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Natural Knowledge, Inc.: The Royal Society as a metropolitan corporation

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Abstract

This article attempts to think through the logic and distinctiveness of the early Royal Society's position as a metropolitan knowledge community and chartered corporation, and the links between these aspects of its being. Among the knowledge communities of Restoration London it is one of the best known and most studied, but also one of the least typical and in many respects one of the least coherent. It was also quite unlike the chartered corporations of the City of London, exercising almost none of their ordinary functions and being granted very limited power and few responsibilities. I explore the Society's imaginative and material engagements with longer-established corporate bodies, institutions, and knowledge communities, and show how those encounters repeatedly reshaped the early Society's internal organisation, outward conduct, and self-understanding. Building on fundamental work by Michael Hunter, Adrian Johns, Lisa Jardine and Jim Bennett, and new archival evidence, I examine the importance of the city to the Society's foundational rhetoric, and the shifting orientation of its search for patronage; the development of its charter; and how it learned to interpret the limits and possibilities of its privileges through its encounters with other chartered bodies, emphasising the contingent nature of its early development.

Introduction

The Royal Society is, and has been, many things. Currently it describes itself as 'the independent scientific academy of the UK and the Commonwealth, dedicated to promoting excellence in science'.¹ According to its Charter of incorporation (last updated 2012), it remains 'The Royal Society of London for Promoting Natural Knowledge', its title since the Charter's first revision in 1663.² It functions simultaneously as a learned society (an elective association of, in this case, senior

scientists); as the UK's national academy of science, advising on scientific policy and promoting science nationally and internationally; and a mid-level scientific publisher and research funder. It is at once a private club for its members and a publicly-funded national body; a charitable trust and a business.

Among the things it is currently not are: a professional body; a regulatory authority; a licensed monopoly; or a teaching institution. Yet all these functions were contemplated at various points in its early history, and the chartered corporations of early modern London typically exercised some or all of them. This essay aims to think through the logic, distinctiveness, and impact on its early development of the Royal Society's identity as a metropolitan chartered corporation.

This was fundamental from the Society's inception,³ customarily dated to November 1660 when a knot of regular attendees at Christopher Wren's Astronomy lectures at Gresham College in the City of London proposed founding 'a college for the promoting of physico-mathematical experimental learning'.⁴ As has been amply documented, there was a great variety of models and antecedents from which the new institution drew ideas and inspiration – precursor groups in London and Oxford, private and princely academies in Italy and France, more or less formally constituted communities and correspondence circles, as well as the colleges of Oxford and Cambridge, Gresham College, and the Royal College of Physicians. In being incorporated it was like the monopoly companies and trade guilds of early modern London; but, as a chartered corporation operating in a domain that was not yet clearly enough defined to be demarcated by commercial or craft boundaries or by an obviously pre-existing social function, it represented something new.

The new institution did not regulate a trade, bind apprentices, or confer particular obligations (other than the payment of dues) upon most of the members. Its Charter and Statutes were drawn broadly enough to allow the members to participate at the level they found congenial, which in more than a few cases meant never turning up at all.⁵ The Charter gave the Royal Society a very loosely defined remit and purpose and certain privileges – notably the right to appoint its own 'typographers,

chalcographers or engravers', to a certain number of criminal cadavers for anatomical dissection, and to correspond freely with the Continent on scientific matters – but it enjoyed no monopoly and few responsibilities.

The fact of the Society's incorporation nevertheless had various significant effects. It gave royal recognition to the enterprise of 'promoting natural knowledge' (in the phrase of the revised Charter of 1663). It formally established a community dedicated to that enterprise.⁶ It shaped a social order within that community, and gave it legal being, allowing it as a corporate body to own land and property and to receive gifts or bequests.⁷ Michael Hunter rightly emphasises the Charter's merging of 'formality of constitution, decision-making and finance with a devotion to research' and its exemplary importance for the voluntary learned societies that became a vital and growing part of Britain's intellectual culture over the next 150 years.⁸ But he also crucially insists on the contingency and uncertainty of many aspects of the Society's identity during its foundational period, and its capacity to develop in ways that the founders had not obviously anticipated.⁹ This essay is indebted to and firmly situated within that framework. It deploys new evidence, and reappraises old, to highlight the extent to which early conceptions of the Society remained fluid, and to identify the pressures bearing upon them. I suggest that the voluntarist model that emerged from the ferment of the Society's foundation was shaped by the distinctiveness of the Society's position as a new chartered corporation, based in London, with potentially significant privileges and relatively limited responsibilities, and by friction and negotiation with other metropolitan chartered bodies. The essay is divided into three sections: one on the development of the Charter, the second on the representation of the Society's relationship to London, and the third on the exercise of its chartered privileges in relation to other corporations, notably the Stationers' Company and the College of Physicians.

Thinking about incorporation: The development of the Charter

Perhaps the most obviously contingent and experimental period in the Society's early history was the time between its first proposal in November 1660 and its incorporation by Charter in July 1662. Much productive attention has been paid to this phase of the Society's existence and to the significance of the Charter itself. The actual process by which the Charter arrived at its official form, however, has remained necessarily obscure for lack of evidence. Thanks to a pair of early drafts, identified and discussed here, it is possible to add significant nuance and detail to our understanding of the early Royal Society and its constitution.¹⁰ I particularly discuss several provisions that were dropped or significantly toned down in the final text. These are witnesses to early intentions and ambitions, some of them attested to elsewhere, that the Society felt compelled to abandon or defer as having the potential to cause controversy with other institutions and disagreement among the membership. They do not simply fill in a gap in our understanding, however: they also modify the meaning of the Charter, by showing us what the final text represents a departure from, and help to ground speculations about why it took the form it eventually did.

The drafts are part of the Domestic Manuscripts series in the Royal Society's archives. They are in Latin, described respectively as forms of a *Diploma Regium* (a Royal Charter) and *Litterae Patentes* (Letters Patent). These descriptions are contemporary with the documents, and reproduced in the archive catalogue. The former is in the hand of George Ent and the latter of William Croone, both physicians and founding Fellows of the Society. Croone was also the 'Register' (i.e. record-keeper) of the pre-Charter period. The distinction between the labels is curious and its significance hard to parse. Charters envisage a grant in perpetuity and Letters Patent not necessarily; however, Charters are necessarily issued in the form of Letters Patent.¹¹ As well as the authors' drafts, fair copies of each survive in a single hand (possibly that of the Society's amanuensis, whom Croone had been deputised to find).¹² They represent two drafts of a single charter rather than, strictly speaking, two draft charters. Despite significant textual differences, their structure and provisions agree both in the broad contours and in matters of detail. This strongly suggests that they are separate attempts

at producing Latin versions of an agreed-upon outline, probably the outcome of collective discussion among the early Fellows or at least a group of them.

Precise dating is impossible. They certainly predate the actual Charters of 1662 and 1663 and do not belong to the revisions of 1669: the drafts are comparatively vague on electoral protocol and constitutional governance, areas in which the official texts are highly and increasingly precise. One circumstantial factor that may at least give a terminus for their dating is that both have Charles II declaring himself the Society's 'Founder and Patron', possibly based on the King's offer, responding in October 1661 to the Society's initial petition for royal approval of their design of incorporation, 'to be entered one of their Society'.¹³ At the very least the drafts had to be composed far enough in advance of July 1662 to allow for very significant revision, and for the necessary legal formalities.

The drafts consist of a comparatively short preamble, in which Charles II is made to articulate the logic behind the new enterprise.¹⁴ He articulates his sense – gleaned from 'our own experience while we were in foreign lands', and 'the universal consensus of all the learned and wise men with whom we were acquainted' – of the existing deficiencies in '[those] preeminent parts of the substantial sciences which pertain to the examination of natural things': namely, that 'men influential in those studies, have propounded their theories and principles excessively hastily, plainly before a sufficient stock of experiments or natural histories, the foundations of these sciences, had been amassed'.¹⁵ This is a simple, not to say reductive, statement of Baconian principle (and a judgement that might well have been seen as taking aim at the College of Physicians and the Universities). Its presence in the drafts is as close as the Society ever came to giving Francis Bacon's preference for direct observation and experiment over premature system-building the status of official policy, and its absence from the Charter is correspondingly significant. The 1662 text refers instead to Charles's wish

to extend not only the boundaries of Empire, but also of the very arts and sciences ...

Therefore we look with favour upon all forms of learning, but with particular grace we

encourage philosophical studies, especially those which by actual experiments attempt either to shape out a new philosophy or to perfect the old.

