many ingenious and industrious Merchants and Lawyers' were among shareholders and were involved in its management.⁸⁵

The constitution of the Company largely followed other joint-stock companies. Twelve directors, who held a minimum of twenty shares each, were to work under a governor and a deputy-governor. They together formed the board of directors or the

⁸¹ *Flying post or the post master*, 529, Thurs. 29 Sep. 1698; *Post man and the historical account*, 520, Thurs. 29 Sep. 1698; *Post boy*, 566, Sat. 26 Nov. 1698. For example, *New abstract* was available in such places as the Queens Head, Little Lincolns-Inn Fields, 'and most of eminent Booksellers in London and Westminster', and was probably given gratis. *Post boy*, 520, Thurs. 1 Sep. 1698; *Post boy*, 560, Sat. 12 Nov. 1698.

⁸² [The Mine-Adventurers of England], *A list of the fortunate adventurers in the Mine-Adventure* (1699); [The Mine-Adventurers of England], *A list of all the adventurers in the Mine-Adventure* (1700).

⁸³ For Leeds, Hearne, Vernon, and Hedges see respective entries in *Oxford DNB*. For Digby, see Erskine-Hill, *Social Milieu of Alexander Pope*, pp. 143-44.

⁸⁴ G. S. De Krey, 'Hedges, Sir William (1632-1701)', *Oxford DNB*, vol. 26, p. 227.

⁸⁵ William Shiers, *A familiar discourse or dialogue concerning the Mine-Adventure* (1700), sig. A4. For more details see [The Mine-Adventurers of England], *A settlement of the mines late of Sir Carbery Pryse* [1698], p. 1; Evans, 'Mackworth's Industrial Activities', appendix N.

select committee that managed the business. Shareholders with more than three shares could cast a vote at annual general meetings to choose directors and approve the management. All shareholders were allowed to make complaints at general meetings of the Company, but not in law courts.⁸⁶

Promotional literature stressed that the Company would achieve three ambitious goals: piety, profit, and public service. It was '*An Undertaking Advantagious for the Publick Good, Charitable to the Poor and Profitable to every Person who shall be concerned therein*'.⁸⁷ Not everyone, however, believed the publicity, and the Company was indeed also stereotyped as a dubious 'project'. One pamphlet alleged that the Company was driven by 'Projectors that have Fiction for their foundation' and that its 'Publick-spiritedness [was] pretended'.⁸⁸ To manage such distrust the Company marshalled a wide range of strategies. It published legal testimonies to prove the richness of the mines, an essay on the value of the mines by the mining expert and the head steward of the Company's mines in Cardiganshire, William Waller, and even a poem and 'familiar dialogues' on the Company.⁸⁹ These pamphlets invoked Xenophon's comments on Athenian mining and its public significance, and also discussed precedents of successful mining in Europe and Peru. Doing so helped stir up a sense of national pride that Augustan England should

⁸⁶ See Scott, *Joint-Stock*, vol. 2, p. 447; Rees, *Industry*, vol. 2, p. 531. It was emphasised that each shareholder had only one vote.

⁸⁷ [The Mine-Adventurers of England], *New abstract*.

⁸⁸ *An answer to the postscript of a paper, published by Sir H. M[...] intitul'd An answer to several objections* (1698), p. 1.

⁸⁹ [The Mine-Adventurers of England], *A true copy of several affidavits* (1698); William Waller, *An essay on the value of the mines* (1698); Thomas Yalden, *A poem on the mines late of Sir Carbery Price. Dedicated to Sir Humphry Mackworth* (1701); Shiers, *Familiar discourse*.

compete with its ancient and contemporary rivals.⁹⁰ The Mine Adventure was therefore a typical 'project', making grandiose promises and attracting a degree of suspicion.

Plans for the establishment of the Mine Adventure emerged when its deputy governor, Mackworth, sought to raise funds to extend the mining business of his wife's family.⁹¹ Mackworth was the second son of a Shropshire landowner. As a result, while his father and grandfather were men of some estate, he could not expect to inherit or live off the estate, and had to establish himself, building upon connections and an annuity of £80 from his father. Before turning twenty, he entered Oxford and then the Middle Temple. In 1683 Mackworth was knighted for legal service although he stopped pursuing the profession soon afterwards. In 1686 he married Mary Evans, the daughter and sole heiress of Sir Herbert Evans of Glamorganshire, south Wales. This was an advantageous match. Though not matching the estates of the Beauforts, the Mansels, and the Windsors in the same region, Mackworth was to inherit a family estate worth about £1200 p.a. (including rich coal mines), a scale that stood out among some two hundred lesser gentry families of the county.⁹² He did not actually inherit the estate until 1696, having to wait due to the remarriage of his mother-in-law.

Once he inherited the estate, Mackworth seems to have exploited the opportunities that it offered very vigorously. He developed the coal and copper mines, furnaces and other infrastructures, restoring the industrial complex from the relative

⁹⁰ Waller, *Essay on the value of the mines*, pp. 41-47, 53-54; Shiers, *Familiar discourse*, pp. 83-84.

⁹¹ Unless otherwise indicated, biographical information about Macwkorth in this section is taken from *Oxford DNB* and Hayton, 'Mackworth'.

⁹² Arthur H. John and Glanmor Williams (eds.), *Glamorgan County History* (5 vols, Cardiff: University of Wales Press, 1936-1988), vol. 5, p. 7.

neglect of previous decades. In 1698 Mackworth tried to purchase the lead mines of the deceased Sir Caberry Price of Cardiganshire in western Wales, which were believed to be very rich in silver. His plan was to form a company to reorganise the venture Price had started, and to bring lead ore to his Glamorgan estate and smelt it with the coal from his own mines. Mackworth was thus an enterprising gentleman: ‘severall persons oberv[e]d th[at] I was too Eager & Carefull, too fond of these new designes’, he noted in his diary.⁹³ As Martin Daunton points out, under the law of trusts and a legal decision of 1673, ‘the Court of Chancery permitted unincorporated business associations to vest their assets in trustees through a deed of settlement’; this facilitated ‘investment in public works and utilities which would otherwise have been difficult’.⁹⁴ The Mine Adventure began as an unincorporated joint-stock company of this kind, and became incorporated in 1704.

The Company found it difficult, as we shall see below, to yield adequate profits to pay out dividends from as early as 1700; yet it remained active until about 1707. Thereafter, it failed to sustain the appearance of prosperity and failed disastrously. The Company’s decline has been told several times now.⁹⁵ Put simply, it collapsed primarily because it extended its activities over too many different mines and related refining activities, used paper credit to borrow far beyond the liquidity of its assets, overestimated future profitability, and clung too much to the hope that the scheme might in the end flourish. The Company’s mines failed to achieve the expected level

⁹³ Mackworth Diary, fol. 71, 27 Sep. 1696.

⁹⁴ M. J. Daunton, *Progress and Poverty: Economic and Social History of Britain 1700-1850* (Oxford: OUP, 1995), pp. 239-40, at p. 240. See also Ron Harris, *Industrializing English Law: Entrepreneurship and Business Organization, 1720-1844* (Cambridge: CUP, 2000), chap. 1.

⁹⁵ The following summary is based on Scott, *Joint-Stock*, vol. 2, pp. 450-55; Rees, *Industry*, vol. 2, pp. 549-67.

of profit; so under Mackworth's direction, the management fabricated false news and 'cooked' its accounts. Some directors manipulated the share price, sold off part of their shares, and thereby paid creditors and shareholders and profited themselves. Even some of the directors fell victim; the select committee meetings were often held without meeting the quorum, and were frequently dominated by Mackworth, his cousin, and their associates. Breaches of trust were not criminally punishable,⁹⁶ and complaining to the Company's directors was not an effective remedy. Disaffected subscribers and directors thus petitioned parliament in 1710. The Whig-dominated Commons voted that Mackworth was 'guilty of many notorious and scandalous Frauds' and of conduct in violation of the Company's charter.⁹⁷ The Company survived the collapse of 1710, came back on the public stage during the Bubble of 1720, and continued its operations, developing links with the York Buildings Company. Some of the Company's Cardiganshire mines produced more than a thousand ton of lead ore annually even in the mid-nineteenth century.⁹⁸ So while the Company and its first deputy governor might well have perpetrated a great deal of fraud, the scheme had some material basis.

Mackworth was expelled from the Company in 1710. He sought to defend his honour by publishing a series of pamphlets; yet as we shall see, Mackworth came to be denounced as the 'projector' who siphoned money out of the gullible. If we take

⁹⁶ For background, see Richard Grassby, *The Business Community of Seventeenth-Century England* (Cambridge: CUP, 1995), pp. 216-17; James Taylor, 'Company Fraud in Victorian Britain: The Royal British Bank Scandal of 1856', *English Historical Review*, 122 (2007), p. 719.

⁹⁷ *CJ*, vol. 16, p. 391. The verdict came out of the parliamentary investigation documented in *ibid.*, vol. 16, pp. 311, 322, 328, 358-69, 388-90.

⁹⁸ W. J. Lewis, 'Lead Mining in Cardiganshire', in Geraint H. Jenkins and Ieuan Gwynedd (eds.), *Cardiganshire County History: Volume 3 Cardiganshire in Modern Times* (Cardiff: University of Wales Press, 1998), pp. 168, 169, 178.

such accusations at face value, this episode would confirm the conventional account that landed gentlemen like Mackworth could not ‘dirty’ their hands in business affairs without abandoning their ideals (such as the Country Tory ideology). Nevertheless, we are able to recover a more complex picture, because, throughout this thesis, we have repeatedly found that stereotypes shaped, but did not accurately describe, the practices of innovations. By deliberately putting aside the bad reputation that Mackworth began to acquire from the mid-1700s, I will now examine the promotional pamphlets of the Mine Adventure and juxtapose them with Mackworth’s diary and his letters. Doing so will reveal the surprising way in which Mackworth conceptualised and promoted his abortive and ultimately fraudulent mining business.

Piety, Profit, and Public Service: Conceptualising and Promoting the Mine Adventure

Not surprisingly, Mackworth benefited from the Mine Adventure. He privately admitted he had ‘labored & toyled in th[a]t business, p[ar]tly for profit, p[ar]tly for my reputac[i]on in this world’.⁹⁹ To take the profit first, coal mines and mineral refining at Mackworth’s estate in Neath came to yield as much as £600 pounds p.a. – a substantial sum considering his £80 annuity from his father.¹⁰⁰ The lead mines in Cardiganshire were expected to raise the vast profit of above £171,000 p.a. (as mentioned earlier) although the Company failed to realise it.

The Mine Adventure also served to enhance Mackworth’s reputation, most clearly because under his direction it was vigorously promoted as public service. The

⁹⁹ Mackworth Diary, fol. 98, 30 Jul. 1699.

¹⁰⁰ Hayton, ‘Mackworth’, p. 725.

head steward of the mines Waller published *An essay on the value of the mines* at the time of the flotation. Recalling his visit to Mackworth's estate and his mining business there, Waller praised Mackworth as a reliable leader who not only had knowledge in mining, business management, and law, but also had a 'Disposition for the publick Good':

I had the favour of being admitted to see the Copper-works and Coal-works of *Sir Humphry Mackworth*; and having observed his new Contrivances in the Management thereof [. . .]; and taking notice of his Judgment in Matters of Law, and also of his frank and generous Disposition for the publick Good; and that he was by no means of a covetous or grasping Temper, but took delight in the Advantage he brought to others, especially the poor Miners and Labourers, as well as in the Gains he got for himself. I presently concluded, that he was the fittest Person I knew to set the Wheels a going[.]¹⁰¹

Mackworth was also hailed as a credible gentleman. For example, a handbill that called for subscribers for the Company's lottery presented Mackworth as a public figure who would ensure no cheat be involved in the lottery or in the Company's transactions. Mackworth showed his willingness to take an oath to ensure fair transactions:

'*Sir Humphrey Mackworth* doth declare [. . .] at the Request of any *Adventurer*, to make a Voluntary *Affidavit* before a *Master in Chancery*, That he doth not gain, directly or indirectly, and Advantage to himself, but what is equally and fairly communicated to every other *Adventurer* whatsoever.'¹⁰²

If we turn to the lengthy legal document that sets out details of the lottery, notaries as well as the deputy governor were to take oaths.¹⁰³ Yet the handbill makes only sporadic reference to the notaries. In the Company's publicity, Mackworth was thus

¹⁰¹ Waller, *Essay on the value of the mines*, sig. b.

¹⁰² [The Mine-Adventurers of England], *New abstract*. For a cultural history of oath-taking, see John Spurr, 'A Profane History of Early Modern Oath', *Transactions of the Royal Historical Society*, 6th ser., 11 (2001), 37-63.

¹⁰³ [The Mine-Adventurers of England], *A settlement of the mine-adventure* [1698], pp. 8, 10.

presented above the others as the symbolic guarantor of fairness, a role that would have enhanced his reputation as a 'man of credit'.¹⁰⁴

Furthermore, the Mine Adventure led to tangible political advancement. In a letter sent to the mine steward Waller in April 1700, Mackworth declared that 'nothing would be so honourable for your friend as to be elected for that county where the mines lie', and instructed him to publicise his 'service' to local prominent figures.¹⁰⁵ For Mackworth, becoming an MP was a 'great affaire'.¹⁰⁶ In December 1700, about two years after the flotation of the Company, Mackworth dined in London with other potential candidates 'to settle the Election at Cardiganshire', and sent letters about the affair.¹⁰⁷ He was indeed elected for Cardiganshire in 1701, thanks to the connections he had obtained from the Mine Adventure, and possibly to the bribes he had offered.¹⁰⁸ Joint-stock companies were thus not inherently detrimental to gentility and social prestige. Serving as the deputy governor, Mackworth not only hoped to raise profit, but in fact developed his parliamentary career.¹⁰⁹

Mackworth, however, never publicly admitted that he was merely pursuing

¹⁰⁴ Defoe recommended that lotteries be supervised 'by Men of known Integrity and Estate' to prevent fraud. See Defoe, *Essay upon projects*, p. 187.

¹⁰⁵ William Waller, *Mine-Adventure laid open* (1710), p. 17, Mackworth to Waller, 9 Apr. 1700.

¹⁰⁶ Mackworth Diary, fol. 113, about 21 Dec. 1700.

¹⁰⁷ Mackworth Diary, fols. 113-16 ff., 20-23, 25, 27 Dec. 1700.

¹⁰⁸ Mackworth told Waller to pay 'compliments to my Lord Lisburne, that he may command what coal he pleases, at his own price.' Hayton, 'Mackworth', vol. 4, p. 726. See also Henry Horwitz, *Parliament, Policy, and Politics in the Reign of William III* (Manchester: Manchester U.P., 1977), p. 321.

¹⁰⁹ For his subsequent parliamentary activities, see Hayton, 'Mackworth', passim; Mary Ransome, 'The Parliamentary Career of Sir Humphrey Mackworth, 1701-13', *University of Birmingham Historical Journal*, 1 (1948), 232-54.

personal aggrandisement. On the contrary, he consistently publicised the scheme as a noble public service and tried to implement it as such. Creating jobs for the poor was one aspect of public service the Mine Adventure highlighted. One of its pamphlets claimed that the Company would not only benefit its 'Adventurers', but also the poor, and the country at large:

In short, these *Mines* [. . .] will supply the Nation with Bullion, raise Estates for all the Adventurers, promote a Foreign Trade with the Commodities of own Country, and provide for *Many Thousands of Poor People* in all Parts of the Kingdom.¹¹⁰

The Company's economic claim extended to the national economy. It would, another pamphlet contended, 'Employ the Poor, and improve our Manufactures; and consequently, to add considerably to the National Stock, and bring more Wealth to England than any Foreign Trade whatsoever.'¹¹¹

The Mine Adventure also promoted charity, something that had wide appeal and perfectly fit for high Tories like Mackworth. Under his direction, the Mine Adventure supported two charity schools chiefly for the children of mineworkers.¹¹² It was further said that 'all aged and impotent Miners and Labourers in their service [to the Company], are to be maintained out of the Profits of the Mines.'¹¹³ Mackworth even planned to donate 'as far as Ten thousand pounds' worth of the Company's shares to Corporations for the Poor in London, Bristol, York and elsewhere, so that they would

¹¹⁰ [The Mine-Adventurers of England], *New abstract*. See also Waller's praise of Mackworth quoted earlier.

¹¹¹ [The Mine-Adventurers of England], *True copy of several affidavits*, p. 4.

¹¹² See Thomas Shankland, 'Sir John Philipps of Picton Castle, the Society for Promoting Christian Knowledge, and the Charity-School Movement in Wales 1699-1737', *Transactions of the Honourable Society of Cymmrodorion*, (1904-1905), pp. 142, 211.

¹¹³ Shiers, *Familiar discourse*, p. 150.

be funded annually by dividends from the Company.¹¹⁴ Earlier promoters of economic innovations and improvement had often proposed the employment of condemned criminals.¹¹⁵ The Company did the same. It arranged condemned criminals 'to be Transported over *Severn* to work in the Mines' of the Company as indentured labourers for five years, slavery with a charitable gloss by which the nation would 'reap the benefit of their Labour, and the poor penitent Criminals be able to make some Atonement for their Crimes in the Service of their Native Country.'¹¹⁶

The Company's promotion corresponded to Mackworth's view of the undertaking as godly public service, a view he frequently expressed in his diary (1695-1704). The diary is tightly bound and has 161 pages. It was neither too large nor too heavy, and the entries suggest Mackworth carried it around with him.¹¹⁷ Not all the entries were dated, but Mackworth seems to have written entries mainly on Sundays, often writing about the sermons he heard in the morning. While the diary covers such diverse topics as politics, music, business activities, and addresses to children, most of them were written from an overwhelmingly spiritual perspective.

¹¹⁴ Shiers, *Familiar discourse*, pp. 11-14. This plan was later changed to the donation of 1/12 of yearly clear profit.

¹¹⁵ See Thomas Bushell, *An extract by Mr. Bushell of his late abridgment of the Lord Chancellor Bacons philosophical theory in mineral prosecutions* (1660), p. 29; Thomas Birch, *History of the Royal Society of London* [1757] (4 vols, Bruxelles: Culture et Civillisation, 1968), vol. 3, p. 196-216 (esp. p. 210), Sir Robert Southwell's 'discourse concerning water'; Defoe, *Essay upon projects*, p. 103.

¹¹⁶ Shiers, *Familiar discourse*, pp. 141-50 (quotations from p. 142).

¹¹⁷ The diary consists of a single gathering, measures 325 x 210 x 10 mm., and weighs 934 grams (with modern bindings). While it was repaired and rebound sometime after its accession at the NLW in 1942, there is no surviving evidence of any previous binding and nothing to indicate the removal of any pages. I am grateful to Mr Rhys M. Jones of the NLW for answering my enquiries. Several quotations from the diary can be found in Phillips, *Vale of Neath*, pp. 169, 233-37, 263, 377-79. It is not known whether Mackworth kept a diary after 1704, although there survives a much shorter diary that covers 1722-1723 at Neath Antiquarian Society, Neath, Gnoll Estate Collection, NAS Gn/P2/12.

On the first page, for example, Mackworth wrote: 'Remember & always call to mind that you have but one thinge to doe & th[at] to serve God; this is y[ou]r business in this world, all the affaires are collateral'.¹¹⁸ Mackworth repeated such 'observances' and 'examination' to remind himself that 'I am doing his business in the world'.¹¹⁹

Religious self-fashioning of this kind was widespread throughout the seventeenth century, and was part of what Andrew Cambers calls the 'Godly religious culture', a culture 'that had sociability at its heart', where diaries 'were indeed read, cherished, and circulated'. These writings were 'private' only in that they did not address the unrestricted reading 'public'. '[M]odelled from the outside, not just written from the inside', these writings reflected writers' engagement with contemporary conventions and culture.¹²⁰ Exploring Mackworth's diary will therefore reveal how embracing the economic and religious ideals that informed many projecting activities also enabled this Tory landed gentleman to conceptualise and legitimise his mining business.

Mackworth saw the employment of the poor as part of his 'duty' to advance the public good. Two years before the floatation of the Mine Adventure, he wrote in his diary: 'I thought it my duty to bee carefull of my Temporall talent in order to doe more good to Employ poore labourers'.¹²¹ Within two months of this, his father-in-law died suddenly, and the management of the family business finally came

¹¹⁸ Mackworth Diary, fol. 1, [n.d.]. See also *ibid.*, fols. 2, 100.

¹¹⁹ Mackworth Diary, fol. 77, 15 Nov. 1696. See also *ibid.*, fol. 4, [n.d.]: '*How doth this designe or action tend to the Glory of God; or his Service?* If you don't aske y[ou]r self this question, hee Certainly will in effect at the day of Judgment.' Cf. David Hayton, 'Moral Reform and Country Politics in the Late Seventeenth-Century House of Commons', *Past & Present*, 128 (1990), 48-91, esp. p. 75.

¹²⁰ Andrew Cambers, 'Reading, the Godly, and Self-Writing in England, circa 1580-1720', *Journal of British Studies*, 46 (2007), p. 824.

¹²¹ Mackworth Diary, fol. 72, 27 Sep. 1696.

to his hands. Feeling God's providence in this turn of events, Mackworth resolved to use the estate business as an instrument to serve the public good and his family:

when God was pleased in opposition to my adversaryes to give mee a Coalework, I resolved then in obedience to his commands to apply my self to the manag[em]ent of it, purely out of a design to doe more good in the world, to my children and to the whole town & countrey ab[ou]t Neath who were grown very poore & [I] would Employ [them] & [encourage] Trade.¹²²

Note that he again presented the employment of the poor as public service, a view that anticipated the promotion of the Mine Adventure.

Creating jobs was one of the underlying themes in the history of projecting activities, and was seen as an example of public service in early modern social and economic reforms.¹²³ Mineral works required labourers for digging and transporting ore; metal extraction required smelters. Thus, those who had estates rich with mineral resources, like the Lowthers, the Beaumonts, and the Evans (whose estates Mackworth inherited), could display their public service by developing the mining industry.¹²⁴ According to Gabriel Plattes's *A discovery of subterranean treasure*, mining would set 'people on workes; not onely in the discovering of them [mines], but also in the severall operations about the digging, melting, and refining of them'.¹²⁵ In this way, Plattes argued, mining would tend 'to releev and sustaine the lives of Men', and therefore had '*the great benefit [. . .] to divers Kingdomes and*

¹²² Mackworth Diary, fols. 75-80, [15 Nov. 1696?] (quotation from fol. 80).

¹²³ See Chapter One; Slack, *From Reformation to Improvement*.

¹²⁴ Aristocrats and lesser landowners played a range of roles in mining, and there is rich historiography. See, for example, Lawrence Stone, *The Crisis of the Aristocracy, 1558-1641* (Oxford: Clarendon, 1965), pp. 338-55; Heal and Holmes, *Gentry*, pp. 120-3; G. E. Mingay, *English Landed Society in the Eighteenth Century* (London: Routledge, 1963), pp. 189-96; and J. V. Beckett, *The Aristocracy in England 1660-1914* (Oxford: Blackwell, 1986), pp. 209-25.

¹²⁵ Gabriel Plattes, *A discovery of subterranean treasure* (1639), sig. [B2v]. The book went through at least two editions during Mackworth's lifetime (1679, 1684 and probably 1715),

Countries’ when properly managed.¹²⁶ This was, then, one of the ideals that helped Mackworth (and later the Mine Adventure) to conceptualise mining as a public service.

The Company’s charitable arrangements reflected Mackworth’s view of charity. In an entry probably written prior to his involvement in mining, Mackworth wrote how he ‘must labor in an honest Calling’:

wee may Employ the Treasure wee get as may bee most for his [i.e., God’s] Glory & Service; here wee proportion a part thereof to the poore; and soe [that we] are actually labourers in his Vineyard, providing for his family, & in his immediate service.¹²⁷

Mackworth linked this charitable aspiration to the industrial activities. When the management of the estate came to his hands, he wrote:

the L[or]d[,] grant th[a]t in all my designs of Coaleworks & Copperworks I may not relye on my self, or please my self w[i]th any hapyness from them, any further th[a]n I may doe more good in the world, for my dear children, & for the poore[.]¹²⁸

Mackworth understood the Mine Adventure in the same way. In the first entry he wrote after he had set up the Company, he aspired to make it ‘acceptable’ to God:

O Lord Grant (I beseech thee) th[a]t I began this Undertaking w[i]th a good designe soe I may Carry it on in such manner as may bee acceptable in thy light & may most tend to the honour & glory of thy most Holy name; by doeing good to the poor for y[ou]r sole sake of my Blessed Saviour[.]¹²⁹

If the prospect of employing the poor *enabled* Mackworth to see his mining business as public service, then the ideal of charity *obliged* (rather than merely enabled) him to sanctify the undertaking and make it acceptable to God’s eyes.

¹²⁶ Plattes, *A discovery of subterranean treawsure*, sig. [Bv], sig. [B2v].

¹²⁷ Mackworth Diary, fol. 5 [n.d.].

¹²⁸ Mackworth Diary, fols. 77-78, 15 Nov. 1696.

¹²⁹ Mackworth, Diary, fol. 98, 30 Jul. 1699.

