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RESEARCH ARTICLE

The Limitation of Water Flow and the Limitations of Postmodernism

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This article critically evaluates how far the interpretation of archaeological evidence has been aided by the recent 'materialist turn' in social theory. This perspective, linked to the work of Bruno Latour, argues that we should give agency to not only humans but also to cultural objects and environmental processes. It thus increasingly influences archaeological interpretation. By considering how water supply has been theorised in the Roman World, then setting such theories against evidence for two wells from a landscape near York, I argue that we should retain a distinction between human agents and natural processes. The implication is that Latour's stance, by failing to provide a social context for interaction between culture and nature, is problematic for archaeological understanding. In contrast, I suggest, Marxist analytical tools provide a more vibrant way forward in explaining both past developments and present climate crises.

Keywords: water; Rome; Postmodernism; York; Latour; culture/nature

Introduction

Access to water answers a fundamental, and often immediate, human need. Yet how this was accomplished has varied greatly between places and across time. What follows explores whether recent developments in social theory might be useful in understanding such diversity of response. To do so, it first outlines the nature of postmodernism and its intellectual and, in particular, political roots. The 'linguistic turn' embedded in such approaches, admitting no material context 'beyond the text', derives from a retreat from political activity by its advocates after 1968 and their disillusion with, and thus denunciation of, Marxism. The same process of rejection has, more recently, generated a 'materialist turn', in which society is now assimilated with nature: animals, environmental processes and even objects are to be given agency alongside humans.

By considering the way in which water supply has been theorised in the Roman World, I show how recent studies of rivers and aqueducts recognise the need to integrate the functional/physical aspects of water movement with cultural, particularly symbolic, dynamics. Yet they fall short of truly interdisciplinary exploration of such entanglements: each has a long way to go before it can be said to have contributed to a convincing 'archaeology of flow' (Edgeworth 2011). As my aim here is to assess the application of analytical tools to archaeological interpretation, I develop the latter point on general perspectives by considering evidence for two wells from the site of Heslington East, near York. Detailed consideration of these features, designed to interrupt water flow at particular points in that landscape ('the limitation of flow' of the title), brings home the inadequacy of current interpretative frameworks ('the limitations of postmodernism').

As a result of this empirical engagement, I argue that retaining distinctions between ritual and functional activity, and between human agency and natural processes, will facilitate, not constrain, archaeological interpretation, and that merging such dualities, as happens with Latour's Actor Network Theory (henceforth 'ANT'), simply points up the latter's failure to confront the social context in which culture and nature interact. This lacuna, evident equally in earlier 'linguistic' perspectives and their more recent 'materialist' alternatives, is not only problematic for archaeological interpretation. The latter, in particular, reduces our ability to meet the current challenges of climate change. I conclude by suggesting that Marxist analytical tools, although rejected by postmodernism in its various forms and shades, can provide a route out of such dead-ends.

The Intellectual and Political Roots of Postmodernism and Their Impact on Archaeological Theory

Postmodernism, via post-processualism, has opened up a variety of important debates within archaeology and TRAC shows that Roman Studies have readily taken these developments to heart: Scott (1993) noted the absence of discussion of gender and human agency, a challenge since confronted by many others; the notion of identity has become increasingly prominent and now lies at the core of a respected academic commentary on Roman Britain (Mattingly 2006); and 'post-colonial' perspectives (Webster and Cooper 1996) have been developed in landscape studies and on religious practices. Finally, postmodern ideas have noted how current political structures influence our interpretative frameworks, thus making us reflect on how we 'write' the Roman Empire: Hingley (2000) discusses relationships with modern imperialism; James (2008) and Wood (2008) explore the creation of 'Late Antiquity' in relation to the European Union. There is, therefore, much to welcome.

