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FAILURE TO DRAIN: EXPERT RESISTANCE AND ENVIRONMENTAL THOUGHT IN THE SEVENTEENTH-CENTURY DUTCH REPUBLIC^{*}

I

INTRODUCTION

In 1641 Jan Adriaanszoon Leeghwater, millwright and hydraulic engineer, compared the Dutch Haarlemmermeer with a hungry wolf poised to wreak havoc on the land around it. The lake, in his view, had become a ‘large, pernicious, and harmful water, like an inland sea, which each year further harms the surrounding lands, and their inhabitants, like a devouring wolf’.¹ Leeghwater, who had probably written his pamphlet in the hope of gaining employment with one of the five groups that proposed the lake’s drainage between 1617 and 1642, argued that the ravenous wolf could be defeated by draining the lake and creating a new polder (low-lying piece of reclaimed land protected by dykes): a solution that, in his view, would also enrich investors and the public alike. But not everyone agreed with Leeghwater’s proposal. The towns of Haarlem and Leiden had resisted proposals to drain what they considered ‘their’ lake from the very start. Now Claes Arentsz Colevelt, surveyor in Leiden, portrayed the plan as perilous, wasteful and full of empty promises. ‘Experience teaches us’, he wrote, ‘that a resolution, appearing to offer great

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¹ Jan Adriaensz Leeghwater, *Haarlemmermeerboeck, dienende tot een remonstratie, verklaringh ende voor-bereydinge om de Haarlemmer ende de Leytse-meer te bedijken*, 1st edn (Amsterdam, 1641), 1.

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advantages, once finished is shown to have caused so much damage and harm'.²

The discussion between Leeghwater and Colevelt over the drainage of the Haarlemmermeer, which followed an enormous wave of land reclamation projects in the Dutch Republic in the first decades of the seventeenth century, offers a fresh perspective on the history of the entanglement between expertise, elites and the environment. From the sixteenth century onward, Eric Ash and others have shown, state agents and early capitalist elites initiated far-reaching, large-scale interventions in the landscape on an unprecedented scale.³ In this, they were assisted by experts who provided practical know-how and abstract knowledge as well as legitimation, in the form of a Baconian programme that promoted human dominance over nature. Together, experts and emerging states cleared forests, drained lakes and lands, and engineered canals in Europe and the colonized world.⁴

These interventions in nature did not go by unopposed, and historians have increasingly sought to highlight the resistance they evoked, especially from the local communities most affected by new plans and projects. The history of English projects especially foregrounds the violent response from rural protestors aggrieved by authoritarian rule and by unfulfilled promises of the wealth that drainage technologies were supposed to deliver.⁵

² Claes Arentsz Colevelt, *Bedenckingen over het droogh maken van de Haerlemmer ende Leydtsche Meer* (Amsterdam, 1642), 2.

³ Chandra Mukerji, *Impossible Engineering: Technology and Territoriality on the Canal du Midi* (Princeton, 2009); Vera S. Candiani, *Dreaming of Dry Land: Environmental Transformation in Colonial Mexico City* (Stanford, 2014); Eric H. Ash, 'Introduction: Expertise and the Early Modern State', *Osiris*, xxv, no. 1 (2010), 5–9, and Eric H. Ash, *Power, Knowledge and Expertise in Elizabethan England* (Baltimore, 2004).

⁴ Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (San Francisco, 1980); Paul Slack, *The Invention of Improvement: Information and Material Progress in Seventeenth-Century England* (Oxford, 2014); Sara Miglietti and John Morgan (eds.), *Governing the Environment in the Early Modern World: Theory and Practice* (Abingdon and New York, 2017), editors' intro.

⁵ Eric H. Ash, *The Draining of the Fens: Projectors, Popular Politics, and State Building in Early Modern England* (Baltimore, 2017); Elly Robson, 'Improvement and Epistemologies of Landscape in Seventeenth-Century English Forest Enclosure', *Historical Journal*, lx, no. 3 (2017); Koji Yamamoto, *Taming Capitalism before its Triumph: Public Service, Distrust, and 'Projecting' in Early Modern England* (Oxford, 2018).

In doing so, these studies explicitly seek to contest scholarship that takes a much more positive view of expertise, connecting the rise of the expert firmly with economic growth and modernizing, rational progress.⁶ However, as Timothy Mitchell has pointed out, focusing on violent resistance to expert interventions risks presenting such resistance as a natural response to (necessary) change, and in positioning this as the direct opposite of the logic of modernity, science, technology and capitalism, it implicitly confirms that logic.⁷ The alternative proposed by Mitchell and others is to explore the forms of violence inflicted by expertise and the inequalities introduced or bolstered by it.⁸ As Mitchell has shown in the case of the reorganization of the flow of the Nile in modern Egypt, expert interventions had far-reaching consequences not just for the material world through immense construction projects, but also for forms of political, social and economic order as mapping and surveying practices reshuffled the rules of property and taxation to the benefit of large, capitalist landowners.⁹

Equally consequential, the massive drainage projects in the early seventeenth-century Dutch Republic — between 1590 and 1650, 80,000 hectares of land were reclaimed from lakes and from the sea — illustrate a different and thus far understudied dynamic in the entanglement between expertise, elites and the environment. While recent scholarship tends to underscore the long-standing idea that experts invariably drive environmental intervention and act in service of the state, positioning experts and the state in direct opposition to ordinary people, Dutch drainage involved a politics of knowledge in which different elites clashed and experts disagreed. Urban non-nobles looking for investment opportunities most often initiated drainage, while

⁶ Joel Mokyr, *The Gifts of Athena: Historical Origins of the Knowledge Economy* (Princeton, 2002); Slack, *Invention of Improvement*; Harry Collins and Robert Evans, *Rethinking Expertise* (Chicago, 2007).

⁷ Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley, 2002), 14.

⁸ James C. Scott, *Seeing Like A State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, 1998); Gabrielle Hecht (ed.), *Entangled Geographies: Empire and Technopolitics in the Global Cold War* (Cambridge, MA, 2011), editor's intro.

⁹ Mitchell, *Rule of Experts*.

urban governments for whom the water itself formed a valuable resource were especially prone to object to their plans. However, their opposition often proved futile in light of close personal connections between investors and those charged with the approval of plans. This changed when the towns of Leiden and Haarlem, confronted with plans to drain the Haarlemmermeer, found a new way to contest plans: by turning to the advice of experts. Previously only consulted after investors had obtained patent approval, they were now requested, by the parties who opposed drainage, to provide technological detail, calculations and measurements to demonstrate the feasibility of investors' plans before approval. This revealed the lack of technological sophistication in the plans and resulted in significant delays and setbacks for the investors, and ultimately to the shelving of their plans altogether. The case of the Haarlemmermeer thus collapses the binary dichotomy between experts fulfilling interventionist agendas and ordinary people opposing these plans by showing how experts questioned and resisted proposed interventions.

The debate on the Haarlemmermeer's fate moreover shows how the involvement of experts led to a fundamental debate on the value of drainage projects. Historians, political theorists and sociologists of science have demonstrated that referring to the advice of experts can be a way to circumvent more open discussions about values and the social and political impact of policy decisions. Technocratization is, in other words, often understood as a way to depoliticize specific issues.¹⁰ In contrast, in the case of the Haarlemmermeer the introduction of experts not only politicized but also conceptually problematized the environmental, political and economic concerns at stake in drainage plans. In this regard, the case of the Haarlemmermeer differs from those of early modern England and colonial Mexico, where (lay) experts criticized design choices but did not question intervention on a conceptual level.¹¹ Here, experts brought with them a

¹⁰ Mitchell, *Rule of Experts*; Esther Turnhout and Thomas Gieryn, 'Science, Politics, and the Public in Knowledge Controversies', in Esther Turnhout, Willemijn Tuinstra and Willem Halffman (eds.), *Environmental Expertise: Connecting Science, Policy, and Society* (Cambridge, 2019).

¹¹ Candiani, *Dreaming of Dry Land*, 6; Ash, *Draining of the Fens*, 209–10.

broadening of the discourse about environmental value and the process through which drainage plans were approved, including a novel type of argument that foreshadows later developments in thinking about what we now call sustainability.

As Paul Warde has shown, ‘the idea that to endure, a society must not undermine the ecological underpinnings on which it is dependent’ was fully established by the late eighteenth century.¹² Other studies have demonstrated that awareness and fears of wood scarcity had already translated into the development of long-term forestry management strategies and sophisticated state bureaucracies in seventeenth-century Venice and Spain.¹³ The debate on the drainage of the Haarlemmermeer foregrounded in this article shows that seventeenth-century Dutch elites’ emerging awareness of their dependence on scarce ecological resources — in this case, land and water — formed grounds for conflict and debate, rather than consensus, and points to the highly divisive nature of environmental policy and environmental thought from the very start of large-scale interventions in nature. The different parties, exemplified by those who pursued the debate in print, had widely diverging views on how long-term stability could be achieved by making optimal use of natural resources, and what risks were acceptable in the pursuit of this vision. While investors expressed faith in economic growth fostered by technological innovation, a view still echoed in the majority of historical scholarship on Dutch drainage, opponents argued for a conservation-based approach that emphasized the need to let nature run its course, foregrounding the needs and wants of local communities. Recovering these early debates over environmental intervention allows us to avoid teleological narratives that firmly tie expert intervention to economic growth and modernizing progress, and shows that early modern attitudes toward nature were not singular or unified.

