Roundtable: environmental histories of agriculture in early modern Britain and Ireland

by Elly Robson, Eugene Costello *and* John Morgan*

Editor's note

This is the first roundtable to be published in *Agricultural History Review*. The aim of roundtables is to provide an opportunity for discussion and reflection among scholars on significant issues in the field of rural and agricultural history. Roundtables are peer-reviewed but are not intended to be comprehensive or equivalent to survey essays. This roundtable arises out of a panel discussion at the BAHS Winter conference of 2022, and thus also provides readers with a sense of current discussions at Society events. The Editor welcomes suggestions for further roundtables.

Abstract

In this roundtable, three early-career historians discuss relationships between early modern agricultural and environmental history in Britain and Ireland. The discussion focuses on how the growing field of environmental history can both contribute to and ask new questions of agricultural history, particularly through an attention to each subdiscipline's history, sources, methods and key debates. Britain and Ireland provide the geographical focus due to their rich traditions of early modern agricultural history, which contrast with the relatively recent development of early modern environmental histories of the region. The contributors bring their varied disciplinary training in environmental, social and intellectual history and archaeology to bear on questions that trace and blur the boundaries of environmental and agricultural history and offer fresh perspectives on their future intersections.

The field of environmental history has grown significantly in the last fifty years, as escalating environmental concerns have prompted scholars to look for historical precedents, trajectories, and occasionally solutions for the interrelated problems of biodiversity loss, climate change, and health security. Within this movement, significant themes in early modern history have been considered anew. We have environmental histories on the colonization of the Americas, the energy demands of industrializing economies, and the health and sanitation of growing urban centres. But despite pressing contemporary concerns about the role of industrialized

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agriculture in land systems change and soil exhaustion, explicitly environmental histories of early modern agriculture are thin on the ground. Albeit with debate about the timing, extent, and causes of 'revolutions' in productivity, there is little doubt about the *economic* significance of the changes in agriculture that took place across early modern Europe and their contributions to the development of commercialization and capitalism. It was also the primary way that early modern people remade their immediate surroundings, created food, energy, and motion, related to animals, defined the wild and weedy, and experienced changes in weather.[1]

Taking these contrasts and absences as our starting point, this discussion – begun as a roundtable at the British Agricultural History Society's Winter Conference in 2022 – explores what it means to think environmentally about agriculture in early modern Britain and Ireland. Often, the environment appears as what lies beyond the boundaries of the farm, while agriculture demarcates the realm of the human: a domestication and commodification of nature where soil is a resource, animals become stock, and plants are crops. And yet, agriculture sits at the very juncture between nature and culture from which the environment emerges as 'a human product, an alloy of nature, and the impacts of human labour', and therefore as a product (and subject) of history.[2] Historically and historiographically, definitions of agriculture have been similarly unstable. In some parts of the world, 'agriculture' refers only to arable farming, with the keeping of cows, sheep and goats considered a separate practice called 'pastoralism'. Since there is rarely a sharp division in north-west Europe, we use 'agriculture' here to refer to both arable and animal farming. Indeed, more expansive parameters might include forestry, aquaculture, and horticulture. In early modern England, agricultural reformers prized and promoted the cultivation of crops, but their husbandry extended to new techniques for keeping bees, catching birds, and harnessing water. Here too, we seek to think beyond 'the land', working at the fertile edgeland between agricultural and environmental fields.

The focus on early modern Britain and Ireland in part reflects our respective research specialisms but there are also important historiographic reasons to examine this part of north-west Europe. Scotland, thought to contain 'most of the wild land in Britain', developed an early strand of environmental history with a distinctive conservationist impulse.[3] By contrast, as Sverker Sörlin and Paul Warde have noted, the field of environmental history has been slower to develop in England and Wales. Themes of 'man' versus 'wilderness', of colonization and indigeneity, that animated much early environmental history in North America were not easily transposed to England's palimpsest agricultural landscapes, where historical geography had already 'conquered the ground to which environmental history might later

[1] For readers unfamiliar with environmental history, helpful introductions to the field in general and topics germane to agricultural history in particular can be found in A. C. Isenberg, 'Introduction: a new environmental history', in A. C. Isenberg (ed.), *The Oxford handbook of environmental history* (2014), pp. 1–20; J. Emrys Morgan, 'Environmental history', in S. Handley, R. McWilliam and L. Noakes (eds), *New directions in social and cultural history* (2018), pp. 213–31; H. Ritvo, 'Animal planet', *Environmental Hist.* 9 (2004), pp. 204–20; V. Winiwarter, 'Environmental history of soils', M. Agnoletti and S. Neri Serneri (eds), *The basic environmental history* (2014), pp. 79–119.

[2] S. Sörlin and P. Warde (eds), *Nature's end: history and the environment* (2009), p. 3.

[3] C. Smout, *Nature contested: environmental history in Scotland and northern England since 1600* (2000), p. 9.

aspire'.[4] In Ireland, meanwhile, the study of farming practices and landscape change has not attracted the same attention as political, cultural, and religious questions.

There is no unified story to be told about these agricultural environments in early modern times. While the English (and later British) conquest and colonization of Ireland drew the two islands closer together, rural dwellers in each place had markedly different experiences and scholars have often situated 'plantations' of Ireland in closer relation to North American colonies than English parishes. At the same time, Ireland and Britain are both part of a wider European story. The geographic boundaries of the discussion that follows are consequently porous and we draw lessons from research on early modern agriculture in France, the Low Countries and Scandinavia. As an approach, the environmental encourages broad international perspectives as well as highly localized, place-specific ones: events like the 1783 Laki Fissure volcanic eruption had far-reaching consequences for agriculture across Afro-Eurasia, yet, as Verena Winiwarter reminds us, the history of soil on which all farming depends is local, taking place at the scale of the earthworm.[5]

We are three early- to mid-career historians, whose work addresses environmental histories of agriculture from different methodological and conceptual positions. Eugene Costello is a lecturer at University College Cork, with an interest in farming practices and environmental change in late medieval and early modern Europe. John Morgan is a lecturer in Geography at the University of Bristol, working on the social and environmental histories of early modern England. Elly Robson is a lecturer at Birkbeck, University of London and is currently completing her first monograph, provisionally titled *Violent Waters: The Politics of Wetland Improvement in Early Modern England*. Rather than seeking to comprehensively survey existing scholarship, we offer some provisional answers to questions that bring agricultural and environmental histories into dialogue, in the hope that it will provoke further conversation, thinking, and research.

What environmental questions or concepts animate your own work on the history of early modern agriculture?

John Morgan: I work on early modern flooding, which necessarily takes me outside of agricultural history, particularly when trying to think about flooding in broad terms. I try to proceed from a more or less agnostic perspective when it comes to flooding itself. In practice, this means something perhaps anathema to some agriculturalists and agricultural historians: not taking floods to be harmful or unwanted. It can lead me to a broad, almost childish definition of a flood – the process by which something gets wet. But by thinking in these terms, I can begin to understand flooding as something not framed by the concerns of cultivation from the outset.[6]

[4] S. Sörlin and P. Warde, 'The problem of the problem of environmental history: a re-reading of the field', *Environmental Hist.* 12 (2007), pp. 107–30.

[5] A. Mikhail, 'Ottoman Iceland: a climate history', *EH* 20 (2015), pp. 262–84; V. Winiwarter, 'Environmental history of soils', in Agnoletti and Neri Serneri (eds), pp. 79–119; V. Winiwarter, 'The view from below: on energy in soils (and food)', *RCC Perspectives* 2 (2013), pp. 43–8.

[6] J. Emrys Morgan, 'Flooding in early modern England: cultures of coping in Gloucestershire and Lincolnshire', (unpublished PhD thesis, University

While these broadest questions go beyond agriculture, they cannot avoid it altogether. To understand flooding, I begin with the question 'how did people live with water?' For early modern England, this question is asked in the context of a predominantly rural society, its agricultural economy, and its largely local political and administrative organization. It is also a question which is asked in the context of the Little Ice Age, the legacies of medieval river engineering, and ongoing local practices of water management. So we cannot escape agriculture, but to understand how people lived with water we need to think about all those things with which agriculture contended, and many other things beside them.

As Eugene explains below, the history of agriculture is grounded in people, places, and practices. That grounded approach informs the conceptual frameworks which help me understand flooding, and which necessarily go beyond the farm gate. Concepts from the physical and social sciences help me stay focussed on the much-more-than-human nature of flooding – concepts like the 'flood pulse' and the 'river continuum' – which, in different ways, encourage me to think about floods as processes, rather than events. From the social sciences, concepts like vulnerability and resilience help me consider the impacts of flooding and flood protection on societies and individuals across different timescales. These concepts provide an opening for a history of flooding that situates floods within broader patterns and processes, only some of which are driven by or affect agriculture.