Equally, postmodernism has not been without its critics, both from within conventional social theory: how can we adopt such perspectives without sliding into simplistic relativism?; and from without: Marxists such as Callinicos (1989) show that modernism had always been self-critiquing, so there is little new to be 'post' about. The latter approaches lie at the core of the following critique. Dialectical materialists portray the postmodernist movement as derived from a crisis in Marxism. The denunciation of Stalin marked the end of an era which put political expediency before theory and fatally undermined the notion of science. Various people attempted to defend what they thought was then left of Marxism, a response grounded in Saussurian linguistics and the work of Nietzsche, and thus firmly within a philosophy of difference. Althusser (1971), for example, in confronting stagist determinism vs. voluntarism, portrayed history as contingent, random events occurring within underlying structures: economic, religious, and political instances, although mutually determining in the end, interacted in relative autonomy beforehand.

Furthermore, intellectual enquiry was merely another such instance, its structures divorced from reality. The latter argument has profound implications for the role of language and writing. With signifiers no longer anchored in the signified, communication became an endless chain of such signifiers operating in a separate, symbolic realm. This is best expressed in Derrida's now (in)famous phrase '*There is nothing outside the text*' (or, strictly speaking, that '*there is no outside-text*' (*il n'y a pas de hors-texte*: 1967). Some suggest that Derrida means to argue that context is all when reading a text but, as he provides no guidance on how to define such contexts, then the general implication below still stands). Equally, for Derrida, a text should 'hide from the first comer'. Hence, if all intellectual enquiry simply comprises an endless discussion of a publication (or, if not actually endless, something that can 'take centuries' to unravel), there is every incentive to create complex and dense textual outputs. These ideas fitted the then context of French philosophy: intellectuals retreating into the ivory tower after failure of the 1968 student revolt to overthrow capitalism. Revolutionary activity now simply comprised of the production of another article for intellectual dissection (see Callinicos 1989 for the whole argument).

Postmodernist theory also argued against the creation of overarching categories. This is clearest in the work of Hindess and Hirst, foremost British Althusserians, who first questioned the notion of a Mode of Production in understanding pre-capitalist society (1975), then abandoned the whole concept (1977). With no possibility of explaining surface phenomena in relation to underlying structures and processes, history became, instead, a 'logic of contingency' (Laclau and Mouffe 1985), precluding the use of any grand narrative in explaining present — or past — society. Finally, it meant an end to the strategy of testing theory against practice, and so the possibility of analysing data to reach understanding (thus, strictly speaking, removing the need to gather such data at all — although few archaeological commentators make this conclusion).

This 'linguistic turn' saw science as a constructed trope, with nature dominated by, and elevated into, society (analytically, space dominates process, and thus time). More recently, such idealist constructionism has generated a new 'materialist turn' (Latour 1991), in which society descends into nature: not only humans but animals, and even objects, have agency (partly a recognition that current environmental crises derive from past actions: time now dominates space). Latour's project to reassemble the social sees agency defined, in minimalist vein, as anything that makes 'some difference to a state of affairs' (2005: 52, thus leading to his promotion of 'ANT'). Portraying nature as an active, shaping force has been viewed as a positive way of introducing non-human actors ('actants') into historical narratives and reinvigorating environmental history (Asdal 2003): such actants can form a '*swarm of … vitalities*' ripe for exploration (Bennett 2010: 31–2). These perspectives, replacing humanism with heterogeneity, are still clearly indebted to the notions of diversity and différence/différance (Derrida 1973) noted above.

As has been well rehearsed, postmodernist approaches played themselves out archaeologically in the form of post-processualism, a process kicked off by Shanks and Tilley (1987). They purported to seek a reconciliation between cultural and scientific approaches to social analysis, yet had been influenced previously by structural Marxism, an approach which, *inter alia*, countenanced the notion of a 'mode of reproduction' operating to oppress women independent of historical circumstances. Thus post-processualism was already some way down the road to constructing a past in terms of autonomous instances. It was only a small step from here to give short shrift to a straw man of 'New Archaeology' and its evolutionary and adaptive notions to dismiss not only functionalism but all overarching perspectives for their essentialism and use of an unacceptable 'logic of necessity'. The conclusion became inevitable: 'the economic cannot be separated from the political, from ritual' (Shanks and Tilley 1987: 122). There is no universal series of units such as band or tribe, only an open field of relations in an indeterminate articulation.