Finally, such a focus on division and conflict may seem surprising for the context of drainage in the seventeenth-century

¹² Paul Warde, *The Invention of Sustainability: Nature and Destiny, c.1500–1870* (Cambridge, 2018), 3–5, quotation at 5.

¹³ Karl Appuhn, *A Forest on the Sea: Environmental Expertise in Renaissance Venice* (Baltimore, 2009); John T. Wing, *Roots of Empire: Forests and State Power in Early Modern Spain, c.1500–1750* (Leiden, 2015).

Dutch Republic, as historians have long pointed to its success and lack of contestation. Within and outside academia, the idea that the Dutch found a particularly effective way to deal with conflicts over landscape interventions has found lasting expression in the popular notion of the supposedly harmonious ‘poldermodel’.¹⁴ Historians have explained the particular success of Dutch land reclamation by pointing to the fruitful merger between capital and technology that characterized Dutch projects, the particular blend of private–public partnerships, and the development of ‘efficient regulation’ to limit conflict.¹⁵ The vast majority of such studies implicitly or explicitly present drainage as a positive development, and one that was pivotal in establishing Dutch environmental sustainability as well as long-term economic growth by increasing resilience to flooding and facilitating the rise of agricultural capitalism.¹⁶ This article suggests that the current historiography of Dutch land reclamation might need revising. Its purpose is not to argue that drainage may have had much more detrimental effects than often acknowledged — even though one might explore such a claim now that the techno-optimist view is increasingly criticized for having contributed to capitalism’s adverse effects and the importance of wetlands for biodiversity, nitrogen removal and carbon sequestering is

¹⁴ Maarten Prak and Jan Luiten van Zanden, *Nederland en het poldermodel: sociaal-economische geschiedenis van Nederland, 1000–2000* (Amsterdam, 2013); Jared Diamond, *Collapse: How Societies Choose to Fail or Survive*, revised edn (London, 2011), ch. 16; Dennis Bos, Maurits Ebben and Henk te Velde (eds.), *Harmonie in Holland? Het poldermodel van 1500 tot nu* (Amsterdam, 2007).

¹⁵ Karel Davids, *The Rise and Decline of Dutch Technological Leadership: Technology, Economy and Culture in the Netherlands, 1350–1800*, 2 vols. (Leiden, 2008), i, 66–71; Piet van Cruyningen, ‘Landaanwinningsprojecten: omgaan met belangen van derden’, in Milja van Tielhof, *Consensus en Conflict* (Hilversum, 2021); Piet van Cruyningen, ‘Dealing with Drainage: State Regulation of Drainage Projects in the Dutch Republic, France, and England during the Sixteenth and Seventeenth Centuries’, *Economic History Review*, lxxviii, no. 2 (2015).

¹⁶ Piet van Cruyningen, ‘From Disaster to Sustainability: Floods, Changing Property Relations and Water Management in the South-Western Netherlands, c.1500–1800’, *Continuity and Change*, xxix, no. 2 (2014); J. L. Price, *The Dutch Republic in the Seventeenth Century* (London, 1998), 108–11; J. L. Price, ‘Water and Land’, in Helmer J. Helmers and Geert H. Janssen (eds.), *The Cambridge Companion to the Dutch Golden Age* (Cambridge, 2018). An important exception and a much more critical view is Tim Soens, ‘Resilient Societies, Vulnerable People: Coping with North Sea Floods Before 1800’, *Past and Present*, no. 241 (Nov. 2018).

becoming ever clearer — but to show that resistance to projects was common and early modern actors were fundamentally divided over whether drainage would have positive effects.¹⁷ The case of the Haarlemmermeer does not stand out because it evoked fierce resistance but because that opposition proved successful and lays bare, through the wider debate between experts and their referral to the disappointing results of earlier, completed projects, broader dissatisfaction with landscape interventions and the way they took shape.

The next section of this article briefly describes the process through which Dutch drainage projects normally took shape, highlights the sorts of resistance they normally encountered, and argues this often proved futile. The third section introduces us to the Haarlemmermeer and the different groups of investors who proposed the lake's drainage, showing they were all excellently positioned to leverage their social and political capital into patent approval and yet failed to do so. The fourth and fifth sections demonstrate that this was due to the increasing importance of experts. Section four shows that the introduction of experts led to a more technocratic debate as Haarlem and Leiden's continued rejection of the investors' plans pushed the aspiring drainers increasingly to rely on surveyors and map makers to promote their plans, while the towns simultaneously employed their own experts to develop alternatives to drainage. Section five, finally, shows how the debate broadened to encompass more fundamental questions by zooming in on the printed works of two experts who formulated distinctly different views on humanity's relation to nature, revealing deeper frustrations about landscape interventions within the Dutch Republic.

II

DRAINAGE PATENTS AND THEIR APPROVAL

Discussions about draining the Haarlemmermeer took place against the backdrop of a wave of land reclamation projects in

¹⁷ Amitav Ghosh, *The Nutmeg's Curse: Parables for a Planet in Crisis* (Chicago, 2021); Kuno Kasak *et al.*, 'Restoring Wetlands on Intensive Agricultural Lands Modifies Nitrogen Cycling Microbial Communities and Reduces N₂O Production Potential', *Journal of Environmental Management*, cxcix (2021); Anum Yousaf *et al.*, 'Nitrogen Dynamics in Wetland Systems and Its Impact on Biodiversity', *Nitrogen*, ii, issue 2 (2021).

the early modern Low Countries, especially in Holland. Between 1540 and 1640, all while experiencing a period of significant political turmoil and dealing with the climatic changes brought about by the Little Ice Age, the Dutch drained 122,169 hectares of land.¹⁸ The wave started slowly, around 1540, with the creation of coastal polders and the drainage of several smaller lakes in North Holland. Drainage all but died down in the later 1560s and 1570s, during the early years of the Revolt against Spanish rule. By 1590, however, drainage fever assumed full force, leading to a peak in land reclamation over the next fifty years.¹⁹ The northern part of Holland saw the sharpest changes in its watery landscape: over fifty projects, including the drainage of five large lakes between 1607 and 1635, increased the land area by a third.²⁰ The first plans to drain the Haarlemmermeer were launched right at the peak of this wave of drainage projects, in 1617. The last — for a while anyway — were discussed and rejected in 1642, and this rejection ushered in a period of much slower change: between 1640 and 1740 total land reclamation amounted to 64,829 hectares, about half as much as in the preceding century.²¹

In the Dutch Republic, the parties most likely to undertake large-scale drainage projects were groups composed of wealthy, non-noble urban investors looking for relatively safe investment opportunities. After agreeing to share the risks and profits of drainage, they would file for a patent with the appropriate provincial government, which, in the case of the Haarlemmermeer, was the States of Holland and West Frisia.²² If granted, patents gave investors a temporary monopoly to drain a specific area within a set time frame. After completion of the project the

¹⁸ Jan de Vries and Ad van der Woude, *The First Modern Economy: Success, Failure, and Perseverance of the Dutch Economy, 1500–1815* (Cambridge, 1997), 32; Dagomar Degroot, *The Frigid Golden Age: Climate Change, the Little Ice Age, and the Dutch Republic, 1560–1720* (Cambridge, 2018).

¹⁹ Davids, *Rise and Decline of Dutch Technological Leadership*, i, 66; De Vries and Van der Woude, *First Modern Economy*, 27–45, esp. table 2.2.

²⁰ Han van Zwet, *Lofwaardighe Dijkagies en Miserabele Polders: Een Financiële Analyse van Landaanwinningprojecten in Hollands Noorderkwartier, 1597–1643* (Hilversum, 2009), 15, 483.

²¹ De Vries and Van der Woude, *First Modern Economy*, table 2.2.