Elly Robson: My work centres on environments which were identified as ecologically, economically, and culturally marginal by governors and reformers in early modern England; primarily wetlands and woodlands.[7] Of central importance to local communities, their agrarian livelihoods, and political cultures, large and biodiverse forest and fen commons provided collective resources of pasture, wood, peat, fish, and more.[8] State-led projects of 'improvement' in these places have been identified as some of the 'most dramatic' and 'spectacular' examples of the new structures of ownership, farming techniques, and ideas that characterized an early agricultural revolution in seventeenth-century England.[9]

My research places the focus on environmental processes instead of economic outcomes. Rather than taking property and productivity as categories of analysis, I ask how these categories – material and intellectual – were produced by acts of improvement. I also think beyond 'the land' as the primary site of agriculture by exploring the materiality of water, animals, soils, and plants and their interactions each other and with humans. Doing so disrupts the traditional units of agrarian life: the farm, the manor, the village community. Milja van Tielhof, for instance, has argued that coastal defence fostered relationships of 'forced solidarity' for amphibious communities.[10] At a larger scale still, a 'shared history of risk' shaped

Note 6 *continued*
of Warwick, 2015); Morgan, 'Understanding flooding in early modern England', *J. Hist. Geog.* 50 (2015), pp. 37–50; Morgan, 'The micro-politics of water management in early modern England: representation and regulation in early modern commissions of sewers', *Environment and Hist.* 23 (2017), pp. 409–30.

[7] E. Robson, 'Improvement and epistemologies of landscape in seventeenth-century English forest enclosure', *Hist. J.* 60 (2017), pp. 597–632; Robson, 'Improvement and environmental conflict in the northern fens, 1560–1665' (unpublished PhD thesis, University of Cambridge, 2018).

[8] Angus Winchester offers an exploration of these resources over the long term in *Common Land in Britain: a history from the middle ages to the present day* (2022).

[9] E. Kerridge, *The agricultural revolution* (1967), ch. 4.

communities across the North Sea basin, which were characterized by cooperative social and institutional formations to manage the threats posed by storms, sea surges, and coastal erosion.[11]

While concepts such as 'disturbance' or 'resilience' offer tools to unpick dynamics of ecological change, they do not provide flat descriptors of historical realities. As Tim Soens has recently argued, societies are not analogous to ecological systems. Historians are equipped to examine how different interests, social inequalities, power structures, and systems of knowledge shaped distributions of risk, experiences of disruption, and the ability to recover or adapt.[12] My work examines the politics that arose as humans made arguments and choices in response to environmental problems and opportunities; asks how and why particular phenomena were identified as problems or opportunities in the first place; and traces how human negotiation, in turn, constituted environments.

Eugene Costello: I do not think it is possible to study farming practices without giving detailed consideration to the environment in which crops and livestock were managed. But what do I mean by 'environment'? My concern is primarily with the physical environment, and how it was both perceived and manipulated by farmers over time. The term 'landscape', as understood by geographers, archaeologists, and landscape historians, could be used here too.[13] However, I am conscious that academic debates on 'landscape' have run ahead of wider public discourse, in which it is still associated with art and aesthetics; for instance, a 'picturesque landscape'. The term 'environment' has its own issues, but it is broad enough to prevent this confusion and more easily accommodates weather and climate.[14]

The actors that my environmental histories focus on are non-elite farmers and their communities; in other words, the vast majority of society in pre-modern times. I investigate how they managed land and livestock, and then gauge what these practices say about their knowledge of the environment. I first became interested in the question of non-elite environmental knowledge through my research on transhumance in north-west Europe, a form of seasonal mobility by humans and livestock which required a close understanding of land.[15] When evidence from historic maps, oral histories, placenames, written records, pollen data, and archaeological features is combined, we can start to see patterns in how people navigated terrain with their cows, sheep, and goats and also how they identified different niches within uplands for grazing and small-scale crop growing. This intimate, multi-faceted approach produces a grounded view of how farmers in so-called peripheral parts of Europe fared during the Little Ice Age.

[10] M. van Tielhof, 'Forced solidarity: maintenance of coastal defences along the North Sea coast in the early modern period', *E&H* 21 (2015), pp. 319–50.

[11] G. Bankoff, 'The "English lowlands" and the North Sea basin system: a history of shared risk', *E&H* 19 (2013), pp. 3–37.

[12] See T. Soens, 'Resilient societies, vulnerable people: coping with North Sea floods before 1800', *P&P* 241 (2018), pp. 143–77; B. van Bavel *et al.*, *Disasters and history: the vulnerability and resilience of past societies* (2020).

[13] J. Wylie, *Landscape* (2007); B. David and J. Thomas (eds), *Handbook of landscape archaeology* (2008); R. Muir, 'Conceptualising landscape', *Landscapes* 1 (2000), pp. 4–21.

[14] P. Warde, L. Robin and S. Sörlin, *The environment: a history of the idea* (2018).

[15] E. Costello, 'Temporary freedoms? Ethnoarchaeology of female herders at seasonal sites in northern Europe', *World Arch.* 50 (2018), pp. 165–84; E. Costello, *Transhumance and the making of Ireland's uplands* (2020).

My second major focus is the extent to which farmers altered habitats and soils in their localities over multiple generations, especially as meat and dairy production became more market-oriented in late medieval and early modern times. I am currently investigating this issue in two somewhat contrasting countries, Ireland and Sweden, since the question of agrarian commercialization is ultimately an international one. While challenging logistically and methodologically, I believe that comparative case studies hold a lot of potential for environmental historians of early modern farming.[16] Beyond offering a source of analogy, they can help us to evaluate the scale and pace of environmental change and the adaptability of farmers in different socio-political contexts.

What can agricultural historians' detailed research on inequalities, social structures, and labour practices bring to our understanding of environmental change in this period?

Elly Robson: Although work and nature are often posed in opposition to one another in contemporary discourse, it is exactly in the interaction between them that the *environmental* arises. By defining nature as 'the world we have not made', Richard White argued in 1995, environmentalists designated it as a space to be protected from work and conserved for leisure. Yet work is the primary means through which humans have modified environments, in ways that are quotidian, collective, and cumulative: 'it is ultimately our own bodies and our labour that blur the boundaries between the artificial and natural'.[17] In England before 1700, the majority of work was agricultural.[18] Much environmental research in this period, however, has centred on state actors, large processes, or histories of ideas and science. As Paul Warde pointed out in 2009, 'while the *land* has been a perennial concern … interest in *agriculture*, most especially perhaps in Europe, has frequently been rather incidental'.[19]

Agricultural historians have always engaged deeply with the materiality of the natural world and the techniques that early modern people used to make livelihood or profit from it, even when environment and ecology are absent conceptually.[20] In the founding issue of *Rural History* (1990), its editors wrote of how 'regional landscapes, or *pays*, embody different ways of seeing and organizing land and space, but… may also control or restrict the ways in which rural culture and society can develop'.[21] The cornucopia of studies in the multivolume *Agrarian History of England and Wales* – and especially Joan Thirsk's work – contain rich resources for

[16] For recent attempts at internationalising the discussion, see A. Panjek, J. Larsson and L. Mocarelli (eds), *Integrated peasant economy in a comparative perspective: Alps, Scandinavia and beyond* (2017); E. Costello and E. Svensson (eds), *Historical archaeologies of transhumance across Europe* (2018).

[17] R. White, 'Are you an. environmentalist or do you work for a living?' in W. Cronon (ed.), *Uncommon ground: rethinking the human place in nature* (1996), pp. 171–85 at p. 173. See also: S. Barca, 'Laboring the earth: transnational reflections on the environmental history of work', *EH* 19 (2014), pp. 3–27.

[18] P. Wallis, J. Colson, and D. Chilosi, 'Structural change and economic growth in the British economy before the Industrial Revolution, 1500–1800', *J. Econ. Hist.* 78 (2018).

[19] P. Warde, 'The environmental history of pre-industrial agriculture in Europe', in Sörlin and Warde (eds.), *Nature's end*, pp. 70–92 at p. 70.

[20] For instance: D. Woodward, 'Straw, bracken and the Wicklow whale: the exploitation of natural resources in England since 1500', *P&P* 159 (1998), pp. 43–76.

[21] E. Bellamy, K. D. M. Snell, and T. Williamson, 'Rural history: the prospect before us', *Rural Hist.* 1 (1990), pp. 1–4 at p. 3.

environmental histories 'from below', tracing regional economies in ways that also illuminate how communities experienced and enacted change in their immediate environs.