Mackworth's and the Company's charitable aspiration echoed an influential biblical dictum that 'If thou wilt be perfect, go *and* sell that thou hast, and give to the poor, and thou shalt have treasure in heaven' (Matthew 19: 21). More specifically, his mining scheme was integral to what historians have often called the 'godly reformation' or the 'moral revolution'.¹³⁰ From the 1690s, Societies for the Reformation of Manners were established; the Sunday School movement grew; founding hospitals and workhouses were erected; and special sermons funded by public subscriptions, so-called 'lectureships', thrived.¹³¹ Landed gentlemen as well as middling sorts took part. As Robert Nelson urged, 'men of quality' should 'value their high Rank and Station in the World, chiefly as it is an Instrument of doing Good.'¹³² In 1698, while busy setting up the Mine Adventure, Mackworth indeed helped found the SPCK.¹³³ From 1701 he was a member of the Society for the Propagation of the Gospel in Foreign Parts (SPG), donating £10 yearly to support its missions abroad.¹³⁴ Worldly affairs like the Mine Adventure could not be divorced from these charitable missions. Mackworth felt he 'should adjust a due care of

¹³⁰ Tony Claydon, *William III and the Godly Revolution* (Cambridge: CUP, 1996); John Spurr, 'The Church, the Societies and the Moral Revolution of 1688', in John Walsh, Colin Haydon, and Stephen Taylor (eds.), *The Church of England c. 1689-c. 1833: From Toleration to Tractarianism* (Cambridge: CUP, 1993), 127-42.

¹³¹ Mark Goldie, 'Voluntary Anglicans', *Historical Journal*, 46 (2003), pp. 989-90. For background see also Craig Rose 'Providence, Protestant Union and Godly Reformation in the 1690s', *Transactions of the Royal Historical Society*, 6th ser., 3 (1993), 151-69; Tim Hitchcock, 'Paupers and Preachers: the SPCK and the Parochial Work-house Movement', in Lee Davison, Tim Hitchcock, Tim Keim, and Robert B. Shoemaker (eds.), *Stilling the Grumbling Hive: the Responses to Social and Economic Problems in England, 1689-1750* (Stroud: St. Martin's Press, 1992), 145-66.

¹³² Robert Nelson, *An address to persons of quality and estate* (1715), p. 8.

¹³³ Craig Rose, 'The Origins and Ideals of the SPCK 1699-1716', in Walsh, Haydon, and Taylor (eds.), *The Church of England*, p. 173.

¹³⁴ Lambeth Palace Library, London, SPG VI, fols. 7, 14-15, 27, 35, 37, 63, 112.

Temporall affairs & of Sprituall Together'.¹³⁵ Mackworth thus not only conceptualised the Company's goal as the pursuit of piety, profit, and public service, but also put some of his ideals into practice. This issues a useful warning about our interpretation of the rhetoric of godly public service. When we have encountered it in *promotional literature* in earlier parts of this thesis, it has been difficult to ascertain the extent to which promoters *embraced* the ideal they publicised. While we cannot take Mackworth to represent all other promoters, his case warns us that such rhetoric could be much more than a mere publicity tool.

This is not to suggest that Mackworth was a god-like entrepreneur. Pious he might have been, but Mackworth was all too happy to use godliness to lend credibility to what some commentators stereotyped as a dubious 'project'. Using condemned criminals as indentured labourers smacked of slavery, and Mackworth was at pains to reassure that, far from making them slaves, the proposal would save them '(that have forfeited their Liberty) from the Slavery, both of Sin and Death'.¹³⁶ As the Company started calling for subscriptions to its lottery, it tripled its charitable contributions, presumably hoping for the public's attention.¹³⁷ The use of a lottery was justified on this account. One of the company's pamphlets acknowledged that 'Lotteries have been generally abused'. But the pamphlet contended that cheating and unfair lotteries should be 'restrained and regulated', with 'a tacit Commendation of those that make a right use' of it.¹³⁸ Highlighting that 'a Twelfth part of the Profits

¹³⁵ Mackworth Diary, fols. 71-72, 27 Sep. 1696.

¹³⁶ Shiers, *Familiar discourse*, pp. 143-44 (at p. 144).

¹³⁷ Compare [The Mine-Adventurers of England], *Settlement of the mines late of Sir Carbery Pryse*, p. 16; [The Mine-Adventurers of England], *Settlement of the Mine-Adventure*, p. 3. The former, signed on 3 August 1698, arranged to set off 1/40 of the clear profits, whereas the latter, signed two months later when the subscription opened, offered 1/12 part.

¹³⁸ Shiers, *Familiar discourse*, pp. 5-6.

of all these Mines [would be] appropriated to Charitable Uses', the pamphlet praised the Company's lottery as a means to achieve a noble end:

This Lottery was at first contrived with a very good Design not only [. . .] to set on work so great Mine for the Publick Good, and employ great Numbers of poor Workmen, their Wives and Children; but also thereby [. . .] to Carve out of the Mines a very Great and Noble Share for Charitable Uses, which could not in all probability have been obtained by any other means.¹³⁹

Immediately after this passage, a 'Learned Doctor of Divinity', one of the protagonists of this pamphlet, told the reader that 'so great a Charity' of the Company convinced him to subscribe to the Company's lottery:

This, my Lord, was the Reason that induced me to engage in this Undertaking [. . .] I thought it became every good Man to give a helping Hand to it, not only to bring this particular Undertaking to good Effect, but by the Success of this, to encourage all other Persons concerned in Mineral Works, to follow so good an Example; and set to set apart some Share of the Profits thereof to Charitable Uses, if it were only to the Relief of such poor Miners, their Wives and Children, as may in time stand in need thereof.¹⁴⁰

Significantly, prominent 'Learned Doctor[s] of Divinity' were in fact among subscribers and directors. Thomas Bray, the founder of the SPCK, wrote that he had 'a considerable Interest' in the Company.¹⁴¹ The non-juror and Jacobite, Robert Nelson, another member of the SPCK whose views on charity I quoted earlier, held shares valued at more than £400, acting twice as a director.¹⁴² By the time the Company collapsed, John Chamberlayne, a translator, FRS, member of the SPCK and a secretary to the SPG, was owed £791 by the Company, whereas one Thomas

¹³⁹ Shiers, *Familiar discourse*, pp. 11, 10.

¹⁴⁰ Shiers, *Familiar discourse*, pp. 10-11.

¹⁴¹ H. P. Thompson, *Thomas Bray* (London: SPCK, 1954), pp. 43, 61 (quotation from p. 61).

¹⁴² See [The Mine-Adventurers of England], *List of all the adventurers*.

Nichol was owed more than £5,000 'in Trust for Christ Hospital'.¹⁴³ The Mine Adventure thus thrived in a state of symbiosis with charitable missions. Dividends would help finance charitable organisations. The ideal of charity in turn helped lend prestige to the business: having your name listed along with prominent aristocrats and a few well-known divines 'did one's social position little harm'.¹⁴⁴ Godly aspirations even helped justify the use of slavery and a lottery that could be controversial.

'Temptac[i]ons of Satan': Understanding a Fraud from a Godly Perspective

Having recovered Mackworth's conceptualisation and promotion of his business, we can now ask whether or not the Mine Adventure descended into fraudulent transactions because Mackworth abandoned his aspirations for piety and public service. Here, I will explore one of the earliest symptoms of malpractice for which we have evidence in Mackworth's diary accounts. Doing so will reveal that the fraud that contemporaries later denounced as an epitome of relentless 'projecting' was an ill-conceived attempt at keeping shareholder confidence in the precarious stock market, and that Mackworth was far from unrepentant of his fraud. While this account can be seen as exonerating him from the worst charge of rank hypocrisy, my intention is to use this episode to explore a middle ground between saint-like philanthropy and unrepentant fraud, a grey area in which many promoters of

¹⁴³ [The Mine-Adventurers of England], *An alphabetical list of the creditors of the Company of Mine-Adventurers of England* (1712), pp. 5, 14. For Chamberlayne, see also SPG XIV/256, secretary [Chamberlayne] to Robinson and Reynolds, 30 Jun. 1711. For Thomas Nichol, see also *A list of the names of the Governour and Company of the Mine-Adventurers, of England* (1708), p.3.

¹⁴⁴ Stewart, *Rise of Public Science*, p. 181.

economic innovations conceivably operated.

The Mine Adventure initially promised that an interest of six percent would be ‘paid every Second Wednesday in June Yearly, and the Principal as the Profits shall arise.’ Once the principal was repaid, dividends would follow.¹⁴⁵ But the Company made no promise as to when. Subscribers were left to peruse Waller’s *An essay on the value of the mines* (1698) which proclaimed that ‘I have not read or heard of such a Mine of Lead in all the World, as the great Vein’ at the Company’s mines.¹⁴⁶ He asserted, provided that ‘a Year’s time be allowed for putting the Work in Order’ with the ‘Stock proportionable’ to the undertaking, then ‘the work will be clear from all Obstructions from Water’ so that ‘Levels, Adits, Shafts’ could be constructed, thereafter ‘employ[ing] at three several Shifts, every eight hours, several Hundred Men’ to raise oar ‘by blasting upwards with Gun-powder’.¹⁴⁷ While this bold prospect probably helped draw in investors, it was built upon fatal assumptions. It underestimated the cost of drainage or the duties that the Company would have to pay to the landowners. Waller also failed to take into proper account any additional time or money that could be required for setting up a profitable routine.¹⁴⁸ As we saw in the last chapter, maintaining investors’ confidence and paying what was due on time were vitally important for large-scale undertakings. Here, we find similar dynamics played out in the emerging stock market.

In January 1700, as it became unlikely that the mines would return the expected profits by June, Mackworth began to fabricate reports from the mines. He told Waller

¹⁴⁵ [The Mine-Adventurers of England], *New abstract*; Scott, *Joints-stock Companies*, vol. 2, p. 447.

¹⁴⁶ Waller, *Essay on the value of the mines*, p. 5.

¹⁴⁷ Waller, *Essay on the value of the mines*, pp. 6, 12, 26.

¹⁴⁸ Waller, *Essay on the value of the mines*, p. 12.

what to write in his reports:

the Water being strong upon you, and you cannot suddenly drain it, nor make room for many Men to work, but in time you shall double your Men, and raise Quantities, but much more, when [. . .] no water troubles you[.]¹⁴⁹

Using a series of published abstracts of the letters from the mines, Waller began to excuse the delay in draining the mines and reaching profits.¹⁵⁰ In a report dated 2 April, he wrote that ‘we are troubled with Water and cannot raise much Oar yet’. At the same time, he promised that once the drainage was finished he would ‘then double and treble our Men in raising Oar’, an excuse that bore striking resemblance to Mackworth’s instruction.¹⁵¹ In a report sent shortly afterwards, Waller again followed Mackworth’s instruction closely and projected the ‘Victory [. . .] in Prospect’ while excusing the delay.¹⁵² Such reports were ‘confirmed’ by other reports, and then endorsed as ‘matters of fact’ by the directors in London who gave order to print and publish them.¹⁵³

One of the few extant outgoing letters from Mackworth reveals that this information fraud was not primarily intended to fleece investors. Referring to one of

¹⁴⁹ *CJ*, vol. 16, p. 360. See also an undated letter: ‘I hope you will send us a particular Account of the Mines in yours, that may put Life into us, for we all dead at present.’ Waller, *The Mine-Adventure laid open*, pp. 36-37.

¹⁵⁰ [The Mine-Adventurers of England], *The second abstract of the state of the mines of Bwlchyr-Eskir-Hyr* (1700), pp. 2, 3.

¹⁵¹ [The Mine-Adventurers of England], *The second abstract*, p. 9.

¹⁵² [The Mine-Adventurers of England], *The second abstract*, p. 13.

¹⁵³ The authentication of ‘matters of fact’ was a prevailing knowledge-making procedure in experimental philosophy, legal courts, and in novels. See Steven Shapin and Simon Schaffer, *Leviathan and Air-pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton U.P., 1985); Barbara J. Shapiro, *A Culture of Fact: England, 1550-1720* (Ithaca: Cornell University Press, 2000); Simon Schaffer, ‘Defoe’s Natural Philosophy and the Worlds of Credit’, in John Christie and Sally Shuttleworth (eds.), *Nature Transfigured: Science and Literature, 1700-1900* (Manchester: Manchester U.P., 1989), 13-44.

the Company's mines, Mackworth wrote:

As to Bwlchyr-Eskirhyr, give me leave to put in my foolish Thoughts, unless you can coffer out [i.e., drain] the Bog-Water into the Levels, or Curtis Drift, I could never imagine what good you could do in so wet a place [. . .]. We have given it all over the Town that you are raising Ore in two places, and now we shall be found Lyars. [. . .] You cannot imagine the Cry against us in the Town. All my best Friends begin to forsake us. If there be no Prospect of Interest Money this *June*, neither Blanks, nor Shares, will be worth Picking up in the Streets; but, if we had a little Oar in the Banks, and were raising Oar in Two or Three Places, I could get the Committee, perhaps, to buy the company's Shares, and pay the Interest, at least to all the new Adventurers. [. . .] The name of raising Oar in several Places will raise us Money, and keep our Credit, till the great Vein is found, and our Interest Money paid. Pray consider these things, and see what you can do.¹⁵⁴

The letter suggests that Mackworth committed the fraud because he was desperately trying to maintain the company's credit and keep the shareholders on board. This was difficult, especially because investors' confidence in joint-stock companies was deemed to be precarious. Investors sought financial return from investments, but were also wary of being cheated by joint-stock 'projects'. Accordingly, an imaginary character in *A familiar discourse* (1700) announced: 'there hath been several Projects set on foot, which have either proved unsuccessful, or which is worse, meer Cheats'.¹⁵⁵ In 'all the late Projects that were not founded on an honest bottom, the principal Promoters of them sold out immediately'.¹⁵⁶ As indicated earlier, the Mine Adventure also suffered from widespread distrust of dubious 'projects'. 'I have heard this Undertaking so ridiculed'; some 'malicious or designing Person shall spread a

¹⁵⁴ The quotation is reconstructed from two transcripts of the same letter, found in *CJ*, vol. 16, p. 360; Waller, *The Mine Adventure laid open*, pp. 78-80. These transcripts cover different portion of the same letter that seems to have been lost, but the transcripts match word-by-word where they overlap. Most of extant business letters by Mackworth have survived only as transcriptions printed in Waller's polemics against Mackworth. The letter quoted here was reportedly transcribed from the original which two of Mackworth's closest subordinates 'owned to be Sir *Humphry Mackworth's* Hand-writing' (*CJ*, vol. 16, p. 360).

¹⁵⁵ Shiers, *Familiar discourse* (1700), p. 16. See also *ibid.*, p. 45: 'they are resolved to make the *Mine-Adventure* to be a meer Cheat, right or wrong'.

¹⁵⁶ Shiers, *Familiar discourse* (1700), p. 44.

false Report in Town, which will soon be believed by a thousand such Inconsiderate Persons'.¹⁵⁷

Paying the promised dividends would surely have been the best retort to these allegations. Yet, the Mine Adventure could not do this because of the underlying problems of the limited availability of reliable technology and slender profit margin, both of which plagued large-scale undertakings throughout the early modern period. It is known that the Mine Adventure was using shafts for drainage called 'levels' and 'drifts' besides pumps and engines. Mackworth's letter quoted above suggests these technologies failed to function as expected. It was a commonplace that cost of draining rose rapidly as mines went deeper. As one commented in the 1660s, 'Instead of dreining the water, their pockets are dreined'.¹⁵⁸ The Mine Adventure's struggle was thus characteristic of the plight of early modern mining. The letter also reveals that Mackworth was anxious about the prospect of paying 6% interest (£2,000) in six months. Securing profits was difficult even for technically or operationally sound enterprises. As has been mentioned earlier, proprietors of the Newcomen steam engine had also to wait almost two decades until the engine began to yield modest profit.¹⁵⁹ The New River Company which began in James I's reign and survived into the Victorian era, had to endure two decades of unprofitable operations with huge overhead charges.¹⁶⁰ Likewise, the Mine Adventure also suffered from the slender

¹⁵⁷ Shiers, *Familiar discourse* (1700), pp. 2, 16. See also [The Mine-Adventurers of England], *The fourth abstract of the state of the mines of Bwlchyr-Eskir-Hyr* (1701), p 3; idem, *An abstract of letters concerning the mines* (1706), p. 4.

¹⁵⁸ S. Primatt, *The City and Country Purchaser and Builder* (1667), p. 29, as quoted in Stone, *Crisis of the Aristocracy*, p. 340. See also Heal and Holmes, *Gentry*, p. 120.

¹⁵⁹ For the episode, see Smith, 'Steam and the City', 5-20. See also Stewart, *Rise of Public Science*, pp. 115-16.

¹⁶⁰ Jenner, 'L'Eau Changé en L'Argent?', p. 650.

profit margin at its inception. Mackworth's involvement in the fraud was, therefore, an ad-hoc and imprudent response to the interlocking problems of drainage, realising profits, and keeping corporate credit in the precarious financial market. Mackworth was aware that he was instructing dubious practices. In the letter to Waller quoted earlier, he conceded: 'if you think the Mines will not answer' the expectation of great profit, 'we had better give them up.'¹⁶¹

For the high-churchman who conceptualised his business as a worldly pursuit of God's honour, this manipulation of reports was at worst a despicable sin. Mackworth accordingly used the diary to write out his repentance and record his resolutions to amend through godly self-examination. For most of 1700, while he was busy working on the Mine Adventure and instructing Waller to write 'encouraging' reports, Mackworth did not write any entries at all. Earlier in the year, in February, he once wrote that 'I hope [to] Endeavour for the future Every day to Examine myself, repent & amend the faults of each day.'¹⁶² It appears that he failed to keep the resolution. On 4 December, 'After many months Neglect of my daily observances', Mackworth resumed his diary. 'I have now not a day, but a yeare to acc[oun]t for', he told himself.¹⁶³ He repented 'how has my life been spent in a hurry in a Crowd of

¹⁶¹ Waller, *The Mine-Adventure laid open*, p. 80. This was perhaps one of the earliest information frauds in an unincorporated joint-stock company in Britain. For later examples, see the spectacular financial frauds of the York Buildings Company, whose governor 'was deliberately trying to convince stockholders and potential investors that the company was in good shape' (Cummings, 'York Buildings Company', pp. 95-96, quotation from p. 96). Cf. *CJ*, vol. 22, p. 187. For a Victorian parallel, see the Royal British Bank Scandal of 1856, in which the bank's governor admitted that 'we knew we had doubtful figures, which we hoped that future prosperity would have enabled us to cover up', (Taylor, 'Company Fraud', p. 712).

¹⁶² Mackworth Diary, fol. 103, 23 Feb. 1700.

¹⁶³ Mackworth Diary, fol. 109, 4 Dec. 1700.

worldly projects, w[i]thout the least concerne for my poor Soule'.¹⁶⁴ He went on: 'wh[a]t are all the Mines in the world to mee, unless applyed to the Glory of God, by doeing Good in the world'?¹⁶⁵

Mackworth went on to make a more specific confession in the same entry. He resigned himself and wondered that God might not after all allow the sins Mackworth had committed out of 'Temptac[i]ons' to prevail and 'convince' others. Here, Mackworth was looking back on the 'crowd of projects' in the management of the mines, and repented his depending too much upon his 'own Strength', a confession he made about a year earlier.¹⁶⁶ The entry smacks of the shady manipulation of corporate credit he had knowingly and rather successfully committed over the year:

L[or]d have mercey upon mee & grant if it bee thy blessed will that those Temptac[i]ons & fallings away may convince few, [then] little wee can depend on our own Strength, & how all our hopes are in the Infinite Mercy of our L[or]d to protect & defend, assist & strengthen us ag[ain]st the power of Satan[.]¹⁶⁷

On 10 December 1700, just six days after this entry, Mackworth reflected upon the 'hurry of writing letters' as Satan's temptation. Having written many sheets to 'instruct' Waller and others, Mackworth must have been in a fit position to reflect upon the subject:

¹⁶⁴ Mackworth Diary, fol. 109, 4 Dec. 1700.

¹⁶⁵ Mackworth Diary, fol. 109, 4 Dec. 1700. Where he referred to his mining project in his diary, he tended to repent his involvement in such a general term. See for example, Mackworth Diary, fols. 77-78, 80, 98, 99-100, 148.

¹⁶⁶ Mackworth Diary, fols. 99-100, 20 Nov. 1699: 'O L[or]d, I heartily beg pardon for all my sins & in particular for soe often depending on my own strength or policy'. Mackworth did not linger on the detail of his sin.

¹⁶⁷ Mackworth Diary, fol. 109, 4 Dec. 1700. For the prevalent invocation of providence in diaries and in 'seveenth-century political argument and decision-making', see Jeake, *Astrological Diary*, pp. 1, 6, 8-11; Blair Worden, 'Providence and Politics in Cromwellian England', *Past & Present*, 109 (1985), p. 55.

the very Surprise of Business might be a Call upon us to watch ag[ain]st the temptac[i]ons of Satan; of knowing th[at] th[e]re is the time th[at] hee will most Industrious to deceive us[.]¹⁶⁸

Such awareness of sinfulness was a commonplace in the early modern godly culture. As Margo Todd has shown, godly diary-keeping was intended not only to *reflect* one's interiority, but also to *shape* oneself into a godly mould that would be acceptable in God's eyes.¹⁶⁹ In the later seventeenth century, this ideal of *imitatio Christi* was often expressed in the teaching of 'practical godliness' and 'sanctification'. According to John Spurr, many Anglican and dissenting clergymen argued that in order for sinners to be accepted and saved as righteous on account of Christ's atonement they would have to show some evidence of repentance and amendment first. That is to say, they would have to 'sanctify' their life by doing good for god's honour.¹⁷⁰ Thus, the Mine Adventure was not simply a vehicle by which Mackworth aspired to do good in the world. It was at once a place of agony and atonement where he had to acknowledge Satan's temptation and the near impossibility of eradicating sins.¹⁷¹ Elements of self-interest and even the fraud that drove the joint-stock company were not exogenous to this godly frame of mind.

Embodying despicable sins as well as the possibilities of atonement, the Mine Adventure went on operating, with somewhat contradictory financial and economic ramifications. Unable to deliver the promised dividends, it clung to the conviction

¹⁶⁸ Mackworth Diary, fol. 111, 10 Dec. 1700.

¹⁶⁹ Margo Todd, 'Puritan Self-fashioning: The Diary of Samuel Ward', *Journal of British Studies*, 31 (1992), pp. 238, 249-50.

¹⁷⁰ John Spurr, *The Restoration Church of England, 1646-1689* (New Haven: Yale University Press, 1991), chaps. 5-6. Spurr suggests that this doctrine became widespread after the Restoration.

¹⁷¹ For his diary reference to worldly temptations and Satan see, for example, Mackworth Diary, fols. 3, 4, 6, 73, 109.

that further investment would, with God's assistance, bring profit eventually. In June 1701, the Company's Select Committee proposed to extend the Company's mine fields.¹⁷² By January next year, the directors decided that 'so many Blanks and Shares be added by way of Engrafftm[en]t' for the purchase.¹⁷³ In 1704, further resolution was made to bring in more subscribers to raise more silver for 'Public Service' as well as for investors' benefit.¹⁷⁴ In the same year, the Company obtained a charter for incorporation, and later petitioned parliament to obtain permission to set up the Mine-Adventure Bank.¹⁷⁵ The Bank did circulate its bills as a quasi-legal tender, an experiment that led to further debts.¹⁷⁶ The Company also urged creditors to accept the Company's shares instead of payment, an ad-hoc measure to convert debts into nominal investment. By the end of 1707, however, the Company had incurred debts of over £33,000 above its cash reserve of just £927, and still promised to pay a 5% dividend in May 1708, 'in new Money to be coined from Bullion, extracted from their Lead', a promise which would have required £15, 567 worth of silver.¹⁷⁷ About this time, the Company's share price, which, surprisingly, had been kept mostly above the nominal value, began to decline.¹⁷⁸

¹⁷² [The Mine-Adventurers of England], *A short account of the proceedings of the select committee of the Mine Adventurers* [. . .] *for lengthening their term and enlarging their boundaries* (1702), p. 1. See also Rees, *Industry*, vol. 2, p. 545.

¹⁷³ Mine Adventure Minutes, fols. 138-39 (at, p. 138), 29 Jan. 1702.

¹⁷⁴ [The Mine-Adventurers of England], *At a Court of Directors of the Governor and Company of the Mine-Adventurers of England* [. . .] *on Thursday the 15th day of June, 1704* [1704], p. 4. See also *idem*, *At a Court of Directors of the Governor and Company of the Mine-Adventurers of England* [. . .] *on Thursday the sixth day of December, 1704* [1704].

¹⁷⁵ Mine Adventure Minutes, fol. 258, 4 May 1704.

¹⁷⁶ See Scott, *Joint-Stock*, vol. 2, pp. 451-52; Rees, *Industry*, vol. 2, pp. 549-50, 554-555.

¹⁷⁷ *CJ*, vol. 16, p. 362; Scott, *Joint-Stock*, vol. 2, p. 452; Rees, *Industry*, vol. 2, p. 554.

¹⁷⁸ Scott, *Joint-Stock*, vol. 2, p. 450.

Despite, or perhaps in part thanks to, the scandalous transactions in London, the Mine Adventure helped diffuse new technologies and develop infrastructures for future economic development in Wales. Mackworth brought skilled miners and smelters from his native Shropshire; instead of working on surface coal, he drove a 'level' into a rising ground to assist drainage by pumps;¹⁷⁹ he cut a river to make 'a Docks', and installed 'Flood-Gates' so that larger ships could carry goods effectively;¹⁸⁰ by 1700, he was 'making an Artificial Waggon-way or Wooden-Rails' from 'the Canal to the Work-houses, and from the Work-Houses to the Canal.'¹⁸¹ Robert Lydall, the chief operator of works in Neath, obtained patents in 1697, 1702, and 1705, including the one for 'a new way of smelting and melting black tin into good merchantable white tin in a reverberatory furnace without the help of bellows'.¹⁸² By 1708, the industrial complex in Neath boasted a smelting house of 165 feet long and 78 feet wide, furnished with twenty-two furnaces, along with store-houses for ores, a counting house, and a lime-kiln.¹⁸³ As Mackworth put it when he decided to develop 'Smelting Houses in *Cardiganshire*', these developments were '*designed so [. . .] that the same may be continued to future Ages, as well for the Public Good of this Nation, as for the privat advantages of the present*

¹⁷⁹ Rees, *Industry*, vol. 2, pp. 524-525

¹⁸⁰ [The Mine-Adventurers of England], *Second abstract*, pp. 14-15.