²² Marius Buning, *Knowledge, Patents, Power: The Making of a Patent System in the Dutch Republic* (Leiden, 2021).

new land was theirs to cultivate, lease out, or use for a country estate; or they could sell to others, as Dutch ownership rights had become increasingly absolute.²³ The States normally relied on the Chamber of Accounts to investigate whether there were other claims on the land or possible conflicts of interest, but if a patent was approved it gave investors the right to negotiate with third parties affected by their plans.²⁴ The small farmers who still owned most of the land in the first half of the sixteenth century increasingly sold their lands from 1580 onwards, following high taxation in the early decades of the Eighty Years' War.²⁵ This left urban governments the parties most likely to protest against drainage plans, as cities drew income from toll privileges and relied on lakes for their water supply, industry and trade. Cities competed especially for the best access to Amsterdam, which functioned as a crucial hub to accommodate (overseas) trade, and drainage plans almost invariably affected existing transport routes.²⁶

Cities also had a crucial role in the approval of drainage requests: the States of Holland were composed of representatives of the eighteen most important towns, which each had one vote, and of representatives of the nobility (the *Ridderschap*), who together had one vote. This gave cities an important say in the approval of patents.²⁷ Nonetheless, as different cities also competed over power and specific projects, the process of requesting and rewarding patents often worked to the advantage of investors — even in the face of the enduring resistance and violence the projects evoked from the beginning. Though towns

²³ B. J. P. Van Bavel, 'The Organization and Rise of Land and Lease Markets in Northwestern Europe and Italy, c.1000–1800', *Continuity and Change*, xxiii, no. 1 (2008).

²⁴ Van Cruyningen, 'Dealing with Drainage', 423, 427.

²⁵ B. J. P. Van Bavel, 'Land, Lease and Agriculture: The Transition of the Rural Economy in the Dutch River Area from the Fourteenth to the Sixteenth Century', *Past and Present*, no. 172 (Aug. 2001), 16–17.

²⁶ Van Bavel, 'Land, Lease and Agriculture', 16; Diederik Aten, *'Als het gewelt comt . . .': politiek en economie in Holland benoorden het IJ, 1500–1800* (Hilversum, 1995), 61–3; De Vries and Van der Woude, *First Modern Economy*, 33.

²⁷ Maarten Prak, *The Dutch Republic in the Seventeenth Century*, trans. Diane Webb, 2nd edn (Cambridge, 2023), 165; Robert Fruin, *Geschiedenis der staatsinstellingen in Nederland tot den val der republiek* (The Hague, 1901).

could oppose investors' plans by pointing out they would hurt current economic interests, this rarely proved successful in the long run. Competition between different cities meant that urban governments often ceased their opposition over time, either in the hopes of gaining an advantage over a neighbouring city or after accepting gifts of land from the investors. Close personal relations between investors and the Republic's political elite further worked to the investors' advantage. Two examples serve to make this point.

The first is the drainage of the Beemster lake (1607–12), perhaps the best-known Dutch drainage project. The group undertaking it was granted its patent within two weeks of applying, which suggests that the Chamber of Accounts performed only a perfunctory investigation of conflicting interests or skipped the step entirely — possibly because one of the investors proposing the drainage was the brother of the powerful Land's Advocate Johan van Oldenbarnevelt.²⁸ That decisions were reached swiftly and projects executed quickly by no means indicates that local parties did not resist and oppose attempts to drain their land: a 1609 edict issued by Van Oldenbarnevelt recounts how a group of farmers, though 'they had no reason to oppose the commendable works with proper means', had vandalized the newly built dikes around the Beemster. The edict threatened future transgressors with fines or corporal punishment if they were to 'pierce or open [the dikes] in any way'.²⁹ But the Beemster's patent also saw the introduction of a new clause that worked to the drainers' advantage: the so-called contentment clause stipulated that investors should negotiate with third parties until these could reasonably be expected to be satisfied. This clause, Piet van Cruyningen has argued, provided 'efficient regulation' because it prevented negotiations over points of contention from endlessly dragging on: if no consensus was reached, members of the Supreme Court (*Hoge Raad*) would arbitrate and decide on the best course of action, after which no further appeal was possible.³⁰ As such, the clause strengthened the position of investors with close ties to Holland's political elite in

²⁸ Van Cruyningen, 'Dealing with Drainage', 425–6.

²⁹ *Resolutien van de Heeren Staten van Hollandt ende Westvrieslandt* (The Hague, 1574–), xxvii, 1607–1609, 6 Jan. 1609, 786–7.

³⁰ Van Cruyningen, 'Dealing with Drainage', 425–7.

general and the Supreme Court in particular — its president, Reinout van Brederode, was Johan van Oldenbarnevelt's son-in-law, and Rombout Hogerbeets, another of the Beemster's drainers, served as a member since 1596.³¹

The second example concerns the violent opposition of the city of Hoorn to the drainage of the Heerhugowaard in September 1625. Competition between cities played an important role in this case: Hoorn's decision followed its frustration with the city of Alkmaar on the one hand and with promises made by two of the investors on the other hand. In a private meeting with Hoorn's deputies in March 1625, these investors had agreed to start work on the Heerhugowaard's drainage only after satisfying the city's concerns. They later reneged on this promise and, when Hoorn's magistrate protested, suggested arbitration by commissioners of the States of Holland. This was hardly an enticing prospect for Hoorn, given the especially powerful position of the investors: Nicolaas Cromhout and Pauwel van Asperen, the two investors who had met with Hoorn's deputies, respectively served as President of the High Court of Holland (*Hof van Holland*) and as a member of the Supreme Court. In the meantime, Alkmaar — which was in favour of the drainage — started work on a new canal that would connect the town to the circular canal around the Heerhugowaard once it was drained. In September 1625, Hoorn decided to use violence and sent its city militia to demolish the recently dug canal. Ultimately, however, the city had to fold its resistance when the High Court of Holland ruled in Alkmaar's favour.³²

The approval and timely execution of drainage plans, then, hinged to a large extent on personal connections rather than stemming from consensus and agreement, and though various agents frequently resisted plans through political and violent means, they were rarely successful in the long run.

³¹ A. J. Van der Aa, *Biographisch Woordenboek Der Nederlanden*, 21 vols. (Haarlem, 1852), ii.2, 1263–4, entry for Reinout van Brederode; S. J. Fockema Andreae, *Het Hoogheemraadschap van Rijnland: zijn recht en zijn bestuur van den vroegsten tijd tot 1857* (Leiden, 1934), 406; for a full list of the Beemster's investors see Van Zwet, *Lofwaardighe Dijkagies en Miserabele Polders*, 485; on family ties and power in the Dutch Republic, see also Julia Adams, *The Familial State: Ruling Families and Merchant Capitalism in Early Modern Europe* (Ithaca, NY, 2007).

³² Aten, 'Als het gewelt comt . . .', 97–101.

III

IMPROVING THE HAARLEMMERMEER

Having sketched the key dynamics of Dutch drainage projects, we can now focus on the specific case of the Haarlemmermeer and its aspiring *bedijkers* or drainers. Why, precisely, did no fewer than five groups propose its drainage between 1617 and 1642? Talk of draining the Haarlemmermeer can be traced to The Hague, where in August 1616 a group of eighteen men first agreed to try to obtain a patent.³³ The group's spokesman, the Gorinchem merchant Anthonie de Hoogh, was a newcomer in drainage projects, while most of the group's other members were wealthy citizens from Amsterdam and The Hague who were part of the young Republic's political elite, several of whom had experience with earlier drainage projects: the group included the aforementioned veterans Hogerbeets, Van Asperen and Cromhout.³⁴ The request filed by De Hoogh and his group followed conventional forms. It outlined the benefits of drainage on two counts in particular, using the language of improvement and combined private and public interests.

The first point made by De Hoogh and his companions was that drainage would solve the dangers the Haarlemmermeer posed: the lake was 'of such a nature and so positioned', they wrote, 'that it greatly damaged the lands near and around it on a daily basis', so that 'every year a great number of *morgens* [the local unit of measurement; around 0.851 ha] are washed and taken away by the violence of the water'.³⁵ If nothing was done, the patent request claimed, the lake would eventually form an inland sea that threatened all of Holland.³⁶

The aspiring *bedijkers* were not wrong in calling the lake a threat to its environment. As Petra van Dam has shown, the land around it had undergone an ecological transformation in the late medieval period, when its raised peat bogs were increasingly drained

³³ Noord-Hollands Archief, Haarlem, 3993 Stadsbestuur van Haarlem (hereafter GAH), inv. no. 7248, fo. 3^r.

³⁴ De Hoogh was probably selected precisely because he had no previous experience: when investors from Alkmaar proposed drainage of the Haarlemmermeer, they appointed a spokesperson from Amsterdam to obscure their own involvement, which would have immediately put Hoorn on edge. Aten, '*Als het gewelt comt . . .*', 69.

³⁵ Leiden, Hoogheemraadschap van Rijnland, Hoogheemraadschap van Rijnland (Oud Archief Rijnland, 1255–1857 (hereafter OAR), inv. no. 1577, fo. 1^v.