The allusion to experiment as a means to proceed was retained but not, as in the draft, erected into a carefully specified epistemological rationale for a methodological principle; a Baconian echo linking the expansion of political empire with the expansion of the bounds of knowledge is clearly present, but in a form not likely to tie the Society's hands.¹⁶

There is, in short, a deliberate softening from draft to official text. This is emphatically not to imply a rejection of Baconianism on the part of the Society; on the contrary, broadly equivalent statements to those in the drafts can be found in the works of numerous Fellows as well as Thomas Sprat's *History*.¹⁷ It represents rather a decision not to inscribe them explicitly in the Society's official beginnings, and a desire not to circumscribe the scope and direction of the Society's activity at the outset. In this it serves not only to confirm the view of many historians that the Society's Baconian commitments were more nuanced and varied than simple discipleship, but also to imply the early Fellows' own understanding of that variety.¹⁸

What follows is not a detailed analysis of the draft Charters' differences from the 1662 text and from each other, for which there is not space here, but an identification of three key provisions that were eliminated from, or radically altered in, the adopted version. These indicate just how closely the founding Fellows of the Society identified their new institution with the power and patronage of the restored monarchy; and, by the same token, their dramatic curtailing show how thoroughly the Society had overestimated how far royal interest was likely to support the Society and its ends, while underestimating the entrenched interests of longer-established bodies. The first proposal concerns the rights of the Society to secure the benefit of any inventions it produced, and to act as a repository of patent specifications; the second would grant to the Society all the same privileges as were granted to the Colleges of Oxford and Cambridge; and the third proposed significant rights in the Society's government for members of the nobility.

The first provision divided into two parts. The first was largely to do with the Society's internal policy; the second was more outward-looking, and laid claim to an authority that was likely to complicate deeply the Society's relations with London's livery companies and mechanical inventors more broadly. It reads as follows:

[...] that the profit of things found/invented by them, should fall to the sole benefit of the College; and that the enjoyment of the same should extend to nobody else without their [i.e. the Society's] consent. Moreover, whenever Letters Patent under the great seal of England shall have been obtained for mechanical works or inventions; They [the inventors] shall be bound, to offer a suitable specimen of their machine [mechanism] to this Society, that it may be kept safe with them.¹⁹

This provision would allow the Society to turn its activity to financial advantage. As is well documented, the question of how the Society was to finance itself was an early and abiding preoccupation, and this proposal takes its place among many schemes intended to relieve its dependence on members' subscriptions – though it is unusual in resting specifically on the Society's activity, rather than on proposed grants of income or commercial monopolies. The proliferation of such schemes in the 1660s demonstrates at once the grandeur of the Society's earliest ambitions and its awareness of the precariousness of its own existence. It also lends credibility to the fragmentary evidence of early plans to limit the size of the Fellowship.²⁰ If the Society intended to finance itself through the profits of inventions and discoveries made by the institution, there would be correspondingly less need to rely on membership fees and less reason to countenance a significantly enlarged membership.

The subsequent history of this provision is complex. In the first instance it simply disappears from the Charter text. There may have been no need for it; the Society was entitled to enter into and benefit from commercial arrangements as a corporate body.²¹ Robert Moray and the Scottish landowner Alexander Bruce discussed strategies in November 1663 for obtaining an English patent

for the latter's efforts, with the Dutch horologist and mathematician Christiaan Huygens, to develop a sea-going pendulum clock, intending to name the Royal Society as one of the beneficiaries.²² This was never obtained, but in March 1665 a pendulum-regulated longitude clock was folded into an omnibus patent of inventions developed under the Society's direction.²³ This was intended for the Society's benefit, but registered in the name of its Treasurer, Abraham Hill.

Such vacillating policy and practice indicates uncertainty about the feasibility of collective patenting. It also maps suggestively onto Michael Hunter's analysis of the context which, as he notes, gave rise to the omnibus patent – namely, the attempt to mobilise the Society's intellectual resources through the institution of specialist committees. This was partly legible as a solution to the problem of yoking the aggregated voluntary efforts of individual members to productive corporate ends, which Hunter shows beset the Society from the beginning.²⁴ Putting pressure on the voluntary membership, however, also made more pressing the question of apportioning credit between individual and institution – particularly if money was in question. Creating an institutional structure that framed the inventions claimed in the patent as the work of more than one person – or, as in the case of the pendulum longitude clock, as having already been offered up to the Society – bolstered the Society's claim to profit from them. By previously suppressing the draft provision about patents from the final charter, the Society appeared to acknowledge the potential difficulty of attempting to subsume the innovations of its members wholly to its own benefit. The committee context discussed here, by creating frameworks that made such appropriation more plausible or palatable, shows that the problem had not gone away by 1665. We do not know why the patent was taken out in Hill's name rather than the Society's. In the context of efforts to reinforce the Society's financial position and related concerns about the legitimate extent of the Society's claims upon the work of its members, it may indicate an anxiety about who the patented inventions would revert to if the Society were to collapse. The patent was for a term of fourteen years, perhaps pointing to a greater faith in the longevity of an individual and his heirs than of the institution.²⁵

The second part of the provision, and its eventual non-adoption, also signals a problematic aspect, in the institutional context, of the financial benefits hoped for from the new philosophy. This was the proposal that all mechanical inventions for which patents were issued should have a 'specimen' of them deposited with the Royal Society. (Ent's use of this term could refer either to a model, a working example, or a graphic representation; Croone uses 'Iconismos', which more commonly means a diagram or schema.) This provision would have made the Society an official repository of mechanical patents and granted them detailed knowledge of the specifics of a variety of (presumably) useful inventions – as well as perhaps assuming the function of evaluating the claims made for their inventions by prospective patentees. In many respects this seems like an obvious function for the Society to have assumed, and it is easy to see how it might have been beneficial, helping to facilitate the Society's development of new inventions based on the information entrusted to it. Why then was it not adopted?

The issue of trust is probably the critical one. By claiming regulatory authority over mechanical invention, and asking for the right to profit by it, the Society was expecting to be trusted with a lot, in a highly contested and ambiguous domain. Patents, as Christine Macleod has shown, cut across issues of law, constitutional authority, guild regulation, and public interest, and were expensive to acquire and difficult to enforce.²⁶ Despite nominal protections, it was argued – by Fellows of the Society, among others – that the Restoration patenting system did too little to prevent anyone making minor improvements to a patented technology from claiming it as a new invention.²⁷ The two parts of the proposed system risked incurring opposition from mechanical inventors, who would have to hand over detailed descriptions of their inventions to a body of skilled competitors with financial interests of their own; from the gildated trades, whose livelihoods new inventions in the useful arts might threaten; and even from Fellows of the Society unconvinced of the virtues of surrendering their own interest in their discoveries to the institution.²⁸

Scrapping the provision from the Charter did not settle these issues. The Society *did* experience difficulty with people claiming that information or inventions shared with the institution were not treated equitably or with adequate confidentiality, and other mechanisms – ciphers, explicit promises of confidentiality, and sealed notes – were employed by those hoping to use the Society’s credit and resources to secure priority without full disclosure.²⁹ Moreover, the possibility of the Society’s acting as an adjudicator of patents was three times revived after the Charter was issued, in October 1662, March 1663/4 and, finally, fifty years later.³⁰ In the first instance Robert Moray reported the King’s ‘pleasure, that no patent should pass for any philosophical or mechanical invention, but what was first put to the examination of the Society’.³¹ It is worth noting that the Society was particularly eager to make itself useful to the crown at this time – it resolved on the same date to print the responses it had collated to enquiries about shipbuilding materials from the Commissioners of the Navy, a project that gave rise to John Evelyn’s *Sylva* (1664). March 1664 saw the proposal revived at the Society’s behest:

It was moved, that the king might be desired by the President, Sir Robert Moray, and Sir Paul Neile, to give a rule to the two Secretaries of State, that all the proposals, that should be made concerning mechanical inventions, should be referred to the Council of the Society, to be examined by them, whether they were new, true, and useful.³²

A resolution to the same effect was carried the following week, but there is no evidence that anything came of it. It reads rather like an effort to implement formally the measure that the king had approved eighteen months before. (There is a hint of its *informal* implementation in Robert Moray’s discussing before the Society a patent application shown him by the King in June 1663, still pending, and describing a technique for fertilising barren soils.)³³ The third instance, in early 1713, also came to nothing, despite apparently originating with the sovereign, and I dwell on the significance of this episode in the essay’s conclusion.