Latour's later ideas of applying 'ANT' to a post-constructivist universe have yet to gain real traction within archaeology but are apparent in recent writing allocating agency to artefacts (Knappett 2013). Unsurprisingly, they have also fed into environmental and landscape studies. What follows assesses the utility of such perspectives in interpreting archaeological evidence for Roman water supply — a good place to explore the issues, as water has been studied using a combination of 'scientific' and 'cultural' approaches.

The Supply of Water in the Roman World: Current Approaches to the Interpretation of Rivers, Aqueducts and Wells

The amount of water on earth is constant, but only 0.007% is available for human consumption (Woolf 2007: 242). Hence, as world population increases, *per capita* allocations must necessarily fall. Being basic to human needs, it is now generally accepted that water is a source of conflict and inherently political. Usually, mechanisms are developed to resolve such disagreements (Woolf 2007), but violent 'water wars' can still occur. This is perhaps at its clearest in the Middle East, where the 1967 'Six-Day War' allowed the Israeli state to double its access to fresh water resources, with conflicts over water continuing in the Golan Heights. Pollution of the sea by harmful chemicals and plastics stands as a metaphor for capitalism's relationship with natural resources (Empson 2014: 262ff). Finally, water is a factor in international migrations, and creates conflict at national and local levels. In short, political struggles around water arise today at every scale of human relationship with the environment.

It is unsurprising, therefore, that corresponding issues arose when defining cultures in pre-modern societies (Clark 1944), Plato seeing the Greeks gathered around the Mediterranean '*like frogs around a pond*' (Phaedo 109b). River water was vital to societies reliant on agricultural production, the creation of irrigation schemes seen as facilitating state formation in Mesopotamia (Wittfogel 1957). Rivers have also been studied for their long-term relationships with climate change (Franconi 2017b), role in transport and defence (Franconi 2017a), and the technological sophistication embodied in controlling them (Wikander 2000). Legal provisions on how, when, and whether water might be supplied were of huge importance to Rome. An inscription from Lamasba (Shaw 1982) makes it clear, however, that conflict resolution could occur at a purely local level between indigenous members of a community, with little reference to external norms or personnel even when 'Roman' technology was being used. In sum, concern with regulating the movement of water ran from the imperial heights to its very base.

Rome, like Greece, clustered initially around the Mediterranean, but stepping beyond the shores of *Mare Nostrum* (a phrase using an explicit claim on a body of water to define identity) involved engaging with rivers in diverse landscapes (Campbell 2012). Rivers could define the limits of Empire (the Rhine: Franconi 2017b); be pivotal to trade (the Rhone: Leveau 2017a, Bravard 2017); or require investment to control torrents and flash floods (in North Africa: Wilson 2017, and even in unpromising, almost waterless, circumstances such as the Fazzan: Wilson 2003). Controlling unpredictable flow was of concern at the imperial core (e.g. the flooding of the Tiber: Aldrete 2007) and equally where inundation was anticipated and welcome, as in Egypt. Even here, the process of exploitation might be problematic. Thus Haug (2017) discusses investment in Fayyūm irrigation when the floods failed downstream, alongside its unwelcome by-product of swampy, smelly ground prone to salination (this environment was likely of less concern to absentee landowners than to those who actually laboured in that landscape: see further below on the social context of encounters with water).

Environmental studies of the Rhine and Rhone noted above show how much conditions varied along their length and how their water was put to various uses at different points and played diverse roles at various spatial levels, all of which calls into question the notion of 'the river' as a single entity. Waterscapes defined islands beside Romano-British towns, as well as boundaries around them, and pools within them (Rogers 2012). Social

control of water within Pompeii saw fountains used to construct urban sub-identities (Laurence 2006: 45ff) and to redefine the use of space within elite domestic settings (Jones and Robinson 2005).

Its fundamental significance imbued water with symbolic associations and activities, most obviously in relation to Roman bathing and the body, each with religious connotations. This is at its clearest with aqueducts and much archaeological energy has gone into finding their alignments (Ortloff and Crouch 2001) exploring their administration (Hodge 1992) and calculating flow and distribution mechanisms (Hodge 1984, Taylor 1997). Many issues remain unresolved: how much was the state involved in the process (Evans 1982, Bruun 1991) and did they transform water supply across the board or only for restricted sections of society? Clearly, however, re-organising water supply was part of the Augustan remaking of Rome. These monuments were named gifts to the population and the water they delivered had particular properties and perhaps a personality (The Aqua Virgo supposedly named for its purity, the Tepula for its tepid, unpalatable character: Evans 1982): Rome's aqueducts were a product of socially-embedded exchange, designed to bind (certain sections of) Roman society together.