³⁶ OAR, inv. no. 1577, fos. 1^v–2^r, 3^v.

to cultivate grain. The bogs gradually sank until they reached ground water level some time around 1500, which made the land not only unsuitable for agriculture but also increasingly vulnerable to flooding. In these circumstances the barriers between three smaller lakes — the Spieringmeer, the Leidsemeer and the old Haarlemmermeer — easily succumbed during storms, and in 1510 the ‘new’ Haarlemmermeer was born.³⁷ Though its precise size was contested — one mapmaker estimated it at 20,000 *morgens*, while another claimed it measured 30,000 *morgens* — it was by far the largest water mass in Holland.³⁸ The vulnerabilities caused by human peat-digging were further exacerbated by natural circumstances. Strong winds from the sea further eroded the shores, leading the Haarlemmermeer to absorb nearby pools and ponds as well as entire villages. Nor were there indications that the situation would soon improve. While extensive regulations existed to counter excessive peat-digging, these did not hold a candle to the young Republic’s burning need for energy, and peat-digging went on mostly uninterrupted.³⁹ It proved a double-edged sword: many smaller villages were entirely dependent on peat-digging for their income, while others lost so much land to the water that they had to file for tax relief with the *Hoogheemraadschap Rijnland*, the regional water authority responsible for the area between Haarlem, Amsterdam, Gouda and The Hague.⁴⁰

De Hoogh and his companions further held that turning water into land would ‘bring it to fecundity’, and bring ‘countless benefits and advantages in general and in particular’.⁴¹ The project would provide jobs, enticing ‘countless artisans and farmers, dike workers, engineers, surveyors, carpenters, bricklayers, smiths and other types of people’ to stay in Holland, workers who had ‘in great numbers’ and ‘with whole families’ left for

³⁷ Petra J. E. M. van Dam, ‘Sinking Peat Bogs: Environmental Change in Holland, 1350–1550’, *Environmental History*, vi, no. 1 (2001), 32–5.

³⁸ Jan Werner, ‘Haarlemmermeer, Plankaarten van Vroeg-17e-Eeuwse Droogmakingsvoorstellen’, *Caert-Thresoor*, x, no. 1 (1991), 4.

³⁹ Van Dam, ‘Sinking Peat Bogs’, 36–7.

⁴⁰ *Ibid.*, 36.

⁴¹ OAR, inv. no. 1577, fo. 3^r.

Germany, France and Flanders, seeking land and work.⁴² The investors reasoned that profitable land was a cornerstone of a well-functioning state: a 'republic's good fortune' depended on its ability to 'keep its inhabitants — through reasonable means — in their provinces', and therefore it needed to 'make all its territories and regions, especially those at the heart of the country, fit to serve and support its inhabitants'. They added that the republic would prosper in turn, as it could now extract higher taxes on land and goods.⁴³

Though fairly standard, De Hoogh's patent request was not approved, and neither were the subsequent requests to drain the Haarlemmermeer made by various other groups: De Hoogh disappears from the archival record after this rejection, but others picked up where he left off. In December 1623, a few men who had been part of De Hoogh's circle started a new company with the express purpose to drain the lake: Cromhout threw his name in the hat once more, but Hogerbeets, who had by now fallen out of political favour, did not.⁴⁴ Another group formed around the Leiden lawyer Gerrit Meerman in 1629 and joined forces with the Amsterdam merchants Elias Trip and Cornelis Bicker a few years later, on the advice of Grand Pensionary Adriaan Pauw, who had already invested in the drainage of the Bijlmermeer (1622–7) and had to call upon soldiers when a water mill on his land was violently destroyed in 1638.⁴⁵ All of these groups were excellently positioned to leverage their social and political connections. Why, then, did they fail to get their plans approved?

IV

RESISTING DRAINAGE

Upon receiving De Hoogh's request for a drainage project, the States of Holland and West-Friesland forwarded it to the cities that would be most directly affected by the project and to the

⁴² *Ibid.*, fo. 2^{r-v}.

⁴³ *Ibid.*, fo. 2^v.

⁴⁴ GAH, inv. no. 7248, fo. 3^r. Hogerbeets supported Van Oldenbarnevelt and the Remonstrants against Stadholder Maurice and was imprisoned in 1619.

⁴⁵ *Ibid.*, fo. 4^v; Gemeentearchief Amsterdam, 5075 Archief van de Notarissen ter Standplaats Amsterdam, inv. no. 1051, J. van de Ven, fos. 43^v–54^r.

Hoogheemraadschap Rijnland. The cities strongly objected to De Hoogh's plans, on the grounds that the proposal was vague about where precisely the group proposed to build their dike, which waterways they would construct 'for the common use' and which water outlets they would leave to Rijnland.⁴⁶ The investors subsequently pushed back against this call for more detail and claimed they could not share their plans before being promised preferential treatment over other groups, as competing groups might get hold of their 'secrets' and all their efforts would be wasted.⁴⁷ The cities did not accept this explanation, and on 18 May 1617, the States of Holland and West-Friesland shelved the first proposal.⁴⁸

Drainage patents were often vague on technical details, especially in the first wave of projects. The Chamber of Accounts did not assess the technical acuity of proposals, and investors only hired the millwrights, engineers and overseers necessary to execute their project after they received patent approval.⁴⁹ The Beemster's drainers did not even inspect the land they proposed to drain before their patent was approved.⁵⁰ Though De Hoogh's group claimed to have sought ample 'information and advice' before submitting their request, this most likely consisted of a concise report of the lake's measurements drawn up in October 1616 by the Leiden-based surveyor Jan Pietersz Dou. Dou, who had worked with several of the aspiring *bedijkers* in the Beemster, did not present a more detailed plan, and it is unlikely that the drainers had one before applying for their patent.⁵¹

Increasingly, groups of investors engaged the services of surveyors and other experts to make their plans more epistemically viable and to allay political and economic concerns. Jan Pietersz Dou, together with the surveyor Floris Jacobs, once more measured the Haarlemmermeer in 1624, most likely at the request

⁴⁶ OAR, inv. no. 1577, fo. 7^r.

⁴⁷ *Ibid.*

⁴⁸ *Resolutien van de Heeren Staten van Hollandt ende Westvrieslandt*, xxix, 1613–1620, 18 May 1617, 346.

⁴⁹ Van Zwet, *Lofwaerdighe Dijkagies en Miserabele Polders*, 90–100.

⁵⁰ Alette Fleischer, 'The Beemster Polder: Conservative Invention and Holland's Great Pleasure Garden', in Lissa Roberts, Simon Schaffer and Peter Dear (eds.), *The Mindful Hand: Inquiry and Invention from the Late Renaissance to Early Industrialisation* (Amsterdam, 2007), 152.

⁵¹ GAH, inv. no. 7248, fos. 3^r–4^v.

of Cromhout's group, and in May 1632 Dou, at Meerman's request, gauged the water levels at Gouda during ebb and flow.⁵² In 1629, the hydraulic engineer Jan Adriaenszoon Leeghwater calculated the costs involved in drainage, supplementing his findings with a manuscript that emphasized the need for and benefits of drainage.⁵³ The investors also gathered and cited stories of people living and working around the lake to suggest the wide support their plans enjoyed. In the surveyors' reports, local captains and lock masters confirmed rising tides, and the memory of the grandfather of one of the would-be drainers, the Lord of Warmond, was invoked as evidence of the lake's recent growth.⁵⁴

The increased reliance on experts seemingly confirms the picture of a close and fruitful collaboration between technology and capital that emerges from previous studies. However, the maps depicting the proposed drainage demonstrate that experts and investors struggled to determine the best course of action as they debated whether to drain the entire Haarlemmermeer or only parts of it. Leeghwater particularly wavered when remodeling his plans over time, including and excluding different parts of the lake in the different maps he made for his proposals.⁵⁵ Though the increasing technical detail in these maps came at the explicit request of the cities, Leeghwater's repeated changes were to no avail: Haarlem and Leiden continued to find the plans too radical, risky and neglectful of current interests. To them, the lake presented a valuable resource in its own right.

Leiden feared especially for its water supply and its fishing rights. With strong northeastern winds the water level in the lake rose, propelling water into the city, and when the wind changed and the lake's water level fell, so did the water levels in the town's canals, leaving only the murky, greasy water soiled by the waste

⁵² *Ibid.*, fo. 4^v; OAR., inv. nos. 1579 and 1582.

⁵³ It is unclear whether Leeghwater drew up his budget at the request of a group of investors or acted of his own accord.

⁵⁴ OAR, inv. no. 1576, fo. 4^r (captains); inv. no. 1579, fo. 1^r (lock masters); inv. no. 1578, fo. 36^v (Warmond).