¹⁸¹ [The Mine-Adventurers of England], *The third abstract of the state of the mines of Bwlchyr-Eskir-Hyr* (1700), p 4; Clive Trott, 'Copper Industry', in Elis Jenkins (ed.), *Neath and District: A Symposium* (Neath: Published by the editor, 1974), pp. 124-25.

¹⁸² *CSPD 1697*, pp. 284, 322; *CSPD 1702-1703*, pp. 420, 488 (quotation from p. 420); *CSPD 1704-1705*, pp. 298, 302. The 1705 patent was revoked a year later. *CSPD 1705-1706*, p. 163.

¹⁸³ Trott, 'Copper Industry', pp. 125-27.

*Partners, and their Successors.*¹⁸⁴

The long-term benefits of those efforts, perhaps unevenly distributed across regions and social strata, are nonetheless unmistakable. The tramway developed in Neath in Glamorganshire was the earliest wooden railway in Wales, while Lydall's invention, used in both Neath and Garreg (Cardiganshire), was the first coal-fired reverberatory furnace in Britain.¹⁸⁵ While smelting at Garreg 'was not a success', the Company introduced to the region the uses of gunpowder for blasting and of coal for smelting the ore.¹⁸⁶ The Mackworths maintained interests in the mining industry throughout the eighteenth century, and Neath became 'the earliest to achieve some prominence' among smaller Welsh ports.¹⁸⁷ The advancement was such that a Welsh carpenter praised Mackworth as a 'Protector of Wales' while the wealthier Mansels of south Wales launched an organised sabotage against the Mackworths.¹⁸⁸ In a provincial context, then, Mackworth stands unequivocally among the 'pioneering entrepreneurs' who pushed industrialisation and long-term local economic development.¹⁸⁹

Few contemporary commentators acknowledged that a godly landed gentleman could cause financial havoc while, paradoxically, contributing to economic

¹⁸⁴ [The Mine-Adventurers of England], *Third abstract*, p. 4.

¹⁸⁵ M. J. T. Lewis, *Early Wooden Railways* (London: Routledge, 1970), pp. 247-250; John Hatcher, *The History of the British Coal Industry, Volume I, Before 1700: Towards the Age of Coal* (Oxford: Clarendon, 1993), p. 211; Lewis, 'Lead Mining', p. 162; Geraint H. Jenkins, *The Foundations of Modern Wales, 1642-1780* (Oxford: Clarendon, 1987), p. 121.

¹⁸⁶ Lewis, 'Lead Mining', p. 161.

¹⁸⁷ Philip Jenkins, *The Making of a Ruling Class: The Glamorgan Gentry, 1640-1790* (Cambridge: CUP, 1983), pp. 59-60; John and Williams, *Glamorgan County History*, vol. 5, quotation from p. 481.

¹⁸⁸ Phillips, *Vale of Neath*, pp. 735-36, at p. 736.

¹⁸⁹ John and Williams, *Glamorgan County History*, vol. 5, p. 489.

development. The Company's collapse thus attracted few sustained analyses of its business failure, let alone critical reflections upon the working of godly aspirations. Instead, the deputy governor drew criticism according to what was becoming a dominant element in the projector stereotype: the image of the dubious company promoter siphoning money out of the gullible.

As early as June 1705, the Mansels, Mackworth's local nemesis, received a rumour that 'S[i]r Humphreys projecting faculties are at worke how to [. . .] p[re]vent the ill consequences of the Dammed Lye he told' to the investors.¹⁹⁰ In the 22 October 1706 issue of *Review*, Defoe listed the Mine Adventure among what he called all 'Sort of Enigmas' such as 'Salt-Peter Works; Linen Manufacturers, Paper Companies, diving Engines, and the like'. They had, he argued, 'nothing material in them, but being merely imaginary in their Substance'; the investors 'were deceived with the Appearance.'¹⁹¹ In 1709, a year before the Company's subscribers petitioned parliament, Mackworth was satirised as 'an old *successful-projecting-Chevalier*' who had 'found in a corner of *Atlantis* the *Mines of Potosi*', a mock-reference to the Company's publicity that invoked the Peruvian silver mines. Alluding to the Company's rhetorically dextrous 'Reports', the anonymous author ridiculed Mackworth, saying that he was 'destin'd to enjoy the *present Benefit*' by feeding the investors 'with *distant pretended Hopes*: No easy Task to *content* and *delay* (and by which he shows his vast Capacity)'. So the Mine Adventure, its deputy governor and reports in particular, came to offer an

¹⁹⁰ NLW, P&M Muniments (2)/L521, [William Phillipps?] to [Thomas Mansel?], 5 Jun. 1705.

¹⁹¹ Daniel Defoe, *Defoe's Review*, ed. Arthur Wellesley Secord (22 vols, New York: Columbia University Press, 1938), vol. 3, bk. 8, no. 126, p. 503. See also, *ibid.*, vol. 3, bk. 8, no. 126, pp. 502-503.

enlightening and entertaining lesson for a '*Multitude*, stung with the quickest, the universalest of all Passions, the Desire and Prospect of becoming suddenly Rich.'¹⁹²

Conclusion

In this chapter, we have brought to life what contemporary observers like Defoe were probably unwilling to acknowledge: the problematic involvement of landed gentleman in the public consumption of economic projects. In the early financial revolution, economic projects evolved into objects of intensive consumption. Of course, joint-stock companies, news mongering, and the diffusion of paper credits were, taken separately, no new innovation of the 1690s. Nor was it the case that other modes of projecting were completely phased out. Some economic initiatives were promoted without subscription or publicity in the stock market.¹⁹³ Denunciations of monopolistic 'projectors', which had resurfaced during the parliamentary discussion over the Stour navigation bill, were still present when the Commons discussed a bill for making the Weaver navigable in 1699.¹⁹⁴ Even so, we have found that crucial symptoms of change surfaced concurrently by the mid-1690s: public subscription to joint-stocks flourished; the rise of newspapers and the use of patents for publicity added to the already existing print, scribal, and oral channels for promoting schemes for economic innovations and improvement; publics composed of different political

¹⁹² *Secret memoirs and manners of several persons of quality, of both sexes* (1709), pp. 257-58 (see also its index for the identification). For other contemporary accounts, see possible allusions in *Tatler*, ed. Donald F. Bond (3 vols, Oxford: Clarendon, 1987), vol. 1, no. 57, pp. 396-98, no. 61, pp.420-22. For historians accounts, see Scott, *Joint-Stock*, vol. 2, p. 452; Ransome, 'Parliamentary career', p. 235, fn. 16. For a more balanced view, see Hayton, 'Mackworth', vol. 4, pp. 731-34.

¹⁹³ Stewart, *Rise of Public Science*, pp. 50-52.

¹⁹⁴ *T&C*, pp. 427-28.

and economic strata became consumers of their news, rumours, shares, and dividends; and lastly, negative stereotypes about the projector also came to be reconfigured and associated closely with stock-jobbing. Without replacing other modes of projecting, the public consumption of economic projects had become a conspicuous feature by the early eighteenth century.¹⁹⁵

New joint-stock companies were frequently denounced as fraudulent ‘projects’ fleecing investors. Nevertheless, distinguishing activities from negative stereotypes has enabled us to explore how Mackworth originally conceptualised and promoted the Mine Adventure, a scheme that others later came to denounce as a fraudulent ‘project’. The Country Tory, seemingly exogenous to the financial revolution, vigorously promoted one of the largest domestic enterprises of his age. He did so not only because he could expect social and financial benefit from it, but also because he conceptualised and promoted his mining scheme as godly public service. We have seen in Chapter One that other schemes promoted in the later seventeenth and early eighteenth centuries emphasised public service. Here, by moving beyond the analysis of promotion, we have revealed that the Tory landed gentleman not only drew upon, but also even internalised, some of the recurrent ideals that promoters of economic innovations and improvement expressed during the seventeenth and early eighteenth centuries.

We need more research to know just how many landed gentlemen embraced godly aspirations as Mackworth did, and in doing so lent legitimacy to their

¹⁹⁵ In so far as presenting the consumption of projects as *one of the ways* in which publics had come to be involved in the projecting culture, my account parts with Stewart’s. Projectors, entrepreneurs, and Newtonians, he suggests, had handed natural philosophy from private patrons to ‘the public that would increasingly be the arbiter of the value of natural philosophy.’ See Stewart, *Rise of Public Science*, pp. xv, xxii, 384, 392-93 (quotation from p. xv).

involvement in economic initiatives. In highlighting his piety, however, Mackworth was hardly unique. Speaking of his plan to publish hitherto concealed medical recipes, Robert Boyle declared: 'I should not think it many mispent but employed to promote a publick good, if upon reasonable terms I should redeem any valuable Receipts or Processes, that [. . .] may relieve the sick'. It was 'a work of Charity [. . .] to do good'.¹⁹⁶ Men of quality, Robert Nelson exhorted, 'should be a Father to the Poor' because god devolved the 'Care of those who are destitute of every Thing [. . .] upon those who possess all things in Abundance.'¹⁹⁷ Preaching to the Levant merchants, Laurence Hacket urged that 'Riches, and Honour, and Power are given unto Mankind, for no other end, but to Do Good, and Shew Mercy, and he who frees the Poor and Oppressed [. . .] acts God-like in his Station'.¹⁹⁸ While these expressions of piety 'cannot be treated as a unified and harmonious discourse', Mackworth and his Company were arguably drawing upon some of the basic tenets shared by otherwise heterogeneous religious and social groups.¹⁹⁹ It is therefore suggestive that clerics like Bray and Nelson, and people drawn from a wide political and social spectrum did become directors and shareholders of the Mine Adventure. The Company's (and Mackworth's) emphasis on piety and public service probably made its dividends morally and socially acceptable.

The Mine Adventure was not unique in this respect. Contemporary insurance companies were similarly emphasising piety, profit, and public service. The

¹⁹⁶ Quoted by Michael Hunter, *Robert Boyle (1627-91): Scrupulosity and Science* (Woodbridge: Boydell, 2000), pp. 221, 215.

¹⁹⁷ Robert Nelson, *Address to persons of quality and estate* (1715), pp. 227, 224-25.

¹⁹⁸ Quoted by Glaisyer, *Culture of Commerce*, p. 97.

¹⁹⁹ Quotation is from Glaisyer, *Culture of Commerce*, p. 86. For common grounds across religious spectrum, see Spurr, *Restoration Church*, pp. 328-29.

Company of London Insurers, for example, presented its schemes as ‘more desirable’ than ‘a truly Charitable Work’, for they would ‘prevent’ people from being ‘driven into great Wants and Necessities’.²⁰⁰ Insurance companies like this one attracted investment from many clergymen, and could be seen as ‘the Janus-faced quintessence of the moral and financial revolution.’²⁰¹ Thus, the Mine Adventure, along with other companies, again reminds us that, even where economic innovations were pursued through private companies, the assertion of godly public service was one of the prevailing features of projecting activities.

Precisely because Mackworth, whom so many condemned as the fraudulent ‘projector’, tried to make his scheme a part of his godly public service, we must raise a more general question about the validity of the image of unrepentant, greedy, Merecraft-like capitalists. How far can we draw upon this image to characterise the burgeoning market culture of early eighteenth-century England? Are we reproducing the contemporary projector stereotype in doing so? Public responses to the Mine Adventure’s frauds can be best understood in this context. We have found that the Company’s information fraud was a hodgepodge of responses devised in order to keep its credit in a volatile stock market when the profit return was much lower than expected. We have also found that Mackworth was repentant for using his ‘own Strength’ in fabricating reports from the Welsh mines. Virtually nothing about these complex stories ‘behind the scene’ was captured in the accusation of Mackworth as the relentless ‘projector’. By contrast, in drawing upon the negative stereotype, contemporaries turned the complexities into an enlightened parable, something ‘good

²⁰⁰ [William Adams], *The proposal of the Company of London Insurers* (1714), pp. 5, 6, 7.

²⁰¹ Geoffrey Clark, *Betting on Lives: The Culture of Life Insurance in England, 1695-1775* (Manchester: Manchester U.P., 1999), p. 57. See also Slack, *From Reformation to Improvement*, pp. 114, 120-21, 130-31.

to think', in which the Tory gentleman's personal demise was singled out as an amusing caution against human greed. Behind the stereotype, we have found a mundane promoter of an innovative industrial scheme. Like many others before him (e.g. Cressy Dymock) and also conceivably many others after him, Mackworth not only pursued his own social and material gains, but also (less convincingly) tried to meet the duty of piety and public service.

CONCLUSION

The idea of 'projecting' was ubiquitous in early modern England. The notion described the alchemical transmutation of base metals; it was used to discuss various new plans and dubious schemes and plots in politics, in public finance and in poor relief; in the economic sphere, a 'project' meant an initiative for developing new industries or improving or expanding existing ones. The term was widely used in letters and diaries, and appeared in pamphlets, petitions, plays and even in songs. Used in various social contexts and expressed in different media, the concept of 'projecting' encapsulated deep-seated concerns about the promotion of novelties that promised public service, new initiatives that could nonetheless turn out to be impractical or fraudulent or even oppressive. Precisely because virtually all the promoters of economic innovations and improvement spoke of 'projects' and 'projectors', we must take these notions seriously when exploring their activities.

By reappraising the early modern notion of projecting, this thesis offers fresh perspectives on the history of economic innovation. It suggests that the terms 'project' and 'projector' were not accurate descriptions of the practices of innovation but negative stereotypes about them. This insight reveals that negative stereotypes about the 'projector' shaped promoters' identity, constrained their conduct, and influenced how they formulated the actual arrangement of their schemes. Once we begin to examine the dynamic interaction between projecting as a stereotype and projecting as an activity, both the administration of monopolistic patents in the late sixteenth century, and the boom of joint-stock companies a century later can be understood as part of the evolution of projecting culture. Exploring this evolution within wider social and political contexts demonstrates that changing practices of innovation and wider developments in society (the press, wars, changes in political

culture, and the growth of the stock market) made an impact on stereotypes about economic innovations. None of these findings would have been possible without taking the notion of 'projecting' seriously. In the remainder of this conclusion, I will bring these key findings together and discuss how this thesis contributes to important broader discussions about trust and commercial culture, two central issues in economic history and the history of technology and science. In so doing, I will also raise questions for future research.

When economic and technological innovations were first promoted vigorously in England during the sixteenth century, promoters frequently emphasised godliness and public service. By the early seventeenth century such self-presentation was criticised as a typical 'pretence' of the nefarious 'monopolist' and 'projector'. Crucially, however, most promoters of economic innovations did not abandon promises of (godly) public service or material rewards to themselves. Many historians have acknowledged this, but have failed to explore its far-reaching implications for our understanding of projecting culture. Because promoters remained in a grey zone between philanthropy and the greedy pursuit of gain, many of them continued to look like grandiose or unreliable or oppressive 'projectors'. Virtually all promoters that this thesis has examined complained of distrust of the projector, and many of them tried to avoid being perceived as such. The pervasive images of the nefarious 'projector' thus do not really suggest that culture of innovation was dominated by greedy Mercraft-like capitalists, a world that had to be policed by a handful of disinterested, and therefore credible, philosopher-experts. This thesis presents a richer picture by distinguishing between projecting as a set of practices and projecting as stereotypes – a key analytical contribution of this thesis. The advocacy of public service pervaded seventeenth- and early eighteenth-century

England, creating a great concern about whether the public good and private interests could be reconciled when it came to the promotion of new economic initiatives. The enduring stereotype of the nefarious 'projector' was precisely the manifestation of such a concern, not the accurate reflection of the complex practices of innovation.

This finding has enabled me to approach the history of economic innovations from a fresh perspective: the interaction between practices and preconceptions. As Thirsk, Luu, and others have shown, the latter half of the sixteenth century saw the first boom of initiatives to introduce economic and technical innovations from the Continent.¹ Yet, distinguishing stereotypes from activities has allowed me to demonstrate that the negative stereotype of the 'projector' was largely absent until the 1600s. Like the self-identity of the Puritans that emerged *after* the circulation of negative stereotypes about them, the self-identity of the 'projector' emerged only after the Elizabethan Commons had vehemently criticised monopolists and patentees in 1601, and after writers and playwrights like Hall and Jonson thereafter had begun to mock those who launched ridiculous or oppressive 'projects'. Historians have shown that we cannot fully understand activities of the Puritan or the poor or women without exploring contemporary ideas about them.² In the same way, economic historians should now take into account how early modern contemporaries understood the identity of the 'projector' and how that public understanding affected projectors' practices.

¹ See Introduction.

² Patrick Collinson, 'Ben Jonson's *Bartholomew Fair*: The Theatre constructs Puritanism', in David L. Smith, Richard Strier, and David Bevington (eds.), *The Theatrical City: Culture, Theatre and Politics in London, 1576-1649* (Cambridge: CUP, 1995), 157-69; Paul Slack, *Poverty and Policy in Tudor and Stuart England* (London: Longman, 1988), chaps. 2, 4, 5; Alexandra Shepard, *Meanings of Manhood in Early Modern England* (Cambridge: CUP, 2003).

This thesis bridges the chronological gap in the historiography from this integrated perspective: joint-stock companies that flourished from the 1690s can now be understood as a result of the long-term move away from monopolistic 'projects' that flourished under the early Stuarts. The patent records show this long-term trend most dramatically, revealing that the post-Restoration period saw a clear move away from the use of patents as a fiscal instrument (see Fig. 7). Yet beyond this, this thesis finds no linear development in financial arrangements of economic innovations between the 1640s and the 1680s. Chapters Two to Four have shown that what had changed in the mean time was the *plausibility* of certain ways of promoting innovations. Focusing on *distrust* (as opposed to trust) is crucial here, for doing so reveals a specific constraint at play (in addition to the generic negative stereotype of the 'projector' as the conman or the deluded dreamer): hostility towards the monopolistic 'projector' remained widespread after the demise of Charles's Personal Rule, and this rendered the imposition of economic innovations less credible and less publicly acceptable.

However, this thesis suggests that there was no consensus as to how best one could promote schemes for economic innovations, and that even after 1640, promoters of economic innovations and improvement continued to seek the possibility to implement their schemes through government imposition. After the outbreak of the Civil War, millenarian aspirations led some promoters to advocate the strong government-led initiatives like the 'universal trade' as a step towards the reformation of mankind. Although this strand of religious aspiration also became less publicly acceptable after the Restoration, both well-connected and desperate promoters like Petty and Dymock continued to seek governmental support for their draconian schemes. These attempts generally failed because the image of the

destructive, monopolistic ‘projector’ was repeatedly brought back, and made it difficult to win support from the government. Their failure reminds us that the long-term evolution of projecting culture was at times inconspicuous, difficult to detect even from the perspectives of contemporary actors.

On the other hand, we have also seen that some promoters took concrete steps to avoid the appearance of the monopolistic ‘projector’. In the 1640s and 1650s, Plattes and Blith sought to promote improvement of husbandry by asserting financial independence, and by publishing how-to manuals to encourage readers’ private initiatives. After the Restoration, some promoters like Evelyn, Smith, and Yarranton also opted to avoid seeking government imposition and chose to encourage private initiatives. The government’s role changed accordingly. The case of the Stour navigation scheme has shown how safeguarding local economic interests became an important issue in parliament when the restored regime was anxious to portray itself as the legitimate promoter of economic prosperity. So, before the Nine Years War diverted capital into domestic investment, the imposition of government authority had long been discredited as the plausible mode of projecting. This was one of the reasons why the war triggered the boom of joint-stock companies rather than of monopolistic patents.³

The projector stereotype continued to circulate in the early eighteenth century because the vigorous promotion (or ‘projecting’) of new schemes and the assertions of public service remained central to the operation of joint-stock companies. It is worth remembering that Tory Sir Humphrey Mackworth viewed his seemingly

³ Another factor would be the demise of James II and his supporters like Sir Josiah Child who supported monopolies in overseas trade. See Steve Pincus, ‘A Revolution in Political Economy?’, in Maximillian E. Novak (ed.), *The Age of Projects* (Toronto: University of Toronto Press, 2008), p. 122-26.

'private' mining enterprise as a pursuit of godly public service just like economic initiatives had done in previous decades. Yet dominant connotations of the projector stereotype changed as the imposition of government authority became exceptional: the image of the 'projector' (including that of Mackworth) became more of the relentless company promoter, someone more closely associated with the stockjobber than with the monopolist. The development of the stock market and the burgeoning public consumption of information about joint-stock companies certainly represented new elements in projecting culture; yet the historian can no longer suggest Defoe's '*Projecting Age*' represented economic modernity, something that had little to do with early Stuart projecting culture.

While reappraising the pervasiveness of distrust, this thesis also contributes to the broader issues about the roles of piety and self-fashioning in commercial culture. By paying close attention to various ways in which promoters conceptualised and presented new economic and technological schemes, I have shown that religious idioms and the practices of piety continued to play important roles throughout the seventeenth and early eighteenth centuries. What changed after the Restoration was less religious *mentality* than what could be said in public. Some promoters may have quite thoroughly excised religious expressions when they published proposals for their schemes; yet, it does not follow that they came to embrace secular *conceptualisation* of economic affairs. Like Boyle who refrained from expressing some of his religious views and interests in print, promoters of innovative economic schemes were often circumspect about how they expressed religious ideals when promoting their schemes publicly.⁴ Doing so allowed them to avoid being perceived

⁴ Michael Hunter, *Robert Boyle (1627-92): Scrupulosity and Science* (Woodbridge: Boydell, 2000), chap. 10.

as religious ‘fanatics’. Mackworth’s pious diary as well as the early eighteenth-century revival of puritan aspirations that Barry and Slack have traced should warn us against giving too much weight to secularisation.⁵

This discussion of religious expressions exemplifies the importance of self-presentation for our understanding of culture of innovation. In this respect I have drawn heavily upon the works of historians of science and technology such as Steven Shapin, Stephen Johnston, and Eric Ash.⁶ Nevertheless, this thesis also warns us against exaggerating the importance of the knowledgeable, competent, and reliable expert when exploring the operation of large-scale undertakings like the Stour scheme. We must treat such images cautiously because that was precisely how men like Yarranton would have liked to portray themselves. As we have seen, such a portrayal could mask complex and often difficult negotiations in the actual implementation: the case of the Stour navigation scheme has shown that the hard-headed issues of safe-guarding local economic interests and maintaining credit-lines were crucial for passing a bill and implementing the scheme in order to realise profits. In order to come to an integrated understanding of the protracted processes of turning a large-scale ‘project’ into reality, therefore, we must study self-fashioning *along side* other mundane issues like interest politics and the management of financial credit.

⁵ Jonathan Barry, ‘The “Great Projector”’: John Cary and the Legacy of Puritan Reform in Bristol’, in Margaret Pelling and Scott Mandelbrote (eds.), *The Practice of Reform in Health, Medicine and Science, 1500-2000* (Aldershot: Ashgate, 2005), 185-206; Paul Slack, *From Reformation to Improvement: Public Welfare in Early Modern England* (Oxford: Clarendon, 1998), esp. chap. 6.

⁶ Steven Shapin, *Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: University of Chicago Press, 1994); Stephen Johnston, ‘Making Mathematical Practice: Gentlemen, Practitioners and Artisans in Elizabethan England’ (Ph. D thesis, University of Cambridge, 1994); Eric H. Ash, *Power, Knowledge, and Expertise in Elizabethan England* (Baltimore: Johns Hopkins U.P., 2004).

There are a number of areas which future research should explore in greater depth. First, although this thesis has paid much attention to promotional activities in London, new economic initiatives were also launched outside the metropolis: Municipal corporations in Bristol, York, and Newcastle, for example, supported things like linen manufacture, river navigation schemes, and water-supply companies.⁷ Freemen of municipal corporations were deemed capable of serving the public at large although they were earning a living by being a member of trades or craft guilds.⁸ As a clerk of Great Yarmouth noted, ‘Every commonwealth, as saith Aristotle (the prince of philosophers) is a company, and every company is ordained to some good, and most chiefly to obtain the most principal and most excellent good of others.’⁹ How far, then, did projecting activities backed by municipal corporations share ‘the imperatives of public good and moral judgement that were disseminated across the corporate system’?¹⁰ How far were such imperatives couched in terms of the good *of the nation*? We need more research into local archives to explore provincial projecting culture.

⁷ Barry, “‘Great Projector’”; Baron F. Duckham, *The Yorkshire Ouse: the History of a River Navigation* (Newton Abbott: David & Charles, 1967); J. H. Thomas, ‘Thomas Neale, A Seventeenth-Century Projector’ (Ph. D thesis, University of Southampton, 1979), pp. 138-45.

⁸ Jonathan Barry, ‘Civility and Civic Culture in Early Modern England: The Meanings of Urban Freedom’, in Peter Burke, Brian Harrison and Paul Slack (eds.), *Civil Histories: Essays Presented to Sir Keith Thomas* (Oxford: OUP, 2000), pp. 181, 186-87.

⁹ Henry Manship, *The History of Great Yarmouth*, ed. Charles Johyn Palmer (1854), p. 190 (quoted by Phil Withington, *The Politics of Commonwealth: Citizens and Freemen in Early Modern England* (Cambridge: CUP, 2005), p. 67).

¹⁰ Withington, *Politics of Commonwealth*, p. 67. Cf. Patrick Collinson, *Elizabethan Essays* (London: Hambledon Press, 1994), chap. 1. For the sheer scale of municipal office-holding and its social and intellectual implications, see Mark Goldie, ‘The Unacknowledged Republic: Officeholding in early modern England’, in Tim Harris (ed.), *The Politics of the Excluded, c. 1500-1850* (London: Palgrave, 2001), pp. 159, 161-63, 178-82.