Recent scholarship on agricultural labour, social relations, and knowledge offers tools to tease out the varied ways in which early modern people worked with and upon environments. Craig Muldrew, for instance, has asked what rural labourers ate. Food consumption had implications for workers' energy and productivity, and demand for products like meat unfolded in dialogue with agricultural environments.[22] Meanwhile, James Fisher has recently argued that the production and dissemination of agricultural knowledge in husbandry books was a crucial tool in changing patterns of work, 'enclosing' communal and emplaced knowledge.[23] To this, environmental historians might add questions such as: did expertise about water management develop in the same way as knowledge about soil fertility? My own work examines how disputes over local common rights, customs, and boundaries disclose not only social relations between neighbours, landlords and tenants, or adjacent communities, but also how they related to wood, water, and animals and how these entities became subjects of contention.

Eugene Costello: In many of the areas that I study – hilly and mountainous regions of Ireland, Scotland and elsewhere – there has not been very much *detailed* research into pre-modern inequalities and labour practices, be it in agricultural history or related fields.[24] Without doubt, there has been some fundamental research on socio-political change across this Gaelic-speaking world between the fifteenth and mid-eighteenth centuries. For example, historians and geographers have noted the evolving kinds of rents and dues collected by Gaelic lords and the transformation of their clients and followers into 'tenants' with whom they had a more financial relationship.[25] Less attention has been paid to the everyday lives of these clients and tenants, however, so there is much we still do not know about local farming practices and how they may have contributed to environmental change in different parts of early modern Ireland and Scotland.

Day-to-day work practices cannot be overlooked: as Elly reminds us, they were ultimately what brought farmers into contact with soil, vegetation, and animals. Indeed, since agricultural tasks are quite diverse, they can provide an insight into how communities viewed and interacted with *different parts* of the rural environment. For example, there is now a recognition in labour history that unpaid work by women and children has been greatly underestimated as a component of the early modern economy.[26] Their work was not limited to the domestic sphere

[22] C. Muldrew, *Food, energy and the creation of industriousness: work and material culture in agrarian England, 1550–1780* (2011), ch. 1.

[23] J. D. Fisher, *The enclosure of knowledge: books, power and agrarian capitalism in Britain, 1660–1800* (2022).

[24] One exception, in northern England and southern Scotland is Angus Winchester, *The harvest of the hills: rural life in northern England and the Scottish Borders, 1400–1700* (2000).

[25] N. Canny, 'Hugh O'Neill, Earl of Tyrone, and the changing face of Gaelic Ulster', *Studia Hibernica* 10 (1970), pp. 7–35; R. Dodgshon, *From chiefs to landlords: social and economic change in the western Highlands and Islands, c.1493–1820* (1998); W. Smyth, *Map-making, landscapes and memory: a geography of colonial and early modern Ireland, c.1530–1750* (2006), pp. 4–5, p. 127; C. Dalglish, *Rural society in the Age of Reason: an archaeology of the emergence of modern life in the southern Scottish Highlands* (2006).

[26] M. Ågren (ed.), *Making a living, making a difference: gender and work in early modern European society* (2017); J. Whittle, 'A critique of approaches to 'domestic work': women, work and the pre-industrial economy', *P&P* 243 (2019), pp. 35–70.

either. In many areas of north-west Europe, women and children played an important role herding dairy animals in uplands and forests several kilometres away from their farmsteads.[27] These summer pastures were viewed by the community as liminal spaces where unmarried young people often experienced a degree of freedom (and danger) in summertime. They were also places that required specific skills of navigation and husbandry, many of which never made it into the canon of 'improved' agricultural science that developed in the eighteenth and nineteenth centuries. Paying attention to all members of the household can therefore take us into realms of environmental knowledge that are now largely lost. While we can never fully revive this knowledge, we can start to get a sense of it from placenames, oral histories, travellers' accounts, and archaeological survey.

Social *stratification* remains highly relevant, especially in debates about *why* environmental change occurred. As demands for meat and dairy rose in Europe's cities and across the Atlantic, livestock rearing intensified in many places and resulted in significant changes to flora and fauna. Non-elite tenants and herders were deeply involved in this process, but how much agency should we ascribe to them if their decisions were being influenced by the amount of rent they had to pay to landlords and the taxes and tolls imposed by government? Traditional thinking would have us believe that non-elite farmers could do no more than *respond* to conditions set by others, be they elite policies or market prices.[28] But the nature of early modern tenure and governance is so varied, and the gaps in our knowledge so many, that detailed research into regional socio-political structures is essential to fully untangle the causation behind environmental change.

John Morgan: In the predominantly rural societies of early modern Britain and Ireland, there is scope for agricultural historians to explore how the inequalities studied by social and economic historians were registered environmentally. Early modern commentators were keen to stress the self-sustaining relationship between unimproved landscapes, poor inhabitants, and their inability or unwillingness to make improvements.[29] But recent research in environmental history has shifted focus to how inequalities came to be embedded within landscapes and environments. For example, Tim Soens has shown that social inequalities created conditions for disastrous sea-flooding in the early modern North Sea region, including parts of the south-east coast of England. Poorer tenant farmers were more exposed to storm surges due to inequalities in access to flood protection.[30]

This dynamic of inequality rendering people and places vulnerable is not replicated everywhere. Processes that perpetuate inequality in the landscape can lead to unexpected environmental outcomes. Histories of enclosure present a complex picture of the environmental

[27] See, for example: J. Larsson, 'Labor division in an upland economy: workforce in a seventeenth-century transhumance system', *Hist. of the Family* 19 (2014), pp. 393–410; Costello, 'Temporary freedoms?'.

[28] For examples, see D. Dickson, *Old world colony: Cork and South Munster, 1630–1830* (2005), p. 147; N. Hanley *et al.*, 'Economic determinants of biodiversity change over a 400-year period in the Scottish uplands', *J. Applied Ecology* 45 (2008), pp. 1557–65; P. Roebuck, *Cattle droving: Scotland and Ireland through Cumbria to the south* (2022), *im passim*.

[29] For a discussion of poverty and environments, see J. Emrys Morgan, 'Poverty and environment in early modern England', in D. Hitchcock and J. McClure (eds), *The Routledge history of poverty, c. 1450–1800* (2021), pp. 79–99.

[30] A recent example is Soens, 'Resilient societies'.

impacts of the privatisation of common land.[31] In certain ecologies, the biodiversity of flora declined as enclosing technologies like drains and ditches altered soil composition and water quality; this comes through clearly in Aneurin Merrill-Glover's recent research exploring the effects of drainage and enclosure on acidophilic plants on Chat Moss in Lancashire.[32] In late eighteenth and early nineteenth-century South Cambridgeshire, enclosure and ploughing of heathland destroyed habitat for ground-nesting birds such as curlews and the transformation of meadows removed habitat for wildflowers, but cover crops and hedgerows supported proliferating wood pigeon and sparrows.[33] Tom Williamson has also pointed to the more ecologically-equivocal impact of enclosure, suggesting that hedgerow planting and restrictions on common rights of 'estovers' may have nurtured ecological niches for birds and fungi in particular.[34] In this research, agricultural history's concern with local social structures and inequalities can help us understand the environmental change that came with changes in labour and landscape, in nuanced and potentially unexpected ways.

Does integrating 'nature' as an actor within human histories require different sources or methods to those conventionally used by agricultural historians?

John Morgan: Agricultural historians are omnivorous when it comes to sources, particularly when thinking across the *longue durée*. Agricultural history, as a subject rather than a sub-discipline, has been methodologically diverse and wide ranging in its adoption of sources and techniques from adjacent disciplines. As reviews editor of the *Agricultural History Review*, I encounter work discussing agricultural history that proceeds from archaeology, literary studies, anthropology, ecology, and more. In this sense, historians working on agriculture are already exposed to a wide range of techniques and I'm not certain an environmental historian could show them something new under the sun.

However, no source or technique reveals a history on its own, and it is how we use and interpret these sources that might differentiate agricultural and environmental history. While both might already be thinking in terms of nature and ways to get at it with varied sources and techniques, both the 'nature' of that nature and its centrality to the stories we seek to tell diverge. Here, Paul Warde's concept of 'environing' is useful – the idea that defining an environment involves defining a meaningful set of boundaries within which people might have influence.[35] Environing, as a process, requires us to consider what our historical subjects understood as the limits of their influence on the natural world, and how they defined, accounted for, and valued what was beyond those limits. An older form of 'cows and ploughs' agricultural history can be seen as an attempt to write history within the confines of these boundaries, to understand how people arranged a world they defined as arrangeable, while sometimes dealing with things that interjected, like

[31] See, for example, Maïka De Keyzer and Mark D. Bateman, 'Late Holocene landscape instability in the Breckland (England) drift sands', *Geomorphology* 323 (2018), pp. 123–34.