⁵⁵ Han van Zwet, 'Het Haarlemmermeer: Leeghwater Zoekt Emplooi', in Diederik Aten, Marijke Joustra and Han van Zwet (eds.), *Leeghwater en het Haarlemmermeer* (Edam, 2009), 18–25; Werner, 'Haarlemmermeer, Plankaarten van Vroeg-17e-Eeuwse Droogmakingsvoorstellen'.

of the textile industry. Water and wind cleared away waste and kept the town clean(ish).⁵⁶ The burgeoning textile industry was itself also fuelled by the lake's growth: continued peat-digging provided energy, while the workforce pushed out of the countryside by rising water levels provided cheap urban labour.⁵⁷ The fishing industry, too, had undergone crucial changes with the lake's expansion, and eel fisheries especially grew in importance and size.⁵⁸ Aspiring drainers admitted that if the lake were drained, the town would lose 'the largest part of her fisheries', but they also claimed that this part was the 'least profitable and least used'. They promised Leiden that some ten smaller lakes and ponds would be kept intact, assuring the town that it 'need not raise objections regarding their fisheries'.⁵⁹

Haarlem, meanwhile, was especially concerned about the way drainage would affect its trading network. To appease Haarlem's anxieties, the drainers proposed to include two new waterways besides the ring canal. One of these was to be used for ships going upstream and the other for ships going downstream, so that 'no ships would encounter others and bother and trouble each another'.⁶⁰ A further canal would supply water to the town and safeguard its industry and trade.⁶¹ Haarlem's objections were shared by Gouda, and probably based on recent reports of obstructed trade routes in the Beemster. For their part, the drainers held that the problems that had arisen there due to the narrow ring canal would be avoided this time.⁶² Other problems that had resulted from the drainage of the Beemster provide further context for the cities' reticence: the newly won land initially proved too wet to cultivate grains, and milling and maintenance of the dykes remained challenging until the 1630s.⁶³

⁵⁶ Roos van Oosten, 'The Dutch Great Stink: The End of the Cesspit Era in the Pre-Industrial Towns of Leiden and Haarlem', *European Journal of Archaeology*, xix, issue 4 (2016).

⁵⁷ OAR, inv. no. 1578, fo. 33^r. The textile industry blossomed in part because of the availability of cheap labour and energy from the fifteenth century onward: Van Dam, 'Sinking Peat Bogs', 38.

⁵⁸ Van Dam, 'Sinking Peat Bogs', 41–2.

⁵⁹ OAR, inv. no. 1578, fo. 34^{r-v}.

⁶⁰ *Ibid.*, fo. 35^r.

⁶¹ *Ibid.*, fo. 33^r; GAH, inv. no. 7271.

⁶² OAR, inv. no. 1578, fo. 35^r; Aten, 'Als het gewelt comt...', 70–71.

⁶³ Fleischer, 'Beemster Polder', 146, 163–4.

The towns may have also feared that drainage would decrease their political influence in the region. In the second half of the sixteenth century the regional water boards (*Hoogheemraadschappen*), originally controlled by the nobility, increased in size and started to include town representatives. The Hoogheemraadschap Rijnland, responsible for managing and maintaining dikes, sluices and other water works in the area between Haarlem, Amsterdam, Gouda and The Hague, grew from seven seats to twelve, five of which were reserved for citizens of Haarlem and Leiden.⁶⁴ The cities also possessed seats on the polder board (*College van hoofdingelanden*), which represented the interests of landowners within the region and held significant power as well: from 1550, the Hoogheemraadschap and dike-reeve (*dijkgraaf*) could not make any significant decisions without the approval of the polder board. Leiden and Haarlem only had two of the ten seats — the other eight were reserved for the nobility — but wielded considerable influence.⁶⁵ Investors did normally ask (as the aspiring drainers of the Haarlemmermeer did) for the right to start a polder board for the newly drained land. This gave them considerable freedom in all civil and religious matters and also allowed them to appoint the polder's own dike-reeve, secretaries and treasurer, giving them substantial power over the area.⁶⁶

To counter the threat of drainage, Haarlem and Leiden forged new connections and collaborations. Until 1634, their burgomasters and city councils had simply rejected proposals for drainage and refrained from exploring alternative courses of action. But in early 1634 Rijnland received a request from local villages and landowners around the lake to stop the lake's continued expansion. The Hoogheemraadschap took the request seriously and initially kept several options open, considering either full drainage or more targeted measures that protected

⁶⁴ Milja van Tielhof, 'Het college van hoofdingelanden: de vertegenwoordiging van de ingelanden in Rijnland en Schieland in de vroegmoderne tijd', *BMGN — Low Countries Historical Review*, cxxxi, no. 2 (2016), 28; Van Dam, 'Sinking Peat Bogs', 36; Fockema Andreae, *Het Hoogheemraadschap van Rijnland*.

⁶⁵ Van Tielhof, 'Het college van hoofdingelanden', 34–5.

⁶⁶ Aten, 'Als het geweld comt...', 22; Van Zwet, *Lofvaerdighe Dijkagies en Miserabele Polders*, 55–7; OAR, inv. no. 1577, fo. 4^v.

those spots along the banks of the lake most in danger of collapse. After carrying out an inspection of the banks in April, however, the Hoogheemraadschap — but not the representatives from Leiden and Haarlem, who had refrained from joining the inspection — decided that draining the lake in its entirety would be preferable.⁶⁷ The decision spurred the city magistrates of Haarlem and Leiden into action, and in the following months they collaborated to find alternatives that might avoid full drainage, including installing large sloping buffers of sand underwater; constructing masts chained to poles along the banks' most vulnerable spots, which would break the waves and save the banks from further erosion; protecting part of the banks with poles, slabs and spruces — or, alternatively, erecting a stone wall that ran along the same 400-metre stretch of bank; and finally, building dikes and quays and braiding them with seaweed, creating what were known as *wierdijken* (weed dikes).⁶⁸ Though the alternative solutions were considerably cheaper and less invasive than drainage, the Hoogheemraadschap seems to have seriously considered only the first one. It soon dismissed the plan as unrealistic, citing a failed attempt at the Kagermeer near Leiden in 1607, even though Haarlem argued that installing underwater sand banks had proved beneficial elsewhere.⁶⁹

The collaboration between Haarlem and Leiden was limited by the towns' diverging interests and ideas of ownership of the lake. Haarlem proved most steadfast in its rejection of drainage plans, once sending no fewer than thirty-two negative responses to a proposal made by Elias Trip and his four companions. Trip — who was among the Republic's ten richest citizens, served as a director of the East India Company and had made his fortune selling iron, arms, soldiers and possibly also slaves — proclaimed drainage to be in 'the common and our particular interest', and stated that their proposal was 'nothing but fair and

⁶⁷ Glaudemans, 'De oude plannen tot droogmaking van het Haarlemmermeer' (unpublished paper, Leiden University, 1985), 14. The water board again accompanied landowners and officers of neighbouring villages in August 1636: OAR, inv. no. 1582, fos. 6^r–7^v.

⁶⁸ GAH, inv. no. 7239; Glaudemans, 'De oude plannen', 16–18; on *wierdijken*, see also Davids, *Rise and Decline of Dutch Technological Leadership*, i, 67–8.

⁶⁹ Glaudemans, 'De oude plannen', 18.

reasonable'.⁷⁰ To ease the city council along, Trip's consortium promised the city magistrates forty *morgens* each if they were to agree to drainage. This was a strategy that often worked, though it also led, in the case of Alkmaar's sudden support for draining the Schermer, to an anonymous pamphlet that accused the city council of corruption. In what can be read as a criticism of early capitalist ideals and practices, the pamphlet dismissively referred to the drainage of the lake as an unnatural 'artifice' and compared all drainers with victims of *watersucht* (rabies): clearly, they had gone mad, and the resulting insatiable thirst and desire for profit now caused them to choose their own, private interests over their public responsibilities.⁷¹ In contrast to Alkmaar, however, Haarlem's city council did not budge, and decided to send each and every letter back as a sign of their disapproval, arguing that Trip's proposal would prove harmful and even 'ruinous' to the city.⁷²

Leiden proved more divided. Over the years the city council revealed a more ambiguous attitude, fuelled by a direct sense of ownership over the lake and the profits drainage could bring. From 1617 onwards individual citizens had occasionally thrown their hats in with groups of investors, and in 1629 a larger group gathered around the lawyer Gerrit Meerman. He could not, however, convince the rest of the city council that drainage was a good idea, and in response the city council decided to ban further discussion of drainage.⁷³ Still, at the same time the city council blocked Meerman's proposal, the burgomasters also decided that *if* the lake were to be drained, the city should gain from it. They argued that not only would drainage easily yield

⁷⁰ GAH, inv. no. 7246, fo. 2^r. On Trip, see Kees Zandvliet, *De 250 rijksten van de Gouden Eeuw: kapitaal, macht, familie en levensstijl* (Amsterdam, 2006), 24–5; Leo Balai, *Geschiedenis van de Amsterdamse slavenhandel: over de belangen van Amsterdamse regenten bij de trans-Atlantische slavenhandel* (Zutphen, 2013), 31, 99; P. W. Klein, *De Trippen in de 17e eeuw: een studie over het ondernemersgedrag op de Hollandse stapelmarkt* (Assen, 1965), 139–40.

