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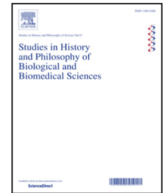

Where to start and where to end up: Early modern knowledge-making from wish-list to notebook to archive

Sociable Knowledge: Natural History and the Nation in Early Modern Britain, Elizabeth Yale. University of Pennsylvania Press, Philadelphia (2016). 360 pp., Price $69.95 cloth, ISBN: 9780812247817

Knowledge and the Public Interest, 1575–1725, Vera Keller. Cambridge University Press, Cambridge (2015). 310 pp., Price $99.99 hardback, ISBN: 9781107110137

Notebooks, English Virtuosi, and Early Modern Science, Richard Yeo. University of Chicago Press, Chicago (2014). 384 pp., Price $48.00 cloth, ISBN: 9780226106564

One of the critical benefits of constructivist approaches to the history of science has been the opening up of the possibility that any aspect of knowledge-making processes might assume previously unsuspected significance. Studies of such apparently trivial tools of scholarship as lists, forms, tables, footnotes, prefaces, catalogues, indexes, and even envelopes, as well as previously neglected sites and spaces, have yielded rich insights into these processes. The three books under review all take up this approach. Each is, at its most basic, a study of a highly specific mode or genre of writing practised by early modern naturalists, philosophers, historians, political thinkers, and virtuosi. Those modes are lists of desiderata; topographical histories; and notebooks. Each examines the longer descent of its given mode, the evolving use of the mode, and the characteristic challenges – intellectual, social, and material – associated with it. Each also drills deep into the communities that shaped these modes, and their potential for fashioning intellectual and wider communities in turn. All three are works of impressive scope and scholarship, cross-disciplinary in approach, and full of fresh insight. All three can be unhesitatingly recommended to scholars and students of early modern intellectual history, book history, and the history of science; read together, they are also mutually illuminating to a high degree. The order in which they have been considered here reflects the alphabetical order of the authors' surnames, as well as a shift from the visionary anticipation of knowledge represented by desiderata to the more material considerations of its making represented by the other two.

Vera Keller's *Knowledge and the Public Interest, 1575–1725* is a study of desiderata, or, as she more frequently calls them, wish lists, in early modern Europe. Her use of this term is not simply a matter of quirkily historicising a scholarly and curatorial term of art: Keller advances some very large claims for the significance of wish lists in early modern scientific and political thought and it is a testament to her scholarship and ingenuity that the interest and plausibility of these is sustained throughout. Not only did the wish list "[help] reformulate what could count as scholarly work" (p. 4): in Keller's account, it reconfigures relations between early modern science and politics, emphasising not "the triumph of a rational, self-explanatory, and certain perspicuity, but the ingenious instrumentalisation of doubt, desire, and probabilism" (p. 10).

This richly promising line of enquiry locates seventeenth-century rationales for the advancement of knowledge in a tradition of political thought that emphasised a notion of public interest as the accretion, interaction, and mobilisation of private desires. These enquiries begin, in Keller's account, with the work of Giovanni Botero and his efforts to redeem sixteenth-century 'reason of state' – from *ragion di stato,* a mode of political thought and discourse that subordinates individual and legal considerations to a notion of state interest – from Macchiavellian pragmatism (pp. 35–6). Reason of state's purpose was to extend empire, but this extension did not have to be accomplished through territorial expansion and conquest. Instead empire could be expanded internally, through the amplification of its trade and manufacture, through its use of resources, and the proper exploitation of Art's superiority to Nature—particularly in its capacity to produce a multiplicity of things. Botero thus helped found a tradition of political theory that was rooted in knowledge of nature, and in the mutability of both. Wish lists of lost or undiscovered techniques for the mastery and transformation of nature worked to excite the desires and to articulate forms of collective interest that would advance epistemic empire – via an empiricism founded not on "stable and disinterested facts", but "motivating interests and changing states" (p. 44).

