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TED MCCORMICK

Reclaimed Land

Natural History and Seventeenth-Century Projecting, with Particular Attention to Ireland

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▼ **ABSTRACT** Although natural history as a genre had classical, medieval, and Renaissance forms, seventeenth-century natural histories played a distinctive role in relation to projects—especially large-scale projects of expropriation, economic exploitation, planned mobility, and settlement. Sites targeted for such projects must be shown to be thoroughly known for the projects proposed to seem feasible or profitable and the risks involved calculable and worthwhile; at the same time, portraying these sites as vacant, waste, or unimproved—*tabula rasa*, white paper, *vacuum domicilum*, *terra nullius*—offered an important justification and argument for the kinds of intervention and expropriation these projects required. In this context, natural history (understood as embracing both works of nature and the achievements of art) became part of a larger epistemic project that predicated the assessment of a situation's future potential on the knowledge of its present state and resources—often known through local testimony—while simultaneously downplaying past interventions, including even earlier natural histories. Such histories partook of the nature of projects while serving as important instruments for projectors. Though visible in natural histories of various parts of the early modern world, this dynamic is particularly clear in the case of natural histories in Cromwellian and later Stuart Ireland.

▼ **KEYWORDS** natural history; projecting; land; trade; empire

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Ted McCormick • University of Pennsylvania, USA, ted.mccormick@concordia.ca

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BREPOLS

> *For natural history to appear… it was necessary… for History to become Natural.*[1]
>
> *The collision between a static sense of nature created only once and the historical refinement of natural materials turns the classical conflict between* natura *and* ars *into a point of friction caught between stillstand and development.*[2]

A White Paper?

"Ireland is as a white paper."[3] So wrote William Petty in his 1662 *Treatise of Taxes and Contributions*, addressing the Duke of Ormond, King Charles II's newly appointed Lord Lieutenant of Ireland. Ormond, Petty wrote, had the "opportunity, to pass into Positive Laws whatsoever is right reason and the Law of Nature."[4] What created this vacuum? In England, the 1640s and 1650s witnessed civil war, regicide, republicanism, and a Cromwellian "Protectorate," ending with the restoration of the monarchy. Across the Atlantic, power struggles among planters and colonial officials became entangled with metropolitan divisions, while a centrally formulated project—Oliver Cromwell's "Western Design" of 1654–1656—made new demands on colonial manpower and resulted in the conquest of Jamaica.[5] In Ireland, a rebellion against English Protestant plantation in 1641 had been followed in 1649–1652 by Cromwell's brutal reconquest and then by two massive projects in the middle 1650s: large-scale Irish Catholic displacement (the "transplantation into Connacht"), and territorial expropriation, based on a survey, mapping, and classification of Irish land.[6] While the Restoration purported to turn back the clock in England, in Ireland, the Caribbean, and the empire at large, the later Stuarts built on Cromwellian foundations.[7]

Though shunning the name of "projector," Petty had already proposed a land registry to Ormond as a way to anchor new interests by securing property claims.[8] This was of obvious importance to planters such as Petty, whose estates came from recent confiscations; but for him and others in Samuel Hartlib's intellectual network it was a predicate for investment in metropole

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1 Foucault, *Order of Things*, 128.
2 Bredekamp, *Lure of Antiquity*, 74.
3 Petty, *Treatise of Taxes*, sig. A4r.
4 Ibid.
5 See Pestana, *English Atlantic*; Pestana, *English Conquest of Jamaica*.
6 See Ohlmeyer, "Confederation and Union," 315–32; see also Barnard, *Cromwellian Ireland*. On the transplantation, see Cunningham, *Conquest and Land*.
7 See Glickman, *Making the Imperial Nation*.
8 Petty to Ormond, 1 March 1660/1, in *Marquis of Ormonde*, 11. On land registries, see Ito, *English Economic Thought*, 166–92; in Ireland, Gillespie, *Irish Economy*, 23; Smyth, "Wrestling with Petty's Ghost," v–lxii, at xx.

and colony alike.[9] Ireland, then, was not a white paper. It was a palimpsest of claims, policies, and populations, troubled by and troubling to projectors whose ambitions required both greater clarity in the present and selective erasure of the past. If the country could *seem* like a blank, this was only because both the proponents of forced transplantation and Petty, who tallied Irish improvements as director of the "Down Survey," worked hard, in different ways, to make it so—and because the State to which they appealed could act as if it were. The point of this double gaze of surveillance and erasure was the mobilization of power in the name of possibility; this depended on an account of the contents, past and potential, of the place in question. Mapping this unstable space fell to natural history.