⁷¹ The accusations of corruption were published around 1635 in an anonymous pamphlet: Anon., *Schermerbedyckinghe* [n.p., n.d.]; H. E. van Gelder, 'De Bedijking van de Heerhugowaard (1624–1631)', in *Alkmaarse Opstellen* (Alkmaar, 1960), 99–100; Van Zwet, *Loftwaardighe Dijkkagies en Miserabele Polders*, 216–217.

⁷² GAH, inv. no. 7246, fo. 2^v.

⁷³ Erfgoed Leiden en Omstreken, 0501A Stadsarchief van Leiden (1574–1816) (hereafter SAL), inv. no. 5852.

300,000 guilders profit but also that Leiden owned the lake and could thus not be excluded from any project that proposed altering it.⁷⁴ The city did not present specific arguments to legitimate its claims of ownership but may have felt its fishing rights warranted the position. Haarlem, however, consistently refuted the claims whenever Leiden repeated them, careful not to lose sight of its own interests even while fighting against a common threat.

The continued objections of Leiden and Haarlem to each of the investors' plans was rooted in a desire to protect existing interests and anxiety about the unpredictable impact of unwieldy projects. And anxiety was not unwarranted: drainage plans were vague, unsophisticated, and often wavered, and recent projects regularly failed to make good on their promises. The towns' continued resistance gave rise to new political collaborations and was expressly built on the experience and knowledge of local experts. The alternatives they explored, however, did not suffice to settle fully the debate, and it did not take long before the discussion broadened into a more fundamental debate on the risks and value of drainage projects.

V

THE EXPERTS

The last attempts to drain the Haarlemmermeer — for a while anyway — took place in 1642, following a lively debate in which the expert practitioners Leeghwater and Colevelt took centre stage. Their exchange did not simply focus on the feasibility of draining the Haarlemmermeer, but amounted to a much more fundamental debate on its desirability, in which experts came to argue for intervention *and* conservation. The exchange lays bare widely diverging ideas about profit, risk, humanity's proper relation to nature, and the value of past drainage projects, and shows how we can use expert exchanges to gain better insights into the different motives driving conflicts over landscape intervention.

The hydraulic engineer Jan Adriaanszoon Leeghwater (his self-chosen surname translates to 'low water') had little to no theoretical training but based his claim to expertise on

⁷⁴ *Ibid.*, fo. 1^r.

his extensive experience with various projects in the Dutch Republic, Germany and France.⁷⁵ He had been advocating behind the scenes for drainage of the Haarlemmermeer from 1629 onwards and in 1641, when Leeghwater was around 60 years old and the project was no closer to completion, he at last sought to draw public attention to his cause by publishing a longer version of the manuscript booklet he first wrote in 1629. Republished in several editions over the next few years, Leeghwater's work ends with the assertion that if he were to be hired, his skills could be put to use to 'the reclamation and the prosperity of the common land'.⁷⁶

Leeghwater's treatise echoes the language of improvement and combined private and public interests the investors also trumpeted. He illustrated his points by extensively referring to the Beemster, reminding readers of his own involvement in the project (he had been employed as a mill maker at the time) and his connection to powerful investors. We have already seen that the land initially proved quite wet and difficult to manage, but in Leeghwater's account the polder was transformed into the epitome of success. The newly won land there immediately yielded 'bounteous fruits', he claimed, and over time 'God blessed the Beemster so abundantly' with 'fat oxen, cows and sheep, with many beautiful horses and stallions, as well as plentiful amounts of butter and cheese' that it now yielded an annual profit of 250,000 guilders.⁷⁷ The 'common means of the land' had been 'greatly improved' as well, and he argued that the same was to be expected for the Haarlemmermeer: the anticipated abundance of food produced in the newly drained lands would easily feed thousands of people, while drainage would also provide jobs to many who would in turn spend their income in nearby towns, meaning that local markets would thrive as well.⁷⁸

⁷⁵ Much of what we know, or think we know, about Leeghwater is derived from a work he published in 1649. This outlines and celebrates his early years and accomplishments but sometimes seems to exaggerate Leeghwater's own contributions: Jan Adriaensz Leeghwater, *Een kleyne chronycke ende voorbereidinghe van de afkomst ende 't vergrooten van de dorpen van Graft en de Ryp* (Amsterdam, 1649); Diederik Aten, 'Leeghwater, de mythe en de persoon', in Aten, Joustra and Van Zwet (eds.), *Leeghwater en het Haarlemmermeer*, 7–10.

⁷⁶ Leeghwater, *Haarlemmermeerboek*, 3rd edn (Amsterdam, 1642), 40.

⁷⁷ *Ibid.*, 16, 21.

⁷⁸ *Ibid.*, 16, 28.

Leeghwater also crafted an early capitalist rhetoric that tied risk-taking to virtue, and made the prospect of undertaking such a large project seem attractive rather than daunting. Hinting at recent colonial enterprises, Leeghwater held that his sort of work suited the Dutch specifically: 'whenever there was just the hint of profit and gain', his countrymen had 'spared no expense to commence, investigate and achieve' it, even if they had to travel far and incur great dangers on their way.⁷⁹ This time, the prize was to be found much closer to home, but uncovering it was no easy feat. The lake was fickle and treacherous, and its drainage could not be undertaken in a 'feeble' manner, but instead needed to be done 'deliberately and with good courage, as well as with good advice and actions, and virile tenacity'.⁸⁰ Their perseverance would be richly rewarded with ever growing returns on the initial investment: Leeghwater argued that land would only become more valuable over time as the international appetite for 'beautiful, good, and pure' cheese from Holland was insatiable because of its 'virtue'.⁸¹

Leeghwater used the same affective appeals that he had employed to make drainage seem attractive, heroic and profitable to convey the threat of deteriorating land along the banks of the lake. He devoted the first pages of his book to stories of people living close to the lake, whose lives and livelihood were threatened by its constant growth. They remembered, he wrote, the time when their land had been prosperous and inhabitable. Now the lake wore away the land at the shores and destroyed homes and fields, making their property useless and their lives a constant battle against the water.⁸² The stories, though mediated and perhaps embellished, are echoed in archival records in the form of attestations filed by bailiffs and sheriffs of various villages surrounding the lake.⁸³ The enduring deterioration of the land near the lake was, for Leeghwater, one of the most important reasons the Haarlemmermeer needed to be drained, and why those who undertook the project were to be praised for

⁷⁹ *Ibid.*, 18.

⁸⁰ *Ibid.*, 17.

⁸¹ *Ibid.*, 15.

⁸² *Ibid.*, 2–4.

⁸³ GAH, inv. no. 7243.

their efforts. He presented the maintenance of the physical environment as a virtuous, almost pious act: it was part of managing 'man's daily life', which he believed was almost as important as people's 'care for the salvation of souls'.⁸⁴

While eighteenth-century ideas about sustainability and the scarcity of resources were framed more explicitly, Leeghwater here shows a nascent awareness of the impact of environmental conditions on economic and political realities. For Leeghwater and the aspiring *bedijkers*, letting the Haarlemmermeer's growth run unopposed was a form of ecological mismanagement: it meant losing valuable land that could feed thousands and offer work to as many people. As we have seen, the investors emphasized that draining the lake would prevent migration to neighbouring countries and boost the Republic's economy. Leeghwater added a new perspective in the third and subsequent editions of his work, where he invoked the moral judgment of future generations: if no action were taken now, he warned, 'our descendants will accuse us of having wasted the time God has given us'.⁸⁵

If Leeghwater managed to convey the urgency and appeal of drainage, he did not propose a plan that made the project seem attainable. Apart from an exercise in some very light geometry in which the engineer argued that it was simply more efficient to drain especially large lakes — they yielded more *morgens* than smaller ones, while needing only slightly more rods of dike — Leeghwater did not go into detail about how he proposed to undertake draining a lake of the Haarlemmermeer's size.⁸⁶ The fairly detailed budget, which runs to four pages and estimates the total costs of drainage at around 3,600,000 guilders, gives just a few clues about the proposed logistics: it states the number of mills Leeghwater thought would be necessary, but it contains few indications of where and how he proposed to dig canals and

⁸⁴ Leeghwater, *Haarlemmermeerboek*, 3rd edn, 6.

⁸⁵ *Ibid.*, 6; on the intersections between religion, climate change and knowledge, see the work of Lydia Barnett: Lydia Barnett, 'The Theology of Climate Change: Sin as Agency in the Enlightenment's Anthropocene', *Environmental History*, xx, no. 2 (2015); Lydia Barnett, *After the Flood: Imagining the Global Environment in Early Modern Europe* (Baltimore, 2019).