The second significant provision in the draft charter is the proposal that the Society be awarded:

[all] the benefits, immunities, liberties, and privileges whatsoever, heretofore granted to other societies, or to the colleges of either University, either of Oxford or of Cambridge (except the privilege of conferring academic degrees in any faculty).³⁴

This is, to say the least, expansive and vague. There were 34 colleges founded in the two universities prior to 1661 and the nature of the privileges referred to is unspecified. Several of the College Charters specify their standing at law, their size, their various rights in relation to property, inheritances, incomes, and exemptions, and the terms of their initial endowments, but little concerning their scope or activity or for that matter the obligations of the members. In casting their net this widely the early Fellows made plain that the Colleges of Oxford and Cambridge were their exemplary chartered institutions, but perhaps only insofar as their privileges seemed especially generous and useful. The proviso against awarding degrees was probably a matter of avoiding taking corporate imitation of Oxford and Cambridge to the point of competition, and thereby incurring their hostility.³⁵ It should be noted that although the draft Charters do not specify a teaching function for the new institution, this does not mean that none was envisaged, or at least contemplated – various analogies between the Society's functions and those of the universities and of Gresham College, drawn out by contemporaries, are discussed in the next section.

It seems most likely that these provisions were intended as a form of shorthand, cramming in with maximum efficiency as many as possible of the corporate attributes of the bodies that the Society – and presumably others – anticipated that it would most resemble. There are several notable elements to this. It is unlikely, though not impossible, that the early Fellows had taken a census of extant College charters; much more likely is that they were hedging their bets, and did not know precisely what they were asking. Furthermore, the colleges were responsible for the physical and spiritual well-being of their members in a way that the Society was ill-placed to emulate. But the claim indicates that a collegiate model, with Fellows actually living together, was given serious collective consideration early on. Certainly there were other proposals, including John Evelyn's and

Abraham Cowley's well-known designs for a philosophical college, that anticipated a more residential version of the Society than was ever realised.³⁶ There were also other privileges, belonging to the universities rather than the colleges, including those of setting up as publishers and licensing books for publication outside the regimes of either the civil and ecclesiastical authorities or the Stationers' Company of London, that the Society may have had its eyes on. (A version of this privilege was, of course, adopted, and some of the points of friction with the Stationers that shaped its use are discussed in the essay's final section.).

In the end the 1662 Charter did not rule out a more collegiate vision of the Society – the right to build premises, described as a college, was retained – but tied it explicitly to London, without invoking the Universities as examples. This approach reflects a degree of nervousness about how the Universities would receive the new institution, but also a more basic reality: colleges of any kind, whether on the model of Gresham or Oxbridge, could not be established without an endowment. The shift from draft to official text points to a sharp decline in the Society's immediate hopes of securing one – but it also indicates that the possibility had been, at a fairly advanced phase of the Society's thinking about its corporate being, still strongly present in the Fellows' minds.

The final provision I discuss here concerned governance. It envisaged a Council of seventeen, rules for a quorum, and honorary offices (namely a President, Treasurer, Register, and Secretary).³⁷ The initial term of office was to be a year, after which elections could take place, and the composition of the council altered or continued; and it provided that if any 'noblemen, that are fellows of this College, are present at the time arranged for these Councils, it shall be granted to the same both to attend, and to bear suffrage.'³⁸

Automatic voting rights on Council for noblemen in the Society would have introduced a powerfully hierarchical element into its constitution, creating a permanent body with significant authority and no power to diminish it. Since the nobility enjoyed its lands, titles and privileges by grant of the crown, and since much of the nobility at the Restoration was more pragmatically beholden to the

crown for the return of its influence, political offices, and sequestered estates, the provision would create a significant bloc within the Council whose devotion to the royal interest could be more or less taken for granted.

I believe this is how it should be understood – not simply as a gesture of respect due to rank, but as an explicit show of loyalty and submission. How constraining it might have proved in practice is unclear. On the one hand most of the titled Fellows on the well-known list of desirable recruits to the early Society actually served on its Council at some point.³⁹ On the other, if the definition of nobility were not fairly restrictive the effect could have been to flood the Council with potential voters, which might well have affected subsequent recruitment policies.⁴⁰ Certainly it is easy to see the Society's ongoing tendency to welcome aristocratic figures for their social cachet and potential influence at court developing differently under a dispensation of this kind, since the Society could not hope to secure their influence on its behalf without granting them significant, indeed disproportionate influence in turn. The nobles would admittedly have to be present to exercise their votes, and the power might well have come to seem notional, a rarely-used entitlement rather than a real force in the Society's government. Yet the fact of its inclusion in the draft points to a deliberate, demonstrative attempt to make of the Society a specifically *royalist* as well as a royal corporation. I intend 'royalist' in a limited sense, however: rather than indicating a strongly-felt ideological orientation, it is more likely that the Society was looking for gestures with which to demonstrate its political soundness in the absence of clear official indications about what this should look like.⁴¹

Remarkably, neither the Corporation Act of 1661 nor the reinstatement of the Oaths of Allegiance and Supremacy by the Cavalier Parliament seem to have clarified this point. Though the Society was a public body, the Charters allowed it to administer its own form of oath to its officers and Council, and it was only with the third revision to the Charter in 1669 that the Oaths of Supremacy and Allegiance were actually prescribed.⁴² In short, the Society actively courted royalist influence in its

draft charters, walked it back significantly in the 1662 text, and eventually had a conventional assertion of royal supremacy imposed upon it. This sequence of events maps broadly onto the wider atmosphere of uncertainty about the Restoration religious settlement, as the early hope of toleration receded definitively by the late 1660s.⁴³ Aristocratic candidates continued to receive preferential treatment when it came to election into the Society but did not automatically enjoy equal status with the Council. The Society remained concerned to secure the king's goodwill and patronage, but sought other routes to it than by making large potential sacrifices of their autonomy.⁴⁴ More broadly, it is important to note how quickly the Society moved away from its near-total identification with restored royal power in the draft charter. As much in the language of its preamble as in its actual provisions, the draft conceives of its corporate identity in relation to King and Court rather than the City. The emergence of a more distinct metropolitan orientation by the mid-1660s, principally discernible in the postures of the Society's rhetoricians and apologists but also in important aspects of its institutional conduct, gains in significance when contrasted with the Society's initial intentions.

None of the provisions discussed here were fully adopted; however, echoes or softened versions of most of them found their way into the Charter. This roads-not-taken approach allows us to perceive that much of what was omitted from the Charter was *consciously* omitted. As shown, those omissions included a more obvious Baconian commitment; a regulatory and record-keeping function for mechanical invention and intellectual property; a more collegiate than voluntarist version of the Society; and an exceptional rather than official-conventional demonstration of loyalty. Some of these point to the uncertainty of the political and religious situation, others to doubts about how the Society's establishment would be received by institutions and interests that saw its potential to infringe upon them, still others to the Society's own anxiety about how best to settle and project its identity. All of them indicate the intensely contingent nature of the Society's emergence and the sense of flux around its beginnings, one that Michael Hunter and Adrian Johns and others have shown would not be dispersed until quite deep into its existence.

Being of the City: what London meant to the early Royal Society

The evidence of the draft charters makes clear how rapidly and radically its founders were forced to revise their early wishes for the Society. If its founding document is to be understood as a compromise measure rather than an ideal statement of ambitions, it follows that readings of the classic contemporary accounts of the Society's foundational period should keep in mind the probability that their authors were acutely conscious of its mutability and contingency. Insofar as the apologetic and propagandistic thrust of, say, Thomas Sprat's *History of the Royal Society* is very well known, this is a commonplace; insofar as the emphasis on contingency dramatises the difference between the context in which Sprat's *History* was written and the one it purportedly addresses, it remains a useful one to make. I am particularly concerned here with the ways in which London is invoked in three contemporary accounts of the Society's early history, and how these reflect their authors' attempts to orient perceptions of the Society, its legitimacy as an enterprise, and its activity. These are a preamble to a draft charter (by Christopher Wren, c. 1662); Sprat's *History*; and John Wallis's *Defence of the Royal Society* (1678).⁴⁵

Though Wallis's account is chronologically last, I consider it first because it extends the descent of the Royal Society from the Oxford of the 1650s to 1645 in London – 'the first ground and foundation' of the meetings. As Mordechai Feingold has argued in an important essay, Wallis specified this more to amplify his own claims to authority and familiarity with the Society than to imply an inherent logic or propriety to the Society's metropolitan basis.⁴⁶ Wallis's testimony is deeply bound up with the Society's institutional politics at the time, and the purpose of his deeper identification of the Society with London was, Feingold shows, to delegitimise the recent campaign to assume control of the Society by a clique of Fellows whom Wallis and his allies particularly associated with Oxford.⁴⁷

Though Wallis's account supplies a vital intellectual genealogy for the early Royal Society – including a nexus of figures holding important official roles in the College of Physicians and Gresham as well as

Oxford and Cambridge – London had for him no inherent quality that made it a desirable location for the Royal Society’s prehistory.⁴⁸ He used it instead to confer a sort of typological legitimacy – just as the Royal Society proximately emerged from the Gresham gatherings of the late 1650s, the London group of the mid-1640s soon came to a focus around the Gresham lectures of an earlier professor, Samuel Foster. If the dedication to the Society’s displaced President, William, Viscount Brouncker, in Wallis’s *Defence* was an assertion of the legitimacy of one faction within the Society over another, it becomes reasonable to view the structural parallels between the emergence of the Society and Wallis’s revisionist account of its ancestor as part of that legitimising narrative.