That colonizers looked at distant places and saw vacant space—a blank page, *tabula rasa*, or *vacuum domicilum*—is an old idea. From the sixteenth century onward, the idea that *terra* or *res nullius* was a legitimate object of invasion and settlement had been bound up with understandings of how colonial expropriation was justified in America.[10] Despite its formal status as a Tudor kingdom after 1541, and its long history of English settlement, similar arguments were deployed in early modern Ireland.[11] As early as 1572, Sir Thomas Smith's plantation of the Ards peninsula was justified in such terms: "What should let that in a cuntrie almost desolate… wee might not inhabite and dwel in safetie[?]"[12] There are obvious affinities between the white paper of a colonial scheme and the blank screen across which projectors cast their visions of the future. Yet while articulations of *res nullius* were only more explicit in subsequent decades, planters and projectors alike belied its premise, preferring to exploit existing labor forces and assessing the profitability of land on its established capacity—established by local testimony—to generate wealth.[13] No space was truly empty, no screen merely blank.

This paradoxical construction of the site in which art would work upon nature as simultaneously a plenum of qualities and a vacuum that justified and demanded intervention was an essential feature of projecting. Natural history in this vein cast its object as by turns a place with a set of features, products, and histories of use (which intimated potentials and underwrote proposals by diminishing risk) and a space receptive to interventions precisely because its potential was yet, or again, unrealized. While a place's characteristics must be known, none was decisive for its future. Defining a situation for projects thus entailed a degree of epistemic violence toward the past and present—toward people, customs, landscapes, and ways of life—well before the future

9 See McCormick, "Improvement, Projecting, and Self-Interest," 25–43.

10 See Pagden, *Lords of All*, 76–79; Canny, *Making Ireland British*, 133.

11 On the relationship between Ireland as a "kingdom" and its "colonization" *before* 1541, see Veach, "From Kingdom to Colony."

12 Hill, *Historical Account*, 405–15, at 411.

13 See Canny, *Making Ireland British*, 144–45; Horning, *Virginian Sea*, 85–86.

arrived, gun in hand.[14] This was bluntest in places such as Ireland, where prior transformations had failed at great cost; but projects left traces of their promise and fate in the landscapes around the early modern world, to be read backward and forward in time. Natural history as a genre of learned inquiry long predated "projecting." But seventeenth-century projectors made distinctive use of it, drawing selectively on its categories and adjusting its priorities to suit their purposes.

Natural History as an Epistemic Project

If projects needed vacuums to fill, studies of European natural history emphasize the plenitude of that genre in the sixteenth and seventeenth centuries. Physicians compiled descriptions of plants and their uses.[15] Humanists traced the symbolic significance of different animals.[16] Travelers shared observations; chorographers gathered anecdotes. Collectors reveled in the exotic while cataloguing the local, creating a sense of untranslatable "indigeneity."[17] The line between art and nature was thinly drawn. Hence a recent historian of English natural history treats "naturalists and antiquaries" as a group and likens the preservation of "slips and scraps" to the curation of *Wunderkammern*.[18] Studies of colonial or global science have sounded different notes. While scholars once sought to distinguish between more or less "scientific" approaches to the New World, the context of empire is now generally understood to have been implicated in everything from questionnaires to gardens, centering on the systematic exploitation of flora and fauna.[19] Yet tracing colonial dimensions of metropolitan science has given way to exploring distinctive creole engagements with nature.[20] Interest has also grown in colonies as sites of non-elite knowledge creation, exchange, and hybridization—or "the construction and spread of scientific knowledge through reciprocal, albeit asymmetric, processes of circulation and negotiation"—if not egalitarian "trading zones."[21]

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14 The concept of "epistemic violence," particularly but not exclusively in the sense of "the remotely orchestrated, far-flung, and heterogeneous project to constitute the colonial subject as Other," originated with Gayatri Chakravorty Spivak: Spivak, "Can the Subaltern Speak?," 280–81. Spivak there attributes a prior, narrowly metropolitan account of epistemic violence to Foucault.

15 Cook, "Physicians and natural history," 91–105.

16 Ashworth, "Emblematic Natural History," 17–37.

17 Cooper, *Inventing the Indigenous*.

18 Yale, *Sociable Knowledge*. On "naturalists and antiquaries," see 10, 31, 44, 88; on John Aubrey's curation of manuscripts, 139.

19 Compare for example Gerbi, *New World*, 3–126, with Rubiés, "Instructions for Travellers"; McClellan and Regourd, "Colonial Machine"; Brockway, *Science and Colonial Expansion*; Schiebinger, *Plants and Empire*; Portuondo, *Secret Science*.