[32] A. K. Merrill-Glover, 'Mosslands in early modern Lancashire: carbon, community, and conservation (1650–1850)' (unpublished PhD thesis, University of Manchester, 2023).

[33] S. Wittering, *Ecology and enclosure: the effect of enclosure on society, farming and the environment in South Cambridgeshire, 1798–1859* (2013), pp. 123–55.

[34] T. Williamson, 'How natural is natural? Historical perspectives on wildlife and the environment in Britain', *Trans. Royal Hist. Soc.* 29 (2019).

[35] Warde, 'Pre-industrial agriculture'.

climate or prices. An environmental historian using 'environing' as a lens through which to look at agriculture might take a different approach, thinking more in terms of the drawing and redrawing of these boundaries, and the constant (re-)production of nature and environment.

So while agricultural history is written from a source base as broad and diverse as that of environmental history, the key difference is in how those sources are employed. An environmental history approach to the history of agriculture might then use the same sources to not only understand historical environments, but also how those same environments have been defined, reproduced, and contested in the practice of farming, being guided less by a view of agriculture as primarily a process of production and more by how it arranged and defined nature.

Eugene Costello: Having been trained in archaeology as well as history, I believe that a variety of sources and methods always needs to be used in the study of the past. As John rightly points out, no one source reveals everything. It is fair to say, though, that agricultural historians have mainly relied on written evidence. There are good reasons for this. For one thing, documentary sources have very fine chronological resolution; letters, annals, land surveys, rentals, customs records, and maps have dates that are generally accurate to the year, if not the day. When available, they can be excellent for tracing the impact of relatively sudden events on agrarian production, such as war, extreme weather events, and the arrival of animal disease. Diaries can also be an invaluable source of information on how people viewed these events.[36] As we know, however, only a small minority of society could write in early modern times, and in many places this minority did not even understand the language that most farmers spoke, namely, Irish in Ireland, Scottish Gaelic in much of Scotland, and Welsh in Wales. So by definition the actions and ideas of non-elite farmers are under-represented, and sometimes entirely missing, from the documentary record.

Archaeology will not be completely new to agricultural historians, but more active engagement with its methods is needed to get at the daily lives of the non-elite majority and their interactions with the physical environment. In addition to excavating, it is possible to undertake fieldwalking, geophysics, and remote sensing to prospect for and map out the physical remains of past farming activity. These methods help to identify where exactly non-elite farmers lived, what they consumed and produced, and how they ordered social space around them over time, e.g., through commons, enclosures and living space within settlements. However, it can be very difficult – if not impossible – to obtain annually-resolved dates for archaeological features.[37] Excavated finds like ceramics can help to refine chronologies and, if present, timbers and volcanic ash layers may provide single-year dates for certain features within a building or site. Otherwise, the dating relies on radiocarbon or optically-stimulated luminescence dating, which only provide dates that are accurate to a few decades at best and usually only one or two centuries.[38] As a result, archaeological research on human-environment interactions speaks more to *processes* than events. Meanwhile, ice cores, speleothems, and tree rings offer valuable proxies of temperature

[36] See S. White, C. Pfister, F. Mauelshagen (eds), *The Palgrave handbook of climate history* (2018), chs 5 and 6.

[37] For a discussion on the chronological resolution of sources, see Costello *et al*., 'Adapting to the Little Ice Age in pastoral regions: an interdisciplinary approach to climate history in north-west Europe', *Hist. Methods* 56 (2023), pp. 77–96.

[38] C. Renfrew and P. Bahn, *Archaeology: theories, methods and practice, eighth edition* (2020), see ch. 8.

and precipitation during the late medieval and early modern periods, before instrumental data becomes available.[39] Yet these proxies are mute when it comes to the adaptability of farmers.

A mixture of sources and methods is therefore essential if we are to get a balanced view of the factors influencing farming practices over time. In north-west Europe, Scotland has already seen some good examples of this, including a *longue durée* study of settlement and land use in Lochtayside, led by archaeologists but involving historians, geoarchaeologists, and palynologists,[40] and Robert Dodgshon's long-term history of Gàidhealtachd communities and their economy, which considered the results of archaeological fieldwork and soil survey as well as documentary records.[41] In climate history, the combination of humanities and natural science methods has been described as the 'consilient' approach.[42] Such mixed-method approaches could do with more explicit discussion in early modern agricultural history, given how valuable archaeological and palaeo-environmental evidence can be.[43]

Elly Robson: Agricultural and environmental histories, and their many interlocutors, form a Venn diagram of approaches, sources, and questions. Those interested in economic and environmental change over the *longue durée* may share more of a common language and method than a historian of the Little Ice Age and one interested in political ideas about animal rights. Yet, as John highlights, centring 'nature' changes the nature of the questions asked. To take one example, how have historians located the significance of cattle and sheep within early modern agriculture? Traditionally, the number and types of livestock owned by different households – discoverable in inventories and wills – has been used as a measure of agrarian change, occupational structures, wealth, and social inequalities.[44] Counting cows (and other animals) can also suggest how, and to what extent, commons functioned as a collective resource within rural communities.

By contrast, environmental historians (broadly defined) have suggested that animals can be approached not just as indicators, but also as instruments and agents of social, economic, and environmental change. Briony McDonagh and Virginia DeJohn Anderson have argued that the mobility of livestock made them crucial actors in 'making and breaking' property in English commons and at American frontiers.[45] Asking why English cattle became targets of

[39] Some historians have already used these, see S. White, J. Brooke and C. Pfister, 'Climate, weather, agriculture, and food', in White, Pfister and Mauelshagen (eds), *Climate history*, pp. 331–53; H. Huhtamaa, 'Combining written and tree-ring evidence to trace past food crises: a case study from Finland', in D. Collet and M. Schuh (eds), *Famines during the 'Little Ice Age' (1300–1800)* (2018), pp. 43–66; Costello *et al.*, 'Adapting'.

[40] J. Atkinson (ed.), 'Ben Lawers: an archaeological landscape in time', Scottish archaeological internet reports 62 (2016).

[41] R. A. Dodgshon, *No stone unturned: a history of farming, landscape and environment in the Scottish Highlands and Islands* (2015).

[42] M. McCormick, 'History's changing climate: climate science, genomics, and the emerging consilient approach to interdisciplinary history', *J. Interdisciplinary Hist.* 42 (2011), pp. 251–73.

[43] Initial discussions about 'source pluralism' have taken place in Swedish agrarian history: J. Myrdal, 'Source pluralism as a method of historical research', S. Fellman and M. Rahikainen (eds), *Historical knowledge: in quest of theory, method and evidence* (2012), pp. 155–89. For more on interdisciplinarity, see pp. 154–6.

[44] For example: M. Overton *et al.*, *Production and consumption in English households, 1600–1750* (2012), pp. 41–7.

[45] B. McDonagh, 'Making and breaking property: negotiating enclosure and common rights in sixteenth-century England', *HWJ* 76 (2013), pp. 32–56; V. DeJohn Anderson, *Creatures of empire: how domestic animals transformed early America* (2004).

ritual violence during the Irish Rebellion in 1641, meanwhile, Keith Pluymers has examined how they culturally and economically produced plantation. Animals, and struggles over their regulation, generated social and ecological relationships.[46] Livestock often acted in unanticipated ways – European pigs and goats proliferated on Caribbean islands, for instance – and made habitats, as when deer kept for royal hunting destroyed young trees and crops.[47] Property and pests formed two sides of the same fence, and which was which was often a matter of dispute amongst early modern people.

In these studies, animals are not confined to the farm and its archives of accounting, but wander through legal testimony, local courts, colonial correspondence, and reports of riot. Yet, as Erica Fudge has shown, wills and inventories can be read anew to examine *how* livestock were categorized as property and to centre the meanings of humans' everyday relationships with farm animals.[48] Environmental approaches locate the material world – weather, disease, animals etc. – at the heart of humans' productive practices, social relations, and cultural perceptions, rather than as proxies or factors.

Which other related disciplines or historiographical lineages – for instance, historical geography, landscape history, or archaeology – overlap with and inform environmental histories of agriculture in Britain and in Ireland? How can these disciplines fruitfully engage with one another today, and are there obstacles to doing so?

John Morgan: Agricultural history, historical geography, and environmental history have interesting histories which can go some way to explaining where we are today, particularly when compared and related to the story in North America.

The ground environmental history might have occupied in its formative years in the 1970s and 1980s was, in the UK, already claimed by landscape history and climate history. As Matthew Johnson has argued, landscape history was a subject motivated by a sense of loss in the mid-twentieth century, particularly the loss of rural landscapes and agriculturally-oriented villages in post-war reconstruction, the development of the new towns and suburbs, and the increasing capitalization and industrialization of agriculture.[49] This, as Johnson shows, was an approach to history that required affinity with particular places, often involving walking landscapes which were being lost during the course of research. This approach to rural and landscape history, exemplified by the likes of W. G. Hoskins and Maurice Beresford, crystallized as a particular form of 'local' history, given an institutional home at the University of Leicester. Here, it proceeded to engage with developments in economic and social history, as well as debates in geography around regions and scales.