The notion of instrumentalised desires as a tool for perfecting human knowledge and human polities is traced from Botero through the lists of lost and found things compiled by the legal scholar Guido Pancirolli and into the work of the satirist Traiano Boccalini, who likened the promises of epistemic empire to those of charlatans in the marketplace. Boccalini's critical treatment of wish lists leads Keller to visit late seventeenth-century contests over the legitimacy of desire and interest, and to a compelling re-evaluation of the Rosicrucian pamphlets as a debate over precisely this question. In a wonderfully suggestive aside, Keller identifies Botero's reframing of desire and interest as desirable qualities in the advancement of a polity as an indispensable step towards making the market an object of analysis in eighteenth-century political economy, by theorising interest and desire as constitutive of moral and social order rather than disruptive of them (pp. 62–3).

The Rosicrucian pamphlets also allow Keller to shift her focus from the Italian to the German context, and to Jakob Bornitz's use of wish lists to argue for the legitimacy of trade and the pursuit of wealth within a Christian moral framework and to trumpet the role of artisans and technicians within the polity. From Bornitz's mixture of Ramist methodising and emphasis on mutability and contingency derived from reason of state Keller arrives at the work of his contemporary Francis Bacon. It is not only anglocentric bias that leads me to characterise this chapter as the heart of the book, since it is Bacon who forms the hinge

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between the wish list as an instrument of political theory and its entry into the practical realm of accumulating, reforming and promoting natural knowledge, embodied in the efforts of Samuel Hartlib and his associates and later taken up and modified by the Royal Society and its imitators.

Keller focuses on Bacon's admission of the *failure* of his attempt to uncover a new, ironclad scientific logic, and takes this admission up as the basis for his deployment of ‘probabilistic tools’ derived from humanistic domains in the pursuit of expanding the empire of the sciences. Baconian wish lists yoked human desire to these ends, Keller contends, creating a continuing basis both for enlarging the bounds of knowledge even in the absence of state support and for reformulating scholarship so as to valorise collective endeavour and the partial contribution towards a desired whole. (This goal, as she suggests, has been fully internalised by modern scholarly practice). The crux of this section of the argument, and in some ways of the book as a whole, occurs in Keller's presentation of the lists of desiderated discoveries (and rediscoveries) in the *Magnalia Naturae*, alongside Bacon's cautionary recapitulation of the claims of impostors and charlatans in the *Novum Organum*. These two wish lists overlap to an extraordinary degree. Their juxtaposition represents the extreme instance of Bacon's willingness to adapt reason of state's techniques for advancing political empire to the advancement of epistemic empire, and the test of Keller's argument is whether it can accommodate Bacon's two apparently contradictory valuations of the same thing. She finally does so by showing how Bacon deferred choosing between the two until epistemic and political empire are perfected, at which point they become identical – as in the polity of Bensalem in *New Atlantis*, for example. Working towards that state of perfection from the middle of the maze, however, meant working across such epistemic divides as that between natural magic and speculative natural philosophy, and even upending traditional epistemic hierarchies (pp. 157–66).

Keller reads Bacon—with consistently powerful and provocative results—against a recent tradition that tends to enforce separation between his scientific and political thought (Peltonen, 1992). The second half of her study traces the fate of wish lists in general, and Baconian desiderata in particular, into the realm of real-world projects for political or epistemic improvement. She examines the use of desiderata (and meta-desiderata) in the reformist schemes of Samuel Hartlib (pp. 166–98), in the Royal Society's efforts to establish itself as a producer of useful knowledge along Baconian lines (pp. 213–45), and into the realm of print and professional domains including law, medicine, and the universities in the early eighteenth-century German lands (pp. 267–317). The early avidity with which groups of reformers in London and Oxford during the Interregnum and after took up the use of *desiderata* testifies to the hopes entertained of their usefulness in initiating and co-ordinating the collaborative pursuit of systematic knowledge.