20 See Cañizares-Esguerra, *Nature, Empire, and Nation*.

21 See for instance Raj, *Relocating Modern Science*, 13; Gómez, *Experiential Caribbean*, 4–8. On hybrid knowledge, see Winterbottom, *Hybrid Knowledge*. On "trading zones," see Long, *Artisan/Practitioners*, 8–9, 94–126.

Engagements with the local, vernacular, or Indigenous are key themes in work on natural history, as on natural knowledge generally. This is especially notable in recent work on science in Spanish and Iberian imperial contexts, where both local appropriations of natural knowledge and serial, transnational translations of it between manuscript and print and across European national and linguistic boundaries have significantly complicated our picture of "science in the service of empire."[22] But the boundary between colonies and metropoles (or centers and margins) remains under-examined, as does the status of objects that move between cultural and epistemic frames.[23] While the influence of Spanish (and Jesuit) example on the forms and aspirations of English and Baconian natural history is undeniable, moreover, there are significant contextual differences between natural history as an academic genre drafted into bureaucratic service at the behest of the Crown—the setting for much sixteenth-century Spanish cosmography—and natural history as a resource for virtuosi, speculators, and office-seekers operating at the margins of institutional and political respectability in the British world.[24]

In a British historiographical context, meanwhile, scholars interested in the role of natural knowledge in creating a sense of Britain have interrogated the "interrogatories" (reminiscent of the Spanish *relaçiones geograficas* in form, yet distinct in content, institutional origin, and purpose) that proliferated from the middle of the seventeenth century, and which independent intelligencers such as Hartlib and Henry Oldenburg and Fellows of the Royal Society, including Robert Boyle and Robert Hooke, sent in all directions in Britain and beyond.[25] Elizabeth Yale emphasizes the role of "marginal" Britons—the Welshman Edward Lhuyd being the prime example—and of geographical margins (Scotland, Wales, the West Country, northern England) in the shaping of "British" natural history.[26] Both Ireland as a site of natural-historical efforts, to which the next section turns, and projecting as a lens through which to see natural history as a subject and a set of textual genres (paper, letter, questionnaire, history) suggest new ways of thinking about these relationships.

Natural history was a genre, not a "project." Even projectors engaged in it recognized classical, medieval, and Renaissance antecedents, from Pliny forward. Scholarly interests competed and mingled with programmatic aspirations for the places surveyed. Peter Mancall notes that by the mid-sixteenth century, "European travel accounts routinely included details of regional

22 I borrow this phrase from Gascoigne, *Service of Empire*. See, for instance, Bigelow, *Mining Language*; Marroquín Arredondo and Bauer, *Translating Nature*.

23 See Cooley, Toledano, and Yıldırım, *Natural Things*; Gómez, *Experiential Caribbean*, esp. 118–44.

24 Cañizares-Esguerra, *Nature, Empire, and Nation* 14–45; Portuondo, *Secret Science*, 3–8. See also Bauer, *Alchemy of Conquest*, 369–470.

25 See Stagl, *History of Curiosity*; Rubiés, "Instructions for Travellers"; Hunter, "The Early Royal Society"; Fox, "Printed Questionnaires"; Avramov, "Letters and Questionnaires." On the *relaçiones*, see Portuondo, *Secret Science*, 210–56.

26 Yale, *Sociable Knowledge*, 13, 33.

resources and the potential profits to be extracted from American shores."[27] Yet even colonial natural histories might criticize projectors' efforts and ethos. Spanish Jesuit José de Acosta denounced proposals for a canal joining the Atlantic and Pacific as "useless," since "no human power is capable of tearing down the strong and impenetrable mountains that God placed between the two seas"; even if it were possible, one should "expect punishment from Heaven for wishing to improve the works that the Maker… ordered in the fabric of this world."[28] Still, natural histories of "Births" (products of fire, air, water, and earth) and "Arts" were crucial to the natural philosophy Bacon sought.[29] *This* natural history was "a massive thing which would take great pains and expense to complete; it requires the efforts of many men, and… is in some sense a royal task."[30] Histories would shun "antiquities and citations of authors and authorities."[31] They would avoid "numerous descriptions and pictures of species" and overly "minute varieties."[32] Finally, they must "bid a stern farewell to all superstitious stories."[33] Unlike collections of secrets or marvels, they aimed neither to "amuse" nor to give "immediate profit" but to facilitate "the discovery of causes."[34] As Peter Harrison notes, such "natural history… imposes order on the world not through a passive reading which yields up meanings, but by an active investigation of things which uncovers their material utility."[35]