Wallis’s invocation of London was principally rhetorical. So were Wren’s and Sprat’s; but in their accounts London’s civic attributes matter. As Jim Bennett and Rebekah Higgitt make clear in their introduction to this special issue, Sprat represented the commercial and artisanal vitality of London as not just an asset but the indispensable condition for the pursuit of experimental natural knowledge. In this he echoes Wren, whose draft preamble to a Charter of the Society connected the situation of the Royal Society with London’s craft communities:

The Way to so happy a Government, we are sensible is in no manner more facilitated than by the promoting of useful Arts and Sciences, which, upon mature Inspection, are found to be the Basis of civil Communities, and free Governments, and which father Multitudes, by an Orphean Charm, into Cities, and connect them in *Companies*; that so, by laying in a Stock, as it were of several Arts, and Methods of Industry, the whole Body may be supplied by a mutual Commerce of each others particular Faculties; and consequently that the various Miseries, and Toils of this frail Life, may, by as many various Expedients, ready at hand, be remedied, or alleviated; and Wealth and Plenty diffused in just Proportion to every one’s Industry, that is, to every one’s Deserts.⁴⁹

The point, Wren hastened to add, was not to infringe upon or derogate the function of the Universities. Rather, he suggested, natural philosophy was only incidental to their function, and the

Society should take up for 'Natural Experimental Philosophy' the role the universities played as 'perpetual Fountains of Religion, and Laws:

Not that herein we would withdraw the least Ray of our Influence from the present established Nurseries of good Literature, and Education ... but, that we purpose to make further Provision for this Branch of Knowledge likewise, Natural Experimental Philosophy ...

If the date of this document is consistent with the other Charter drafts, Wren probably wrote this after becoming Savilian professor of Astronomy at Oxford in late 1661. Again, it is evidence that the pre-Charter Fellows looked to the colleges of Oxford and Cambridge as the obvious analogue to their own foundation (though with a different remit); and, equally obviously, it signals their concern about how the analogy might be received by the Universities.⁵⁰

The pivot from Oxford and Cambridge towards London invokes the analogy and simultaneously enforces the distinction between the types of institution. It draws on an idea of human felicity that is specifically urban and metropolitan, grounded in the notion that the useful arts and sciences are what bring cities, almost by conjuration, into being. A company of natural philosophers – such as the Royal Society – dedicated to the promotion of these *for their own sake* would be both the flower and the root of the process that constitutes cities in the first place. It would, he suggests, connect and thereby amplify the work of the individual Livery Companies (which arise 'by an Orphean charm' to regulate the useful arts and sciences which produce them).

Writing in the mid-1660s, Sprat located the Society's immediate ancestry not in London in the 1640s but in Oxford in the 1650s. He did more than Wren to acknowledge the University's ancestral significance for the Society but made less of their parallel functions in different spheres of learning. He also represented the Interregnum gravitation of philosophically-minded men towards Oxford as a regrettable necessity rather than some ideal state of affairs,⁵¹ his rhetoric becoming more forceful when he contemplated the positive virtues, for the enterprise of experimental natural philosophy, of being of the city:

By this [the Fellows] have broken down the partition wall, and made a fair entrance, for *all conditions of men* to engage in these Studies ... Thus they have form'd that Society, which intends a *Philosophy*, for the use of *Cities*, and not for the retirements of *Schools*, to resemble the *Cities* themselves: which are compounded of all sorts of men, of the *gown*, of the *Sword*, of the *Shop*, of the *field*, of the *Court*, of the *Sea*; all mutually assisting each other.⁵²

The singular mutual adaptation of London and the Society was predicated, for Sprat, on London's maritime orientation and the strength of its trade: 'if we should search through all the World, for a perpetual habitation, wherein the Universal Philosophy might settle it self; there can none be found, which is comparable to London, of all the former, or present Seats of Empire.' The comparison is drawn out exhaustively, and it is only when compared at length with Holland, and Amsterdam and the Hague in particular, that the emphasis on London and the particular qualities of its merchant community comes into focus.

... we have another help in our hands, which almost forces this Crown on the head of the English Nation: and that is, the Noble, and Inquisitive Genius of our Merchants.

This cannot be better shewn, than by comparing them, with those of that one Countrey; which onely stands in competition with us for Trade. The Merchants of England live honourably in forein parts; those of Holland meanly, minding their gain alone: ours converse freely, and learn from all; having in their behaviour, very much of the Gentility of the Families, from which so many of them are descended: The others, when they are abroad, shew, that they are onely a Race of plain Citizens, keeping themselves most within their own Cells, and Ware-houses; scarce regarding the acquaintance of any, but those, with whom they trafick.⁵³

What was Sprat's manoeuvre? His argument was absurd – but if it was not demonstrably the case that English merchants were more inquisitive and less crudely acquisitive than their Dutch

counterparts, why invoke them?⁵⁴ Sprat gives pride of place to the Dutch Republic as England's most direct rival. It was also the culture which England, in some significant respects, most resembled, and recent relations between the two states had vacillated between war and the contemplation of both a royalist dynastic alliance and (briefly and abortively, under the Commonwealth) republican political union.⁵⁵ The move draws attention to an important difference between the English and Dutch scientific and commercial environments; namely the absence of a learned society or scientific academy in the low countries at this time. The Royal Society is the difference, and linking it explicitly to the supposedly unique intellectual curiosity of England's merchant venturers draws attention to its singular status while entwining the Society in its urban context. As with Wren, the Society is figured both as being an inspiration to, and inspired by, London's commercial and intellectual vitality.

In the light of the language of the draft charters – Ent's and Croone's particularly, and Wren's to some extent – Sprat's logic of incorporation, and of the Society's metropolitan basis, looks opportunistic, making a virtue of what could not be helped. More broadly, the significance of London as a context and comparator for the Society gains force from the failure of the analogy to Oxford and Cambridge, its inability to realise itself as an endowed philosophical college. This also helps explain Sprat's insistence on the virtues of a membership composed chiefly of disinterested gentlemen, 'free and unconfined', since it had become apparent that without their support the enterprise could not continue.⁵⁶

Sprat's conspicuous praise of London's merchants should also be considered against his more guarded praise of its artisanal communities, which he represents as important to the city's prosperity while echoing Francis Bacon's warning about their propensity for keeping valuable craft secrets locked up in their workshops.⁵⁷ Wren's invocation of London, and the parallel devotions of the Royal Society and the Companies that regulated the city's trades to the 'useful arts and sciences', located the value of the City more in its artisans than its merchants. Clearly the Society's

history of trades project was fundamental to this understanding.⁵⁸ Sprat also invoked the history of trades as a major part of the Society's enterprise, and included exemplary Baconian histories as evidence of its performances to date. The Society's rhetoricians both translated the project from the learned institutions where Bacon had hoped to establish it to a metropolitan context.⁵⁹ By 1667, however, some of the difficulties inherent in bringing this work to fruition had become apparent. It was also the case that overseas correspondence had come to assume a much greater significance in the Royal Society than the founders appear to have anticipated.⁶⁰ Sprat's greater emphasis on the mercantile community, and on the singular fitness of London as a centre for global knowledge-gathering projects, also reflects this change in orientation – or, more charitably, this new string to the Society's bow.