⁸⁶ Leeghwater, *Haarlemmermeerboek*, 3rd edn, 11–13.

build sluices and dikes, and still fewer signs that he seriously considered the objections raised by Haarlem and Leiden.⁸⁷

The lack of technical detail in Leeghwater's proposal was a weakness exploited by his main opponent, Claes Arentszoon Colevelt. Colevelt worked as an *ijscooper*, a trader in iron, before being admitted as surveyor by the States of Holland in 1626. He was probably educated at the Duytsche Mathematique, the Leiden-based school started in 1600 by Simon Stevin that offered practical and theoretical training to engineers and surveyors.⁸⁸ His training and profession meant that Colevelt possessed a much more recognizable, institutionalized form of expertise than Leeghwater: surveyors had to take an oath of loyalty and were only admitted into the profession after either taking examinations or receiving the support of two professors.⁸⁹ In notarial deeds and other archival records Colevelt refers to himself as 'sworn surveyor' of Leiden or, alternatively, of Rijnland, but his loyalties seem to have lain with Leiden, where he lived with his wife Beatrix until his death in 1649.⁹⁰ In 1644 he drew up a report for Leiden's expansion plans, and we cannot exclude the possibility that he wrote his criticism of Leeghwater, in some way or another, at the request of the city.⁹¹ Published in the first half of 1642, *Bedenckingen over het droogh maken van de Haarlemmer ende Leydtsche Meer* ('Considerations about the drainage of the Haarlemmer and Leydtsche Lake') appears to be Colevelt's only published work.⁹² In Colevelt's treatise we can

⁸⁷ *Ibid.*, 29–33.

⁸⁸ Gerhard Wiesenfeldt, 'The "Duytsche Mathematique" and Leiden Family Networks, 1600–1620', in Fokko Jan Dijksterhuis, Andreas Weber and Huib Zuidervaat (eds.), *Locations of Knowledge in Dutch Contexts* (Leiden and Boston, 2019). Colevelt's admission as surveyor was supported by the mathematicians Willibrord Snellius, professor at the University of Leiden, and Frans van Schooten senior, professor at the same institution as well as lector at the Nederduytsche Mathematique. Three different records of Colevelt's admission exist: Nationaal Archief, Den Haag, Staten van Holland, 3.01.04.01, inv. no. 1805, fo. 246v; Staten van Holland na 1572, 3.01.04.01, inv. no. 1789, fo. 243v; Gecommitteerde Raden van de Staten van Holland en Westfriesland, 3.01.05, inv. no. 3000A, fo. 127r-v.

⁸⁹ Wiesenfeldt, "Duytsche Mathematique" and Leiden Family Networks'; Jenneke Krüger, 'Actoren en factoren achter het wiskundecurriculum sinds 1600' (Utrecht Univ. PhD thesis, 2014), 80–81.

⁹⁰ Van Zwet, 'Het Haarlemmermeer', 23.

⁹¹ SAL, inv. no. 5232.

⁹² Leeghwater, in his fourth edition, stated that he had obtained a copy in June that year.

trace the same concern for ecological mismanagement and the waste of valuable resources that characterized the proposals of the investors and Leeghwater, but it led him to a starkly different conclusion.

Colevelt opened with a programmatic point that shows his calls for caution were underpinned by a fundamentally different understanding of the relationship between nature and humanity than that adopted by the investors and Leeghwater. While they praised intervention, Colevelt emphasized the importance of letting nature run its course. The surveyor drew on historical geography to make his case: Tacitus, he wrote, had discussed 'the misery and dangers involved in stopping waters and changing the natural discharge of rivers' in the first of his books on Roman history, where he described how two consuls proposed to limit the Tiber's flooding by changing the course of the rivers and waters that discharged into it.⁹³ According to Colevelt, the consuls first sought the advice of nearby cities, who objected to the plans. Some wished to protect their agriculture, others feared increased risk of flooding, and a third town presented a more abstract, programmatic argument, stating that the landscape should not be changed at all, as 'nature has connected everything well, and has given the rivers their proper course, discharge, start and end'. The consuls subsequently decided not to make 'any changes in this part of the river'.⁹⁴ These same considerations, Colevelt argued, should inform the decision about whether to drain the Haarlemmermeer. Given that drainage inherently came with the risk of causing more harm than good, Colevelt warned against interventions that were not absolutely necessary, arguing that existing economic interests should be protected over future ones. He further argued that, because of the risks involved, drainage should only be undertaken with the support of all parties affected by it. Though Colevelt did not attack the potential drainers of the Haarlemmermeer directly, the timing suggests frustration over the way drainage projects had been approved and executed thus far, and indicates that his calls for environmental caution were intimately tied to political and economic concerns.⁹⁵

⁹³ Colevelt, *Bedenckingen over het droogh maken van de Haerlemmer ende Leydtsche Meer*, 1.

⁹⁴ *Ibid.*

⁹⁵ *Ibid.*, 1–2.

The rest of Colevelt's treatise revolved around attacking Leeghwater's plan — or lack thereof. Colevelt was first and foremost concerned with the Haarlemmermeer's vital function as the only water reservoir for the entirety of the river Rijn and various canals. If the lake were to be drained, the other canals in the Rijnland region would need to process and discharge more water, which would increase the risk of flooding. To address this increased risk of flooding, all dams, dikes and wharves would need to be heightened, and many more water mills would need to be built. Leeghwater's plan did not provide for any of these measures, as Colevelt pointed out again and again. Moreover, even if the dams, dikes and wharves were heightened, drainage would still have disastrous consequences, Colevelt warned, arguing that the water level in Leiden would occasionally get so high that it would render many of its houses uninhabitable and its streets impassable.⁹⁶

Colevelt was similarly quick to dismiss Leeghwater's promises of riches for all. According to the surveyor, Leeghwater severely underestimated the cost of drainage, especially the cost of the land to build the ring canal.⁹⁷ Colevelt also argued that economic hardship would befall the region as a whole and pointed out what would be lost if the lake were to be drained. As land at its borders flooded, animals would be in danger, while orchards, crops, pasture and hayfields would 'lie barren, seed and labour lost'.⁹⁸ Draining the lake would in addition greatly affect its 'innumerable large, growing' fish population, which had long offered sustenance to many and would now 'decline for the first time'.⁹⁹ The cities would suffer as well, as water would no longer rise and fall with the tide. Shored up within Leiden, it would quickly be contaminated from the 'dirty and greasy' waste of small businesses and artisans, becoming smelly and infected, which would prove detrimental to the town's health.¹⁰⁰ Finally, Colevelt repeated Haarlem's fear that trade routes would be

⁹⁶ *Ibid.*, 2–11.

⁹⁷ *Ibid.*, 26. Modern estimates indicate that Leeghwater indeed miscalculated these costs perhaps even by a factor of five, which would add about a million guilders to his budget: Van Zwet, 'Het Haarlemmermeer', 37.

⁹⁸ Colevelt, *Bedenckingen over het droogh maken van de Haerlemmer ende Leydtsche Meer*, 11, 26.

⁹⁹ *Ibid.*, 22.

¹⁰⁰ *Ibid.*, 12.

heavily affected. The proposed ring belt was too narrow and would therefore silt up, making transport by water slower and more expensive, especially from Haarlem and Leiden.¹⁰¹ In the end, he held, the damages brought to Haarlem, Leiden and the entire region of Rijnland would outweigh any profit the Haarlemmermeer's drainage would bring.¹⁰²

For Colevelt, recent experience only proved his point. Whereas Leeghwater invoked recently completed projects as examples of all the benefits drainage would bring, Colevelt wrote at length about recent storms that had caused insufficient dams and dikes to breach, suggesting that Rijnland and neighbouring areas would suffer the same fate if the Haarlemmermeer were drained. In lucky cases the damages incurred were just financial, as when a breakthrough of the Zoetermeerse dike had narrowly — and at great cost — been prevented by feverishly heightening and strengthening the dike with clay. The Burchardi flood of 11 October 1634 that hit the coastline of Schleswig-Holstein was a different story. When a strong storm tide hit the coast, it overran dikes and washed away homes, land and a considerable part of the island Strand, and a contemporary source reports that about two thirds of the island's inhabitants died in the flood.¹⁰³ Colevelt simply stated that the flood cost 'many lives', human and animal, and 'was known to the whole world'.¹⁰⁴

Colevelt did not select the example of the Burchardi flood just because it was so well-known: at the time of the flood, a Dutch company was working on the reclamation of lands in Dagebüll — and among the experts they employed was none other than Leeghwater. The engineer had been present when the flood broke the dikes, and he later not only described narrowly surviving the storm by seeking refuge in a manor situated on higher terrain, but also recounted how a group of coastal inhabitants and local labourers, blaming him and the other engineers working on the project for the dike breach, forced them to flee from the area.¹⁰⁵ Colevelt did not directly suggest

¹⁰¹ *Ibid.*, 23–4.

¹⁰² *Ibid.*, 3.

¹⁰³ Soens, 'Resilient Societies, Vulnerable People'.