In this vein, Hartlib's network before 1660 and the Royal Society afterwards —the groups overlapped—pursued natural histories as methodical steps in the expansion of human empire on avowedly new grounds. Benjamin Worsley told Hartlib that natural history entailed "for whole countries… all their excesses and all their defects in things naturall convenient or pleasurable for mans vse or in things hurtfull & Inconvenient" as well as "the Ingenuity or backwardnesse of People of such or such a Country to Arts, & what Arts are found with them, & what not."[36] Of such Restoration projects, the best known was the Royal Society's "History of Trades."[37] The "utilitarian and commercial spirit" of this project has more often been seen as an anticipation of the Industrial Revolution than a dimension of natural history.[38] In fact, the pursuit of natural history shaped the coordination of scientific, imperial, mercantile, and family

27 Mancall, *Nature and Culture*, 58.
28 Acosta, *Natural and Moral History*, 123–24.
29 Bacon, *New Organon*, 223–24. On art and nature, see Bredekamp, *Lure of Antiquity*, 63–80.
30 Bacon, *New Organon*, 222.
31 Ibid., 225.
32 Ibid.
33 Ibid.
34 Ibid., 20. But see Eamon, *Secrets of Nature*, 269–300.
35 Harrison, *Bible, Protestantism*, 167.
36 Benjamin Worsley to Samuel Hartlib, 27 June 1648, in Greengrass, Leslie and Hannon, *Hartlib Papers* [hereafter HP], 8/27/2b–7b, at 5b–6a.
37 See Houghton, "History of Trades"; Webster, *Great Instauration*, 335–42.
38 Houghton, "History of Trades," 49; Ochs, "Royal Society of London." Houghton, "History of Trades," notes on page 46 that Petty identified "the history of trades" as a type of natural history in his *Advice of*

networks throughout the period. As Robert Knox's 1681 *Historical Relation of Ceylon* shows, this included cooperation with enterprises such as the East India Company.[39] Hooke, who guided Knox's book to press, lamented the loss of ancient geographical knowledge for "want of sufficient Instructions (to Seamen and Travellers)," "Publick Incouragement," "some easier Way to have all such Printed," and "care to Collect all such Relations… as have been published in other Languages."[40] Even England's "West-Indian Plantations" were *terra incognita*, though Hooke thought Richard Ligon's 1657 *True and Exact History of the Island of Barbados*, which included a detailed account of sugar production, "has done well."[41] The generation of natural histories spanning the globe was a project of knowledge production emanating from and returning to projections of trade and empire.

Hooke could draft Ligon's and Knox's relations into this epistemic project in part because of the local projects—exploitations of circumstance and transformations of nature—that they related. Ligon dwelt on sugar, on the concatenation of land, machinery, and enslaved and indentured human as well as animal labor its production involved, and on the complexities of refining and marketing the product just as it came to dominate the plantation economy in Barbados. But he included other pretended improvements to the island's situation, some unsuccessful. One "Capt. Burrows" had undertaken to fortify the coast in exchange for seven years' worth of excise revenue, for example, but left a fort so "pernicious" that "at my coming from thence, they were pulling it down."[42] On the whole, Ligon presented a picture of a distinctive, dynamic "nature," subject to continual manipulations, transplantations (of people, animals, and plants), and transmutations—some of which generated profits that might inspire emulation, others of which defined or created problems and possibilities for future interventions to solve or exploit.

The power of policy and art to remake land and people suffused Knox's account of the Sinhalese kingdom of Kandy, where he had landed in the service of the East India Company and lived for nineteen years as the king's prisoner. His account of local ingenuity began with terraced wet-rice cultivation:

> For the doing of which they use this Art. They level these Hills into narrow Allies… working and digging them in that fashion that they lye smooth and flat, like so many Stairs up the Hills one above another. …
>
> Where there are no Springs or Rivers to furnish them with Water… they supply this defect by saving of rain Water; which they do, by casting up great Banks in convenient places to stop and contain the Rains that fall…

W.P. to Mr. Samuel Hartlib (1648); see also the anonymous "Remonstrance on William Petty's Design for Advancement of Learning" (c. 1648–1649), HP 53/86/1a–2b.

39 Winterbottom, *Hybrid Knowledge*, 140–62.

40 Knox, *Historical Relation of Ceylon*, 71–72.

41 Ibid., 73. See Ligon, *True and Exact History*, especially 156–68.

42 Ligon, *True and Exact History*, 172–73.

> It was no small work to the ancient Inhabitants to make all these Banks… being some two, some three Fathoms in height, and in length some above a Mile… They are now grown over with great Trees, and so seem natural Hills.[43]

Much as contemporaneous English commentators lauded Dutch mastery in transforming their landscape to exploit its latent possibilities, Knox here described the soil and topography of Kandy as a complex and productive amalgam of nature and art.