Climate history was conducted primarily under the direction of scientists, notably Hubert Lamb and the Climatic Research Unit at the University of East Anglia from the 1970s. Focused on evidencing a changing climate, it was an endeavour which used historical documents and

[46] K. Pluymers, 'Cow trials, climate change, and the causes of violence', *EH* 25 (2020), pp. 287–309.

[47] P. J. Morgan *et al.*, *Sea and land: an environmental history of the Caribbean* (2022), p. 91; K. Pluymers, *No wood, no kingdom: political ecology in the English Atlantic* (2021), pp. 30–1, pp. 204–5.

[48] E. Fudge, *Quick cattle and dying wishes: people and their animals in early modern England* (2018).

[49] M. Johnson, *Ideas of landscape* (2007), p. 40.

methods to make data for the physical sciences. A similar project was underway in France at the same time, but there led by the *Annales* school and, in particular, Emmanuel Le Roy Ladurie. Whereas Lamb's motivations sprang largely from within the sciences, Ladurie's were both scientific (to produce data from which to reconstruct historic climate) and historical (to debunk overdrawn, deterministic long-term historical accounts of relationships between people and their environments).[50] Subsequent development of new techniques for climate reconstruction rendered historical documents less crucial as data sources.

Alongside landscape and climate history, a distinct form of 'ecological history' emerged in the 1970s, with strong links to agricultural history. This ecological history offers another potential lineage for environmental history in the UK, with the BAHS at its head. The Society's 1970 Winter Conference on 'Agriculture and the History of the Environment', featured papers on wildlife, agricultural pests, and the ecological consequences of their control. Research in this vein approached ecology from various perspectives; for example, the historical record was used to evidence the prevalence and decline of different species; ecological concerns over a wide range of issues, such as drainage and pesticides, were historicized and grounded in an understanding of the preceding century; while research that reached back into the early modern period sought to interpret human demography as a response to ecological drivers such as food availability.[51]

These intellectual traditions each offer something to environmental histories of agriculture today. However, there needs to be something of a retooling, rather than a rebranding of existing traditions. Some of that work looks dated when viewed from the perspective of debates in American-oriented environmental scholarship for the last thirty years or so. Take Victor Skipp's 'ecological case study of the Forest of Arden', which attributed fluctuations in fertility and mortality to Tudor deviations from a supposed steady-state of 'ecological equilibrium', characterized by the balanced use of forest resources. The critical interrogation of concepts like the 'steady state' of equilibrium renders much of this kind of research problematic, while the theories underpinning it have been superseded by more systematic models of 'socio-ecological' sites and systems developed by scholars in Europe.[52] So while there are strong affinities between environmental history and scholarship which covered much of the same ground in the UK over the last 70 years, the terms of reference and underlying assumptions can be quite different. Environmental historians might end up looking at very similar contexts and materials, but from different perspectives.

Eugene Costello: Many disciplines and sub-disciplines have dealt in some way with the 'environmental history of agriculture'. Besides agricultural history, I have encountered relevant work in agrarian history, economic history, landscape history, historical geography, rural

[50] E. Le Roy Ladurie, *Times of feast, times of famine: a history of climate since the year 1000*, trans., B. Bray (1971), pp. 10–12.

[51] E. Jones, 'The bird pests of British agriculture in recent centuries', *AgHR* 20, 2 (1972); J. Sheail, *Nature in trust: the history of nature conservation in Britain* (1976); V. Skipp, *Crisis and development: an ecological case study of the Forest of Arden* (1978).

[52] See, for example: D. Demeritt, 'Ecology, objectivity and critique in writings on nature and human societies', *JHG* 20 (1994), pp. 22–37; S. J. Singh *et al.* (eds), *Long term socio-ecological research: studies in society-nature interactions across spatial and temporal scales* (2013).

history, environmental history, landscape archaeology, post-medieval/historical archaeology, zooarchaeology, historical ecology, climate history, and palaeo-environmental science. Each of these has their own traditions, conferences, journals, and audiences. While historical geography and landscape history have been strong in Britain, they have not been as popular in countries like Ireland. Detailed written records of land use prior to 1650 have not survived very well here, and so early modernists have tended to be more interested in Ireland's political and religious history (mainly using sources in English and Latin) and literature (mainly sources in Irish).[53] That said, an explicit discourse in environmental history has now started, and is beginning to consider agriculture in early modern times.[54] Meanwhile, countries like Sweden have a long tradition of research in *agrarian* history, which is slightly broader than agricultural history.[55] Since agrarian history's methodologies often draw from economic history, however, environmental issues do not receive detailed consideration. Two disciplines that are inherently *more* connected to the physical environment are landscape archaeology and palaeo-ecology, and these are particularly useful in rural areas that lack detailed written sources and maps. However, the focus of such work has traditionally been on prehistoric and medieval farmer-environment interactions, and there has not been enough interaction between these scholars and historians.[56]

An environmental history framing can make it easier to bring humanities and natural science approaches together and also draw public attention to the origins of humanity's environmental footprint. For example, recent book-length studies of the late medieval crisis and the impact of the Little Ice Age have started to integrate historical evidence with biological and climatic data and have reached wide audiences thanks to their ambitious scope.[57] At the same time, environmental historians should be careful not to prioritize the synthetic 'grand narrative' style. For agriculture, this bird's eye view cannot be ideal. Having grown up on a farm, I see agriculture as an inherently local and grounded practice: the more removed from the physical landscape our perspectives are, the more likely we are to underestimate the agency of local farmers in historical change. To give them a voice, environmental histories need to pay just as much attention to local conditions as to global processes. The key to achieving this balance, at least for the early modern period, is to undertake case studies which involve archaeological and palaeo-ecological fieldwork as well as archival research. If this kind of approach is to work, environmental history needs to see itself as a broad church which invites

[53] S. Covington, V. Carey and V. McGowan-Doyle, 'Introduction: the past, present, and future of early modern Ireland', in S. Covington, V. McGowan-Doyle and V. Carey (eds), *Early modern Ireland: new sources, methods, and perspectives* (2018), pp. 3–4.

[54] F. Ludlow and A. Crampsie, 'Environmental history of Ireland, 1550–1730', in J. H. Ohlmeyer (ed.), *The Cambridge history of Ireland, Vol II, 1550–1730* (2018), pp. 980–1027; E. Costello, 'Agriculture and the integration of British colonial migrants in early modern Ireland', *J. Migration Hist.* 8 (2022), pp. 291–312; Costello *et al.*, 'Adapting to the Little Ice Age', pp. 77–96.

[55] For a helpful illustration of the relationships and overlaps between agrarian history and other disciplines, see J. Myrdal, 'Agrarhistoria på många sätt. En inledning, in B. Liljewall *et al.*, (eds), *Agrarhistoria på många sätt: 28 studier om människan och jorden. Festskrift till Janken Myrdal på hans 60–årsdag* (2009), pp. 9–15, see figs. 1, 2.

[56] See T. Darvill, 'Pathways to a panoramic past: a brief history of landscape archaeology in Europe', in David and Thomas (eds), *Landscape archaeology*, pp. 60–76.

[57] For instance: G. Parker, *Global crisis: war, climate change, and catastrophe in the seventeenth century* (2013); B. Campbell, *The great transition: climate, disease and society in the late-medieval world* (2016).

(and accepts) people from different disciplinary backgrounds and fosters an open-mindedness about source material in students.