Second, because the systematic encouragement of economic and technological innovations first flourished in the Continent, some comparison with European counterparts will also be useful. Indeed, when the promotion of economic reform boomed in later seventeenth-century Spain, writers like Cervantes ridiculed promoters, and there emerged the stereotype of the *arbitrista*.¹¹ It is also known that the figure of *Projektmacher* carried negative meanings in early eighteenth-century Germany, meanings that were very similar to the English generic stereotype of the projector as the fraudster.¹² Exploring continental parallels both in terms of projecting as an activity and projecting as a stereotype will reveal whether the assertions of public service and distrust about them were pan-European phenomena, and how far the antipathy towards monopolies and the trend away from government imposition was a uniquely English experience.¹³

Third, this thesis reveals that schemes for poor relief and for raising revenues were also conceptualised as 'projects'. Just like historians studying economic innovations, therefore, historians of social welfare and public finance will also need to pay close attention to the notion of projecting, and draw comparisons and contrasts between economic projects and 'projecting' in the other spheres. Doing so will reveal how far the stereotypes about projecting gave a coherent set of meanings to different

¹¹ Steven Hutchinson, 'Arbitrating the National *Oikos*', *Journal of Spanish Cultural Studies*, 2 (2001), pp. 69-70.

¹² Pamela Smith, *The Business of Alchemy: Science and Culture in the Holy Roman Empire* (Princeton: Princeton U.P., 1994), p. 269.

¹³ Important works include Smith, *Business of Alchemy*; Tara E. Nummedal, *Alchemy and Authority in the Holy Roman Empire* (Chicago: University of Chicago Press, 2007); Chandra Mukerji, *Territorial Ambitions and the Gardens of Versailles* (Cambridge: CUP, 1997); Philippe Minard, *La Fortune du Colbertisme: Etat et Industrie dans la France des Lumières* (Paris: Fayard, 1998); Liliane Hilaire-Pérez, *L'Invention Technique au Siècle des Lumières* (Paris: Albin Michel, 2000); Joel Mokyr, *The Gifts of Athena: Historical Origins of the Knowledge Economy* (Princeton: Princeton U.P., 2002).

aspects of social life. This will raise the broader question about the nature of public spheres in seventeenth- and early eighteenth-century England. Given that the image of the 'projector' very often simplified promoters' complex motivations and the processes of business negotiation, my findings seem to agree with those of historians of religion and politics such as Peter Lake, Steve Pincus, and Mark Knights: early modern public discourses were, be they about religion, politics, or economy, full of misrepresentations and were often far from being 'rational'.¹⁴

There is an important question I have left unanswered: when, if at all, did projecting culture come to an end? While the archival case studies for this thesis stop at the Mine Adventure that collapsed in 1710, projecting activities clearly did not end there. A set of playing cards sold presumably in the 1720s, for example, ridiculed numerous 'bubbles' and 'projects'; they included not only the South Sea Company, but also a host of other undertakings I have mentioned in Chapter Five, such as Richard Steel's Fish Pool, the Douglas navigation scheme and the York Buildings Company.¹⁵ Revealingly, moreover, when Jonson's *Alchemist* (1610) was performed in the aftermath of the South Sea Bubble (1720), its epilogue suggested that the audience would find a precursor of 'the South Sea Project' in the play.¹⁶

¹⁴ Peter Lake and Steve Pincus, 'Rethinking the Public Sphere in Early Modern England', in Peter Lake and Steve Pincus (eds.), *The Politics of the Public Sphere in Early Modern England* (Manchester: Manchester U.P., 2007), 1-30; Mark Knights, *Representation and Misrepresentation in Later Stuart Britain: Partisanship and Political Culture* (Oxford: OUP, 2005). Julian Hoppit's bibliographical survey of 'economic' literature has also found that it was 'frequently particular, political, and polemical.' Idem, 'The Contexts and Contours of British Economic Literature, 1660-1760', *Historical Journal*, 49 (2006), pp. 81, 105-108 (at p. 107).

¹⁵ British Museum, London, Schreiber Collection, English 66, 'English Bubble Companies Playing Cards', four of spades, ace of spades, and five of spade.

¹⁶ *An epilogue spoke to a play call'd the Alchymist, performed at Drury Lane, Oct. 27 1721* [1721], in British Museum, *English Cartoons and Satirical Prints, 1320-1832* [Microfilm] (Cambridge: Chadwyck Healey, 1978), no. 1718.

Historians have begun to show that pamphlets, songs, memoirs, and engravings inflated the financial damage of the Bubble and magnified the sins and the greed of perpetrators.¹⁷ Literary scholars have reached similar conclusions.¹⁸ Both groups have explained the response as a somewhat automatic reaction from a society witnessing the ‘rage of party’ and the rapid commercialisation of print. No account of business culture has been offered to explain the scandal-mongering. We need to explore the 1720 speculation boom and public responses to it as a chapter in the history of projecting. Doing so will reveal the extent to which one of the earliest financial bubbles owed much to the pre-existing projecting culture this thesis has examined.¹⁹

If we take a rigid definition of projecting, we may suppose that it began to decline when the terms ‘project’ and ‘projector’ appeared less frequently in title-pages. The decline had taken place by the 1740s. The reason is not entirely clear, but one of the factors may have been the steady rise of the term ‘improvement’ as a more cogent and palatable slogan for economic development (See Fig. 8).²⁰

Whatever the cause for this decline, the endurance of the projector stereotype beyond the mid-eighteenth century seems more significant. As MacLeod has

¹⁷ Julian Hoppit, ‘The Myths of the South Sea Bubble’, *Transactions of Royal Historical Society* 12 (2002), 141-65; Anne Goldgar, *Tulipmania: Money, Honor, and Knowledge in the Dutch Golden Age* (Chicago: University of Chicago Press, 2007), pp. 305-309.

¹⁸ Colin Nicholson, *Writing and the Rise of Finance: Capital Satires of the Early Eighteenth Century* (Cambridge: CUP, 1994); Sandra Sherman, *Finance and Fictionality in the Early Eighteenth Century: Accounting for Defoe* (Cambridge: CUP, 1996); Catherine Ingrassia, *Authorship, Commerce, and Gender in Early Eighteenth-century England: A Culture of Paper Credit* (Cambridge: CUP, 1998).

¹⁹ This is the theme I intend to pursue in one-year post-doctoral research.

²⁰ See David Hancock, *Citizens of the World: London Merchants and the Integration of the British Atlantic Community, 1735-1785* (Cambridge: CUP, 1995), chap. 9; Paul Langford, *A Polite and Commercial People: England, 1727-1783* (Oxford: Clarendon, 1998), chap. 9.

suggested, James Watt, who was to be enshrined as *the* heroic inventor of the Industrial Revolution, ‘could describe himself ironically as a “projector”.’²¹ The Scottish chemist Joseph Black was concerned about his brother James: ‘I always fear this hunting after Schemes and Projects will get him the Character of a Projector [. . .] when they [the public] find his Projects are unsuccessful or impracticable’.²² Writing to Erasmus Darwin, the medical practitioner Thomas Beddoes also spoke of ‘the danger to which I am exposing my reputation’: ‘It is impossible to engage in a new and arduous undertaking without incurring ridicule and obloquy: Of course I must expect to be decried by some as a silly projector’.²³ It is possible, as MacLeod suggests, that the image of the projector became more of ‘over-ambitious and unrealistic visionaries’ than of ‘calculating swindlers and cheats’ in the later eighteenth century.²⁴ So inventors may well have come to be glorified by the Victorian era. But as Boyd Hilton, Geoffrey Searle, and James Taylor have shown, Victorian Britons still had serious concerns about the compatibility of morality and the market, of Christianity and the pursuit of gain. The emergence of economics as an intellectual discipline took place along with these ongoing concerns; it did not remove them.²⁵ In all probability, therefore, distrust of the nefarious ‘projector’

²¹ Christine MacLeod, *Heroes of Invention: Technology, Liberalism and British Industry, 1750-1914* (Cambridge: CUP, 2007), p. 40.

²² William Ramsey, *Life and Letters of Joseph Black* (London: Constable, 1918), p. 104. For background see, Jan Golinski, *Science as Public Culture: Chemistry and Enlightenment in Britain, 1760-1820* (Cambridge: CUP, 1992), chap. 2 (esp. pp. 29-30, 31, 34-36, 40).

²³ Judith Hawley et al. (eds.), *Literature and Science, 1660-1834* (8 vols, London: Pickering & Chatto, 2003-2004), vol. 8, p. 198.

²⁴ MacLeod, *Heroes of Invention*, p. 39.

²⁵ Boyd Hilton, *The Age of Atonement: the Influence of Evangelicalism on Social and Economic Thought, 1795-1865* (Oxford: OUP, 1988); G. R. Searle, *Morality and the Market in Victorian Britain* (Oxford: OUP, 1998); James Taylor, *Creating Capitalism: Joint-stock Enterprise in British Politics and Culture, 1800-1870* (Woodbridge: Boydell Press, 2006).

continued to influence the practices of innovative business schemes throughout the nineteenth century.

The word 'projector' seems to have lost currency as a pejorative term from the beginning of the twentieth century, a time when an electric device that projects images began to be called the 'projector'.²⁶ Intriguingly, however, the idea that new economic initiatives should promote both private interests of those involved *and* the good of the public has been pervasive. It has recently resurfaced as the vogue for social entrepreneurship.²⁷ More generally, the public role of seemingly private businesses has also been a recurrent theme. One only has to think of ongoing discussions about corporate social responsibility to confirm that.²⁸ Negative stereotypes about the nefarious conman persist in recent accounts of the Wall Street speculator too.²⁹ Like the projector stereotype this thesis has studied, the image of the 'corporate greed' seems to reduce complex business failure into the question of personal moral deficiency. Have we come out of the projecting culture? Or have we been living through it? Any study of early modern economic innovations and improvement need to take into account contemporary ideas about projecting, the

²⁶ *OED*, projector, *n.*

²⁷ J. Gregory Dees, 'The Meaning of "Social Entrepreneurship"', (2nd revised ed., 2000), 'http://www.cascatduke.org/documents/dees_sedef.pdf' (22 Sep. 2008); James Austin, Howard Stevenson, and Jane Wei-Skillern, 'Social and Commercial Entrepreneurship: Same, Different, or Both?', *Entrepreneurship Theory and Practice*, 30 (2006), 1-22.

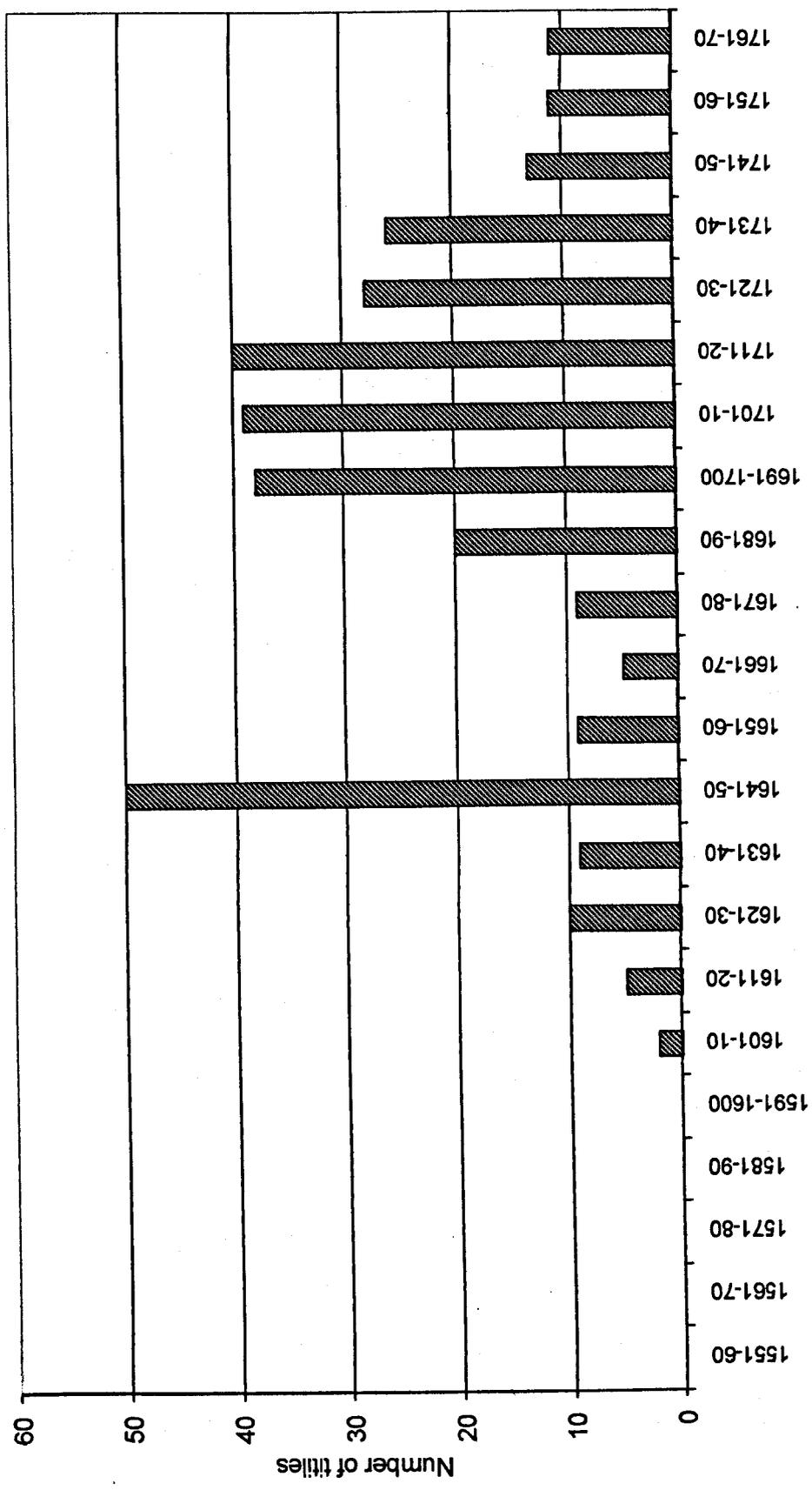
²⁸ Milton Friedman, 'The Social Responsibility of Business is to Increase its Profit', *New York Times Magazine*, 13 Sep. 1970; Peter Drucker, 'The New Meaning of Corporate Social Responsibility', *California Management Review*, 26 (1984), 53-63; Archie B. Carroll, 'Corporate Social Responsibility: Evolution of a Definitional Construct', *Business and Society*, 38 (1999), 268-295; David Henderson, *Misguided Virtue: False Notions of Corporate Social Responsibility* (London: The Institute of Economic Affairs, 2001).

²⁹ Fred Schwed Jr., *Where Are the Customers' Yachts? Or a Good Hard Look at Wall Street [1940]* (New York: Wiley, 1995); Bethany McLean and Peter Elkind, *The Smartest Guys in the Room: The Amazing Rise and Scandalous Fall of Enron* (New ed., London: Penguin, 2004).

ubiquitous assertion of public service, and distrust of such assertions. Precisely because private businesses continue to affect public lives worldwide, doing so would help us rethink how we trust and mistrust business enterprises now.

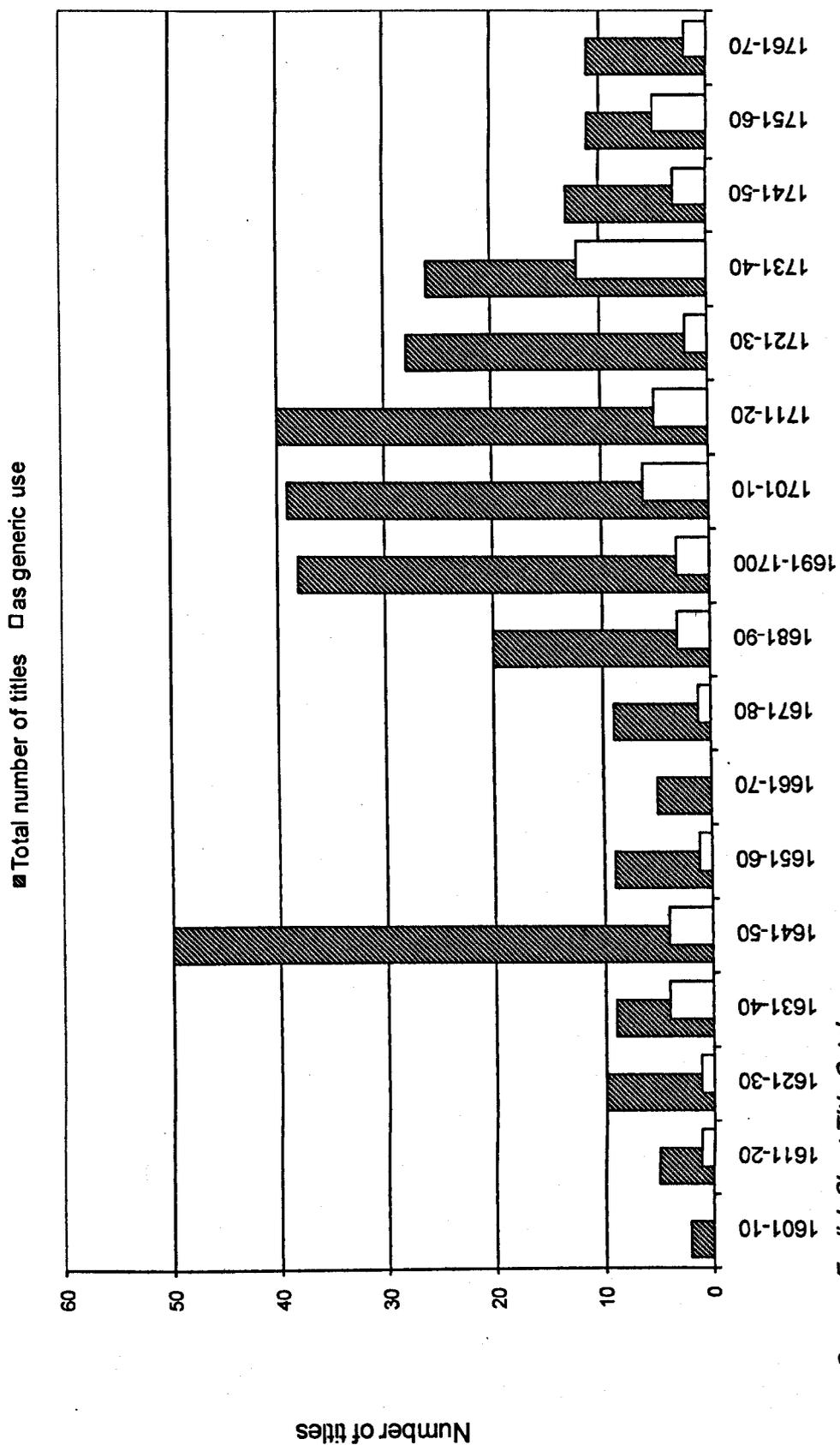
**Appendix 1:
Figures and Tables**

Fig. 1: 'Project' and 'projector' in the ESTC



Source: English Short Title Catalogue

Fig. 2: 'Project' and 'projector' as generic usage



Source: English Short Title Catalogue

Fig. 3: 'Project' and 'projector' in the ESTC

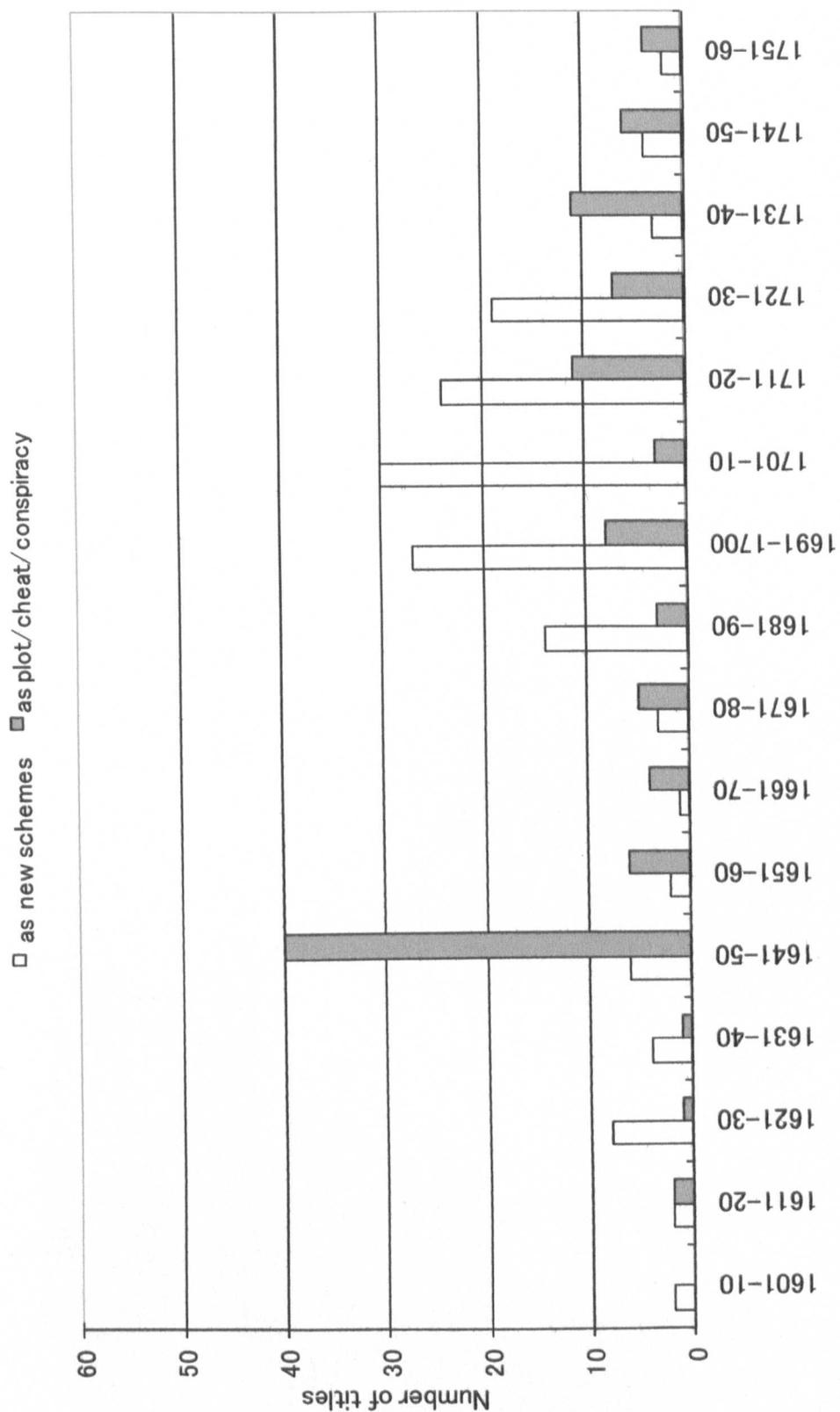
Source: *English Short Title Catalogue*

Table 1, The Distribution of different usage between 1681-1700 in the ESTC

		new schemes	plot/cheat	generic	total
1681-1690	project	14	3	3	20
	projector	0	0	0	
1691-1700	project	25	7	3	38
	projector	2	1	0	

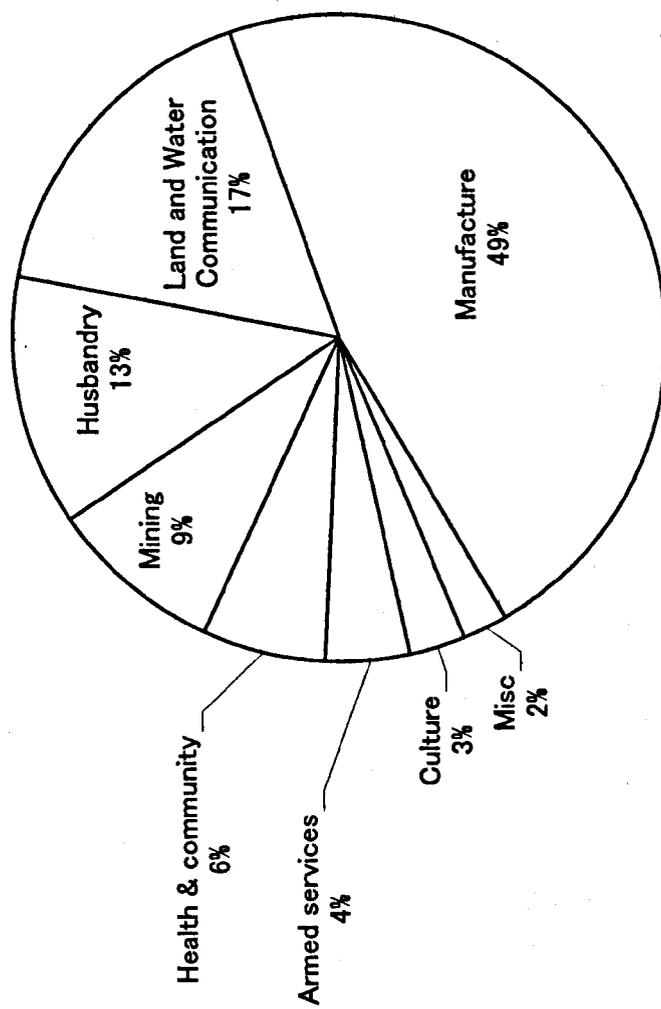
Source: *English Short Title Catalogue*

Table 2: Tabulated index to patents for invention, 1617-1716

	Sectors	1617-19	1620-29	1630-39	1640-49	1650-59	1660-69	1670-79	1680-89	1690-99	1700-09	1710-16	Subtotal	Total
Manufacture	Domestic and consumer goods	1	5	14	5	1	5	7	11	21	8	3	81	288
	Construction (incl. ship)	0	3	6	2	0	1	2	6	8	1	2	31	
	Metallurgy	2	6	14	0	2	11	10	9	17	4	2	77	
	Wool and other textiles (incl. leather)	0	2	7	0	3	2	6	7	18	1	4	50	
	Food and drink	1	2	14	0	1	7	4	3	10	3	4	49	
Husbandry	Agricultural 'production'*	1	3	9	2	4	2	4	0	2	0	0	27	77
	Drainage and flooding*	5	6	8	2	4	4	6	2	11	0	2	50	
Mining	Mining*	1	2	12	0	2	6	6	6	13	2	3	53	53
Land and water communication	Inland navigation, port, and harbour*	4	2	8	1	0	2	6	1	3	1	1	29	103
	Navigation technology	1	0	3	1	0	5	3	2	9	0	0	24	
	Highway and turnpike*	2	3	1	0	1	0	0	0	2	1	0	10	
	Land transport technology	0	1	0	0	0	3	0	2	5	2	2	15	
	Naval salvage	0	0	3	1	0	0	3	3	14	0	1	25	
Health and community	Water supply*	1	1	1	0	0	1	5	1	7	0	2	19	36
	Communal safety and cleanliness	0	0	0	0	0	0	1	1	3	0	0	5	
	Physical and mental health	0	2	3	0	0	1	1	1	2	0	2	12	
Culture	Culture	1	1	3	2	0	2	0	1	6	0	2	18	18
Armed services	Navy	0	0	0	0	0	0	2	2	3	0	0	7	26
	Army	2	1	3	1	1	4	2	1	4	0	0	19	
Misc.	Multipurpose/uncertain	0	1	5	0	0	1	1	0	3	1	1	13	13
	Period Total	22	41	114	17	19	57	69	59	161	24	31	-	614