Yet while Knox admired such achievements, and noted technological adaptations to the landscape (such as short, light ploughs), he asserted that "the Chingulays are Naturally, a people given to sloth and laziness," lacking the "Vend of Traffic and Commerce" that might encourage their industry.[44] The "ancient" age of the banks rendered them invisible *as* art, and lack of trade made further ingenuity pointless—a stark contrast with the recursive and ramifying nature of the transformations others observed in the Dutch situation. Rajasingha II's rule, further, offered dire warnings about the tyrannical uses and material costs of certain projects. "He often employs his People in vast works, and that will require years to finish, that he may inure them to Slavery, and prevent them from Plotting against him."[45] For one such "vast work," namely, "To bring… Water to his Palace," he used forced labor "to split a great Mountain in twain" and pave the resulting valley with stone, leaving the people in the surrounding area "scarce… able to Till their Land." However technically impressive, such projects tended to the "Destruction," not the welfare, of the public.[46]

Such essays in natural history in the later seventeenth century bear out something of the vision Bacon had laid out for it, while transcending its putative role as a propaedeutic for a future natural philosophy. Though not devoid of the curious or entertaining, nor of reference to earlier textual authorities, these histories—and the conversations, correspondence, and queries around them—were assimilable to larger projects of practical knowledge-making that were intimately connected in their production, circulation, and use with networks beyond the scholarly world and emerging structures of capitalist enterprise as well as imperial governance. These were not merely notional connections; Knox's subsequent career included transplanting enslaved people and cultivars from Madagascar, Cape Verde, Java, and elsewhere to factories and colonies at Bencoolen in Sumatra, St. Helena in the South Atlantic, and Barbados—carrying with him an interleaved copy of his own book as he exploited his observations of Sinhalese agricultural techniques and Sri Lankan

43 Knox, *Historical Relation of Ceylon*, 103–4.
44 Ibid., 148.
45 Ibid., 168.
46 Ibid., 168–69.

botany in his activities as a bioprospector and slave trader, and furthered the East India Company's plan for a "chain of settlements" spanning the Atlantic and Indian Oceans.[47]

Ireland's Natural History

Ireland occupies a singular position in seventeenth-century natural history. As an object of English invasion and plantation, it has much in common with transatlantic sites such as Barbados and Jamaica.[48] Like Ligon's history of Barbados, Gerard Boate's *Irelands Naturall History* (composed in 1645, printed in 1652, reissued 1657) retailed the views of planters; both works paid attention not only to the natural features of their subjects but also to the potential of each for profitable improvement, and both places were sites of observation and intervention among the same circles from the Interregnum through the Restoration. The work of the Dublin Philosophical Society (1683–1709) later bears comparison with the material in John Taylor's 1687 manuscript *Multum in Parvo* on Jamaica, or Hans Sloane's natural history of that island.[49] Seventeenth-century writing on Ireland reveals some of the same dynamics of interest, exploitation, and erasure that mark natural history across European empires.[50] Yet unlike Caribbean islands, Ireland had also been part of the medieval scholarly and literary traditions at the roots of Renaissance natural history.[51] Further, non-English Britons and Gaels remained active in the genre.[52] Though largely ignored in earlier work on science in Ireland, the presence even in the early eighteenth century of figures such as the Irish-speaking Connacht scholar Roderic O'Flaherty (Ruaidhrí Ó Flaithbheartaigh)—who met and corresponded with Edward Lhuyd—undermines a purely anglo- (or latino-) centric frame for Irish natural knowledge.[53] Gaelic learning was excluded from Baconian efforts, tied as these were to the aspirations of a Protestant planter elite backed by English military force. But no more than Indigenous knowledge elsewhere was Irish scholarship irrelevant to newer natural history.[54]

Latin writing on Irish flora, fauna, topography, customs, and curiosities was as old as the English presence in Ireland, starting with Gerald of Wales (Giraldus Cambrensis) in the twelfth century.[55] His works linked conquest (*Expugnatio hibernica*, c. 1188) with attempts to assess Irish nature and culture

47 Winterbottom, *Hybrid Knowledge*, 151–59.
48 Canny, *Making Ireland British*; O'Kane and O'Neill, *Ireland, Slavery*.
49 See Hoppen, *Dublin Philosophical Society*; Sloane, *Voyage to the Islands*. Taylor, *Jamaica in 1687* reproduces about half of Taylor's three-volume "Multum in Parvo."
50 Barrera-Osorio, *Experiencing Nature*, 13–28; Schiebinger, *Plants and Empire*.
51 Ogilvie, *Science of Describing*.
52 Yale, *Sociable Knowledge*, especially 25–54.
53 Hoppen, *Common Scientist*, 194. See Sharpe, *Roderic O'Flaherty's Letters*.
54 See Norton, "Quetzal Takes Flight."
55 On Gerald, see most recently Henley and McMullen, *Gerald of Wales*.