The notion that aqueducts were an integral part of Roman urbanism is so prevalent that any 'proper' town is expected to have such system. Thus, for Britain, Stephens proposes that there is 'conclusive' proof for aqueducts serving two of its major cities, York and London (1985: 202). In both cases, however, evidence remains entirely circumstantial. In York, the large sewer and fountain base he cites could be explained by water supplied from contact springs, pressurised by height differentials. In London, the argument for an aqueduct is countered by Williams' (2003) detailed study showing that the Walbrook and Fleet Rivers provided for artisanal needs, and that larger consumers such as bathhouses positioned themselves to take advantage of contact springs overlooking the Thames. Wells were the predominant way of meeting most of London's needs, some employing sophisticated lifting equipment (Blair et al. 2006). Even without an aqueduct, therefore, water from springs, rivers and wells facilitated monumental development, location of industry and domestic settlement.

Investigation of Roman water, whether from rivers or wells, has tended to divide between a concern with its functional or symbolic aspects: science is deployed to explain general landscape processes, and cultural dynamics to explore the local, human level. For Edgeworth (2011), these two spheres, interacting in complex ways, should be studied as a unity to create an 'archaeology of flow'. Water has yet to be fully linked into landscape theory, however, raising the question of what frameworks allow such an integrated approach.

A recent publication of fluvial landscapes (Franconi 2017c), although seeking to point ways forward, actually exposes some continuing challenges. Thus articles by Campbell (2017) and Purcell (2017) may top and tail that volume, the former using documentary sources to define 'watery perspectives', the latter to discuss what rivers mean for the relationship between nature and culture. Yet, despite some personalising their rivers ('Gift of the Orontes': Whiting 2017 and 'Pater Rhenus': Franconi 2017b), most intervening papers focus solely on geomorphological and sedimentary evidence, reflecting the lack of conceptual apparatus to allow truly interdisciplinary exploration of Edgeworth's entanglements.

More promisingly, research by Leveau and colleagues represents a concerted approach to seal this rift by synthesising diverse evidential sources. They have used faunal, geomorphological and sedimentological evidence in relation to textual and epigraphic sources to discuss differential responses to wetland drainage in northern Italy and southern Gaul (Leveau 2017b) and to explore reactions to flooding on the lower Rhone (2017a). The latter study, alongside identifying otherwise undocumented flooding episodes, relates detailed riverine regimes to landscape organisation and settlement development. A recent paper (Walsh et al. 2017) attempts to take this process a stage further, linking hydrogeological evidence from Stymphalos to known religious practice to create a 'geomythological' perspective.

These multi-disciplinary accounts interpret their evidence within a human ecological framework, emphasising notions of sustainability, resilience and persistence. Highlighting the management of hazard, a product of natural forces, and vulnerability, defined by social organisation (Leveau 2011), such studies favour diachronic comparisons over studying 'the Roman period'. Thus Leveau uses medieval documents to understand the drainage of closed depressions in Provence and the Rhone Valley (2012) and describes how fluvial risk was deployed to justify the division of modern France into large regions (2017a: 63). Their approach raises a range of issues: diverse responses to conflicts arising when water dried up; how interpretation of motives for drainage varied across periods (for health and glory in ancient sources, to facilitate agricultural expansion in modern ones); and how local communities were central to the maintenance of any system, and so become pivotal when explaining specific local trajectories of change. These studies can then elucidate much larger matters, for example why some wetland zones in Western Europe were 'conquered' and others still exist today.