¹⁰⁴ Colevelt, *Bedenckingen over het droogh maken van de Haerlemmer ende Leydtsche Meer*, 7–8.

¹⁰⁵ Leeghwater, *Een kleyne chronycke ende voorbereydinghe*; Soens, 'Resilient Societies, Vulnerable People', 167.

that Leeghwater was to blame for the disaster, but the example nonetheless undermined Leeghwater's standing. In contrast to Colevelt, Leeghwater had little to no theoretical training, and he instead claimed authority by positioning himself as firmly embedded within the network of investors initiating drainage and by liberally referring to his extensive practical experience in earlier drainage projects. This opened him up to criticism because the success of past projects was contested; the disaster in Schleswig-Holstein served as an especially stark reminder that Leeghwater's success stories came with downsides and that drainage was not an answer to all problems.

The involvement of experts such as Leeghwater and Colevelt did not, then, lead to consensus over the best way to deal with the lake. Each group turned to advisors whose views aligned with their own, and drainage projects in the Dutch Republic did not avoid the conflicts about knowledge and expertise that characterize the history of English landscape intervention.¹⁰⁶ In England and elsewhere, however, expert involvement ultimately led to more interventions in the landscape. In contrast, in the case of the Haarlemmermeer increasing reliance on experts ultimately led to the rejection of investors' plans. The absence of a strong technological proposal from Leeghwater and the investors made it very easy for the theoretically-trained Colevelt to dismiss Leeghwater's promises as false and empty, arguing that the engineer could not reasonably claim that drainage was a viable solution for all parties. That Leeghwater's authority hinged almost entirely on his earlier practical experience formed further grounds for rejection, and near the end of his treatise Colevelt reminded his audience once more of the inherently uncertain outcome of large-scale projects. The projectors in Holstein, too, had acted 'with great courage' in draining their land, but rather than the 'great profits' they expected they only reaped 'great misery', and repairs were still ongoing.¹⁰⁷ And who, Colevelt asked, 'would assure the *bedijkers* of the Haarlemmermeer that the Dike [...] will prove durable enough to protect these same

¹⁰⁶ Robson, 'Improvement and Epistemologies of Landscape in Seventeenth-Century English Forest Enclosure'; Ash, *Draining of the Fens*.

¹⁰⁷ Colevelt, *Bedenckingen over het droogh maken van de Haarlemmer ende Leydtsche Meer*, 26.

new lands against every breach and leak?’ The surveyor added: ‘I for one do not think it will’.¹⁰⁸

Leeghwater responded to Colevelt’s treatise in 1643, when his *Haarlemmermeer-boeck* appeared in its fourth edition. He had few answers to Colevelt’s more technical questions and instead doubled down on the emotional appeals that had characterized his plea for drainage from the beginning. He recounted that he personally witnessed the land around the lake ‘in pieces and scrambles’ on a recent visit and that several horrible drownings had taken place.¹⁰⁹ Of these the death of a man who had survived many perilous dangers on trips to the East Indies, only to meet his death so close to home, was surely the most tragic.¹¹⁰ Further playing on sentiments of national pride, Leeghwater asked his readers whether it was not ‘sad, and very lamentable, that one had to see and suffer this great ruin in the midst of our Fatherland, which can be protected through human effort, with God’s help’.¹¹¹ He had little patience for Colevelt’s calls for caution and dismissed the surveyor’s concerns as dull, unimaginative, and conservative. It seemed, he wrote, as if Colevelt needed ‘guarantees for everything’.¹¹²

Leeghwater was fighting a losing battle. In July 1642, the States of Holland again discussed two requests for the lake’s drainage.¹¹³ Again, Leiden and Haarlem blocked the proposals, though the States did try to find a way around their objections. The first time the matter was raised, on 2 July, the States decided that the request would be read outside of the meeting, because it should be considered even in light of the two towns’ opposition, and a decision should be made ‘to best serve the Land’.¹¹⁴ In the next meeting, on 11 July, Leiden once more claimed that it was widely known that the city had ‘peaceful possession’ of the lake. Haarlem again contested this, but the cities

¹⁰⁸ *Ibid.*, 26.

¹⁰⁹ Leeghwater, *Haarlemmermeerboeck*, 4th edn (Amsterdam, 1643), art. 16.

¹¹⁰ *Ibid.*, arts. 16–23, esp. 22.

¹¹¹ *Ibid.*, art. 17.

¹¹² *Ibid.*, art. 166.

¹¹³ *Resolutien van de Heeren Staten van Hollandt ende Westvrieslandt*, xxxvi, 1641–1643, 546 and 563–4.

¹¹⁴ *Ibid.*, 546.

found common ground in the argument that the proposed *bedykinge* would plunge them into ‘ruin and decay’. The States then asked both cities to commit their arguments to paper, so that they might be sent on to the Chamber of Accounts for advice, after which a decision could be made. The representatives from Leiden and Haarlem objected ‘sharply and in all seriousness’. They might have agreed to sending out papers for advice, but had been tasked by their city councils with not allowing any kind of resolution to be reached. Leiden, finally, threatened that it would be ‘incapable of supporting any taxes’ should the States decide to pursue drainage. This settled the matter, and although discussions of drainage flared up again in the 1660s, no action would be undertaken until the nineteenth century.¹¹⁵

VI

CONCLUSION

This was not a decisive victory for conservation-based approaches and environmental expertise in the Dutch Republic. Environmental issues are, of course, deeply entangled with political, economic and social concerns, and remain divisive to this day: even if all parties agree that ‘a society must not undermine the ecological underpinnings on which it is dependent’, they rarely agree on how this is best achieved.¹¹⁶ The case of the Haarlemmermeer demonstrates how the entanglement between environmental, economic and political issues created division and dissent from the very start of sustainability debates, as nascent ideas about the value of natural resources for long-term stability developed into starkly different views on the best course of action, and both sides accused the other of ecological mismanagement by wasting valuable resources. And, even as authorities within the Dutch Republic came to rely on experts on a much more regular basis in the decades after the last proposal to drain the Haarlemmermeer was shelved in 1642, this did not lead to a coherent environmental strategy.

¹¹⁵ Fockema Andreae, *Het Hoogheemraadschap van Rijnland*, 204, 277–80; E. Taverne, ‘Het Betwiste Landschap van de Haarlemmermeer’, *BMGN — Low Countries Historical Review*, cxxi, no. 4 (2006).

¹¹⁶ Quotation from Warde, *Invention of Sustainability*, 5.

In contrast to Venice and Spain, where strong forest bureaucracies developed to conserve the natural resources on which the state depended, the highly decentralized Dutch Republic saw a much more divided landscape. Towns, regional water boards and provincial authorities continued to negotiate and compete for power and resources. Even when the Republic saw a slow but decisive move towards provincialized river management in the eighteenth century and experts clearly formulated solutions to shared problems, disagreement over the best way to share the costs involved in dike or river management abounded and often led to long delays in the construction or upkeep of important infrastructure.¹¹⁷

This perhaps sounds familiar. While referral to experts is by now standard, their input is also easily laid aside by policy makers, used to circumvent more open discussions about values and the social and political impact of policy decisions, or simply employed to prop up entrenched positions.¹¹⁸ The debate over the Haarlemmermeer's fate might also be framed in such terms: both sides, after all, enlisted experts to make their case and to refute claims put forward by the other party. But while it is important to recognize that expertise can be used to reify (state) power and depoliticize issues, this case has shown how, within a context of contention in which regulation limited the possibilities for conflicts to escalate but did little to take away the grounds for dissent, regular reliance on experts became a way to have a necessary discussion on the need and desirability of intervening in nature on a conceptual level. This debate revealed conflicting views on the potential benefits and results of drainage, the level of risk that was acceptable in the pursuit of uncertain future profits, and who should bear those risks. These fundamental questions have only gained in urgency since Leeghwater and Colevelt debated them. Recovering early modern expert exchanges and dissent helps us avoid seeing experts

¹¹⁷ Adam Sundberg, *Natural Disaster at the Closing of the Dutch Golden Age: Floods, Worms, and Cattle Plague* (Cambridge, 2022), 169, 182.

¹¹⁸ Turnhout, Tuinstra and Halfman (eds.), *Environmental Expertise*; Naomi Oreskes and Erik M. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (London, 2010); Zeynep Pamuk, *Politics and Expertise: How to Use Science in a Democratic Society* (Princeton, 2021).

solely as proponents of intervention in the service of economic growth and reading them either as harbingers of economic growth and rationalizing progress, or, alternatively, as instruments of violence, exploitation and oppression. This not only helps us better understand the contradictions and conflicts that shaped early modern attitudes to the natural world, but also serves as a reminder that referral to experts *can* significantly broaden debates, even if we might formulate different answers — and, hopefully, consult a much wider set of stakeholders in doing so — to the questions at hand.

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