(*Topographia hibernica*, c. 1187) in moral and analogical terms, combining an interest in Ireland as an island of saints and marvels with moral readings of its natural phenomena (as well as artificial wonders, such as enchanted mills) that recall the *Physiologus*.[56] These works remained objects of critical commentary into the early modern period, both for "Old English" Catholic writers in Tudor Ireland such as Richard Stanihurst—whose 1584 *De rebus in hibernia gestis* reproduced swaths of Gerald's writing—and for the Spanish-educated Gael Philip O'Sullivan Beare.[57] O'Sullivan Beare's *Zoilomastix* (c. 1625), composed in Spanish exile after Irish defeat in the Nine Years' War (1593–1603), opens with a confutation of the *Topographia*, with animadversions on Gerald's "very keen disciple" Stanihurst.[58] "Colonial" natural histories of Ireland thus had a high medieval pedigree and mined older veins of hermeneutical commentary on nature. Well into the seventeenth century, Ireland retained a tradition of Gaelic scholarship and a transnational Latinate elite whose interests included both marvels—such as an island in Lough Derg, Donegal, where "nobody dies"—and such practical concerns as orchards, timber trees, flax, and hemp.[59] Above all, O'Sullivan Beare insisted, Ireland was not "deserted, without roads, and boggy" (*desertam, inviam, et aquosam*): neither a barbarous nor a vacant land.[60]

Nor was it without natural histories; but this was how Hartlib spoke of it just two decades later, pushing for the completion of Gerard Boate's posthumously published *Irelands Naturall History*, which Hartlib saw through the press, still unfinished, in 1652 (reprinted in 1657).[61] Boate, a Dutch physician and philosopher, had come to London in 1630 and was among the subscribers to the 1642 Adventurers' Act, designed to fund the reconquest of Ireland using loans to be repaid in Irish land. Had he survived the early 1650s, Boate would have had a direct interest in the land settlement underpinned by Petty's survey. Perhaps in anticipation of this, he compiled his natural history before setting foot in Ireland, where he moved only in 1650. Certainly, he had the encouragement of such Hartlibians as Benjamin Worsley and John Dury.[62] Meanwhile, his main source for Irish information in the history—besides planters such as William and Richard Parsons, "whom the bloody combustions of *Ireland*, had driven away" to London—was his younger brother Arnold.[63] Arnold had gone to Dublin in 1636 as physician to the Church of Ireland

56 Giraldus Cambrensis, *Expugnatio hibernica*; Gerald of Wales, *History and Topography*. See *Physiologus*. On the mill, see Gerald of Wales, *History and Topography*, 90.

57 Stanihurst, *Great Deeds in Ireland*. Brendan Kane argues persuasively that authors of Tudor-era English treatises on the government of Ireland took few of their cues from Giraldus; Kane, "Did the Tudors Read?" Giraldus's continuing pertinence to Irish authors, however, is unquestioned.

58 O'Sullivan Beare, *Natural History of Ireland*, 33.

59 Ibid., 189, 201, 209, 261.

60 Ibid., 267.

61 Boate, *Irelands Naturall History*.

62 On Worsley, see Leng, *Benjamin Worsley*, 19; on Dury, Fradkin, "Protestant Unity," 281–82.

63 See Arnold Boate's epistle "To the Reader" in Boate, *Irelands Naturall History*, sig. A6r–A8r.

Archbishop of Armagh, James Ussher, and married into a gentry family before fleeing the rebellion for Paris in 1644. *Irelands Naturall History*, written the next year, was thus the work of a Leiden-educated physician, in touch with leading advocates of transnational Protestant unity, and a material beneficiary of Ireland's subjugation.[64]