Elly Robson: To take my own area of research as an example, twentieth-century scholarship about the fens was broadly divided into work concerned with structural determinants of material change and studies which examined political conflict triggered by drainage projects. The first strand was undoubtedly ecological in its preoccupations. Ambitious geological timescales were charted by landscape archaeologists and palaeo-ecologists investigating how fluctuations in sea levels, climatic temperatures, and weather patterns shaped human settlement in wetlands and how wetlands were, in turn, modified by agriculture and infrastructure.[58] Historical geographers like H. C. Darby were similarly interested in dynamic reciprocities between topography, technology, and agrarian change, forming part of a continuous struggle to subdue floods and render the fens productive.[59] In such accounts, the landscape itself emerged as the protagonist. These perspectives were bifurcated, however, from a strand of fen history that took shape in the 1980s, centring human agency by analysing drainage riots in the context of rapidly-unfolding national conflict in the seventeenth century.[60]

Environmental approaches offer (plural) methods for investigating how material change interacted with the political and cultural activities of human societies. In doing so, we must wrestle with the different temporalities and geographies which characterize human and ecological events, without collapsing the complexity and contingency of their interactions. Global climate fluctuations during the Little Ice Age are visible in retrospect over the *longue durée*. And yet, English drainage schemes, and their corollaries across Europe, were not simply responses to bad weather and flood. They were proactive as much as reactive: perceptions of detrimental flooding and efforts to tame 'violent waters' formed part of an expansion of political authority and productive terrain by early modern states. Hydraulic ventures were given momentum by new ideas about agricultural improvement and high land and grain prices, as well as very short-term factors, such as the English crown's struggles with Parliament over taxation and efforts to find alternative sources of revenue. Resulting conflict over property rights and water management became embedded in the legal and political questions that propelled civil war, while also being profoundly environmental in its origins and impact. Dipesh Chakrabarty has recently argued that integrating geological earth-time with concepts of human historical time represents a new methodological challenge of the Anthropocene. This problem is also fundamental to the discipline of environmental history, particularly when analysing earlier periods of accelerated, anthropogenic environmental change.[61]

[58] R. Van de Noort and P. Davies, *Wetland heritage: an archaeological assessment of the Humber Wetlands* (1993); I. D. Rotherham and K. Harrison, 'History and ecology in the reconstruction of the South Yorkshire fens: past, present and future', in B. R. Davies and S. Thompson (eds), *Water and the landscape: the landscape ecology of freshwater ecosystems* (2006), pp. 8–16.

[59] H. C. Darby, *The draining of the fens,* 2nd edn (1956); Darby, *The medieval fenland*, 2nd edn (1974); Darby, *The changing fenland* (1983).

[60] K. Lindley, *Fenland riots and the English revolution* (1982); C. Holmes, 'Drainers and fenmen: the problem of popular political consciousness in the seventeenth century', in A. Fletcher and J. Stevenson (eds), *Order and disorder in early modern England* (1985), pp. 166–95.

[61] D. Chakrabarty, 'Anthropocene time', *Hist. and Theory* 57 (2018), pp. 5–32.

Frontier histories of 'taming the wilderness' have been central to the development of environmental history as a discipline, particularly in its North American iterations. Do frontier frameworks provide a useful tool of analysis for environmental histories of early modern Britain and Ireland?

Elly Robson: Frontier stories were foundational to the emergence of environmental history as a subset of American historiography. As a boundary where human impact on 'untamed' nature was particularly stark, the frontier linked two contrasting stories: a progressive and civilisational trajectory, propelling economic growth and nation building, at a cost of ecological degradation and decline.[62] Environmental histories of the American frontier begin with the arrival of Europeans from 1492 and stretch all the way to the Dust Bowl of the 1930s and beyond. Others have posited an 'unending frontier' in the early modern period, describing the expansionary impulse – whether horizontal (colonial extraction) or vertical (intensified resource use) – which underpinned environmental change globally.[63] Taken in this sense, the frontier operated via the exploitation of energy, minerals, and soils within England and the expropriation of Irish and Scottish lands, as well as across the Atlantic.

Agriculture has been a crucial material and ideological tool of colonial frontiers: introducing intensive practices of cultivation or grazing geared towards commercial production, and necessitating the creation of environments suitable for these activities (cleared, drained, fenced).[64] In the early modern British Atlantic, a rich set of imperial metaphors stemmed from the act of 'planting'; whether referring to colonial projects and estates as 'plantations', the 'transplantation' of English settlers or plants, or the 'cultivation' of apparently wild places in an idealized model of English agriculture. Indigenous inhabitants' allegedly uncivilized manners, disorderly bodies, and idle practices were often identified as a cause and consequence of the absence of productive agriculture. Recent scholarship has shown that the material and conceptual tools of plantation were also at work in Britain and Ireland. Many of these colonial attitudes and activities, John Montaño has highlighted, were first forged during the sixteenth-century plantation of Ireland.[65] Lauren Benton and Kate Luce Mulry, meanwhile, have shown how American colonisation was embedded in the discourses, networks, and processes that also propelled projects of agricultural improvement within England.[66] The way in which frontiers functioned has been complicated even further in recent studies by Alison Cathcart and Aonghas McCoinnich that centre interactions on the 'periphery'. In Scotland, practices of plantation – and civilizing agendas – were embedded in relations between highland and lowland Scots, involved contact and collaboration with Dutch and French merchants, and crossed the bridge of the North Channel as Scots engaged in plantation in Ireland.[67]

[62] W. Cronon, 'A place for stories: nature, history, and narrative', *J. American Hist.* 78 (1992).

[63] J. F. Richards, *The unending frontier: an environmental history of the early modern world* (2003).

[64] W. Cronon, *Changes in the land: Indians, colonists, and the ecology of New England* (1985), pp. 128–49.

[65] J. P. Montaño, *The roots of English colonialism in Ireland* (2012).

[66] L. Working, *The making of an imperial polity: civility and America in the Jacobean metropolis* (2020), ch. 1; K. L. Mulry, *An empire transformed: remolding bodies and landscapes in the Restoration Atlantic* (2021).

[67] A. Cathcart, *Plantations by land and sea: North Channel communities of the Atlantic Archipelago c.1550–1625* (2022); A. MacCoinnich, *Plantation and civility in the North Atlantic world: the case of the Northern Hebrides, 1570–1639* (2015).

Eugene Costello: I think the concept of 'frontiers' could be applied in environmental histories of Europe and in countries like Ireland in particular. For much of the sixteenth century and parts of the seventeenth century, Ireland was a military and colonial frontier of the English Crown. It underwent a series of wars and conquests which led to partial depopulation and paved the way for 'plantation' with settlers from Britain. To help justify this conquest, Ireland was othered by the artist John Derricke and writers such as Edmund Spenser and Fynes Moryson. They portrayed its inhabitants as inefficient and idle pastoralists who were not making proper use of the land. Interestingly, they claimed that these supposedly wandering Scythian-like people took refuge in mountains and forests and could converse with wolves. The idea of Ireland as a wild frontier in need of taming has been much discussed in early modern historiography, and we now know that these tropes built on the writings of Gerald of Wales during the late twelfth-century Anglo-Norman invasion of Ireland.[68]

Elsewhere in Europe, the concept of frontiers has been usefully employed in recent environmental histories. For example, Richard Hoffmann has talked of fish as a frontier food in late medieval times, in that fleets had to search further out into the North Sea and the Atlantic as stocks were depleted.[69] Similarly, Jason Moore has highlighted an expanding frontier of grain growing and timber extraction in early modern eastern Europe and Scandinavia.[70] If we were to apply the concept of frontier to livestock farming, we might describe upland areas of northern Britain and much of Ireland as frontiers of commercial dairy, meat, and wool production in the medieval-to-modern transition.[71]

Having said all that, I have a lingering doubt about 'frontier' as a term in agricultural history. There is a danger in using it that we unconsciously replicate externalist colonial narratives of efficiency and civility. Studies which rely only on textual sources are especially vulnerable in this regard. Oftentimes, the only written sources available for a 'frontier' are from the very people who were driving its exploitation, and so had a vested interest in portraying it as wild or under-utilized. For the local/indigenous communities that lived there, it was not so much a 'frontier' as a home. More balanced interpretations are to be found in interdisciplinary research, which helps to give voice to marginalized peoples and places.

John Morgan: Eugene's last point resonated with me. If we think about so-called internal or domestic colonization in early modern England and the 'frontiers' which operated there, the sources we have most readily available suggest some problems. The frontiers I am thinking of are in the fens, and the extensive forms of largely pastoral agriculture practised there. In a

[68] J. Leerssen, 'Wildness, wilderness, and Ireland: medieval and early-modern patterns in the demarcation of civility', *J. Hist. Ideas* 56, 1 (1995), pp. 25–39; J. Knapp, '"That moste barbarous Nacion": John Derricke's "Image of Ireland" and the "delight of the well disposed reader"', *Criticism* 42, 4 (2000), pp. 415–50; A. Horning, *Ireland in the Virginian sea: colonialism in the British Atlantic* (2013), p. 33.

[69] R. Hoffmann, 'Frontier foods for late medieval consumers: culture, economy, ecology', *E&H* 7, 2 (2001), pp. 131–67.

[70] J. Moore, 'Amsterdam is standing on Norway' part II: The global North Atlantic in the ecological revolution of the long seventeenth century, *J. Agrarian Change* 10 (2010), pp. 188–227.