It is also possible that this mercantile turn in Sprat reflects recent developments in the Society's financing and its hopes for the future. In 1664 the Council of the Society had enthusiastically received Sir John Cutler's proposed endowment of a lectureship in the history of trades for Robert Hooke and then redesignated it as a contribution towards the £80 salary they had promised Hooke as Curator of Experiments, effectively institutionalising what had been intended as a personal benefaction to one of their employees.⁶¹ This was significant for several reasons. For one, Cutler had in effect created a parallel lectureship in the useful arts to those endowed by Thomas Gresham based on the liberal ones. For another, by absorbing the lectureship into its own arrangements with Hooke the Society became involved by default in a form of public teaching – a sphere of activity not commonly associated with the Royal Society but a core function of many different types of chartered body.⁶² And it hints at a prospective identity for the Society as an alternative Gresham College, one dedicated to the useful arts or perhaps to Baconian natural philosophy more broadly, also with endowed lectureships. In this context, Sprat's praise of London's merchants acknowledges at once a change in the orientation of the Society's activity, a specific recent benefaction, and perhaps the hope of future funding from similar sources. As late as 1673, explaining their decision to return to Gresham College after they were displaced by the Fire of 1666, the Fellows gave part of their reason

as ‘the hopes, which they find grounds to entertain, of meeting with some considerable benefactors at that end of the City.’⁶³

Corporate privileges in action and in competition

Another obvious area of crossover between the Royal Society and the chartered bodies of Restoration London was its licensing privilege. This was the basis of the Society’s corporate engagement with the Stationers’ Company, the guild for the London print trades. The Charter of 1662 stipulated that the Society might ‘appoint one or more typographers and printers, and chalcographers or engravers’, who would have ‘faculty to print such things, matters and affairs touching or concerning the aforesaid Royal Society’. This exemption was unusual in two respects. First, it allowed the Society to determine for itself what might be published, without reference to the civil and ecclesiastical authorities. Second, an independent licensing power set it outside the structure of copy ownership embodied in the Stationers and their registers.

As Mario Biagioli has argued, exemption from state oversight in the matter of licensing implied a transfer of responsibility: it became the duty of the Society to ensure that material published under its imprimatur was not politically seditious or religiously heterodox.⁶⁴ In practice, it was more significant that the provision potentially trespassed, in ambiguous language, on the regulatory domain of the Stationers. Did it give the right simply to license, or actually to set up as a printer in its own right? Could it do so without infringing the right of the Stationers’ Company to regulate the trade? The licensing privilege of Oxford University, for example, had required careful negotiation with the London body, and the local printers contracted by the University were forced to make significant commercial concessions to the London Stationers.⁶⁵

The right to publish or reprint a particular title was vested in the stationer who entered it in the Company register – without having to show a manuscript or specify more than the title. Books

published under Royal Society license were only entered long after the fact. The purpose of the register was to clarify ownership of assets within the Company; and because the Royal Society appointed its own printers from within the Company, there was (as far as Stationers were concerned) no possible dispute as to which members of the Company the works licensed by the Society belonged to. Thus it is only after one of the Society's two original sworn printers died in 1670, and ownership shares were transferred between Company members, that we find references in the Register to works licensed by the Society.⁶⁶

This is strongly revealing of the *stationers'* attitude to the significance of the Society's licensing privilege – essentially, that it did little beyond specifying in advance which member of the Company would hold the copy. The Society initially acceded to this interpretation – an important concession, because, as Adrian Johns has argued, adapting itself to the Stationers' model of ownership in this way caused the Society significant difficulties.⁶⁷ Even within this dynamic, however, much else was left ambiguous. Could the Society *compel* its sworn printers to print something they didn't want to? Could it appoint other, additional printers at pleasure?

The Society appeared to believe that it could; the Stationers, that it could not. The issue came to a head in July 1665, at the height of a plague epidemic in London. The Society adjourned its meetings until further notice and many senior Fellows decamped to Oxford. Though the Society could not meet officially outside London they continued to do so unofficially, with the encouragement of the King.⁶⁸ Among those who remained behind was Henry Oldenburg, the Society's Secretary and publisher of the *Philosophical Transactions*. An intriguing letter from Robert Moray, at Oxford, to Oldenburg highlights the key issues:

Before you take any new course for printing your Transactions, I would have you to consult with our president, and withal do nothing till you have given up with Allestre & Martin. Which you may do by writing to them, for if you have not told them you will get a licence for printing though the Council of the Society meet not, they will have a further pretence for

doing as they have done. However I would have every thing done so as they may be no wise cause of grievance on either side. And the rather because you might have had them tyed if you pleased.⁶⁹

From Moray's letter – the only surviving half of the exchange – I make the following inferences.

First, that Oldenburg had asked the Society's printers, John Martyn and James Allestry, to continue printing the *Transactions*. Second, that they had refused to honour, or at any rate tried to renegotiate, the business terms of their arrangement with Oldenburg.⁷⁰ They appeared to have invoked the suspension of the Society – the temporary cessation of its corporate being, by reason of not meeting within ten miles of London – as a reason to stop printing, since it could not therefore issue a licence. More speculatively, I would suggest that Oldenburg had threatened to take his business elsewhere, in violation of what the stationers assumed was their monopoly, and that they sought in the first instance to prevent it; and lastly, that Moray thought that Oldenburg could have held the printers to their original agreement.⁷¹

Allestry eventually relented and signalled permission to Moray to get the *Transactions* printed elsewhere – at Oxford, using the University's licensing authority and printers.⁷² In general, it appears that Martyn and Allestry wanted to retain the Society's business. They insisted on the exclusivity of their status as licensees and tried to leverage what they took to be a position of temporary power to get better terms out of Oldenburg.

The situation was complicated by technicalities. *Transactions*, as a periodical, was licensed issue by issue; if it were licensed by another body (such as Oxford) then it would fall outside the agreement by which all material licensed by the Society was published by its appointed printers. But this sat awkwardly with the Stationers' norms of copy ownership, under which property in a title was continuous unless voluntarily transferred: the identity of the licensing authority was irrelevant. The force of this kind of constraint is made apparent by Evelyn's lament, after it became clear that *Sylva* was a significant publishing success, that the Society had not received the profit of it.⁷³ He evidently

believed that he could not seek another publisher for the second edition, or renegotiate the terms of his original arrangement with Martyn and Allestree.

The Society opted for a limited interpretation of its privilege of appointing printers, one that initially entailed a negotiated monopoly with its chosen stationers and therefore, in normal circumstances, effectively reproduced the ownership norms of the Stationers' register without actually using it.

When it moved outside those norms, contestation between the Society and its Stationers threatened the viability of the works it wished to see published under its imprimatur. The broader point is that the Society endeavoured to exercise a corporate privilege that was notionally quite expansive in terms that would not directly infringe upon the privileges of another corporation.⁷⁴

The Society was equally careful about managing its relationship with the College of Physicians, a body whose interests and membership overlapped significantly with the Society. Much of its early activity concerned anatomical and physiological research and was undertaken by fellows of the College. Despite this, institutional co-operation between them was lacking; a proposal from Christopher Merrett, Fellow of both, for sharing quarters after the Great Fire, which destroyed the College and displaced the Society, was squashed. An anatomical committee proposed in the early 1680s was never set up after Croone, also a member of both, 'objected College of Physicians', presumably because it would be seen as poaching on their territory.⁷⁵ Nothing came of a 1667 attempt to appoint Richard Lower, who had performed numerous demonstrations before the Society, as anatomical curator.⁷⁶ Equally, some physicians were not especially sympathetic to the enterprise of the Royal Society or to the idea of research-driven medicine, which might shine an unflattering light on their professional practices.⁷⁷ The Royal Society also distrusted the Physicians' motives. It was full of wealthy, clubbable Londoners who could afford the services of physicians, who were in turn accused of angling for election to the Society merely to swell their practices without ever contributing usefully to its activity – a concern that continued to be articulated down the eighteenth century.⁷⁸

Conclusion

At the outset we noted that the Royal Society did not regulate a profession or trade, exercise a monopoly, or teach. All three things are true, but it flirted with all three. The absorption of the Cutlerian lectureship of 1664 into the Society's financial arrangement with Robert Hooke, one of its very few salaried employees, coupled with Sprat's hyperbolic praise of London's mercantile community, indicates not only an experiment with turning the Society's research agenda on the history of trades into a form of public service but the hope of further establishments like it. In the mid-1660s, short of cash, it proposed appealing to the king for the grant of a revived royal monopoly on alum mining in England – or, more broadly, for the grant of monopolies which had hitherto proved unremunerative, or a payment on all future patents and monopolies.⁷⁹ The importance of the move lay in seeking a regular source of income other than direct subventions from the crown, shortly before the Society began exploring options for securing itself a more permanent home.⁸⁰ We should also note that the terms of the proposal were reflective of the early Society's optimism; it proposed for itself explicitly the grant of monopolies that had proved unprofitable, surely with the idea that the knowledge and skill of its members, or its own commitment to experiment, would find ways of making them worthwhile.⁸¹ Finally, as we have seen, it also explored the idea of exercising wider regulatory authority – with the suggestion that it should evaluate all proposals (i.e. patent applications) brought before the Privy Council and for the Society's Council to assess whether they were 'new, true and useful'.