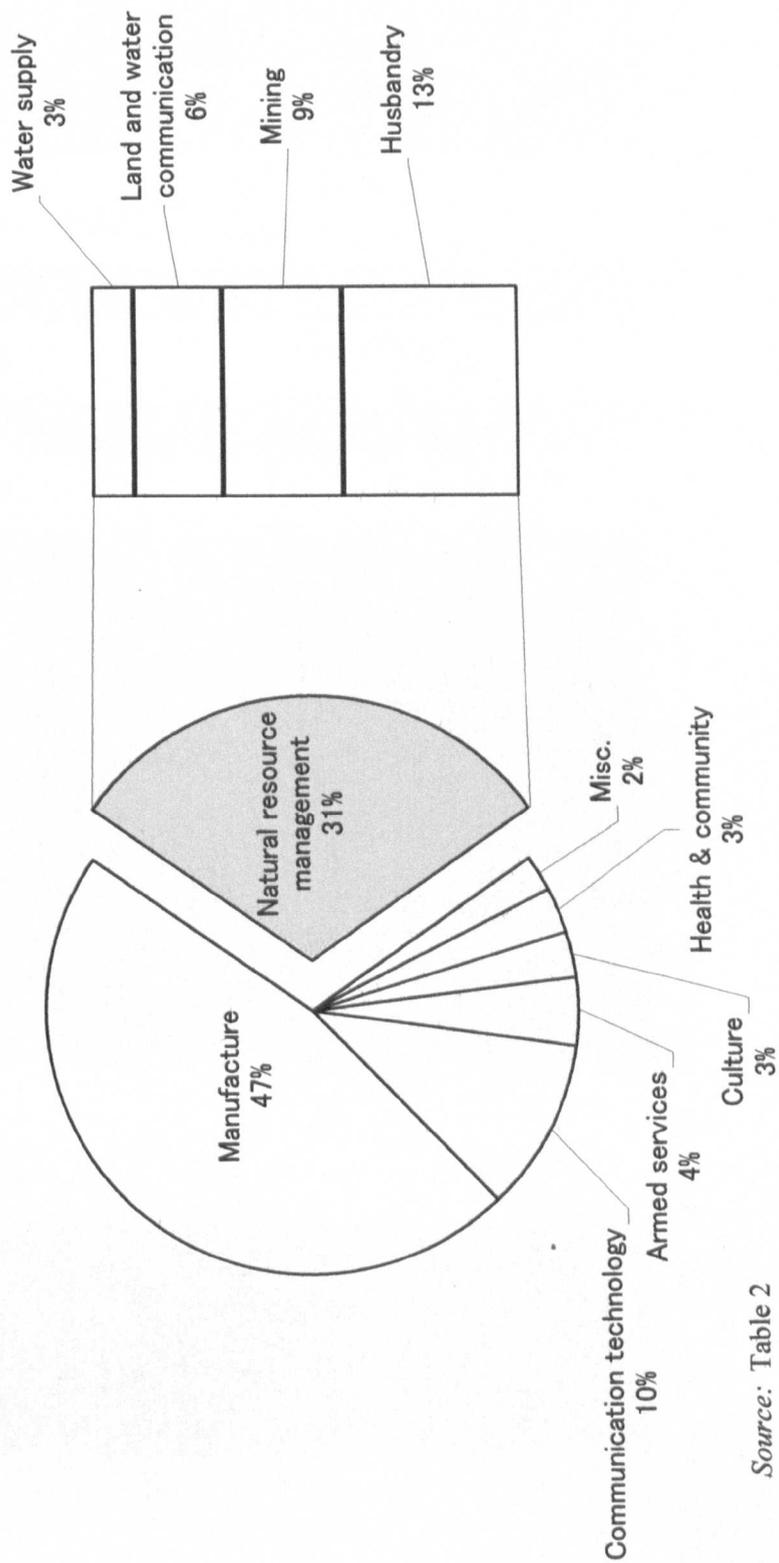
Sources: Woodcroft, *Titles of Patents of Inventions, Chronologically Arranged*, pp. 1-74; Jenkins, 'The Protection of Inventions during the Commonwealth and Protectorate', pp. 162-63; Gomme, 'Data Corrections of English Patents, 1617-1752', pp. 159-64; 'Appendix, Additional and corrected entries', in Woodcroft, *Alphabetical Index of Patentees of Inventions*, pp. viii-xv; MacLeod, 'Patents for invention and technical change in England, 1660-1753', Appendix I; Hunt, 'Book trade patents, 1603-1640', pp. 40-54.

Fig. 4: Patents for invention: an analysis of the Index



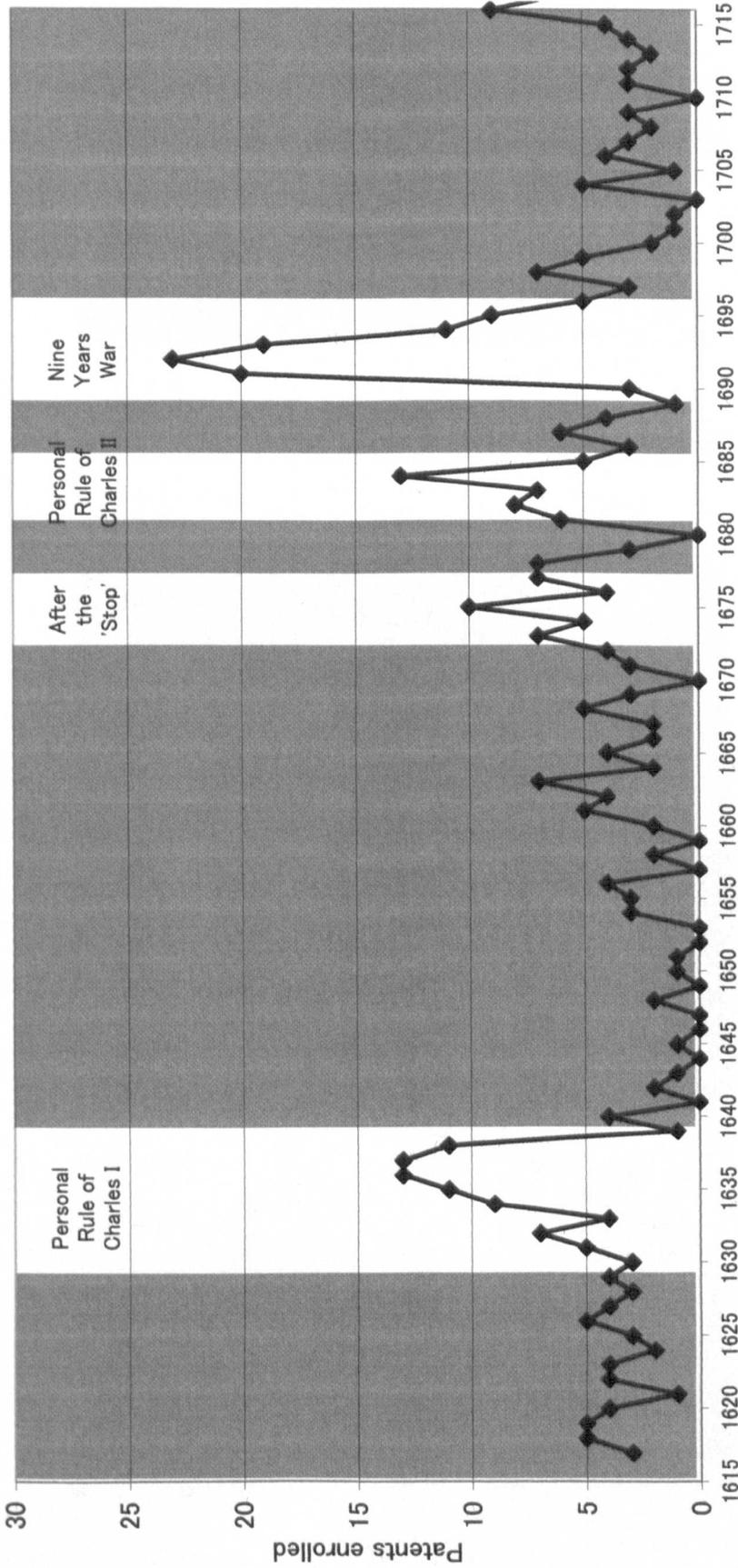
Source : Table 2

Fig. 5 Natural resource management in patents for invention



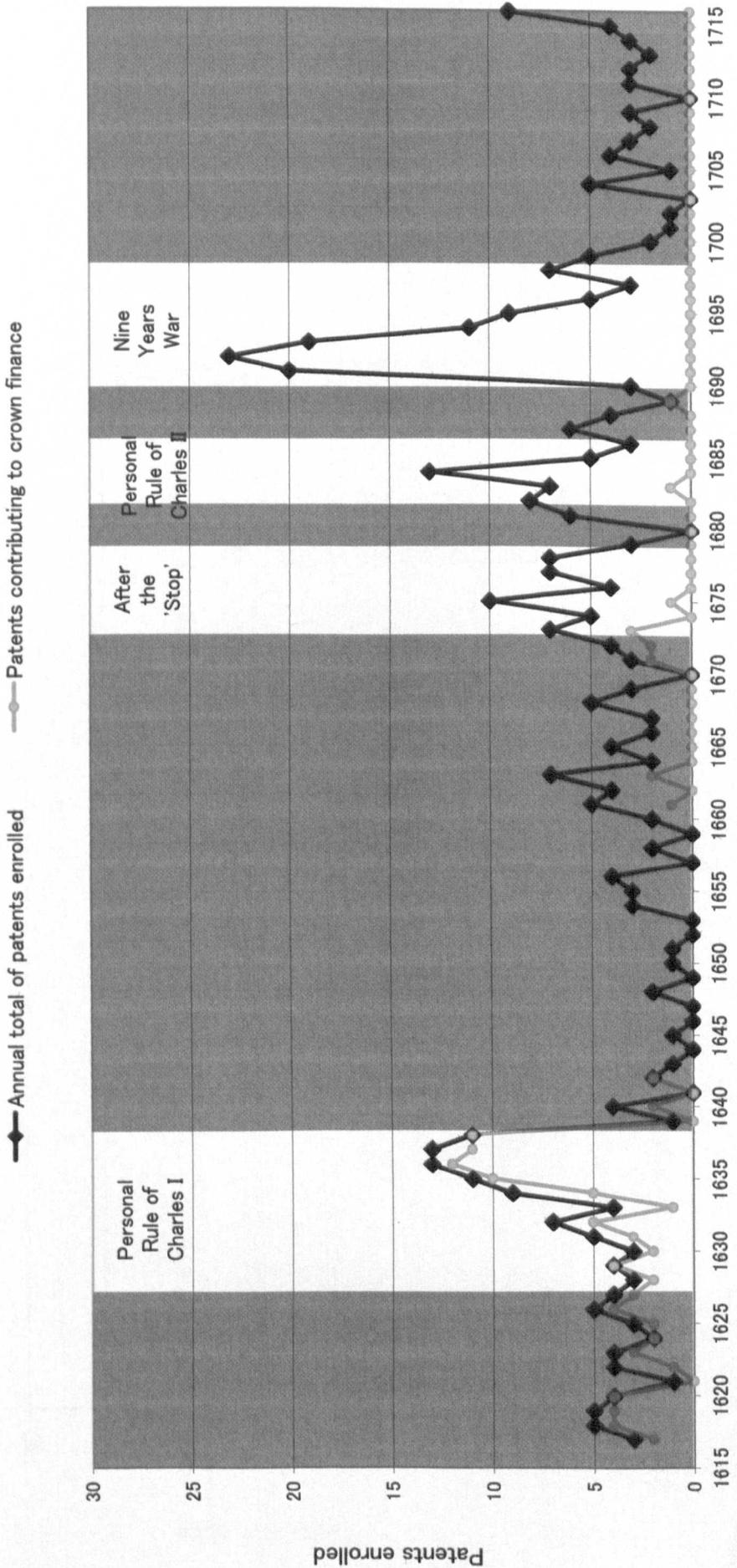
Source: Table 2

Fig. 6: Annual totals of patents for invention enrolled, 1617-1716



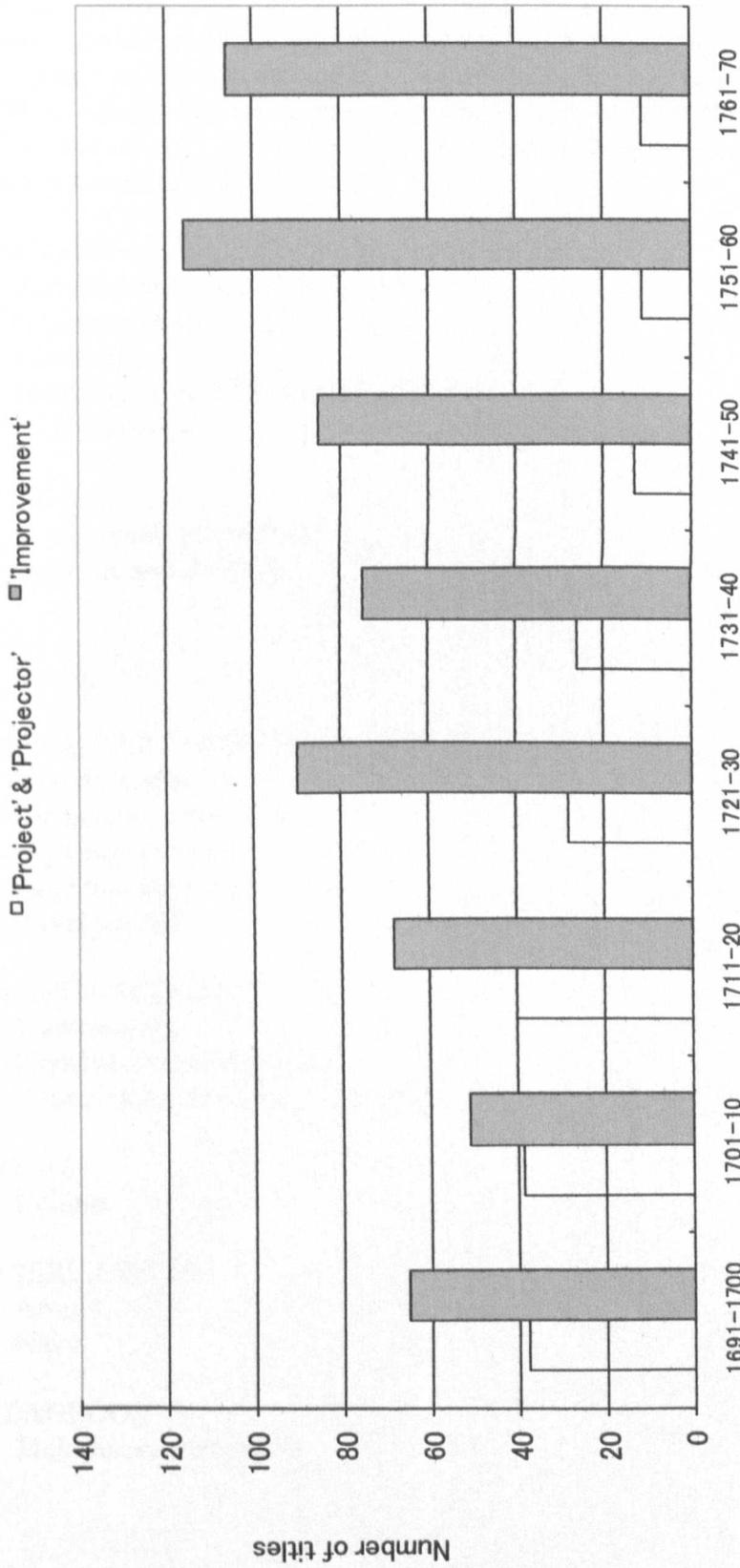
Sources: See Table 2

Fig. 7: Patents for invention and crown finance, 1617-1716



Sources : See Table 2

Fig. 8 'Project', 'projector', and 'improvement' in the ESTC



Source: *English Short Title Catalogue*

Appendix 2: Subject classification for the Patent Database and Table 2

This subject classification is based on eight major categories and twenty sub-categories. In the code the first digit refers to the larger one whereas the two numbers together specify the subcategory. So, all the codes beginning with two refers to husbandry; twenty-one are specifically about mining, twenty-two, agricultural 'production', and so on. I have then used these classes as labels; I have often given more than one label to a single invention.

MANUFACTURE – 1

- 11 Domestic and consumer goods
- 12 Construction (incl. ship)
- 13 Metallurgy
- 14 Wool and other textiles (incl. leather)
- 15 Food and drink

HUSBANDRY – 2

- 21 Agricultural 'production'
- 22 Drainage and flooding

MINING – 3

- 31 Mining

LAND AND WATER COMMUNICATION – 4

- 41 Inland navigation, port, and harbour
- 42 Navigation technology
- 43 Highway and turnpike
- 44 Land transport technology
- 45 Naval salvage

HEALTH AND COMMUNITY – 5

- 51 Water supply
- 52 Physical and mental health
- 53 Communal safety and cleanliness

CULTURE – 6

- 61 Culture

ARMED SERVICES – 7

- 71 Army
- 72 Navy

MISCELLANEOUS – 8

- 81 Multipurpose/uncertain

Notes on criteria:

Browsing Bennet Woodcroft's *Titles of Patents of Invention, Chronologically*

Arranged (1854) would immediately make one realise that there are different ways of categorising these patents. In order to analyse them as data, therefore, a number of decisions have had to be made. Wherever descriptions of patents are ambiguous, I have opted for 'conservative' estimate. For example, Benedicta Webb's patent (patent no. 23) for 'the sole making of oyle of rapeseed and other like seeds' was 'for the use of clothinge', but also 'for anie other use whatsoever'. In cases like this, I have assumed that the invention was primarily intended for wool and other textiles (category 14). I have applied this 'conservative' estimation to several fields. For example, unless other uses are also specified, I have treated water-raising engines as related to 'Draining and flooding' alone (category 22). Desalination engines, which could be used in garrisons and in ships, may be put under the category 'army' and 'navy' (categories 71, 72). But I have put them into 'Food and drink'. New types of mills that had various uses were put under 'Multipurpose / uncertain'. Of course, as historians of technology have reminded us, techniques originally intended for certain technical processes were frequently profitably adopted in others. The protection of 'anie other use whatsoever' seems to suggest that some patentees were aware of the benefit of extending the privilege to cover cases of such unintended cross-fertilisation. So my classification deals only with some key aspects of complex processes of technical application.

I have made more specific decisions too. Inventions related to dyestuff and tanning are treated as part of 'Wool and other textiles (incl. leather)' (category 14). For example, a number of patents like Peter Ladore's for 'glossing plaine and figured sattins' were concerned not with the technical process of weaving textiles, but with finishing of woven textiles into marketable goods of certain quality and character. So, in order to distinguish these patents for weaving engines and finishing techniques, I have treated the latter not as 'Wool and other textiles (incl. leather)', but as the invention applied to the production of 'Domestic and consumer goods' (category 11). These decisions have been vital for analysing what is otherwise an inscrutable data. It is important to note, however, that the overall pictures presented in Figures 4 and 5 do not significantly alter even if we categorised some of these patents differently.

BIBLIOGRAPHY**Primary Sources****Manuscript Sources****Bodleian Library, Oxford**

Carte MS 233

Wood D 27(5)

British Library, London

Sloane MS 654

Harley MS 2003

Add. MS 33923

Add. MS 34218

British Museum, London

Schreiber Collection, English 66

Chetham's Library, Manchester

H.P. 2619

Lambeth Palace Library, London

SPG VI

SPG XIV

The National Archive, Kew

PC 2/59

SP 16/171/18

SP 20/251B

SP 29/21/87

SP 29/44/21

SP 29/66/160

SP 29/99/12

SP 29/171/127

SP 29/234/85

SP 29/338/167-168

National Library of Wales [hereafter NLW], Aberystwyth
14362E, Diary of Sir Humphrey Mackworth

Penrice and Margam Estate Records

P&M 4A, 5555

P&M Muniments (2)/L521

Neath Antiquarian Society, Neath

Gnoll Estate Papers, NAS Gn/P2/12

Parliamentary Archives, London

HL/PO/JP/10/1/38

HL/PO/PB/1/1662/14C2n46

HL/PO/JO/10/1/303

HL/PO/CO/1

Royal Society Archives, London

Boyle Papers, RB/1/40/28

Boyle Letters, RB 3/7/1

Classified Papers, Cl.P. x(3)7

Early Letters, EL/B1/72

Sheffield University, Sheffield

The Hartlib Papers, (2 CD-ROMs, 2nd ed., Sheffield: HR Online, 2002).

Staffordshire Record Office, Stafford

Aqualate Paper, Baldwyn Papers

D(W)1788/P3/B78

D(W)1788/P43/B10

D(W)1788/P45/B14

D(W)1788/P59/B3

D(W)1788/P61/B5

D(W)1788/P61/B6

D(W)1788/P61/B7

West Glamorgan Archive Service, Swansea

Royal Institution of South Wales

Gnoll Estate Collection, RISW/Gn 4/552

G. Grant Francis Collection, RISW/GGF17

Government and Other Official Publication

Acts and Ordinances of the Interregnum, eds. C. H. Firth and R. S. Rait (3 vols, London: Wyman, 1911).

Acts of the Privy Council of England, 1616-1617.

Analytical Index to the Series of Records Known as the Remembrancia (London: E. J. Francis, 1878).

Calendar of State Papers, Domestic.

Calendar of Treasury Books.

Calendar of Treasury Papers.

Commons Debates 1621, eds. Wallace Notestein, Frances Helen Relf, and Hartley Simpson (7 vols, New Haven: Yale U.P., 1935).

The Constitutional Documents of the Puritan Revolution, 1625-1660, ed. Samuel Rawson Gardiner (3rd ed., Oxford: Clarendon, 1906).

The English Reports (178 vols, 1900-1932).

HMC, *Calendar of Manuscripts of the Marquis of Ormonde*, New sers., 3-7 (London: HMSO, 1905-1912).

HMC, *Fifth Report of the Royal Commission on Historical Manuscripts* (2 parts, London: HMSO, 1876).

HMC, *House of Lords, 1692-1693*, 53 (London: HMSO, 1984).

Journals of the House of Commons.

Journals of the House of Lords.

Statute of the Realm.

Stuart Royal Proclamations, eds. James F. Larkin and Paul L. Hughes (2 vols, Oxford: Clarendon, 1973, 1983), vol. 1, 11-14;

Woodcroft. Bennet, *Titles of Patents of Invention, Chronologically Arranged, from March 2, 1617 (14 James I) to October 1, 1852 (16 Victoriae), Part I. Nos. 1 to 4,800* (London: Queen's Printing Office, 1854).

- *Subject Matter Index of Patents of Invention: From March 2, 1617 (14 James I) to October 1, 1852 (16 Victoriae)* (2 vols, London: Queen's Printing Office, 1854).

Periodicals

Flying post or the post master.

Houghton, John. *A collection for improvement of husbandry and trade* (4 vol., 1727-1728).

London gazette.

Philosophical transactions.

Post boy.

Post man and the Historical account.

Spectator, ed. Donald F. Bond (5 vols, Oxford: Clarendon, 1965).

Tatler, ed. Donald F. Bond (3 vols, Oxford: Clarendon, 1987).

Ward, Edward. *The London Spy*, ed. Paul Hyland (East Lansing: Colleagues Press, 1993).

Other Printed Primary Sources

Academy. By the Kings priviledge [1674?].

Angliae tutamen: or, the safety of England (1695).

The Anonymous Life of William Cecil, Lord Burghley, ed. Alan G. R. Smith (Lewiston, NY: Edwin Mellen, 1990).

Answer as well to a paper, entituled Reasons wherefore the making navigable of the rivers Stower and Salwerp [. . .] As also to another paper, intituled, An answer to some partiall pretences, called, reasons dispersed by some Shropshire coal masters [1661?].

An answer to the postscript of a paper, published by Sir H. M [. . .] intitul'd An answer to several objections (1698).

An answer to the reasons for making the river Douglas navigable [1720].

The anti-projector or the history of the fen project (1646).

An appeal to the parliament concerning the poor that there may not be a beggar in England (1660).