It's at this point in Keller's argument, however, that some of the claims made for wish lists start to feel a little strained, even as the concept of desiderata grew more ragged with the friction of actual use (as the category expands from specific ends or desired attributes to simple suggestions for future experiments). Proposing that the Fellows of the early Royal Society framed their endeavours in terms of a concept of public interest that rejected both the narrow self-interest frequently attributed to the artisan and the lofty disinterestedness of the gentleman natural philosopher is suggestive, but it calls for a selective reading of the evidence, and even where such an ideal was evoked by contemporaries it usually boiled down to a claim that only wealthy, educated gentlemen were sufficiently disinterested to act in the public interest. By the same token, what Keller interprets as the Royal Society deploying desiderata as an instrument for subordinating the interests of outsiders to those of its senior members can be read equally plausibly as Robert Boyle and the Society leveraging their own and each other's prestige to get information out of a provincial researcher (Henry Power) eager for association with both. There is no absolute contradiction here, but placing desiderata so constantly in the centre of the frame occasionally overspecifies (or overgeneralises) their social and epistemic significance while distorting the social dynamics actually at work. There's a related tendency, when looking at particular cases of desiderata put to use, to neglect the full complexity of factors in play, and it's perhaps symptomatic of this that Keller is punctilious in recording explicit challenges to the use and legitimacy of desiderata but does comparatively little to point to places and disciplines where they were not much used, or to investigate where the difference lies.

There are a few other instances, almost all in the second half of the book, where desiderata seem to have been loaded up with more significance than they can bear. In general, however, even these look like vices born of virtues, or the courage of convictions pursued slightly further than the evidence strictly allows. Taken as a whole, however, this book is strikingly original, bold, and densely argued, by an author in full command of a dazzling array of scholarship in three major traditions and four languages. It supplies an account of, and a descent for, Baconian empiricism that enlarges rather than diminishes it, and contributes importantly to a startling array of domains across early modern intellectual history. Many of these have been outlined above; among those that haven't, the contribution towards establishing a systematic political and intellectual justification for the activity of projects and projectors stands out for the present reviewer. In view of this book's impressive scholarship, significance, length (close to 160,000 words of main text), and the cross-disciplinary character of much of its argument, it is demoralising that Cambridge University Press has seen fit to issue it without a bibliography. I draw attention to this omission not to make a particular scapegoat of CUP, and certainly not to impute any blame to the author, but as the symptom of a reprehensible and growing tendency among academic publishers to leave out necessary parts of the scholarly apparatus to the books they issue in the name of economy.

Elizabeth Yale's *Sociable Knowledge: Natural History and the Nation in Early Modern Britain* is similarly preoccupied with the overlap between two fields of early modern intellectual endeavour – natural history and antiquarianism in this case – and their role in helping to shape the idea of ‘Britain’ as a cultural and historical entity. The association between those spheres is familiar, but Yale's treatment of it is uniquely sensitive to the overlapping material and social conditions of textual production, networks of information, and practices of preservation involved in early modern topographical writing and collecting. Yale weaves the links between genre, discipline, and the modalities of knowledge production to a density that serves to show not just their interconnection but their mutual determination.

Yale's primary focus is on topographical, antiquarian, natural-historical, and linguistic writing about the British Isles, most of it produced between about 1670 and 1710, although she does not specify a timeframe for the project. The omission is presumably intentional and it has certain advantages. For one thing it makes room for the complexity and duration of her authors' knowledge-gathering practices and their strategies and apprehensions for its archival afterlives, as well as putting the longer history of topographical writing within reach. For another – rightly, I think – it avoids making over-determined connections between her authors' historicisation of Britain and the political upheavals of the period. These upheavals are not ignored but register mainly as one set of material constraints among many, along with the personal circumstances and eccentricities of her protagonists. The principal actors are the English and Welsh antiquarians John Aubrey and Edward Lhuyd, supported by networks of patrons, commentators and correspondents including among many others the Anglo-Irish virtuosi William Molyneux and William Petty, the Scottish naturalist Robert Sibbald, the English county historian Robert Plot, the natural historians and antiquarians Martin Lister in Yorkshire and John Ray in Essex, the Oxford historian and biographer Anthony à Wood, and the London diarist and virtuoso John Evelyn. Yale's book takes its place alongside vital recent work by Kate Bennett (2015), Anna Marie Roos (2011, 2015), and Kelsey Jackson Williams (2016) on Aubrey, Lister, and seventeenth-century natural history and antiquarianism. Yale's work is

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