These unrealised schemes raise far-reaching questions about the scope of the Society's activity, the nature and extent of its epistemic authority (and how comfortable the Fellows were with the prospect of wielding it), its relationship to the crown, to the City, and to public life more broadly. They mimicked the function of existing bodies such as Gresham College, various monopoly companies and patentees, and (in the matter of the patent registries) proposed extending to

themselves one of the functions of state, in much the same way as the Society's licensing privilege was both an exemption from state oversight and a duty to carry it out. Such considerations were always linked to the size and composition of the Fellowship, its search for funding, and (relatedly) its social and even geographic orientation – witness its explicit rejection of a strand of continuing aristocratic patronage in 1673 in favour of a return to Gresham College and further possible endowments from City sources, as it turned down the Duke of Norfolk's invitation to continue its seven-year sojourn in Arundel House on the Strand. The Society's diminishing hopes of substantial support from the Crown are encapsulated in its deflection of an assignment from the King to raise wrecked ships from the Thames at Woolwich in June 1669, on the grounds that the Society was 'destitute of the necessaries for undertaking such a work'. Instead they offered the assistance of selected members. The pointed corollary to the lack of substantive crown patronage was that the Society could not contemplate undertaking crown projects; an advisory role was more or less the limit of its capacity, and the Fellows told the King as much.⁸²

In 1712/13, the Society was ordered by Queen Anne to take up the function it had solicited for itself in the draft charters of 1661, and then again in 1662 and 1663/4, of evaluating patents for mechanical inventions. The Society did not, according to its own records, refuse these instructions, but nothing was ever done about them either. Why did it avoid, fifty years on, a responsibility it had initially been anxious to adopt? The short answer is that it was no longer the same institution – or, more precisely, that what it had become was not what it had originally envisaged. Its identity as a voluntary learned society – one sustained by the interest, membership fees, and (above all) the communications of its English and foreign members and other interested amateurs – was by that point effectively settled, and would largely remain so for the next hundred years. It amounted to a deliberately limited interpretation of the privileges and possibilities set out in its Charter. As I have endeavoured to show here, this was in many respects an effect of its encounters with the other types of institutions, and especially of the corporate bodies of Restoration London. The Society consistently made concessions to the privileges, anxieties, and customary practices of those bodies,

partly as a result of the relative weakness of its position as a newcomer, and the absence of a clearly defined domain over which it was supposed to wield regulatory authority and protective interest. The financial weakness of the Society's establishment also constrained its relations with other corporations – it did not have the resources to test its privileges to their apparent legal limits – but this did not mean that the Society conceived its privileges in such limited terms. The evidence of the draft Charters, and much else besides, shows a desire to frame them, and to use them, much more expansively. The non-adoption of Queen Anne's proposal is an indication not just of how the Society had changed, but of its learning to make a virtue of an identity that had come to feel familiar – a process that began almost before the Society was born, and which significantly shaped the efforts of its founders, historians, and apologists.

¹ <https://royalsociety.org/> [accessed 06/06/2018].

² For the 2012 Charter, see https://royalsociety.org/~media/Royal_Society_Content/about-us/history/2012-Supplemental-Charter.pdf?la=en-GB [accessed 06/06/2018]. For its early Charters and their translations, see *The Record of the Royal Society of London*, London: Royal Society, 1940, pp. 220 ff.

³ The fundamental significance of being a physical assembly in London, and the durability of that identity, are discussed in Aileen Fyfe and Noah Moxham, 'Making public ahead of print: Meetings and Publications at the Royal Society, 1752-1892', *Notes and Records: A History of Science Journal* 70 (2016) 361-80

⁴ Thomas Birch, *History of the Royal Society of London for the Promoting of Natural Knowledge*, 4 vols, London: Andrew Millar, 1756-7, vol. 1, p. 3. (The use of 'college' is transcribed from the Society's founding journal-book, and is thus the language of the founders rather than an eighteenth-century gloss.)

⁵ See Michael Hunter, *The Royal Society and its Fellows 1660-1700: The Morphology of an Early Scientific Institution*, 2nd edn, Oxford: British Society for the History of Science, 1982/1994. Of 551 Fellows elected up to 30 November 1700, Hunter classes over 350 as at most slightly active, with the overwhelming majority of those 'barely active' or 'inactive'.

⁶ See Michael Hunter, *Science and Society in Restoration England*, Cambridge: Cambridge University Press, 1981, pp. 22-3; Douglas McKie, 'The origins and foundation of the Royal Society of London', in Harold Hartley (ed.), *The Royal Society: Its Origins and Founders*, London: The Royal Society, 1960, pp. 1-38, pp. 25-6.

⁷ RS JBO/1 p.2 12 December 1660. The Society deliberately drew attention to the social distinction of its membership through printed lists and in Henry Oldenburg's review of Sprat's *History*, which Hunter interprets as 'an argument for the respectability and innocuousness of the Society's enterprise'. See 'Latitudinarianism and the 'Ideology' of the early Royal Society: Thomas Sprat's *History of the Royal Society* (1667) reconsidered', in Michael Hunter, *Establishing the New Science: The Experience of the Early Royal Society*, Woodbridge: Boydell & Brewer, 1989, p. 49.

⁸ Hunter, op. cit (7), pp. 2-3.

⁹ Hunter, op. cit. (6), p. 49; and for an extended treatment of this theme, the same author's *Science and the Shape of Orthodoxy*, Woodbridge: Boydell & Brewer, 1995, pp. 120-34.

¹⁰ RS DM/5/49-52 (Royal Society).

¹¹ Croone's draft, headed 'Literarium Patentiu[m] Exemplum', nevertheless implies the Society's perpetual continuation: '[...] and we will and moreover ordain that in all future time [this free corporation] be called and named the Royal Society' ('volumus[ue] praeterea ac lubemus, ut in omne tempus futurum Societatis Reglais dicatur ac Nominetur'.) However, the language of the 1662 and 1663 texts lays far greater emphasis on the notion of perpetual establishment than either of the drafts.

¹² Birch, op. cit. (4), 1 p. 4.

¹³ Birch, op. cit. (4), 1 pp. 45, 50.

¹⁴ Ent Draft Charter, DM/5/52 ('quae ad Dei Sospitatoris Nostri gloriam, ad communem humani generis utilitatem, subditorumque Nostrorum honorem atque emolumentum spectant'). For the sake of consistency and the avoidance of confusion I have used Ent's text throughout.

¹⁵ Ent Draft Charter, DM/5/52 ('propterea, quod viri, iis studiis operantes, festinato nimium principia theoriasque suas tradiderint, priusquam nemsoe [nempe], sufficienti Experimentorum historiae ve Naturalis peculio, scientiae huius fundamenta locupletassent').

¹⁶ On Bacon's deployment of the link between political and epistemic empire, see in particular Vera Keller, *Knowledge and the Public Interest, 1575-1725*, Cambridge: Cambridge University Press, 2015, pp. 135-8.

¹⁷ See for example the disclaimer that the Royal Society insisted Robert Hooke included in *Micrographia* absolving them of responsibility for his speculative and theoretical flights in the book; Robert Boyle's statement in the 'Proemial Essay' to *Certain Physiological Essays* (see Michael Hunter and Edward B. Davis, eds., *The Works of Robert Boyle*, 14 vols, London: Pickering and Chatto, 1999-2000, vol. 2, pp. 12-13) in which he took the Baconian wish not to be 'prepossessed by any theory or principles' to the extent of not reading Bacon. On Boyle's Baconianism, see Hunter, 'Robert Boyle and the early Royal Society', in *Boyle Studies: Aspects of the Life and Thought of Robert Boyle*, Farnham: Ashgate, 2015, pp. 54-80; and Rose-Mary Sargent, *The Diffident Naturalist: Robert Boyle and the Philosophy of Experiment*, Chicago: University of Chicago Press, 1995, esp. pp. 23-41.

¹⁸ Paul B. Wood, 'Methodology and apologetics: Thomas Sprat's *History of the Royal Society*', *British Journal for the History of Science* 13 (1980) pp. 1-26; Hunter, 'Latitudinarianism and 'ideology'', in Hunter, op. cit. (7), pp. 45-71.

¹⁹ 'Concedemus libenter huic Soceitati Literas Nostras Patentes, quibus cautum sit, ut rerum ab illis inventarum emolumentem, in Collegij duntaxat commodum cedat; neque earum usus-fructus ad alium quemlibet, ipsis nolentibus, pertingat. Quinetia[m], cuicumque ob operas inventionesve mechanicas, literas patentes sub Magno Angliae Sigillo obtinuerint; tenebentur, Machinarum suarum Specimen idoneum Societati huic offerre, apud eam tut asservandum.' Ent draft Charter, RS DM/5/52

²⁰ See Hunter, op. cit (7), p. 18.

²¹ Prohibitions against dividing the benefits of patents among five people or more were introduced in 1721 following the speculation crisis of the South Sea Bubble. See Christine Macleod, *Inventing the Industrial Revolution: The English Patent System, 1660-1800*, Cambridge: Cambridge University Press, 1988, p. 55.