By the King. A proclamation conteyning his Maiesties royall pleasure, concerning the proiect of dying and dressing of broad cloathes within the kingdome, before they be exported (1614).

Camiltons discoverie, of devilish designs and killing projects of the Society of Jesuites of later yeares (1641).

The charter of the Royal Lustring Company (1697).

A coffee-house dialogue: or a discourse between Captain Y – and a Young Barrester of the Middle-Temple; with some reflections upon the bill against the D. of Y. [1679].

Conscience by scruples, and money by ounces; or, new fashioned scales for old fashioned money (1697).

A continuation of the coffee-house dialogue [1680?].

The copie of a letter sent from the roaring boyes in Elizium [. . .] (1641).

The crisis: or, the Briton's advocate (1733).

A dialogue or accidental discourse betwixt Mr. Alderman Abell, and Richard Kilvert, the two maine projectors for wine (1641).

England's Improvememts Justified; and the author thereof, Captain Y. vindicated from the scandals in a Paper called a Coffee-house dialogue [1679?].

*An epilogue spoke to a play call'd the Alchymist, performed at Drury Lane, Oct. 27 1721 [1721], in British Museum, *English Cartoons and Satirical Prints, 1320-1832* [Microfilm] (Cambridge: Chadwyck Healey, 1978), no. 1718.*

An epistle to a member of parliament, concerning Mr. George Oldner's invention (1699).

The French rogue: or the life of Monsieur Ragour de Versailles (1694).

Hickelty-pickelty: or, a medly of characters adapted to the age (1710).

A letter to a member of this parliament, for liberty of conscience (1668).

A looking-glasse for sope-patentees (1646).

The new projector; or the priviledged cheat [1662?].

Secret memoirs and manners of several persons of quality, of both sexes (1709).

The soap-makers complaint for the losse of their trade [. . .] (1650).

Sport upon sport; or, the Jacobite tos'd in a blanket [1692].

Vox et lacrimae anglorum; or the true Englishmen's complaints to their representatives in parliament (1668).

Amphlett, John. (ed.), *A Survey of Worcestershire by Thomas Habington*, Worcestershire Historical Society, (2 vols, 1895, 1899).

Aubrey, John. 'Brief Lives', *Chiefly of Contemporaries, set down by John Aubrey, between the Years 1669 & 1696*, ed. Andrew Clark (2 vols, Oxford: Clarendon, 1898).

Austen, Ralph. *A treatise of fruit-trees* [. . .] (1653).

- *A treatise of fruit-trees* (2nd ed., 1657).
- *The spirituall use of an orchard, or garden of fruit-trees* (1657).
- *A treatise of fruit-trees* (3rd ed., 1665).

Bacon, Francis. *The Essayes or Counsels, Civill and Morall*, ed. Michael Kiernan (Oxford: Clarendon, 1985).

Baston, Thomas. *Thoughts on trade and publick spirit* (1716).

Becon, Thomas. *The Catechism of Thomas Becon*, ed. John Ayre (Cambridge: CUP, 1844).

Bellers, John. *John Bellers: His Life, Times and Writings*, ed. George Clarke (London: Routledge, 1987).

- The Bible: Authorized King James Version*, eds. Robert Carroll and Stephen Prickett (Oxford: Oxford Paperbacks, 2008).
- Birch, Thomas. *History of the Royal Society of London [1757]* (4 vols, Bruxelles: Culture et Civillisation, 1968).
- Blith, Walter. *The English improver, or a new survey of husbandry* (1649).
- *The English improver improved or the survey of husbandry surveyed* (1652).
- Boyle, Robert. *The Correspondence of Robert Boyle*, eds. Michael Hunter, Antonio Clericuzio, and Lawrence M. Principe (6 vols, London: Pickering & Chatto, 2001).
- Brewster, Francis. *Essays on Trade and Navigation* (1695).
- Brome, Richard. *The court beggar a comedie* [. . .] (1653).
- Bushell, Thomas. *An extract by Mr. Bushell of his late abridgment of the lord chancellor Bacons philosophical theory of mineral prosecutions* (1660).
- Butler, Samuel. *Samuel Butler 1612-1680: Characters*, ed. Charles W. Daves (Ohio: Press of Case Western Reserve University, 1970).
- Brugis, Thomas. *The discovery of a projector* (1641).
- Byfield, Nicholas. *Paterne of wholsome words* (1618).
- Callis, Robert. *The reading of that famous and learned gentleman, Robert Callis* (1647).
- Cary, John. *An essay on the state of England in relation to its trade, its poor, and its taxes for carrying on the present war* (1695).
- Cawdry, Robert. *A table alphabeticall contayning and teaching the true writing and vnderstanding of hard vsuall English wordes* (1609).

Chambers, Ephraim. *Cyclopaedia: or an universal dictionary of art and science* (2 vols, 1728).

Clarendon, Edward Hyde, Earl of, *A history of the rebellion and civil wars in England* [published in 1702-1704, but composed from the 1646 onward] (8 vols, Oxford, 1826).

Cockeram, Henry. *The English dictionarie: or, An interpreter of hard English words* (1623).

Coles, Elisha. *An English dictionary explaining the difficult terms* [. . .] (1692).

Culpeper, Cheney. 'The Letters of Sir Cheney Culpeper (1641-1657)', eds. M. J. Braddick and M. Greengrass, *Camden Miscellany*, 33, 5th ser., 7 (1996), 105-402.

Defoe, Daniel. *An essay upon projects* (1697).

- *A Tour thro' the Whole Island of Great Britain*, ed. G. D. H. Cole (2 vols, London: Peter Davies, 1927).

- *Defoe's Review*, ed. Arthur Wellesley Secord (22 vols, New York: Columbia U.P., 1938).

Dury, John. *A motion tending to the publick good of this age, and of posteritie* (1642).

- *Considerations tending to the happy accomplishment of Englands Reformation in church and state* (1647).

Dymock, Cressy. *An invention of engines of motion lately brought to perfection* (1651).

- *An essay for advancement of husbandry-learning; or propositions for the erecting a colledge of husbandry* (1651).

- *The new and better art of agriculture* [1668].

Evelyn, John. *An apology for the royalist party* (1659).

- *Sylva, or a discourse of forest-trees, and the propagation of timber in his majesties dominions* (2nd ed., 1670).
- *Pomona; or an appendix concerning fruit-trees in relation to cider* [. . .] (2nd ed., 1670).
- *Navigation and commerce, their original and progress* (1674).
- *The Diary of John Evelyn*, ed. E. S. de Beer (6 vols, Oxford: Clarendon, 1995).

Fortrey, Samuel. *England's interest and improvement* (2nd ed., 1673).

Fuller, Thomas. *The history of the University of Cambridge* (1655), [appended to idem, *The church-history of Britain from the birth of Jesus Christ until the year M.DC.XLVIII endeavoured by Thomas Fuller* (1655)].

- *Mixt contemplations in better times* (1660).
- *The history of the worthies of England* (1662).

Gentleman, Tobias. *Englands vway to vvin wealth, and to employ ship and mariners* (1614).

Haines, Richard. *The Prevention of Poverty* (1674).

- *Proposal for building in every country a working-almshouse or hospital* [. . .] (1677).
- *A model of government for the good of the poor and the wealth of the nation* (1678).
- *Aphorisms upon the new way of improving cyder* (1684).

Hall, Joseph. *Characters of virtues and vices in two bookes* (1608).

Harleian Miscellany, ed. William Oldys (8 vols, 1744-1746).

Hartlib, Samuel. *Further discoverie of the office of publick addressse for accommodations* (1648).

- [Cressy Dymock] *The reformed husband-man, or, A brief treatise of the errors, defects, and inconveniences of our English husbandry* (1651).

[Hartlib Samuel?] *Cornu copia, a miscellanium of lucriferous and most fructiferous experiments, observations and discoveries immethodically distributed to be really demonstrated and communicated in all sincerity* (1652).

- [Cressy Dymock] *A discoverie for division or setting out of land, as to the best form* (1653).

- *Samuel Hartlib his legacy of husbandry* (3rd ed., 1655).

- *The compleat husband-man: or, A discourse of the whole art of husbandry; both forraign and domestick* (1659).

Hawley, Judith et al. (eds.), *Literature and Science, 1660-1834* (8 vols, London: Pickering & Chatto, 2003-2004).

Haywood, Thomas. *Machiavel. As he lately appeared to his deare sons, the moderne projectors* (1641).

Hill, Aaron. *Proposals for raising a stock of one hundred thousand pounds; for laying up great quantities of beech-mast for two years* (1714).

Hooke, Robert. *Diary of Robert Hooke, 1672-1680*, eds. Henry W. Robinson and Walter Adams (London: Taylor and Francis, 1935).

Jeake, Samuel. *An Astrological Diary of the Seventeenth Century: Samuel Jeake of Rye 1652-1699*, eds. Michael Hunter and Annabel Gregory (Oxford: Clarendon, 1988).

Johnson, Samuel. *A Dictionary of the English Language* (2 vols, 1756).

Jonson, Ben. *Ben Jonson*, eds. C.H. Herford and Percy Simpson (11 vols, Oxford: Clarendon, 1925).

- *The Devil is An Ass*, ed. Peter Happe (Manchester: Manchester U.P., 1994).

Kem, Samuel. *The king of kings his privie marks for the kingdoms choyce of new members; Remarques upon the new project of association: in a letter to a friend* [1646].

Knight, Valentine. *Proposals of a new model for re-building the City of London* (1666).

Lithgow, William. *A true and experimentall discourse, upon the beginning, proceeding, and victorious event of this last siege of Breda* (1637).

Locke, John. *Correspondence of John Locke*, ed. Edmund de Beer (8 vols, Oxford: Clarendon, 1976-1989)

Luttrell, Narcissus. *A Brief Historical Relation of State of Affairs from September 1678 to April 1714* (6 vols, Oxford: OUP, 1857).

McClure, Edmund. *A chapter in English church history: being the minutes of the Society for Promoting Christian Knowledge for the years 1698-1704; together with abstracts of correspondents' letters during part of the same period* (London: SPCK, 1888)

Mackworth, Humphrey. *The principles of a member of the black list* (1702).

- *England's glory* (1694).

Mathew, Francis. *Of the opening of rivers for navigation the benefit exemplified by the two Avons of Salisbury and Bristol* (1655)

- *Of the opening of rivers for navigation the benefit exemplified by the two Avons of Salisbury and Bristol* (1656).
 - *Of the opening of rivers for navigation the benefit exemplified by the two Avons of Salisbury and Bristol* (1660).
- [The Mine-Adventurers of England], *A settlement of the mines late of Sir Carbery Pryse* [1698].
- *Settlement of the mine-adventure* [1698].
 - *A new abstract of the mine-adventure* [. . .] (1698).
 - *A true copy of several affidavits* (1698).
 - *A list of the fortunate adventurers in the Mine-Adventure* (1699).
 - *A list of all the adventurers in the Mine-Adventure* (1700).
 - *The second abstract of the state of the mines of Bwlchyr-Eskir-Hyr* (1700).
 - *The fourth abstract of the state of the mines of Bwlchyr-Eskir-Hyr* (1701).
 - *A short account of the proceedings of the select committee of the Mine Adventurers* [. . .] *for lengthening their term and enlarging their boundaries* (1702).
 - *At a Court of Directors of the Governor and Company of the Mine-Adventurers of England* [. . .] *on Thursday the 15th day of June, 1704* [1704].
 - *At a Court of Directors of the Governor and Company of the Mine-Adventurers of England* [. . .] *on Thursday the sixth day of December, 1704* [1704].
 - *An abstract of letters concerning the mines* (1706).
 - *A list of the names of the Governour and Company of the Mine-Adventurers, of England* (1708).

- *An alphabetical list of the creditors of the Company of Mine-Adventurers of England* (1712).

Moore, Jonas. *Moore's arithmetick discovering the secrets of that art, in numbers and species* (1650).

- *Moore's arithmetick in two books* (1660).

More, Thomas. *A fruteful, and pleasant worke of the beste state of a publyque weale, and of the newe ysle called Vtopuia*, trans. Ralphe Robynson (1551).

Nash, T. Russell. *Collections for the history of Worcestershire* (2 vols, 1781-1782).

Nelson, Robert. *An address to persons of quality and estate* (1715).

Noddle, Daniel. *To the Parliament of the Commonvealth of England, and every individual member thereof* (1654).

North, Roger. *Examen: or an enquiry into the credit and veracity of a pretended complete history* [. . .] (1740).

Oldenburg, Henry. *The Correspondence of Henry Oldenburg*, eds., trans. A. R. Hall and M. B. Hall (9 vols, Madison: University of Wisconsin Press, 1965-73).

Oldner, George. *Mr. George Oldner's invention to preserve ships from foundering, or sinking, at sea, &c* (1698).

Pepys, Samuel. *The Diary of Samuel Pepys*, eds. Robert Latham and William Matthews (11 vols, London: Bell, 1970).

Petty, William. *The advice of W. P. to Mr. Samuel Hartlib* (1647).

- *A treatise of taxes & contributions* (1662).

Phillips, Edward. *The new world of words: or, universal English dictionary* (6th ed., 1706).

- Plattes, Gabriel. *A discovery of infinite treasure, hidden since the worlds beginning* (1639).
- *A discovery of subterranean treasure* (1639).
 - *A description of the famous kingdome of Macaria* (1641).
 - *The profitable intelligencer, communicating his knowledge for the generall good of the common-wealth and all posterity* (1644).
- Procter, Thomas. *A vvorthy vvowrke profitable to this whole kingdome concerning the mending of all high-waies, as also for waters and iron workes* (1607).
- Prynne, William. *An humble remonstrance to his maiesty, against the tax of ship-money* (1641).
- R., J. *Trades increase* (1615).
- Ramsey, William. *Life and Letters of Joseph Black* (London: Constable, 1918).
- Roberts, Lewes. *The treatise of Traffike or a discourse of forraine trade* (1641).
- Robinson, Henry. *Certain proposals in order to the peoples freedome and accomodation in some particulars* (1652).
- Rymer, Thomas. *Foedera, convectiones, literae, et cujuscunque generis acta publica* [...] (20 vols, 1704-1735).
- Scott, Thomas. *The projector* (1623).
- Shiers, William. *A familiar discourse or dialogue concerning the Mine- Adventure* (1700).
- Skinner, Stephen. *A new English dictionary shewing the etymological derivation of the English tongue, in two parts* (1691).

Smith, John. *England's improvement reviv'd* (1670).

Smith, Thomas. *A Discourse of the Commonweal of This Realm of England*, ed. Mary Dewar (Charlottesville: University Press of Virginia, 1969).

Sprat, Thomas. *The History of the Royal Society* [1662] (London: Routledge 1959).

Steele, Richard and Joseph Gillmore, *An account of the fish-pool* (London, 1718).

Stevenson, Matthew. *Poems* (1665).

Stoughton, William. *An assertion for truee and Christian church-policie* (1604).

Swift, Jonathan. *A Tale of a Tub and Other Works*, eds. Angus Ross and David Wooley (Oxford: OUP, 1999).

- *Gulliver's Travels*, eds. Peter Dixon and John Chalker with an Introduction by Michel Foot (London: Penguin, 1967).

Taylor, John. *The carriers cosmographie* (1637).

- *The complaint of M. Tenter-hooke the proiector, and Sir Thomas Dodger the patentee* (1641).

Thomas, John. *Liberality in promoting the trade and interest of the publick display'd: A sermon preach'd at St. Mary's in Chester September 1733 on occasion of obtaining an act of parliament for making the river Dee navigable* [1733?].

Thompson, Edward Maunde. (ed.), *Correspondence of the Family of Hatton, vol. I, 1601-1704* (Camden Society, 1878).

Vaughan, Rowland. *Most approued, and long experienced water-workes* (1610).

Walcot, Humphrey. *Sea-water made fresh and wholesome* (1702).

Walcot, Humphrey. *Sea-water made fresh and wholsom* [1702], [a printed handbill].

Waller, William. *An essay on the value of the mines* (1698).

- *Mine-Adventure laid open* (1710).

Webster, Charles. (ed.), *Samuel Hartlib and the advancement of learning* (1970).

Wentworth, Thomas. *The Earl of Strafford's letters and Dispatches*, ed. W. Knowler (2 vols, 1739).

Weston, Richard. *A discourse of husbandrie used in Brabant and Flanders* (1650).

Wildman, John. *Putney proiects. Or the old serpent in a new forme* (1647).

Wilson, John. *The projectors. A comedy* (1665).

Winthrop, Robert C. (ed.) with introduction, *Correspondence of Hartlib, Haak, Oldenburg, and others of the founders of the Royal Society, with Govenor Winthrop of Connecticut: 1661-1672* (Boston: Press of John Wilson and Son, 1878).

Worthington, John. *The Diary and Correspondence of Dr. John Worthington*, eds. James Crossley et al., Camden Society, Old ser., 13, 36, 114 (3 vols, 1847, 1855, 1886).

Yalden, Thomas. *A poem on the mines late of Sir Carbery Price. Dedicated to Sir Humphry Mackworth* (1701).

Yarranton, Andrew. *The Improvement improved, by a second edition of the great improvement of lands by clover* (Worcester, 1663).

- *England's improvement by sea and land* (1677).

- *England's improvement by sea and land. The second part* (1681).

Secondary Sources

Andrews, K. R. *Ships, Money and Politics: Seafaring and Naval Enterprise in the Reign of Charles I* (Cambridge: CUP, 1991).

- Appleby, Joyce Oldham. *Economic Thought and Ideology in Seventeenth-Century England* (Princeton: Princeton U. P., 1978).
- Archer, Ian. 'The London Lobbies in the Later Sixteenth Century', *Historical Journal*, 31 (1984), 17-44.
- Asch, Ronald G. 'The Revival of Monopolies: Court and patronage' during the Personal Rule of Charles I, 1629-40', in Ronald G. Asch and Adolf M. Birke (eds.), *Princes, Patronage, and the Nobility: the Court at the Beginning of the Modern Age* (Oxford: OUP, 1991), 357-92.
- Ashcraft, Richard. *Revolutionary Politics and Locke's 'Two Treatises of Government'* (Princeton: Princeton U.P., 1986).
- Ash, Eric H. *Power, Knowledge, and Expertise in Elizabethan England* (Baltimore: Johns Hopkins U.P., 2004).
- Austin, James, Howard Stevenson, and Jane Wei-Skillern, 'Social and Commercial Entrepreneurship: Same, Different, or Both?', *Entrepreneurship Theory and Practice*, 30 (2006), 1-22.
- Aylmer, G. E. *The Crown's Servants: Governement and Civil Service under Charles II, 1660-1685* (Oxford: OUP, 2002).
- Barnard, John and D. F. McKenzie (eds.), *The Cambridge History of the Book in Britain, vol. IV, 1557-1695* (Cambridge: CUP, 2002).
- Barrell, John. *English Literature in History, 1730-80: An Equal, Wide Survey* (London: Hutchinson, 1983).
- Barry, Jonathan. 'Publicity and the Public Good: Presenting Medicine in Eighteenth-century Bristol', in W. F. Bynum and Roy Porter (eds.), *Medical Fringe and Medical Orthodoxy, 1750-1850* (London: Croom Helm, 1987), 29-39.

- 'Civility and Civic Culture in Early Modern England: The Meanings of Urban Freedom', in Peter Burke, Brian Harrison and Paul Slack (eds.), *Civil Histories: Essays Presented to Sir Keith Thomas* (Oxford: OUP, 2000), 181-96.

- 'The "Great Projector": John Cary and the Legacy of Puritan Reform in Bristol', in Margaret Pelling and Scott Mandelbrote (eds.), *The Practice of Reform in Health, Medicine and Science, 1500-2000* (Aldershot: Ashgate, 2005), 185-206.

Barter Bailey, Sarah. *Prince Rupert's Patent Guns* (Leeds: Royal Armouries Museum, 2000).

Baxter, Stephen B. *The Development of The Treasury, 1660-1702* (London: Longman, 1957).

Beckett, J. V. *The Aristocracy in England 1660-1914* (Oxford: Blackwell, 1986).

Bell, Walter George. *The Great Fire of London in 1666* (London: John Lane, 1920).

Bennett, Jim. 'Instrument and Ingenuity', in Michael Cooper and Michael Hunter (eds.), *Robert Hooke: Tercentennial Studies* (Aldershot: Ashgate, 2006), 65-76.

Berg, Maxine. 'The Genesis of "Useful Knowledge"', *History of Science*, 45 (2007), 123-33.

Bevir, Mark and Frank Trentmann, 'Markets in historical contexts: ideas, practices and governance' in Mark Bevir and Frank Trentmann (eds.), *Markets in Historical Contexts: Ideas and Politics in the Modern World* (Cambridge: CUP, 2004), 1-24.

Biagioli, Mario. 'From Print to Patents: Living on Instruments in Early Modern Europe', *History of Science*, 44 (2006), 139-86.

Blondel, Christine and Bernadette Bensaude-Vincent (eds.), *Science and Spectacle in the European Enlightenment* (Aldershot: Ashgate, 2008).

Braddick, Michael. *The Nerves of State: Taxation and the Financing of the English State, 1558-1714* (Manchester: Manchester U.P., 1996).

- *State Formation in Early Modern England c. 1550-1700* (Cambridge: CUP, 2000).
- *God's Fury, England's Fire: A New History of the English Civil Wars* (London: Allen Lane, 2008).

Brewer, John. *Sinews of Power: War, money and the English state, 1688-1783* (London: Unwin Hyman, 1989).

Brooks, Colin. 'Projecting, Political Arithmetic and the Act of 1695', *English Historical Review*, 97 (1982), 31-53.

Brown, Laura. *Fables of Modernity: Literature and Culture in the English Eighteenth Century* (Ithaca: Cornell U.P., 2001).

Brown, Peter J. 'The Early Industrial Complex at Ashtley, Worcestershire', *Post-Medieval Archaeology*, 16 (1982), 1-19.

- 'Andrew Yarranton and the British Tinsplate Industry', *Historical Metallurgy*, 22 (1988), 42-48.

- 'The Military Career of Andrew Yarranton', *Transactions of Worcestershire Archaeological Society*, 3rd ser., 13 (1992), 193-202.

Burley, G. H. C. 'Andrew Yarranton: A Seventeen-century Worcestershire Worthy', *Transactions of Worcestershire Archaeological Society*, new ser., 38 (1961), 25-36.

Butler, Martin. *Theatre and Criticism 1632-1642* (Cambridge: CUP, 1984).

Cambers, Andrew. 'Reading, the Godly, and Self-Writing in England, circa 1580-1720', *Journal of British Studies*, 46 (2007), 796-825.

Cantrill, Thomas Crosbee and Marjory Wight, 'Yarranton's Works at Astley', *Transactions of the Worcestershire Archaeological Society*, 2nd ser., 7 (1929), 92-115.

Carroll, Archie B. 'Corporate Social Responsibility: Evolution of a Definitional Construct', *Business and Society*, 38 (1999), 268-295.

Carruthers, Bruce G. *City of Capital: Politics and Markets in the English Financial Revolution* (Princeton: Princeton U.P., 1996).

Chalklin, C. W. 'Navigation Schemes on the Upper Medway, 1600-1665', *Journal of Transport History*, 5 (1961), 105-115.

Chambers, Douglas. 'Wild Pastoral Encounter': John Evelyn, John Beale and The Renegotiation of Pastoral in the Mid-seventeenth Century', in Leslie and Raylor (eds.), *Culture and Cultivation*, 173-94.

Chandaman, C. D. *The English Public Revenue, 1660-1688* (Oxford: Clarendon, 1975).

Christie, John. 'Laputa Revisited', in Christie and Shuttleworth (eds.), *Nature Transfigured*, 45-60.

Christie, John and Sally Shuttleworth (eds.), *Nature Transfigured: Science and Literature, 1700-1900* (Manchester: Manchester U.P., 1989).

Clark, Geoffrey. *Betting on Lives: The Culture of Life Insurance in England, 1695-1775* (Manchester: Manchester U.P., 1999).

Claydon, Tony. *William III and the Godly Revolution* (Cambridge: CUP, 1996).

Coleman, D. C. *The Economy of England, 1450-1750* (Oxford: OUP, 1977).

Colley, Linda. *In Defiance of Oligarchy: the Tory Party, 1714-1760* (Cambridge: CUP, 1982).

Collinson, Patrick. *Elizabethan Essays* (London: Hambledon Press, 1994).

- 'Ben Jonson's *Bartholomew Fair*: The Theatre constructs Puritanism', in David L. Smith, Richard Strier, and David Bevington (eds.), *The Theatrical City*:

Culture, Theatre and Politics in London, 1576-1649 (Cambridge: CUP, 1995), 157-69.

Cowan, Brian. *The Social Life of Coffee: The Emergence of the British Coffeehouse* (Hew Haven: Yale U.P., 2005).

Cramsie, John. 'Commercial Projects and the Fiscal Policy of James VI and I', *Historical Journal*, 43 (2000), 345-64.

- *Kingship and Crown Finance under James VI and I, 1603-1625* (Woodbridge: Boydell Press, 2002).

Cruikshanks, Eveline, Stuart Handley, and David Hayton (eds.), *History of Parliament: The House of Commons, 1690-1715* (5 vols, Cambridge: CUP, 2002).

Cust, Richard. 'Reading for Magistracy: The Mental World of Sir John Newgate', in John McDiarmid (ed.), *The Monarchical Republic of Early Modern England: Essays in Response to Patrick Collinson* (Aldershot: Ashgate, 2007), 181-99.

Daston, Lorraine. *Classical Probability in the Enlightenment* (New Jersey: Princeton U. P., 1988).

- 'The Domestication of Risk: Mathematical Probability and Insurance 1650-1830', in Lorenz Kruger, Lorraine J. Daston, and Michael Heidelberger (eds.), *The Probabilistic Revolution* (2vols, Cambridge, Mass.: MIT Press, 1987), vol. 1, 237-60.