[71] For initial movements in this direction, see D. B. Adamson, 'Commercialisation, change and continuity: an archaeological study of rural commercial practice in the Scottish Highlands' (unpublished PhD thesis, University of Glasgow, 2014); Costello, *Transhumance*, pp. 167–71; Roebuck, *Cattle droving.*

frontier model, we can see drainage as a frontier, pushing into the wetlands and driving out water and local pastoralism. The sources through which we understand this process are full of the strident opposition of many of those people and places which were to be drained. The complaints of fenland townships show us that the frontier is something often defined by those behind the gun, or here the spade and surveyor's table. The notion of a frontier suggests space to be pushed into, and risks essentializing the 'terra nullius' attitudes of colonists towards the lands they sought to occupy. Along these lines, agricultural and environmental historians have begun to unpick some of the colonial language and attitudes used by enclosers and drainers in a domestic context.[72]

Where frontiers might help us think environmentally about agriculture is again in the practices and definitions of boundaries. If we think of the frontier not as a place or as something with an almost inevitable trajectory, but as an act of definition, we can begin to use it to analyse various aspects of agricultural practice. We would have to ask questions that begin with farmers, their perception of frontiers, and the practices they adopted in order to maintain or advance a given 'frontier'. This is fitting for a particular strain of improving agriculture in the seventeenth century, in particular, where increased yields and rents preoccupied lords farming the demesne, their estate stewards, and more ambitious tenants. But it would be more difficult to hold on to a useful concept of the frontier in contexts where improvement was not the primary motivator of cultivation, in the early modern period and beyond.

Elly Robson: I agree that definitions of agriculture should not be limited to the 'good husbandry' promoted by English improvers and settlers. As Eugene suggests, we must look beyond the archival frontier: the intensified documentation produced by the mapping, governance, and study of environments that facilitated expansionary projects. Archaeological research has been particularly important in illuminating the myriad forms of agriculture practised by societies in the Americas and Gaelic Ireland.[73] Like the material frontier, the archival frontier is less stark in early modern England, where a participatory legal culture and growing agricultural conflict generated a wealth of documentation of the often-unwritten customary rules which governed communal agriculture.[74] Collectively, these approaches challenge the idea of pre-political or static environments before colonization or improvement. The frontier becomes muddied further when we consider more incremental forms of agricultural change. Does it provide the right fit for boundary disputes between neighbouring communities, for instance, or allow us to investigate how commons became increasingly embedded within markets economies?

[72] R. Morera and J. Morgan, 'Les dessèchements modernes: des projets coloniaux? Comparaison entre la France et l'Angleterre', *Études Rurales* 203 (2019); C. Griffin, 'Enclosure as internal colonisation: the subaltern commoner, terra nullius and the settling of England's 'wastes'', *TRHS* 33 (2023). See also B. Arneil, *Domestic colonies: the turn inward to colony* (2017).

[73] For example: Horning, *Ireland*.

[74] A. Wood, *The memory of the people: custom and popular senses of the past in early modern England* (2013).

Some of the fiercest debates in agricultural history have revolved around the development of agricultural capitalism in north-west Europe, especially in Britain. How far do environmental histories cast new light on these trajectories?

Eugene Costello: When environmental history is undertaken in a broad way, methodologically, I believe it can shed new light on the origins of agrarian capitalism. In one sense, this has already received a lot of attention. Research in the 1970s and 1980s focused on places with detailed written sources, particularly England but also parts of France and central Europe. These discussions focused on the early modern period, pivoting on whether capitalism emerged due to wider processes like colonialism and global trade or internal changes in social relations.[75] In the 1990s and 2000s, there was further innovative research on the growth of capitalism in the Low Countries, where the written evidence is slightly less detailed. Here historians argued that increasingly commercial production of livestock, cloth, and other non-agrarian products emerged as an adaptation to declining grain productivity in the fourteenth and fifteenth centuries, which had been caused by soil erosion and sinking land levels.[76] This shows that environmentally-aware assessments of economic change can offer a longer-term perspective on capitalism.

If we draw from an even wider range of evidence – palynology, geomorphology, archaeology, and placenames – it may be possible to deduce the emergence of agrarian capitalism in areas of north-west Europe where written records of pre-modern land use are quite scarce, including Ireland and the west and north of Britain. Landscape sources like these may not speak directly to capital accumulation, but they do provide indicators of land-use intensification that may be compared against available historical evidence for trade and market interaction.[77] This 'consilient' science-humanities approach can help us to examine different forms of commercialisation in north-west Europe, in areas outside the text-rich 'centres' of capitalism.

What is more, as I am currently exploring, it makes it easier to track the long-term *impacts* of commercial farming on soils and habitats and, additionally, assess the significance of climate in land-use decisions. Land-cover change (tree clearance, wetland drainage etc.) and weather variation may be traceable in certain windows of time using diaries, estate records, and maps, but to get a *longue durée* view across many different regions we need a 'consilient' approach to environmental history. By giving equal weight to non-textual data, we can trace changes to landscape and vegetation that may be associated with more intensive food production as well as reveal undocumented local adaptations to the Little Ice Age.[78]

[75] T. Aston and C. H. E. Philpin (eds), *The Brenner debate: agrarian class structure and economic development in pre-industrial Europe* (1985).

[76] R. P. Brenner, 'The Low Countries in the transition to capitalism', *JAC* 1 (2001), pp. 169–241, p. 177; P. van Dam, 'Sinking peat bogs: environmental change in Holland, 1450–1550', *EH* 6 (2001), pp. 32–45; Moore, 'Amsterdam', pp. 193–4. Commercialization notwithstanding, Bas van Bavel argues that agrarian capitalism proper did not emerge in Holland until the late sixteenth and seventeenth centuries; B. van Bavel, *Manors and markets: economy and society in the Low Countries, 500–1600* (2010), p. 260.

[77] For an initial attempt, see Hanley *et al.*, 'Economic determinants'.

[78] E. Costello, 'Hill farmers, habitats and time: the potential of historical ecology in upland management and conservation', *Landscape Research* 45 (2020), pp. 951–65; Costello *et al.*, 'Adapting'.

Elly Robson: One set of debates about agricultural change has focussed on large processes and grand narratives of change. From the 1960s onward, economic historians sought to trace 'revolutions' in agricultural productivity across several centuries in England. Some emphasized new technologies – farming techniques, tools, and crops – while others traced how the social relations of production were reconfigured, marking transitions from feudalism to agricultural capitalism.[79] Grand narratives also animate environmental histories, but its pioneers offered different explanatory models. Writing in 1972, Alfred Crosby argued that transatlantic colonialism was an environmental process which globalized biodiversity. He attributed calorific increases and population growth across the world to a transatlantic biological 'exchange', as South American cassava were planted in African soils and European livestock colonized the Americas alongside humans.[80] Put crudely, agricultural historians (mostly writing from Europe) examined the intensified use of land nationally, while environmental historians (mostly writing from America) highlighted the colonial expansion of land and resources. They were also interested in different forms of exchange – one centred on capital and land, the other on flora, fauna, and pathogens – and in the reorganization of different types of relationships, social and ecological.

New avenues for dialogue between economic and environmental histories of agriculture are signalled by more recent arguments about the relationship between land, labour, and energy. The transition between pre-modern and modern economies was conceptualized by Tony Wrigley, who argued that pre-modern societies faced a 'photosynthetic constraint'. In the 'organic' economy, the production of energy relied almost exclusively on plants (and therefore agriculture of various kinds) – directly, in the form of fuel, and indirectly, in the form of food for humans and animals, who performed almost all work physically. As a result, available land, soil fertility, and weather presented limits to economic and population growth. This ecological constraint was broken by the reserves of energy preserved within coal, which were released by the technological innovations of the industrial revolution and freed land from the demands of energy production.[81] In his influential book, *The great divergence* (2000), Kenneth Pomeranz extended these arguments to locate the 'ghost acres' provided by colonies, as well as coal, as a motor of north-west Europe's accelerated economic development after the eighteenth century.[82]

These models situate ecology at the heart of economic change and bring domestic and imperial developments into dialogue. But they simultaneously establish fossil-fuelled energy as the fundamental point of rupture between the pre-modern and modern. Doing so risks rearticulating Malthusian ideas about limited resources and population pressure before 1750, while emphasizing the vulnerability of pre-industrial economies to environmental 'shocks'.[83] Yet, between 1400 and 1700, global population increased by 70 per cent and land

[79] See, for instance: Aston and Philpin, *Brenner*; J. Whittle, *The development of agrarian capitalism: land and labour in Norfolk 1440–1580* (2000).

[80] A. W. Crosby, *The Columbian exchange: biological and cultural consequences of 1492* (1973).

[81] E. A. Wrigley, *Energy and the English industrial revolution* (2010), pp. 239–50.

[82] K. Pomeranz, *The great divergence: China, Europe, and the making of the modern world economy* (2000).