²² Robert Moray to Alexander Bruce, 5 and 17 November 1663, in David Stevenson, ed., *Letters of Sir Robert Moray to the Earl of Kincardine, 1657-73*, Aldershot: Ashgate, 2007, pp. 234-7; R.E.W. Maddinson, 'Abraham Hill F.R.S. (1635-1722)', *Notes and Records of the Royal Society* 15 (1960), pp. 173-82, p. 175.

²³ Discussed in Michael Hunter, op. cit. (7), pp. 88-90

²⁴ Hunter, op. cit. (7), pp. 98-101

²⁵ BL Add MSS 4441 ff.101-2.

²⁶ Macleod, op. cit. (21), pp. 21-39, 41-4, 186-8; Larry Stewart, 'Science, instruments and guilds in early-modern Britain', *Early Science and Medicine* 10 (2005) pp. 392-410.

²⁷ See Rob Iliffe, 'In the warehouse: print, property and priority in the early Royal Society', *History of Science* XXX [should this be 30 and, either way, not italicised?] (1992), for Robert Hooke's struggles to secure patents (with the assistance of senior figures in the Royal Society) on horological inventions.

²⁸ The possibility of splitting the reward for inventions between Fellows and the Society was raised again in (probably) the 1670s; R.S. Cl.P./20/50 f.86. For discussion, see Hunter, op. cit. (7), pp. 213, 243-4; and Macleod, op. cit. (21), p. 187. For a more general assessment of the impact of the Royal Society and the City's regulated trades on scientific entrepreneurship, see Larry Stewart, *The Rise of Public Science: Rhetoric, Technology and Patronage in Newtonian Britain, 1660-1750*, Cambridge: Cambridge University Press, 1992

²⁹ For a discussion of these issues see Mario Biagioli, 'From ciphers to confidentiality: secrecy, openness and priority in science', *British Journal for the History of Science* 45 (2012), pp. 213-33, esp. pp. 215-77, 222-24.

- ³⁰ For the third instance, see British Library Sloane MS 4026 f.240, draft council minute, of uncertain date but assignable to Queen Anne's reign by a reference to 'her present Majesty'; RS CMO/2, 29 January 1712/13; RS JBO/11, 22 January 1712/13.
- ³¹ Birch, op. cit. (4), 1 p. 116.
- ³² Birch, op. cit. (4), 1 pp. 391, 397.
- ³³ Birch, op. cit. (4), 1 p. 252, 3 June 1663.
- ³⁴ RS DM/5/52, ('Deinque Beneficia, immunitates, libertates, & privilegia quaecunque alia Societiti cuiquam aut Collegio in utralibet Academia, sive Oxoniensi, sive Cantabrigiensi, antehac concessa (excepto privilegio, gradus Academias in ulla facultate conferendi.) Sodalitio huic concedimus.')
- ³⁵ Rumour that the Society intended to award degrees, and the universities' opposition to this, is recorded in Anthony à Wood's notes to his diary for December 1660. This does not establish the date of the rumour, since the notes were added after the fact, but the care with which the draft charters specify the exemption of this power strongly indicate that it was intended to placate Oxford and Cambridge and to forestall active opposition to the Charter. Anthony à Wood, *The Life and Times of Anthony Wood, Antiquary, of Oxford, 1632-1695, Described by Himself*, 5 vols, Oxford: Oxford Historical Society, 1891, vol. 1, p. 354.
- ³⁶ Abraham Cowley, *A Proposition for the Advancement of Experimental Philosophy*, London: 1661; Evelyn to Robert Boyle, 3 September 1659, in Michael Hunter, Antonio Clericuzio and Lawrence M. Principe, *The Correspondence of Robert Boyle*, 6 vols., London: Pickering & Chatto, 2001, v.1 pp. 365-9 (and 497-8 for the differences from the copy retained in Evelyn's letter-book).
- ³⁷ 'volumus praeterea & ordinamus, ut ex praedicto Numero, Septemdecem-viri hi, scilicet [...] una cum Praeside, Thesaurario, Regestario, Secretario, sive septem, pluresve eorum'. Ent draft Charter, DM/5/52. It is not clear from this language whether the Council is to consist of 17 *including* the named officers or 17 *plus* them. The ambiguity, if such it was, was clarified by the 1662 text, which stipulates the number of the Council at twenty-one including the President. Birch, op. cit. (4), 1 p. 89.
- ³⁸ 'Et si qui Nobiles, Collegij hujus Socij, tempore conventus hujus Concilis adfuerint, iisdem conceditur, & assidere, & suffragia ferre.' Ent draft Charter, DM/5/52.
- ³⁹ See Birch, op. cit. (4), 1 p. 4.
- ⁴⁰ I am defining 'aristocratic' as 'of the rank of baron or above', in conformity with the early proposal to waive the requirement of election for anyone of that standing found in Birch, op.cit. (4)., 1, p. 5.
- ⁴¹ A watered-down declaration of loyalty and fidelity to the monarchy and Charles II in particular was included in the list of fitting qualifications for members in the 1662 Charter text, but not stringently applied, since Fellows with strong ties to the protectorate regime were involved with the Society from the outset. Translation of first Charter (1662), *The Record of the Royal Society*, p. 228.
- ⁴² Translation of third Charter (1669), *Ibid.*, p. 284. They were included at the requirement of the Lord Privy Seal; at that time Sir John Robartes, also a Fellow of the Society (albeit inactive). Birch, op. cit. (4), 2 p. 352, 1 March 1668/9.
- ⁴³ Tim Harris, *Restoration: Charles II and his Kingdoms*, London: Allen Lane, 2005, pp. 43-66; Tim Harris, *London Crowds in the Reign of Charles II*, Cambridge: Cambridge University Press, 1988, pp. 62-95.
- ⁴⁴ The strategy of drafting in royalist leadership when the corporation's privileges were under threat was adopted by several of London's livery companies threatened with the revocation of their charters at the height of the exclusion crisis – including the Clothworkers, who imported two government officials as an explicit demonstration of loyalty. They were Joseph Williamson and Samuel Pepys – past and present Presidents of the Royal Society as well as Secretary of State (1674-79) and Secretary of the Admiralty (1674-79, 1684-89). See Mark Knights, 'A City Revolution: The Remodelling of the London Livery Companies in the 1680s', *English Historical Review* 112 (1997) 1141-78, 1149.
- ⁴⁵ Sprat, op. cit (22), pp. 53-7; John Wallis, *A Defence of the Royal Society and the Philosophical Transactions* (London: T.S. for Thomas Moore, 1678), pp. 7-9.
- ⁴⁶ Mordechai Feingold, 'The Origins of the Royal Society Reconsidered', in Margaret Pelling and Scott Mandelbrote, eds., *The Practice of Reform in Health, Science, and Medicine: Essays in honour of Charles Webster*, Aldershot: Ashgate, 2005, pp. 167-184, pp. 168-71 and 173-4. For an argument in favour of Wallis's narrative, see Jason Rampelt, 'The Last Word: John Wallis on the Origins of the Royal Society', *History of Science* 46 (2008) 177-201.
- ⁴⁷ Birch, op. cit. (4), 3 pp. 352-3; H.W. Robinson and W. Adams, eds., *The Diary of Robert Hooke 1672-1680*, London: Taylor & Francis, 1935, pp. 315, 318-22; J.F. Scott and Sir Harold Hartley, 'William, Viscount

Brouncker, P.R.S. (1620-1684)', *Notes and Records of the Royal Society* 15 (1960) 147-57; Feingold, op. cit (41), pp. 178-9.

⁴⁸ For the classic discussion of the roles of these milieus in pre-Restoration science, see Charles Webster, *The Great Instauration: Science, Medicine, and Reform 1626-1660*, London: Duckworth, 1970, pp. 54-5. Webster was part of a wider effort to locate the intellectual origins of natural-philosophical endeavour in the political and religious ferment of London during the civil wars and interregnum: see Christopher Hill, 'The Intellectual Origins of the Royal Society – London or Oxford', *Notes & Records of the Royal Society* 23 (1968) 144-56, and A.R. and M.B. Hall, 'The Intellectual Origins of the Royal Society – London and Oxford', *Notes & Records of the Royal Society*, 23 (1968) 157-68. For an account of the Harveian associations of the group Wallis described see Robert G. Frank, *Harvey and the Oxford Physiologists* (Berkeley, CA: University of California Press, 1980), esp. pp. 23-5. For the proposition that the distinctive robustness of 'Oxford science' as a category arises from the association of men schooled in mathematical and chemical natural philosophy with anatomists and physiologists responding to Harveian challenges and influences, see *passim*, but in particular Ch. 3, pp. 43-5.