Daunton, M. J. *Progress and Poverty: Economic and Social History of Britain 1700-1850* (Oxford: OUP, 1995).

Davies, K. G. 'Joint-Stock Investment in the Later Seventeenth Century', *Economic History Review*, new ser., 4 (1952), 283-301.

- *The Royal African Company* (London: Longman, 1957).

Deaux, Kay and Gina Philogène (eds.), *Representations of the Social: Bridging Theoretical Traditions* (Oxford: Blackwell, 2001).

Dees, J. Gregory. 'The Meaning of "Social Entrepreneurship"', (2nd revised ed., 2000), 'http://www.caseatduke.org/documents/dees_sedef.pdf' (22 Sep. 2008).

Dickson, P. G. M. *The Financial Revolution in England: A Study in the Development of Public Credit, 1688-1756* (London: Macmillan, 1967).

Dircks, Henry. *The Life, Times, and Scientific Labours of the Second of Worcester* (1865).

Dietz, Frederick C. *English Public Finance, 1558-1641* (2nd ed., London: Frank Cass, 1964).

Downie, Alan. 'The Growth of Government Tolerance of the Press to 1790' in Robin Myers and Michael Harris (eds.), *Development of the English Book Trade, 1700-1899* (Oxford: Oxford Polytechnic Press, 1981), 36-65.

Drucker, Peter. 'The New Meaning of Corporate Social Responsibility', *California Management Review*, 26 (1984), 53-63.

Duckham, Baron F. *The Yorkshire Ouse: the History of a River Navigation* (Newton Abbott: David & Charles, 1967).

Dutton, Richard. 'Jonson's Satiric Styles', in Richard Harp and Stanley Stewart (eds.), *The Cambridge Companion to Ben Jonson* (Cambridge: CUP, 2000), 58-71.

Eamon, William. *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture* (Princeton: Princeton U.P., 1994).

Earle, Peter. *The Making of the English Middle Class: Business, Society and Family Life in London, 1660-1730* (London: Methuen, 1989).

Emery, Frank. 'The Mechanics of Innovation: Clover Cultivation in Wales before 1750', *Journal of Historical Geography*, 2 (1976), 35-48.

Epstein, Stephen R. 'Transferring Technical Knowledge and Innovations in Europe, c. 1200 – c. 1800', Working Papers on The Nature of Evidence: How Well Do 'Facts' Travel? No. 01/05 (2005), 1-40,
 'http://www.lse.ac.uk/collections/economicHistory/pdf/FACTSPDF/FACTS1-Epstein.pdf' (27 March 2006).

Ernle, R. E. P. *English Farming Past and Present* (New 6th ed., London: Heinemann, 1961).

Evans, R. C. 'Contemporary Contexts of Jonson's "*The Devil is an Ass*"', *Comparative Drama*, 26 (1992), 140-76.

Fairclough, Keith. 'A Successful Elizabethan Project: the River Lea Improvement Scheme', *Journal of Transport History*, 3rd ser., 11 (1998), 54-65.

Ferguson, Arthur B. *The Articulate Citizen and the English Renaissance* (Durham, N.C.: Duke U.P., 1965).

Finkelstein, Andrea. *Harmony and the Balance: An Intellectual History of Seventeenth-century English Economic Thought* (Ann Arbor: University of Michigan Press, 2000).

Finn, Margot C. *The Character of Credit: Personal Debt in English Culture, 1740-1914* (Cambridge: CUP, 2003).

Fletcher, Anthony. *Reform in the Provinces: The government of Stuart England* (New Haven: Yale U.P., 1986).

Fontes da Costa, Palmira. 'Singularities of Nature at the Royal Society of London in the First Half of the Eighteenth Century', *Studies in History and Philosophy of Science*, 33 (2002), 265-88.

Francis, Grant. *The Smelting of Copper in the Swansea District* (2nd ed., London: Henry Sotheran, 1881).

Freeman, Michael. 'Popular Attitudes to Turnpikes in Early Eighteenth-Century England', *Journal of Historical Geography*, 19 (1993), 33-47.

Friedman, Milton. 'The Social Responsibility of Business is to Increase its Profit', *New York Times Magazine*, 13 Sep. 1970.

Fussell, G. E. *The Old English Farming Books; From Fitzherbert to Tull, 1523-1730* (London: Crosby Lockwood & Son, 1947).

Gerrard, Christine. *Aaron Hill: The Muse's Projector 1685-1750* (Oxford: OUP, 2003).

Gibbs, F. W. 'The Rise of the Tinsplate Industry. I. The Tinsplate Workers', *Annals of Science*, 6 (1950), 390-403.

- 'The Rise of the Tinsplate Industry – II. Early Tinsplate Manufacture to 1700', *Annals of Science*, 7 (1951), 25-42.

- 'The Rise of the Tinsplate Industry – III. John Hunbary (1664-1734)', *Annals of Science*, 7 (1951), 43-61.

Glaisyer, Natasha. *Culture of Commerce in England 1660-1720* (Woodbridge: Boydell, 2006).

- 'Calculating Credibility: Print Culture, Trust and Economic Figures in Early Eighteenth-Century England', *Economic History Review*, 60 (2007), 695-711.

Goldgar, Anne. *Tulipmania: Money, Honor, and Knowledge in the Dutch Golden Age* (Chicago: University of Chicago Press, 2007).

Goldie, Mark. 'The Unacknowledged Republic: Officeholding in Early Modern England', in Tim Harris (ed.), *The Politics of the Excluded, c.1500-1850* (Basingstoke: Palgrave, 2001), 153-94.

- 'Voluntary Anglicans', *Historical Journal*, 46 (2003), 977-90.

Golinski, Jan. *Science as Public Culture: Chemistry and Enlightenment in Britain, 1760-1820* (Cambridge: CUP, 1992).

Gomme, A. A. 'Data Corrections of English Patents', *Transactions of Newcomen Society*, 13 (1932-33), 159-64.

Gough, J. W. *The Superlative Prodigall: A Life of Thomas Bushell* (Bristol: Bristol U.P., 1932).

- *Sir Hugh Myddelton Entrepreneur and Engineer* (Oxford: Clarendon, 1964).
- *The Rise of the Entrepreneur* (London: Batsford, 1969).

Grassby, Richard. *The Business Community of Seventeenth-century England* (Cambridge: CUP, 1995).

Greaves, Richard L. *Deliver Us from Evil: The Radical Underground in Britain, 1660-1663* (Oxford: OUP, 1986).

- *Enemies under His Feet: Radicals and Non-Conformists in Britain, 1664-1667* (Stanford: Stanford U.P., 1990).

Greengrass, Mark. 'Samuel Hartlib and International Calvinism', *Proceedings of the Huguenot Society*, 25 (1993), 464-75.

- 'Archive Refractions: Hartlib's Papers and the Workings of an Intelligencer' in Hunter (ed.), *Archives of Scientific Revolution*, 35-47.
- 'Samuel Hartlib and the commonwealth of learning', in Barnard and McKenzie (eds.), *Cambridge History of the Book in Britain*, vol. IV, 304-22.

Greengrass, Mark, Michael Leslie, and Timothy Raylor (eds.), *Samuel Hartlib and Universal Reformation: Studies in intellectual communication* (Cambridge: CUP, 1994).

Grove, Richard. 'Cressey Dymock and the Draining of the Fens: An Early Agricultural Mode', *Geographical Journal*, 147 (1981), 27-37.

Gunn, J. A. W. *Politics and the Public Interest in the Seventeenth Century* (London: Routledge, 1969).

Haines, Charles R. *A Complete Memoir of Richard Haines (1633-1685), A Forgotten Sussex Worthy* (London: Harrison, 1899).

Halliday, Paul D. *Dismembering the Body Politic: Partisan Politics in England's Towns, 1650-1730* (Cambridge: CUP, 1998).

Hancock, David. *Citizens of the World: London Merchants and the Integration of the British Atlantic Community, 1735-1785* (Cambridge: CUP, 1995).

Harkness, Deborah. *The Jewel House: Elizabethan London and the Scientific Revolution* (New Haven: Yale U.P., 2007).

Harris, Ron. *Industrializing English Law: Entrepreneurship and Business Organization, 1720-1844* (Cambridge: CUP, 2000).

Harris, Tim. 'The Bawdy House Riot of 1688', *Historical Journal*, 29 (1986), 537-56.

- *Restoration: Charles II and his Kingdom, 1660-1685* (London: Allen Lane, 2005).

Hatcher, John. *The History of the British Coal Industry, Volume I, Before 1700: Towards the Age of Coal* (Oxford: Clarendon, 1993).

Haycock, David Boyd. *Mortal Coil: A Short History of Living Longer* (New Haven: Yale U.P., 2008).

Hayton, David. 'Moral Reform and Country Politics in the Late Seventeenth-Century House of Commons', *Past & Present*, 128 (1990), 48-91.

Heal, Felicity and Clive Holmes, *The Gentry in England and Wales, 1500-1700* (Basingstoke: Macmillan, 1994).

- 'The Economic Patronage of William Cecil', in Pauline Croft (ed.), *Patronage, Culture and Power: The Early Cecils* (New Haven: Yale U. P., 2002), 199-229.

Henderson, David. *Misguided Virtue: False Notions of Corporate Social Responsibility* (London: The Institute of Economic Affairs, 2001).

Hilaire-Pérez, Liliane and Marie Thébaud-Sorger, 'Les Techniques dans l'Espace Public: Publicité des Inventions et Littérature d'Usage au XVIIIe Siècle (France, Angleterre)', *Revue de Synthèse*, 5th ser., 2 (2006), 393-428.

- *L'Invention Technique au Siècle des Lumières* (Paris: Albin Michel, 2000).

- and Catherine Verna, 'Dissemination of Technical Knowledge in the Middle Ages and the Early Modern Era: New Approaches and Methodological Issues', *Technology and Culture*, 47 (2006), 536-65.

Hill, Christopher. *The Century of Revolution 1603-1714* (2nd ed., London: Routledge, 1980).

Hilton, Boyd. *The Age of Atonement: the Influence of evangelicalism on social and economic thought, 1795-1865* (Oxford: OUP, 1988).

Hindle, Steve. *On the Parish?: the Micro-Politics of Poor Relief in Rural England, 1550-1750* (Oxford: Clarendon, 2004).

Hirschman, A. O. *The Passions and the Interests: Political Arguments for Capitalism before Its Triumph* (Princeton: Princeton U.P. 1977).

Hitchcock, Tim. 'Paupers and Preachers: the SPCK and the Parochial Work-house Movement', in Lee Davison, Tim Hitchcock, Tim Keirn, and Robert B. Shoemaker (eds.), *Stilling the Grumbling Hive: the Responses to Social and Economic Problems in England, 1689-1750* (Stroud: St. Martin's Press, 1992), 145-66.

- Holderness, B. A. *Pre-Industrial England: Economy and Society 1500-1750* (London: Dent, 1976).
- Holmes, Clive. 'Statutory Interpretation in the Early Seventeenth-century: the Courts, the Council, and the Commissioners of Sewers', in J. A. Guy and H. G. Beale (eds.), *Law and Social Change in British History: Papers presented to the British Legal History Conference, 14-17 July 1981* (London: Royal History Society, 1984), 107-17.
- Hoppit, Julian. *Risk and Failure in English Business, 1700-1800* (Cambridge: CUP, 1987).
- 'Attitudes to Credit in Britain, 1680-1790', *The Historical Journal*, 33 (1990), 305-322.
 - (ed.), *Failed Legislation, 1660-1800: Extracted from the Commons and Lords Journals* (London: Hambledon Press, 1997).
 - *The Land of Liberty? England 1689-1727* (Oxford: Clarendon, 2000).
 - 'The Myths of the South Sea Bubble', *Transactions of Royal Historical Society* 12 (2002), 141-65.
 - 'The Contexts and Contours of British Economic Literature, 1660-1760', *Historical Journal*, 49 (2006), 79-110.
- Horsefield, J. Keith. *British Monetary Experiments, 1650-1710* (Cambridge, Mass.: Harvard U.P., 1960).
- Horwitz, Henry. *Parliament, Policy, and Politics in the Reign of William III* (Manchester: Manchester U.P., 1977).
- Hoselitz, Bert F. 'The Early History of Entrepreneurial Theory', *Explorations in Entrepreneurial Theory*, 3 (1951), 193-220.

Houghton Jr., Walter E. 'The History of Trades: Its Relation to Seventeenth-Century Thought: As Seen in Bacon, Petty, Evelyn, and Boyle', *Journal of the History of Ideas*, 2 (1941), 33-60.

Hoxby, Blair. 'The Government of Trade: Commerce, Politics and the Courtly Art of the Restoration', *ELH*, 66 (1999), 591-627.

Hughes, Edward. *Studies in Administration and Finance, 1558-1825* (Manchester: Manchester U.P., 1934).

Hunt, Arnold. 'Book Trade Patents, 1603-1640', in Arnold Hunt, Giles Howard Mandelbrote, Alison E. M. Shell (eds.), *The Book Trade and its Customers, 1450-1900* (Winchester: St Paul's, 1997), 27-54.

Hunter, Michael. *Science and Society in Restoration England* (Cambridge: CUP, 1981).

- *Establishing the New Science: The Experience of the Early Royal Society* (Woodbridge: Boydell, 1989).

- (ed.), *Archives of Scientific Revolution: The Formation and Exchange of Ideas in Seventeenth-Century Europe* (Woodbridge: Boydell, 1998).

- 'Introduction', in Hunter (ed.), *Archives of Scientific Revolution*, 1-20.

- *Robert Boyle (1627-92): Scrupulosity and Science* (Woodbridge: Boydell, 2000).

Hussey, David. *Coastal and River Trade in Pre-industrial England: Bristol and its Region, 1680-1730* (Exeter: Exeter U.P., 2000).

Hutchinson, Steven. 'Arbitrating the National Oikos', *Journal of Spanish Cultural Studies*, 2 (2001), 69-80.

Hutton, Ronald. *The Restoration: A Political and Religious History of England and Wales, 1658-1667* (Oxford: Clarendon, 1985).

Illife, Robert. 'Material Doubts: Hooke, Artisan Culture and the Exchange of Information in the 1670s London', *British Journal for History of Science*, 28 (1995), 285-318.

Ingrassia, Catherine. *Authorship, Commerce, and Gender in Early Eighteenth-century England: A Culture of Paper Credit* (Cambridge: CUP, 1998).

Inkster, Ian. 'Discoveries, Inventions and Industrial Revolutions: On the Varied Contributions of Technologies and Institutions from an International Historical Perspective', *History of Technology*, 18 (1996), 39-58.

Jackman, W. T. *The Development of Transportation in Modern Britain* (3rd ed., London: Frank Cass, 1966).

Jacob, Margaret C. and Larry Stewart, *Practical Matter: Newton's Science in the Service of Industry and Empire, 1687-1851* (Cambridge, Mass.: Harvard U.P., 2004).

Jenkins, Geraint H. *The Foundations of Modern Wales, 1642-1780* (Oxford: Clarendon, 1987).

Jenkins, Philip. *The Making of a Ruling Class: The Glamorgan Gentry, 1640-1790* (Cambridge: CUP, 1983).

- 'Tory Industrialism and Town Politics: Swansea in the Eighteenth Century', *Historical Journal*, 28 (1985), 103-23.

Jenkins, Rhys. 'The Protection of Inventions during the Commonwealth and Protectorate', *Notes & Queries*, 11th ser., 12 (1913), 162-63.

Jenner, Mark. "'Another *epocha*'? Hartlib, John Lanyon and the Improvement of London in the 1650s', in Greengrass, Leslie, Raylor (eds.), *Samuel Hartlib and Universal Reformation*, 343-56.

- 'The Politics of London Air John Evelyn's *Fumifugium* and the Restoration', *The Historical Journal*, 38 (1995), 535-51.

- 'The Roasting of the Rump: Scatology and the body politic in Restoration England', *Past & Present*, 177 (2002), 84-120.

- 'L'Eau Changé en L'Argent? Vendre L'Eau dans les Villes Anglaises au Dix-Septième Siècle', *Dix-Septieme Siecle*, 55 (2003), 637-51.

John Arthur H. and Glanmor Williams (eds.), *Glamorgan County History* (5 vols, Cardiff: University of Wales Press, 1936-1988).

Johns, Adrian. 'Identity, Practice, and Trust in Early Modern Natural Philosophy', *Historical Journal*, 42 (1999), 1125-45.

Johnson, T. W. M. 'The Diary of George Skyppe of Ledbury', *Transactions of the Woolhope Naturalist's Field Club*, 34 (1952), 54-62.

Johnston, Waren. 'The Anglican Apocalypse in Restoration England', *Journal of Ecclesiastical History*, 55 (2004), 467-501.

Jones, D. W. *War and Economy in the Age of William III and Marlborough* (Oxford: Blackwell, 1988).

Jones, E. L. *Agriculture and Economic Growth in England 1650-1815* (Oxford: Blackwell, 1974).

Jones, Geoffrey and R. Daniel Wadhvani, 'Entrepreneurship and Business History: Renewing the Research Agenda', Harvard Business School Working Paper: 07-007 (2006), 1-48.

Jones, Whitney R. D. *The Tudor Commonwealth, 1529-1559: A Study of the Impact of the Social and Economic Developments of Mid-Tudor England upon Contemporary Concepts of the Nature and Duties of the Commonwealth* (London: Athlone Press, 1970).

Jovchelovitch, Sandra. 'Social Representations, Public Life, and Social Construction', in Deaux and Philogène (eds.), *Representations of the Social*, 165-82.

- *Knowledge in Context: Representation, Community and Culture* (London: Routledge, 2007).

Keblusek, Marika. "‘Keeping It Secret’: the Identity and Status of an Early-modern Inventor", *History of Science*, 43 (2005), 37-56.

Keeble, N. H. *The Restoration: England in the 1660s* (Oxford: Blackwell, 2002).

Keeler, Mary Frear. *The Long Parliament, 1640-1641: A Biographical Study of its Members* (Philadelphia: American Philosophical Society, 1954).

Kerridge, Eric. *The Agricultural Revolution* (London: Allen and Unwin, 1967).

Kewes, Paulina. 'History and its Uses: Introduction', in Paulina Kewes (ed.), *The Uses of History in Early Modern England* (California: University of California Press, 2006), 1-31.

Kiessling, Nicholas K. (ed.), *The Library of Anthony Wood* (Oxford: Oxford Bibliographical Society, 2002).

King, P. W. 'Wolverley Lower Mill and the Beginnings of the Tinplate Industry', *Historical Metallurgy*, 22 (1988), 104-13.

Knights, Mark. *Representation and Misrepresentation in Later Stuart Britain: Partisanship and Political Culture* (Oxford: OUP, 2005).

Kyle, Chris R. 'Attendance, apathy and order? Parliamentary committees in early Stuart England', in Kyle and Peacey (eds.), *Parliament at Work*, 43-58.

Kyle, Chris R. and Jason Peacey (eds.), *Parliament at Work: Parliamentary Committees, Political Power and Public Access in Early Modern England* (Woodbridge: Boydell Press, 2002).

Kyle, Chris R. and Jason Peacey, "‘Under cover of so much coming and going’: Public Access to Parliament and the Political Process in Early Modern England", in Kyle and Peacey (eds.), *Parliament at Work*, 1-23.

Lake, Peter. 'From Troynouvant to Heliogabulus's Rome and Back: "Order" and its Others in the London of John Stow', in J. F. Merritt (ed.), *Imagining Early Modern London: Perceptions and Portrayals of the City from Stow to Strype, 1598-1720* (Cambridge: CUP, 2001), 217-49.

Lake, Peter and Steve Pincus, 'Rethinking the Public Sphere in Early Modern England', in Peter Lake and Steve Pincus (eds.), *The Politics of the Public Sphere in Early Modern England* (Manchester: Manchester U.P., 2007), 1-30.

Langford, Paul. *A Polite and Commercial People: England, 1727-1783* (Oxford: Clarendon, 1998).

Latta, Kimberly, "'Wondring Ghosts of Trade Whymysies": Projects, Gender, Commerce, and Imagination in the Mind of Daniel Defoe', in Novak (ed.), *The Age of Projects*, 141-65.

Leng, Thomas. *Benjamin Worsley (1618-1677): Trade, Interest and the Spirit in Revolutionary England* (Woodbridge: Boydell, 2008).

Lennard, Reginald. 'English Agriculture under Charles II: The Evidence of the Royal Society's "Enquiries"', *Economic History Review*, 4 (1932), 23-45.

Leslie, Michael and Timothy Raylor (eds.), *Culture and Cultivation in Early Modern England* (Leicester and London: Leicester U.P., 1992).

Leslie, Michael. 'The Spiritual Husbandry of John Beale', in Leslie and Raylor (eds.), *Culture and Cultivation in Early Modern England*, 151-72.

Letwin, William. *The Origins of Scientific Economics: English Economic Thought 1660-1776* (Strand: Methuen, 1963).

Lewis, M. J. T. *Early Wooden Railways* (London: Routledge, 1970).

Lewis, W. J. 'Lead Mining in Cardiganshire', in Geraint H. Jenkins and Ieuan Gwynedd (eds.), *Cardiganshire County History: Volume 3 Cardiganshire in Modern Times* (Cardiff: University of Wales Press, 1998), 160-81.

- Lindley, David. *Fenland Riots and the English Revolution* (London: Heinemann, 1982).
- Lipton, Peter. 'The Epistemology of Testimony', *Studies in the History and Philosophy of Science*, 29 (1998), 1-31.
- Long, Pamela O. *Openness, Secrecy, Authorship: Technical Arts and the Culture of Knowledge from Antiquity to the Renaissance* (Baltimore: Johns Hopkins U.P., 2001).
- Luu, Lien Bich. *Immigrants and the Industries of London, 1500-1700* (Aldershot: Ashgate, 2005).
- McCormick, Ted. 'Alchemy in the Political Arithmetic of Sir William Petty (1623-1687)', *Studies in History and Philosophy of Science*, 37 (2006), 290-307.
- McGee, C. E. 'The Presentment of Bushell's Rock: Place, Politics, and Theatrical Self-Promotion', *Medieval and Renaissance Drama in England*, 16 (2004), 31-80.
- McKeon, Michael. *Secret History of Domesticity: Public, Private, and the Division of Knowledge* (Baltimore: Johns Hopkins U.P., 2005).
- McLean, Bethany and Peter Elkind, *The Smartest Guys in the Room: The Amazing Rise and Scandalous Fall of Enron* (New ed., London: Penguin, 2004).
- MacLeod, Christine. 'The 1690s Patents Boom: Invention or Stock-Jobbing?', *Economic History Review*, new ser., 39 (1986), 549-71.
- *Inventing the Industrial Revolution: The English Patent System, 1660-1800* (Cambridge: CUP, 1988).
 - 'The Paradoxes of Patenting: Invention and its Diffusion in Eighteenth- and Nineteenth-century Britain, France, and North America', *Technology and Culture*, 32 (1991), 885-910.

- *Heroes of Invention: Technology, Liberalism and British Industry, 1750-1914* (Cambridge: CUP, 2007).

MacLeod, Christine and Alessandro Nuvolari, 'The Pitfalls of Prosopography: Inventors in the *Dictionary of National Biography*', *Technology and Culture*, 47 (2006), 757-76.

McRae, Andrew. *God Speed the Plough: the representation of agrarian England, 1500-1660* (Cambridge: CUP, 1996).

Macfarlane, Stephen. 'Social Policy and the Poor in the Later Seventeenth Century', in A. L. Beier and Robert Finlay (eds.), *London 1500-1700: The Making of the Metropolis* (London: Longman, 1986), 252-77.

Maddison, R. E. W. 'Studies in the Life of Robert Boyle, F.R.S. Part II. Salt Water Freshened', *Notes and Records of the Royal Society of London*, 9 (1952), 196-216.

Magnusson, Lars. *Mercantilism: the Shaping of an Economic Language* (London: Routledge, 1994).

Malcolm, Noel. *The Origins of English Nonsense* (London: Fontana Press, 1998).

Marcus, Leah S. *The Politics of Mirth: Jonson, Herrick, Milton, Marvell, and the Decline of Old Holiday Pastimes* (Chicago: University of Chicago Press, 1986).

Martin, Evelyn H. 'History of Several Families Connected with Diddlebury. I. The Baldwyns: Part III', *Transactions of the Shropshire Archaeological and Natural Historical Society*, 4th ser., 2 (1912), 327-47.

Mascuch, Michael. 'Social Mobility and Middling Self-identity: the Ethos of British Autobiographers, 1600-1750', *Social History* [Hull], 20 (1995), 45-61. Mendelsohn, J. Andrew. 'Alchemy and Politics in England 1649-1665', *Past & Present*, 135 (1992), 30-78.

Michell, A. R. 'Sir Richard Weston and the Spread of Clover Cultivation', *Agricultural History Review*, 22 (1974), 160-61.

Miller, John. *James II: A Study in Kingship* (Hove: Wayland, 1978).

- *After the Civil Wars: English Politics and Government in the Reign of Charles II* (Harlow: Longman, 2000).

Millgate, Michael. *Testamentary Acts: Browning, Tennyson, James, Hardy* (Oxford: Clarendon, 1992).

Minard, Philippe. *La Fortune du Colbertisme: Etat et Industrie dans la France des Lumières* (Paris: Fayard, 1998).

Minchinton, W. E. *The British Tinplate Industry: A History* (Oxford: Clarendon, 1957).

Mingay, G. E. *English Landed Society in the Eighteenth Century* (London: Routledge, 1963).

Mitchell, Trent A. 'The Politics of Experiment in the Eighteenth Century: The Pursuit of Audience and the Manipulation of Consensus in the Debate Over Lightening Rods', *Eighteenth-Century Studies*, 31 (1998), 307-31.