Boate's work represented an incursion of professedly novel science and an ideology of improvement at a critical point in Ireland's reconquest.[65] How these facts are related is less clear. For K. Theodore Hoppen, *Irelands Naturall History* was "the only scientific book in the modern manner relating to Ireland written before the Restoration," *despite* the book's "severely practical aim of attracting Cromwellian planters to Ireland."[66] For Toby Barnard, it was a "brochure for would-be planters and investors" that "slithered" from the same source as Sir John Temple's virulent history of the Irish rebellion.[67] Patricia Coughlan—playing on Foucault's claim that a natural history required a historical nature—has emphasized instead "the paradoxical relation between the ideal of the advancement of learning and the practice of English policies and actions in Ireland."[68] This can be understood in the cognitive tension between the goal of description and "distaste for, and incomprehension of, the culture being described," or in the practical conflict between the need to exploit local knowledge and the imperatives of forced removal that exiled its bearers.[69] Or, finally, in the oscillation between mining history as a source of natural knowledge and constructing the present as a blank space for its application. For the point of this natural history was to both grasp and transcend a past that could be conceived, in the moment of action, only in negative terms.[70]

Seeing *Irelands Naturall History* and works like it as projects that describe while effacing their subject lets us distinguish the specific work they did in this early modern moment from the genre's longer history and other purposes, connecting them to the concepts in play throughout this issue. The history trumpeted a break with the past. In his prefatory epistle, John Dury cited the need to break the "yokes of Vanity" before "the Intellectual Cabinets of Nature are opened, and the effects thereof discovered"—and lauded Cromwell and his Commander-in-Chief in Ireland, Fleetwood, as "very eminent Instruments" in

64 See Maley, "Double Dutch"; see also Mendyk, "Gerard Boate." I learned much from conversations with Rana Fahmy while she was writing her MA thesis, "Re-Settling Woes." On Leiden, see Cook, *Matters of Exchange*, 175–225.

65 See Barnard, "Hartlib Circle and… Improvement," and Coughlan, "Natural History"; more recently, Montaño, "Education, the New Science." A sympathetic account of improvement is Slack, *Invention of Improvement*.

66 Hoppen, *Common Scientist*, 12.

67 Barnard, "Hartlib Circle and… Improvement," 282–83.

68 Coughlan, "Natural History," 298.

69 Ibid., 305; McCormick, "Irish Plantation."

70 Coughlan, "Natural History," 303–4.

"the breaking of our yoakes."[71] Arnold Boate noted that Gerard had planned further volumes "concerning the natives of *Ireland*, and their old Fashions, Lawes, and Customes; as likewise the great paines taken by the *English*, ever since the Conquest, for to civilize them, and to improve the Countrie."[72] For Dury, natural history was "not vnfitt… but very subservient" to the local advancement of husbandry and trade and the global aim of "Replanting Ireland" with Protestants from across Europe.[73] Perfecting history would change the future.

Gerard dated the origins of conquest to Henry II's time, lamenting that English division and Irish resistance had so wrought things that "nothing remained to them of the whole Kingdom"—a cycle repeated when James I's reduction of Ireland "to obedience and government of the English Lawes, and… English and Scotch colonies" was undone by "this last bloody rebellion."[74] Boate applauded acts of erasure, too, such as when he described the English Lords Justices' demolition of "Patrick's Purgatory," a religious marvel described in earlier histories, as if the physical progress of plantation had obeyed Bacon's injunction for history to shun superstition.[75] But the greatest void had been created by the Irish themselves,

> who not content to have murthered or expelled their *English* neighbours… endeavoured quite to extinguish the memory of them, and of all the civility and good things by them introduced amongst that wild Nation; and consequently in most places they did not only demolish the houses built by the *English*, the gardens and enclosures made by them, the orchards and hedges by them planted, but destroyed whole droves and flocks at once of *English* Cows and Sheep, so as they were not able with all their unsatiable gluttony to devour the tenth part thereof, but let the rest lye rotting and stinking in the fields.[76]

Even bogs were artificial wastes caused by the "Retchelesness of the Irish"—the result not of the land's "naturall property, or primitive constitution, but… superfluous moisture that in length of time hath been gathered therein" for lack of English industry and drainage.[77] Here too, rebellion had undone an almost perfect transformation, a technological yet natural renegotiation of the relationship between earth and water that made the soil profitable and purified the air.[78] In short, the English were "introducers of all good things, in

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71 Boate, *Irelands Naturall History*, sigs. A3r–A3v, A4r. The epistle is signed by Hartlib, but see Fradkin, "Protestant Unity," 281–82.

72 Boate, *Irelands Naturall History*, sig. A6v.

73 Ibid., sigs. A3r–A3v, A6v.

74 Ibid., 7–8.

75 Ibid., 74–78. See Campion, *Tvvo histories of Ireland*, 39–42; O'Sullivan Beare, *Natural History of Ireland*, 251–259.