⁴⁹ Christopher Wren, 'Preamble to a draft Charter of the Royal Society', in *Parentalia*, pp. 196-7

⁵⁰ Hunter, op. cit. (6), pp. 145-7; Feingold, 'The mathematical sciences and the new philosophy', in Nicholas Tyacke, ed., *The History of the University of Oxford, Volume IV: Seventeenth-century Oxford* (Oxford, 1997), pp. 360-448, pp. 391-2, 397.

⁵¹ Sprat, op. cit (22), pp. 53-4

⁵² Sprat, op. cit (22), p. 76

⁵³ Sprat, op. cit (22), pp. 86-7. Sprat's critique of the Dutch failure to realise the promise of their mercantile strength and philosophical liberality made a notable exception for the Hague, a particular focal point for English exiles during the Interregnum. See Lisa Jardine, *Going Dutch: How England Plundered Holland's Glory*, London: Harper Perennial, 2008, pp. 81-2, 175.

⁵⁴ On the depth and intricacy of the connection between Dutch medicine, botany, and commercial culture, see Harold Cook, *Matters of Exchange: Commerce, Medicine, and Science in the Dutch Golden Age* (New Haven: Yale University Press, 2007); more recently, but in a similar vein, Daniel Margocsy, *Commercial Visions: Science, Trade and Visual Culture in the Dutch Golden Age* (Chicago: University of Chicago Press, 2014).

⁵⁵ For a discussion of this project, and of Anglo-Dutch political and cultural relations in the mid seventeenth century, see Steven Pincus, *Protestantism and Patriotism: Ideologies and the Making of English Foreign Policy, 1650-1688*, Cambridge: Cambridge University Press, 1996, pp. 15-39; and Helmer J. Helmers, *The Royalist Republic: Literature, Politics and Religion in the Anglo-Dutch Public Sphere, 1639-1660*, Cambridge: Cambridge University Press, 2014.

⁵⁶ Sprat, op. cit (22), p. 67; Nathaniel Stogdill, 'Out of books and out of themselves': invigorating impartiality in early modern England', in Anita Traninger and Katherine Murphy, eds., *The Emergence of Impartiality: Towards a Prehistory of Objectivity*, Leiden: Brill, 2013, pp. 189-222; and the classic study of gentlemanly disinterest and impartiality in the construction of knowledge, Steven Shapin's *A Social History of Truth: Science and Civility in Seventeenth-Century England*, Chicago: University of Chicago Press, 1994.

⁵⁷ Sprat, op. cit (22), pp. 391-2, 396.

⁵⁸ Kathleen H. Ochs, 'The Royal Society of London's history of trades programme: an early episode in applied science', *Notes and Records* 39 (1985), 129-58.

⁵⁹ See Walter E. Houghton, '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, at 37.

⁶⁰ As suggested by Michael Hunter, op. cit. (6), p. 49. A careful examination of the minutes demonstrates that it was only from August 1661 that letters sent to the Society and to individual fellows began to be read in meetings, initially mainly through Sir Robert Moray and Sir Kenelme Digby; and only from the summer of 1662, through Oldenburg in particular, that they became a significant part of the Society's day-to-day activity.

⁶¹ See Hunter, op. cit. (7), pp. 279-336; Lisa Jardine, *The Curious Life of Robert Hooke* (London: HarperCollins, 2003), pp. 235-40.

⁶² Though Hooke's Gresham and Cutlerian lectures were not always well attended they were by definition open to the public. Hooke seems to have made a point of recording poor attendances; see for example Robinson and Adams (eds), op. cit (42), pp. 289, 294, 297-8; also Hunter, 'Science, Technology and Patronage'.

⁶³ Birch, op. cit. (4), 3 p. 100, 6 November 1673.

⁶⁴ Mario Biagioli, 'From Book Censorship to Academic Peer Review', *Emergences: Journal for the Study of Media & Composite Cultures* 12 (2002) pp. 11-45.

⁶⁵ See Jason Peacey, 'Printers to the University' 1584-1658' in Ian Gadd (ed.), *The History of Oxford University Press, Volume I: Beginnings to 1780*, Oxford: Oxford University Press, 2014, pp. 51-77, pp. 74-7. It is possible

that the Society modelled its licensing privilege on Oxford's, which leaves open the possibility that it too might have set up as a printer in its own right.

⁶⁶ These shares seem to have changed hands more than once; instead of being directly transferred from Allestry's heirs to Martyn they were assigned by John Dunmore to Sir Thomas Davies, and then Davies to Martyn, seemingly on the same day (24 August 1671). These 'assignments' were only actually entered in the Register in December 1672. This was not a transfer of all Allestry's interests in Royal Society publishing – Martyn acquired only *Sylva*, *Micrographia*, and Sprat's *History* (this last not actually published under the Society's imprimatur). *A Transcript of the Registers of the Worshipful Company of Stationers: From 1640-1708 A. D.* (London, 1913: Priv. print), 3 vols, 3, pp. 449, 451-2.

⁶⁷ See Johns, op. cit. (21), pp. 492-7, on the Society's efforts to subordinate the Company's trade practices to its own norms of genteel civility.

⁶⁸ For the Oxford group's meeting, and the conviction that this could not legally constitute the Royal Society, see Robert Boyle to Henry Oldenburg, 30 September 1665, *Oldenburg Correspondence*, vol. 2 pp. 535-7.

⁶⁹ Moray to Oldenburg, 23 July 1665, *Oldenburg Correspondence*, vol. 2 pp. 446-7.

⁷⁰ These were strikingly favourable; Oldenburg was paid outright for copy at the rate of £3 per sheet. See Adrian Johns, 'Miscellaneous Methods: Authors, Societies and journals in Early Modern England', *British Journal for the History of Science* 33 (2000) pp. 159-86.

⁷¹ This episode has been examined, but only cursorily, by C.A. Rivington, 'Early Printers to the Royal Society', *Notes and Records of the Royal Society* 39 (1984) pp. 1-27, p. 5.

⁷² Moray to Oldenburg, 10 October 1665, *Oldenburg Correspondence*, vol. 2 pp. 559-62

⁷³ See Hunter, op. cit. (6), p. 93.

⁷⁴ One of the Society's more curious revenue-raising moves was an enquiry about the possibility of, in effect, charging duty on all philosophical books sold in England, a proposal made a few weeks after it had sworn Martyn and Allestry as its first printers. Birch, op. cit. (4), 1 p. 377.

⁷⁵ Birch, op. cit. (4), 4 p. 65; Christopher Merrett, *A Short Reply to the Postscript &c of H.S.*, London: 1670.

⁷⁶ Birch, op. cit. (4), 2 p. 206.

⁷⁷ See in particular Harold Cook, *The Decline of the Old Medical Regime in Stuart London*, Ithaca: Cornell University Press, 1986.

⁷⁸ See RS DM/5/12 for precisely this complaint. Attributed to Hooke by Hunter and Paul Wood, 'Towards Solomon's House: Rival Strategies for reforming the early Royal Society', in Hunter, op. cit. (7), p. 244. See also James Jurin's complaint that 'many Gentlemen of ye Society object against printing much of Physick or Chirurgery, as not being so properly ye business of ye Royal Society'. Jurin to John Huxham, 3 August 1727, in Andrea Rusnock, ed., *The correspondence of James Jurin* (Amsterdam, 1996), pp. 364-5

⁷⁹ RS DM/5/37; Birch, op. cit. (4), 1 p. 377. The Royal Alum Works, established by Elizabeth I and renewed by James I, had been an expensive disaster for the crown. See William Hyde Price, *The English Patents of Monopoly*, Boston, MA: 1906, pp. 82-101.

⁸⁰ Birch, op. cit. (4), 1 p. 391, for the first proposal that the Society endeavour to acquire from the King the land and buildings of Chelsea College; for the Society's plans for a new London building in the late 1660s, see Hunter, op. cit. (7), pp. 156-76; and on the eventual acquisition and remodelling of Crane Court, the Society's home from 1710 to 1780, see Jim Bennett, 'Wren's last building?', *Notes & Records* 27 (1972) pp. 102-118; and Jennifer Thomas, 'A 'philosophical storehouse': The life and afterlife of the Royal Society's repository', London: 2009 (unpublished PhD dissertation), pp. 26-8.

⁸¹ For a recent discussion of the cultural position of projects and projectors, see Koji Yamamoto, *Taming Capitalism Before its Triumph: Public Service, Distrust, and Projecting in Early Modern England*, Oxford: Oxford University Press, 2018; and for the Royal Society's involvement in this milieu, pp. 180-84.

⁸² Birch, op. cit. (4), 2 p. 385, 24 June 1669.