[83] B. M. S. Campbell, 'Nature as historical protagonist: environment and society in pre-industrial England', *EcHR* 63 (2010), pp. 281–314.

under cultivation by 64 per cent.[84] A rich body of scholarship has charted how resources were conceived of as increasingly elastic, rather than finite, in the early modern period.[85] Much of this work has been led by historians of science and ideas, whether in studies of 'improvement' as a culture of material progress in England, emphasis on the 'management of information for both politics and the study of nature' across Europe, or examination of how technology and science were entangled in the conquest of nature and native people in America.[86] Most recently, a sweeping study of scarcity has argued that this period ushered in the emergence of an 'optimism that nature's resources, however limited, can be extended infinitely by humans'.[87] There is more work to be done on the role of agriculture as a physical act through which energy was harnessed and amplified prior to the age of coal and to understand how such acts were entangled in new forms of environmental knowledge. Moving away from productivist models, energy transition, imperial expansion, and agricultural change can be examined as series of interlocking environmental and economic processes.

Concerns about sustainability, food security, energy, aesthetics, and biodiversity animate contemporary debates about rural environments, and are becoming more prominent in public life in the context of rapid global economic and ecological change. How far do these concepts provide a useful starting point for examining early modern agriculture? Can early modern histories speak to, or inform, these debates?

Eugene Costello: It is only natural that historians might wonder about the origins of our current world views and of problems like the biodiversity crisis and climate change. Every study of the past must get its inspiration from someplace and genuine inspiration should not be confused with superficial 'window dressing'.

Scholars of late nineteenth and twentieth-century agriculture have had a head start in bridging the gap to present-day environmental concerns – highlighting, for example, the consequences of ammonia synthesis for fertiliser manufacturing and productivity.[88] Yet many other issues in food production today – like deforestation, intensification of land use, and global supply chains – can be traced back to early modern times or earlier. So a *longue durée* study could well use research on the early modern period to help explain the present state of agriculture. Indeed, there has recently been important early modern research on the

[84] R. B. Marks, '"Exhausting the earth": environment and history in the early modern world' in J. H. Bentley, S. Subrahmanyam, and M. E. Wiesner-Hanks (eds), *The Cambridge world history*, 9 vols. (2015), vol. 6, pt. 1, pp. 29–53 at p. 32.

[85] M. Ambrosoli, *The wild and the sown: botany and agriculture in Western Europe 1350–1850* (1997); P. Slack, *The invention of improvement: information & material progress in seventeenth-century England* (2015); W. Cavert, *The smoke of London: energy and environment in the early modern city* (2016).

[86] V. Keller, 'Mining Tacitus: secrets of empire, nature and art in the reason of state', *British J. for the Hist. of Science* 45 (2012), pp. 189–212; J. E. Chaplin, *Subject matter: technology, the body, and science on the Anglo-American frontier, 1500–1676* (2001).

[87] F. Albritton Jonsson and C. Wennerlind, *Scarcity: a history from the origins of capitalism to the climate crisis* (2023).

[88] P. Brassley, 'Output and technical change in twentieth-century British agriculture', *AgHR* 48 (2000), pp. 60–84; V. Smil, *Enriching the earth: Fritz Haber, Carl Bosch, and the transformation of world food production* (2004).

long-term legacy of crop and livestock exchange in the Atlantic world, as Elly pointed out above, and on the origins of western views about 'sustainable' resource use.[89]

Tracing the biophysical and conceptual *origins* of the Anthropocene may not be enough, however. The real difficulty lies in actually finding information from or about the past which can be used to solve practical issues on the ground today.[90] Where sustainable food production is concerned, historians could learn a great deal from researchers of historical ecology, who have significant experience in trying to apply lessons from the past in present land-use situations.[91] In my own research on livestock farming and landscape, I see two main ways of applying such lessons.[92] The first is that historical research can help to bring farmers and rural communities into the fold in efforts to conserve habitats and reduce environmental impact. In public discourse today there is a worrying trend of farmers starting to feel alienated from environmentalists, due to a perceived over-emphasis on 'nature' and 'rewilding'. Studies which draw attention to the role of farmers in shaping habitats over time – some of them quite biodiverse – can help local communities to feel they have a key role to play in conservation. The other avenue of impact, I believe, lies in more specific historical case studies of issues like overgrazing, deforestation, and soil erosion, the results of which can be presented to government ecologists to contribute to better long-term management of national parks and other protected habitats.

John Morgan: The early modern – or frequently 'pre-modern' or 'pre-industrial' – is often taken as the starting point for a set of baselines against which degradation and restoration might be measured. It can be the early modern historian's task to unpack how and why our period appeals in contemporary environmental contexts. This is the central concern of a recent book by Frances Dolan, which looks at the use of early modern tropes and metaphors in the marketing and justification of alternative and biodynamic food production techniques today.[93]

The early modern is used as a referent in policy contexts: 1500 is the year after which 'new' species are deemed 'non-native' by the UK's Joint Nature Conservation Committee, for example. Among environmental activists of very different stripes, the early modern past looms large. Advocates of rewilding rivers, landscapes, and species look backwards to the changes, practices and structures of our period as both problems and solutions to contemporary ills, while climate change deniers point, often in bad faith, to the Medieval Climatic Anomaly and Little Ice Age as evidence of so-called cyclical changes about which we are encouraged to be relaxed. More nebulously, there appears to be a sense of heritage and identity bound up with a benign, but often latent, reading of early modern history that has motivated much of the negative reaction to the National Trust's Colonial Countryside project, which considers the colonial connections of early modern country estates.

[89] J. Hancock, *World agriculture before and after 1492: legacy of the Columbian exchange* (2022); P. Warde, *The invention of sustainability: nature and destiny, c. 1500–1870* (2018).

[90] E. Robin, 'Histories for changing times: entering the Anthropocene?' *Australian Hist. Stud.* 44 (2013), pp. 329–40, pp. 335–7; N. Boivin and A. Crowther, 'Mobilizing the past to shape a better Anthropocene', *Nature, Ecology & Evolution* 5 (2021), pp. 273–84.

[91] See C. Isendahl and D. Stump (eds), *The Oxford handbook of historical ecology and applied archaeology* (2019).

[92] Costello, 'Hill farmers'.

[93] F. Dolan, *Digging the past: how and why to imagine seventeenth-century agriculture* (2020), reviewed in *AgHR* 70, II, p. 314.

These are just some of the live (and often lively) contemporary debates which enrol an understanding of early modern environmental and agricultural history to which historians might attend. In so doing, they can problematize oversimplistic, cosy, or outright wrong interpretations, and challenge the use of the historical in some of these debates. If history is to play a role in mitigating the climate and biodiversity crises, then its mode of engagement here needs to be scrutinized. Historians might be some of the most powerful voices in questioning the value of looking for precedents for use in an era of unprecedented challenge.

Elly Robson: One of the great pleasures of being a historian of any persuasion is to bring a set of questions to the archives and see what they answer back. The challenge is to interpret and communicate the significance of findings that do not fit neatly into the narratives of change that we have assembled, as historians or as societies. As we begin to think about what a decarbonized economy might look like, the pre-industrial past looms large. Without the vertical horizons of coal, we return to the constraints of land and debates about its best use. Vital changes in our food systems, new methods of flood management and energy production, and initiatives to increase biodiversity can pull in different directions, and any solutions will require the participation of farmers and rural communities; those 'on the ground'. But urban societies are heavily imbricated in intensified food, flood, and energy systems; these are not just rural problems and responsibilities. More immediately, the UK's agricultural policy and international trade relationships are being re-written in the wake of Brexit, and this – far more than any initiative by individual farmers – will determine the shape of rural environments in this country. Like the histories considered in this article, these contemporary questions signal the importance of exploring complex interactions between local, national, and transnational scales of environmental thought and action.

Increasingly complex chains of human action and impact on the environment, taking place at global and intergenerational scales, have raised questions about what kind of political institutions might deliver effective action and environmental justice in the Anthropocene. While investigating and making visible the scale of crisis is often the remit of scientists, choices about how to respond fall within the domain of politics. Examining earlier moments of rapid environmental change shows how crisis – experienced, perceived, or anticipated – has often acted as an impetus for the intervention of states and as a vehicle for the interests of those with the wealth to both recover and seize opportunities. Who was exposed to risk, who was perceived as vulnerable, who was eligible for protection or compensation, and who paid were political questions, involving decision making in which different groups wielded arguments about responsibility, justice, or economic value. In my work, I think closely about the multiplicity of institutions involved in mediating wetland disputes and enacting solutions, the different forms of participation or exclusion they fostered, and how politics took place within, across, and beyond these institutions. I believe that these perspectives can speak fruitfully to contemporary debates about local consent to wind farms and fracking, whether land should be used for food or rewilding, and the choices that face us in dealing with increased flood risk; not as lessons from the past, but as tools for thinking with in the present.