76 Boate, *Irelands Naturall History*, 89.

77 Ibid., 112–14.

78 Ibid., 115–16.

Ireland"—drainers of bogs, clearers of woods, planters of crops, discoverers of mines, erectors of ironworks—and the Irish their destroyers.[79] Yet all might be "amended by the industry of men, of the country being once inhabited throughout by a civill Nation"; a space (again) rendered vacant might (again) be filled.[80] As John Beale told Hartlib, following a discussion of how fruit trees could flourish in former bog, "the Plantation of Ireland with English… would bee good examples to stir up a lazy people to abhor their idlenes, & to enrich themselves & that soyle."[81] And, as Hartlib told Robert Boyle, Boate's natural history—especially if completed—"may be one means, whereby *Ireland* may be peopled again, and get good tenants."[82]

Ultimately, the land settlement redounded to the benefit of existing Protestant landowners rather than Adventurers, soldiers, or refugees. Boate's book was neither finished nor expanded in the terms once projected for it, but remained in the state in which it appeared in 1652 and 1657. The next project for a natural history of Ireland, by William Molyneux under the auspices of the Dublin Philosophical Society in the 1680s, made no reference to Boate, despite similar methods and the involvement of people familiar with Boate's work. Neither that effort, nor Molyneux's son Samuel's attempt in 1708–1709, produced a book at all.[83] Perhaps in an Ireland beset by litigation over land, with a network of mobile projectors giving way to a Society of leisured *curiosi*, attracting settlers was less pressing than fixing Ireland's place in an imperial system.[84] Nevertheless, the Society pursued some goals framed by Boate and other members of Hartlib's network, for example the drainage of bogs ("the true cause" of which, Archbishop William King wrote in 1684, "is want of industry").[85] Samuel Molyneux's diaries—kept during tours of the Irish midlands, west, and north in 1708–1709—evince the same attitude expressed in Boate's work.[86] Molyneux saw potential realized in proportion as the land was populated by English (or sometimes Scottish) settlers; where the Irish predominated, waste awaited transformation.

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79 Ibid., 114; on woods, 118–22; on mines, 122–30; on ironworks, 131–40. Colin Rynne notes the "colonial mindset" of ironmasters in Ireland: Rynne, "Social Archaeology"; compare Pluymers, *No Wood, No Kingdom*, 59–107.

80 Boate, *Irelands Naturall History*, 168.

81 John Beale to Samuel Hartlib, undated, HP 52/166a–b.

82 Samuel Hartlib to Robert Boyle, May 8 or 9, 1654, in Hunter et al., *Correspondence of Robert Boyle*, 1:177.

83 See Hoppen, *Common Scientist*, 190–97.

84 See Armitage, "Political Economy."

85 King, "Bogs and Loughs," 217. See Barnard, "Hartlib Circle and… Origins"; compare Hoppen, *Common Scientist*, 12–14.

86 See Trinity College Dublin Library, MSS 884, 884a, 885, and 888/2 (MS 888/1 includes Samuel Molyneux's scheme for a natural history, and responses to queries). The diaries are transcribed in Barry, "Journeys of Samuel Molyneux."

Conclusion: Beginning Again

Projects required erasures. As chronicles and instruments of projecting, seventeenth-century natural histories—for all their empirical richness—helped clear the ground. This is visible in their positive content: descriptions of situation that minimize or deny the presence of art in its composition. What began as Indigenous technology becomes, like Knox's Sinhalese embankments, indistinguishable from nature; what improvements prior colonists brought, such as Boate's English flocks and farmsteads, lie rotting or in ruins. It is discernible also in natural historians' pattern of engagement, or failure to engage, with extant traditions of natural history itself. It is hardly surprising that Boate gave short shrift to Old English scholarship on Ireland, while citing Pliny, Orosius, and Giraldus at several points. But it is striking that Boate's onetime associates and heirs apparent in the Royal Society and Dublin Philosophical Society paid scarcely more attention to his own legacy. Notwithstanding intellectual and social continuities between the Hartlib Circle and later efforts, the project for a natural history of Ireland geared toward its improvement was forever just getting started. Perhaps, as one of Elizabeth Yale's vignettes suggests, the horizon was even receding: the framers of the 1721–1730 *Magna Britannia and Hibernia, Antiqua et Nova* justified an exclusive focus on England by describing a natural history adequately embracing Ireland, Scotland, and Wales as akin to "the perpetual Motion, or the Philosopher's Stone."[87] In this, too, natural history shows a strong affinity with projects.

About the Author

Ted McCormick is Isobel Haldane Professor of History at the University of Pennsylvania. He is the author of *William Petty and the Ambitions of Political Arithmetic* (Oxford University Press, 2009) and *Human Enpire: Mobility and Demographic Thought in the British Atlantic World, 1500–1800* (Cambridge University Press, 2022).

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87 Yale, *Sociable Knowledge*, 256.

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