Monod, Paul. 'Dangerous Merchandise: Smuggling, Jacobitism, and Commercial Culture in Southeast England, 1680-1760', *Journal of British Studies*, 30 (1991), 150-82.

Moscovici, Serge. 'Notes towards a Descriptions of Social Representations', *European Journal of Social Psychology*, 18 (1988), 211-50.

Morgan, Victor. 'Some Types of Patronage, Mainly in Sixteenth- and Seventeenth-Century England' in Antoni Maćzak (ed.), *Klientelssysteme im Europa der Frühen Neuzeit* (München: Oldenbourg, 1988), 91-115.

Mokyr, Joel. *The Gifts of Athena: Historical Origins of the Knowledge Economy* (Princeton: Princeton U.P., 2002).

- 'Knowledge, Enlightenment, and the Industrial Revolution: Reflections on *The Gifts of Athena*', *History of Science*, 45 (2007), 185-96.
- Morrill, John. *The Nature of the English Revolution: Essays* (London: Longman, 1993).
- Muchmore, Lynn. 'The Project Literature: An Elizabethan example', *Business History Review*, 45 (1971), 474-87.
- Mukerji, Chandra. *Territorial Ambitions and the Gardens of Versailles* (Cambridge: CUP, 1997).
- 'Demonstration and Verification in Engineering: Ascertaining Truth and Telling Fictions along the Canal du Midi', in Roberts, Schaffer, and Dear (eds.), *Mindful Hand*, 169-86.
- Muldrew, Craig. *Economy of Obligation: The Culture of Credit and Social Relations in Early Modern England* (London: Macmillan, 1998).
- Murphy, Anne. 'Lotteries in the 1690s: Investment or Gamble?', *Financial History Review*, 12 (2005), 227-46.
- Murphy, Gwendole. *A bibliography of English Character-books, 1608-1700* (Oxford: Bibliographical Society, 1925).
- Musson, A. E. and Eric Robinson, *Science and Technology in the Industrial Revolution* (Manchester: Manchester U.P., 1969).
- Nash, Michael. 'Barge Traffic on the Wey Navigation in the Second Half of the Seventeenth Century', *Journal of Transport History*, 7 (1965-66), 218-24.
- Neal, Larry. 'The Rise of a Financial Press: London and Amsterdam, 1681-1810', *Business History*, 30 (1988), 163-78.
- Neeson, J. M. *Commoners: Common Right, Enclosure and Social Change in England, 1700-1820* (Cambridge: CUP, 1993).

Newman, William R. *Gehennical Fire: The Lives of Gerorge Starkey, an American Alchemist in the Scientific Revolution* (Cambridge, Mass.; Harvard U.P., 1994).

- *Promethean Ambitions: Alchemy and the Quest to Perfect Nature* (Chicago: University of Chicago Press, 2004).

Newman, William R. and Lawrence M. Principe, *Alchemy Tried in the Fire: Starkey, Boyle, and the Fate of Helmontian Chymistry* (Chicago: University of Chicago Press, 2002).

Nicholson, Colin. *Writing and the Rise of Finance: Capital Satires of the Early Eighteenth Century* (Cambridge: CUP, 1994).

Noll, Mark A. 'Introduction', in Mark A. Noll (ed.), *God and Mammon: Protestants, Money, and the Market, 1790-1860* (Oxford: OUP, 2002), 3-29.

Novak, Maximillian E. (ed.), *The Age of Projects* (Toronto: University of Toronto Press, 2008).

- 'Introduction', in Novak (ed.), *Age of Projects*, 3-25.

Nummedal, Tara E. *Alchemy and Authority in the Holy Roman Empire* (Chicago: University of Chicago Press, 2007).

Ochs, K. H. 'The Royal Society of London's History of Trades Programme: An Early Episode in Applied Science', *Notes & Records of the Royal Society*, 39 (1985), 129-58.

Outhwaite, R. B. 'Dearth and Government Intervention in English Grain Markets, 1590-1700', *Economic History Review*, 2nd ser., 34 (1981), 389-406.

Parry, Graham. 'John Evelyn as Hortulan Saint', in Leslie and Raylor (eds.), *Culture and Cultivation*, 130-50.

Pawson, Eric. *Transport and Economy: The Turnpike Roads of Eighteenth-Century Britain* (London: Academic Press, 1977).

Pearl, Valerie. *London and the Outbreak of the Puritan Revolution: City Government and National Politics, 1625-43* (Oxford: OUP, 1961).

Peck, Linda Livy. *Court Patronage and Corruption in Early Modern England* (London: Unwin Hyman, 1990).

- *Consuming Splendor: Society and culture in seventeenth-century England* (Cambridge: CUP, 2005).

Peltonen, Markku. *Classical Humanism and Republicanism in English Political Thought 1570-1640* (Cambridge: CUP, 1995).

- 'Politeness and Whiggism 1688-1732', *Historical Journal*, 48 (2005), 391-414.

Phillips, D. Rhys. *The History of the Vale of Neath* (Swansea: published by the author, 1925).

Pincus, Steve. 'Neither Machiavellian Moment nor Possessive Individualism: Commercial Society and the Defenders of the English Commonwealth', *American Historical Review*, 103 (1998), 705-36.

- 'From holy cause to economic interest: the study of population and the invention of the state', in Alan Houston and Steve Pincus (eds.), *Nation Transfigured: England after the Restoration* (Cambridge: CUP, 2001), 272-98.

- 'A Revolution in Political Economy?', in Novak (ed.), *The Age of Projects*, 115-40.

Pocock, J. G. A. *Machiavellian Moment: Florentine Political Thought and the Atlantic Republican Tradition* (Princeton: Princeton U.P., 1975).

- *Virtue, Commerce, and History: Essays on Political Thought and History, Chiefly in the Eighteenth Century* (Cambridge: CUP, 1985).

Price, William Hyde. *The English Patents of Monopoly* (Boston: Houghton Mifflin, 1906).

- Principe, L. M. 'Boyle's Alchemical Secrecy: Codes, Ciphers, and Concealments', *Ambix*, 39 (1992), 63-74.
- Pumfrey, Stephen and Frances Dawbarn, 'Science and Patronage in England, 1570-1625: A Preliminary Study', *History of Science*, 42 (2004), 137-88.
- Rabb, Theodore K. *Enterprise and Empire: Merchant and Gentry Investment in the Expansion of England, 1575-1630* (Cambridge, Mass.: Harvard U.P., 1967).
- Ransome, Mary. 'The Parliamentary Career of Sir Humphrey Mackworth, 1701-13', *University of Birmingham Historical Journal*, 1 (1948), 232-54.
- Ratcliff, S. R. 'Samuel Morland and his Calculating Machines c. 1666: the Early Career of a Courtier-inventor in Restoration England', *British Journal for History of Science*, 40 (2007), 159-79.
- Raylor, Timothy. 'Samuel Hartlib and the Commonwealth of Bees, in Leslie and Raylor (eds.), *Culture and Cultivation*, 91-129.
- Raymond, Joad. *Pamphlets and Pamphleteering in Early Modern Britain* (Cambridge: CUP, 2003).
- Reddaway, T. F. *The Rebuilding of London after the Great Fire* (London: Jonathon Cape, 1940).
- Rees, William. *Industry before the Industrial Revolution* (2 vols, Cardiff: Cardiff U.P., 1968).
- Riggs, David. *Ben Jonson, A Life* (Cambridge, Mass.: Harvard U.P., 1989).
- Roberts, Lissa, Simon Schaffer, and Peter Dear (eds.), *The Mindful Hand: Inquiry and Invention from the Late Renaissance to Early Industrialisation* (Amsterdam: Koninklijke Nederlandse Akademie van Wetenschappen, 2007).

Roberts, Peter R. 'The Business of Playing and the Patronage of Players at the Jacobean Courts', in Ralph Houlbrooke (ed.), *James VI and I: Ideas, Authority, and Government* (Aldershot: Ashgate, 2006), 81-106.

Robertson, H. M. 'Sir Bevis Bulmer: A Large-scale Speculator of Elizabethan and Jacobean Times', *Journal of Economic and Business History*, 4 (1932), 99-120.

- *Aspects of the Rise of Economic Individualism: A Criticism of Max Weber and his School* (New York: Kelley&Millman, 1959).

Rose, Craig. 'Providence, Protestant Union and Godly Reformation in the 1690s', *Transactions of the Royal Historical Society*, 6th ser., 3 (1993), 151-69.

- 'The Origins and Ideals of the SPCK 1699-1716', in Walsh, Haydon, and Taylor (eds.), *The Church of England*, 172-90.

Roseveare, Henry. *The Financial Revolution* (Harlow: Longman, 1991).

Sacks, David Harris. *The Widening Gate: Bristol and the Atlantic Economy, 1450-1700* (Berkeley: University of California Press, 1991).

- 'The Countervailing of Benefits: Monopoly, Liberty, and Benevolence in Elizabethan England', in Dale Hoak (ed.), *Tudor Political Culture* (Cambridge: CUP, 1995), 272-91.

- 'The Greed of Judas: Avarice, Monopoly, and the Moral Economy in England, ca. 1350 – ca. 1600', *Journal of Medieval and Early Modern Studies*, 28 (1998), 263-307.

- 'Richard Hakluyt's Navigation in Time: History, Epic, and Empire' *Modern Language Quarterly*, 67 (2006), 32-62.

Sanders, Julie. *Ben Jonson's Theatrical Republics* (Basingstoke: Macmillan, 1998).

Schafer, R. G. (ed.), *A Selection from the Records of Philip Foley's Stour Valley Iron Works 1668-74*, 2 vols, Worcestershire Historical Society, new ser., 9, 13 (1982, 1990).

Schaffer, Simon. 'Defoe's Natural Philosophy and the Worlds of Credit', in Christie and Shuttleworth (eds.), *Nature Transfigured*, 13-44.

- 'A Social History of Plausibility: Country, City and Calculation in Augustan Britain' in Adrian Wilson (ed.), *Rethinking Social History: English Society 1570-1920 and its Interpretation* (Manchester: Manchester U.P., 1993), 128-57.
- 'The Show that Never Ends: Perpetual Motion in the Early Eighteenth Century', *British Journal for the History of Science*, 28 (1995), 157-89.
- 'The Consuming Flame: Electrical Showmen and Tory Mystics in the World of Goods', in John Brewer and Roy Porter (eds.), *Consumption and the World of Goods* (London: Routledge, 1993), 489-526.

Schumpeter, Joseph A. *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*, tr. Redvers Opie (Cambridge: Mass.: Harvard U.P., 1961).

Schwed Jr., Fred. *Where Are the Customers' Yachts? Or a Good Hard Look at Wall Street* [1940] (New York: Wiley, 1995).

Scott, William Robert. *The Constitution and Finance of English, Scottish and Irish Joint-stock Companies to 1720*, (3 vols, Cambridge: CUP, 1910-12).

Searle, G. R. *Morality and the Market in Victorian Britain* (Oxford: OUP, 1998).

Seaward, Paul. *The Cavalier Parliament and the Reconstruction of the Old Regime, 1661-1667* (Cambridge: CUP, 1989).

Secretan, C. F. *Memoirs of the Life and Times of the Pious Robert Nelson* (London: Jun Murray, 1860).

Shankland, Thomas. 'Sir John Philipps of Picton Castle, the Society for Promoting Christian Knowledge, and the Charity-School Movement in Wales 1699-1737', *Transactions of the Honourable Society of Cymmrodorion*, (1904-1905), 74-216.

Shapin, Steven. *A Social History of Truth: Civility and Science in Seventeenth-century England* (Chicago: University of Chicago Press, 1994).

Shapin, Steven et al., 'Gently Boyle' [Review Symposium on *A Social History of Truth*], *Metascience*, 6 (1994), 1-23.

Shapin, Steven and Simon Schaffer, *Leviathan and the Air-pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton U.P., 1985).

Shapiro, Barbara J. *A Culture of Fact: England 1550-1720* (Ithaca: Cornell U.P., 2000).

- 'Testimony in Seventeenth-Century English Natural Philosophy: Legal Origins and Early Development', *Studies in History and Philosophy of Science*, 33 (2002), 243-63.

Sharman, Frank A. 'River Improvement Law in the Early Seventeenth Century', *Journal of Legal History*, 3 (1982), 222-45.

Sharp, Lindsay. 'Timber, Science, and Economic Reform in the Seventeenth Century', *Forestry*, 48 (1975), 51-79.

Sharpe, Kevin. *The Personal Rule of Charles I* (New Haven: Yale U.P., 1992).

Shepard, Alexandra. *Meanings of Manhood in Early Modern England* (Cambridge: CUP, 2003).

Sherman, Sandra. *Finance and Fictionality in the Early Eighteenth Century: Accounting for Defoe* (Cambridge: CUP, 1996).

Skempton, Alec W. 'Engineering of the English river navigation to 1760', in M. Baldwin and A. Burton (eds.), *Canals. A New Look* (Chichester: Phillimore, 1984), 23-44.

- et al. (eds.), *Biographical Dictionary of Civil Engineers in Great Britain and Ireland: 1500-1830* (2 vols, London: Thomas Telford, 2002).

Skinner, Quentin. *Liberty before Liberalism* (Cambridge: CUP, 1998).

Slack, Paul. *Poverty and Policy in Tudor and Stuart England* (London: Longman, 1988).

- *From Reformation to Improvement: Public Welfare in Early Modern England* (Oxford: Clarendon, 1998).

Smith, Alan. 'Steam and the City: The Committee of Proprietors of the Invention for Raising Water by Fire, 1715-1735', *Transactions of the Newcomen Society*, 49 (1977-8), 5-20.

Smith, Pamela. *The Business of Alchemy: Science and Culture in the Holy Roman Empire* (Princeton: Princeton U.P., 1994).

Smith, R. S. 'A Woad Growing Project at Wollaton in the 1580s', *Transactions of the Thoroton Society of Nottinghamshire*, 65 (1961), 27-46.

Sommerville, J. P. 'Absolutism and royalism', in J. H. Burns and Mark Goldie (eds.), *The Cambridge History of Political Thought 1450-1700* (Cambridge: CUP, 1991), 347-73.

Spurr, John. *The Restoration Church of England, 1646-1689* (New Haven: Yale U.P., 1991).

- 'The Church, the Societies and the Moral Revolution of 1688', in Walsh, Colin, and Taylor (eds.), *The Church of England c. 1689-c. 1833*, 127-42.

- *England in the 1670s: 'This Masquerading Age'* (Oxford: Blackwell, 2000).

- 'A Profane History of Early Modern Oath', *Transactions of the Royal Historical Society*, 6th ser., 11 (2001), 37-63.

- Stevenson, Laura Caroline. *Praise and Paradox: Merchants and Craftsmen in Elizabethan Popular Literature* (Cambridge: CUP, 1984).

- Stewart, Larry. *The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660-1750* (Cambridge: CUP, 1992).

- 'Other Centres of Calculation, or, Where the Royal Society didn't Count: Commerce, Coffee-houses and Natural Philosophy in Early Modern London', *British Journal for History of Science*, 32 (1999), 133-53.

- 'Experimental Spaces and the Knowledge Economy', *History of Science*, 45 (2007), 155-77.

- Stone, Lawrence. *Crisis of Aristocracy, 1558-1641* (Oxford: Clarendon, 1965).

- Straker, Ernest. *Wealden Iron* (London: Bells and Sons, 1931).

- Stubbs, Mayling. 'John Beale, Philosophical Gardener of Herefordshire Part II. The Improvement of Agriculture and Trade in the Royal Society 1663-1683', *Annals of Science*, 46 (1989), 323-63.

- Sturgess, H. A. C. (ed.), *Register of Admissions to the Honourable Society of the Middle Temple* (3 vols, London: Middle Temple, 1949).

- Sudlow, Jno [sic]. 'South Sea Playing Cards', *Notes & Queries*, 3rd ser., 5 (1852), 217-20.

- Swatland, Andrew. *The House of Lords in the Reign of Charles II* (Cambridge: CUP, 1996).

- Tapsell, Grant. *The Personal Rule of Charles II, 1681-1685* (Woodbridge: Boydell, 2007).

Taylor, James. *Creating Capitalism: Joint-Stock Enterprise in British Politics and Culture, 1800-1870* (Woodbridge: Boydell Press, 2006).

- 'Company Fraud in Victorian Britain: The Royal British Bank Scandal of 1856', *English Historical Review*, 122 (2007), 700-24.

Thirsk, Joan. (ed.), *The Agrarian History of England and Wales, Volume IV 1500-1640* (Cambridge: CUP, 1967).

- *Economic Policy and Projects: The Development of a Consumer Society in Early Modern England* (Oxford: Clarendon, 1978).

- 'Plough and Pen: Agricultural Writers in the Seventeenth Century', in T. H. Ashton et. al. (eds.), *Social Relations and Ideas: Essays in Honour of R. H. Hilton* (Cambridge: CUP, 1983), 295-318.

- *The Rural Economy of England: Collected Essays* (London: Hambledon Press, 1984).

- (ed.), *The Agrarian History of England and Wales, Volume VII 1640-1750: Agrarian Change* (Cambridge: CUP, 1985).

- *Agricultural Regions and Agrarian History in England, 1500-1750* (Macmillan: Basingstoke, 1987).

- 'Making a Fresh Start: Sixteenth-Century Agriculture and The Classical Inspiration', in Leslie and Raylor (eds.), *Culture and Cultivation in Early Modern England*, 15-34.

- 'The Crown as Projector on its Own Estates, from Elizabeth I to Charles I', in R. W. Hoyle (ed.), *The Estates of the English Crown, 1558-1640* (Cambridge: CUP, 1992), 297-352.

- *Alternative Agriculture: A History* (Oxford: OUP, 1997).

Thirsk, Joan and J. P. Cooper (eds.), *Seventeenth-Century Economic Documents* (Oxford: Clarendon, 1972).

Thompson, H. P. *Thomas Bray* (London: SPCK, 1954).

Todd, Margo. *Christian Humanism and the Puritan Social Order* (Cambridge: CUP, 1987).

- 'Puritan Self-fashioning: The Diary of Samuel Ward', *Journal of British Studies*, 31 (1992), 236-64.

Travers, Ben. 'Trading Patterns in the East Midlands, 1660-1800', *Midland History*, 15 (1990), 65-82.

Treadwell, J. M. 'Jonathan Swift: The Satirist as Projector', *Texas Studies in Literature and Language*, 17 (1975), 439-60.

Trevor-Roper, H. R. 'Three Foreigners: The Philosophers of the Puritan Revolution', in H. R. Trevor-Roper, *Religion, the Reformation and Social Change and Other Essays* (New York: Harper & Row, 1968), 237-93.

Tribe, Keith. *Land, Labour and Economic Discourse* (London: Routledge & Kegan Paul, 1978).

Trott, Clive. 'Copper Industry', in Elis Jenkins (ed.), *Neath and District: A Symposium* (Neath: Published by the editor, 1974), 111-48.

Turnbull, G. H. *Hartlib, Dury and Comenius: Gleanings from Hartlib's Papers* (London: University Press of Liverpool, 1947).

- 'Hartlib's Influence on the Early History of the Royal Society', *Notes and Records of the Royal Society of London*, 10 (1953), 101-30.

Turner, James Grantham. 'Ralph Austen, an Oxford horticulturalist of the seventeenth century', *Garden History*, 6 (1978), 39-45.

- 'From Revolution to Restoration in English Literature', in David Loewenstein and Janel Mueller (eds.), *The Cambridge History of Early Modern English Literature* (Cambridge: CUP, 2003), 790-833.

Unwin, George. *The Guilds and Companies of London* (London: Methuen, 1908).

- *Studies in Economic History: The Collected Papers of George Unwin* (London: Macmillan, 1927).

- *Industrial Organization in the Sixteenth and Seventeenth Centuries* (2nd ed., London: Frank Cass, 1957).

Wadsworth, Alfred P. and Julia De Lacy Mann, *The Cotton Trade and Industrial Lancashire, 1600-1789* (Manchester: Manchester U.P., 1931).

Wagner, Wolfgang and Nicole Kronberger, 'Killer Tomatoes! Collective Symbolic Coping with Biotechnology', in Deaux and Philogène (eds.), *Representations of the Social*, 147-64.

Walsh, John, Colin Haydon, and Stephen Taylor (eds.), *The Church of England c. 1689-c. 1833: From Toleration to Tractarianism* (Cambridge: CUP, 1993).

Wanklyn, Malcolm. 'The Severn Navigation in the Seventeenth Century: Long-Distance Trade of Shrewsbury Boats', *Midland History*, 13 (1988), 34-58.

- 'The Impact of Water Transport Facilities on the Economies of English River Ports c. 1660-c.1760', *Economic History Review*, 2nd ser., 49 (1996), 20-34.

Walzer, Michael. *Revolution of the Saints: A Study in the Origins of Radical Politics* (Cambridge, Mass.: Harvard U. P., 1965).

Ward, J. R. *The Finance of Canal Building in Eighteenth-century England* (Oxford: OUP, 1974).

Webb, Stephen Sanders. *The Governors-General: The English Army and the Definition of the Empire, 1569-1681* (Chapel Hill: University of North Carolina Press, 1979).

Webster, Charles. *The Great Instauration: Science, Medicine and Reform 1626-1660* (2nd ed. with new Preface, Oxford: Peter Lang, 2002).

- 'The Authorship and Significance of *Macaria*', *Past & Present*, 56 (1972), 34-48.

Weiser, Brian. *Charles II and the Politics of Access* (Woodbridge: Boydell, 2003).

Whyman, Susan. *Sociability and Power in Later-Stuart England: The Cultural Worlds of the Verneys 1660-1720* (Oxford: OUP, 1999).

Wiener, Martin J. *English Culture and the Decline of the Industrial Spirit, 1850-1980* (2nd ed., with a new preface, Cambridge: CUP, 2004).

Wigelsworth, Jeffrey R. 'Bipartisan Politics and Practical Knowledge: Advertising of Public Science in Two London Newspapers, 1695-1720', *British Journal for History of Science*, 41 (2008), 517-40.

Willan, T. S. *River Navigation in England 1600-1750* (London: Frank Cass, 1964).

Willis Bund, J. W. et al. (eds.), *Victoria County History, Worcestershire*, (4 vols, London: Constable, 1901-1924).

Willmoth, Frances. *Sir Jonas Moore: Practical Mathematics and Restoration Science* (Woodbridge: Boydell Press, 1993).

- 'Mathematical Science and Military Technology: The Ordnance Office in the Reign of Charles II', in J. V. Field and Frank A. J. L. James (eds.), *Renaissance and Revolution: Humanists, Scholars, Craftsmen, and Natural Philosophers in Early Modern Europe* (Cambridge: CUP, 1993), 117-31.

Wilson, Charles. *England's Apprenticeship 1603-1763* (2nd ed., Harlow: Longman, 1984).

Wilson, John F. *Lighting the Town: A Study of Management in the North West Gas Industry* (London: Paul Chapman, 1991).

Winch, Donald. *Riches and Poverty: An Intellectual History of Political Economy in Britain, 1750-1834* (Cambridge: CUP, 1996).

Withington, Phil. 'Views from the Bridge: Revolution and Restoration in Seventeenth-century York', *Past & Present*, 170 (2001), 121-51.

- *The Politics of Commonwealth: Citizens and Freemen in Early Modern England* (Cambridge: CUP, 2005).

Wood, Neal. *Foundations of Political Economy: Some Early Tudor Views on State and Society* (Berkeley: University of California Press, 1994).

Worden, Blair. 'Providence and Politics in Cromwellian England', *Past & Present*, 109 (1985), 55-99.

Wrightson, Keith. *Earthly Necessities: Economic Lives in Early Modern Britain, 1470-1750* (London: Penguin Books, 2002).

Zell, Michael. 'Walter Morrell and the New Draperies Project, c. 1603-1631', *Historical Journal*, 44 (2001), 651-75.

Unpublished Theses and Manuscripts

Brooks, Colin. 'Taxation, Finance, and Public Opinion, 1688-1714' (Ph. D thesis, University of Cambridge, 1970).

Cummings, A. J. G. 'The York Buildings Company: A Case Study in Eighteenth Century Corporation Mismanagement' (Ph. D thesis, University of Strathclyde, 1981).

Evans, S. 'An Investigation of Sir Humphrey Mackworth's Industrial Activities (MA thesis, University of Wales, Cardiff, 1953).

Greengrass, Mark. 'The Projecting Culture of Samuel Hartlib and His Circle', (unpublished conference paper for 'Publicists and Projectors in Seventeenth-Century Europe', Wolfenbüttel, 1996).

Jenner, Mark. 'Liquid Schemes, Solid Gold' (unpublished manuscript, n.d.).

Johnston, Stephen. 'Making Mathematical Practice: Gentlemen, Practitioners and Artisans in Elizabethan England' (Ph. D thesis, University of Cambridge, 1994).

McCormick, Ted. 'Sir William Petty, Political Arithmetic, and the Transmutation of the Irish, 1652-1687' (Ph. D thesis, Columbia University, 2005).

MacLeod, Christine. 'Patents for Invention and Technical Change in England, 1660-1753' (Ph. D thesis, University of Cambridge, 1983).

Neufeld, Matthew. 'Restoration Remembrances: Recollections of a Pardonable Past in the Answers of Defaulting Accountants, 1662-1664' (unpublished paper, 2008).

Stephenson, H. W. 'Thomas Firmin, 1632-1697', (Ph. D thesis, University of Oxford, 1949).

Thomas, J. H. 'Thomas Neale, A Seventeenth-century Projector' (Ph. D thesis, University of Southampton, 1979).

Tosney, Nicholas Barry. *Gaming in England, c. 1540-1760* (Ph. D thesis, University of York, 2008).

Yamamoto, Koji. 'Sir Humphrey Mackworth and the Company of the Mine Adventurers of England: Meanings of Gentlemen in Late Seventeenth- and Early Eighteenth-century England' (MRes thesis, University of York, 2005).