Such perspectives, in attempting to transcend positivist limitations, explore human disturbance of the landscape using non-hierarchical variables at different temporal or spatial scales. They thus emphasise complexity and heterogeneity (Crumley 2006) and lend themselves to Latour's 'ANT' perspectives noted initially. This link is at its most explicit in Walsh's (2008) strategy of using small-scale studies of diverse cultural attitudes towards nature to explore how (or if) people adapted to environmental change. Historical ecology linked to 'ANT' is therefore a substantial perspective whose effectiveness can be tested against detailed evidence for water supply.

In what follows, I will evaluate such approaches using a case study of water access at Heslington East, a site in the immediate hinterland of York. That project will be published shortly (Roskams and Neal forthcoming) and a full archive of its detailed evidence made publicly accessible via the Archaeology Data Service (an outline site background is already available: Roskams et al. 2013). Thus I do not pretend to cover all such matters in this landscape, still less to describe fully the detailed evidence which underpins the statements made. Rather I have selected just two wells to explore three, water-related issues: is a distinction between symbolic and the functional dynamics useful interpretatively? (I will argue the answer is yes); can natural processes be said to have agency? (my answer is not really/usefully); and does the notion of historical ecology, underpinned by 'ANT', deliver a more incisive understanding of landscape development at Heslington East? (perhaps not as completely as one is led to expect).

The choice to explore these issues in a wetland landscape was a deliberate one, moving us away from large rivers, aqueducts and towns to consider features in a specific, rural setting. Additionally, wetlands define a challenging context for exploring the utility of 'ANT': unlike the irrigation of dry zones, at which water can be specifically targeted, systematic exploitation of wetland zones requires wholesale, long-term management strategies. Concerning the decision to focus on wells, surface water was no doubt of paramount importance in early human development. Yet a significant change occurred when people started to access subterranean sources. Wells require a grasp of water table depth; engineering skill to revet the sides of any intrusion; and access to mechanisms and containers to raise the water. They also imply some control of the immediate landscape and so are likely to correlate with increased social complexity and perhaps sedentism (Thomas 2003). Finally, wells, unlike rivers, are immobile, even if the water within them changes: once-hidden water is now 'captured' and, seemingly, made to cease to flow (NB the limitation of flow in the title), with lessons for the notion of water as a non-human 'agent'.

Wells may have been important in supplying water to urban contexts (e.g. London, above), but were *critical* in rural settings. Today, 1 kg of grain requires 1,000 litres of water to produce, and 1 litre of milk between 2 and 4 litres of water (Pearce 2006: 21). Roman-period animal and crop types were certainly different, yet these modern figures remind us how reliant on water the agricultural economy must have been (Goodchild forthcoming, 2.2.3). Thomas and Wilson (1994) show how wells, alongside roof and surface run off, supplied water on a farm near Rome, bathing needs here being dwarfed by what was required to grow crops and vegetables, and to support animals.

Case study: Digging Wells at Heslington East

The Heslington East site comprises a landscape of prehistoric and later date lying in the immediate hinterland of Roman York, situated less than 3km to the west. It is situated on southern edge of one of two moraines traversing The Vale of York (**Figure 1a**). These glacial features formed slightly elevated, east-west routes across a landscape portrayed by many commentators as impenetrable, damp ground limiting movement across Yorkshire after the last Ice Age. Interestingly, the zones on either side of The Vale are also characterised in relation to water: The Dales to the west were cut by river valleys interpreted as constraining/channelling movement in prehistory, and the lack of accessible water sources on the Yorkshire Wolds to the east is thought to have limited settlement. Hence water, either through its profusion (the damp, central Vale), its creation of steep valleys (The Dales) or its absence (The Yorkshire Wolds) is portrayed as problematic, literally on all sides.

The Heslington site, just down slope of the York moraine (**Figure 1b**), lacked any running water beyond what may have issued seasonally from contact springs further downslope, along its 22m contour (**Figure 2**). It thus contrasts with the rivers Ouse and Foss to its west which flow naturally throughout the year, their confluence said to dictate the creation of the Roman fortress at York. This landscape is, nonetheless, a place where 'dry', up on Kimberlow Hill to the north, met 'damp', down to the south. The latter, southern zone comprised a wetland mosaic colonised by a diverse set of animals and plants which may have been attractive to mobile Mesolithic and Neolithic communities passing along the moraine.

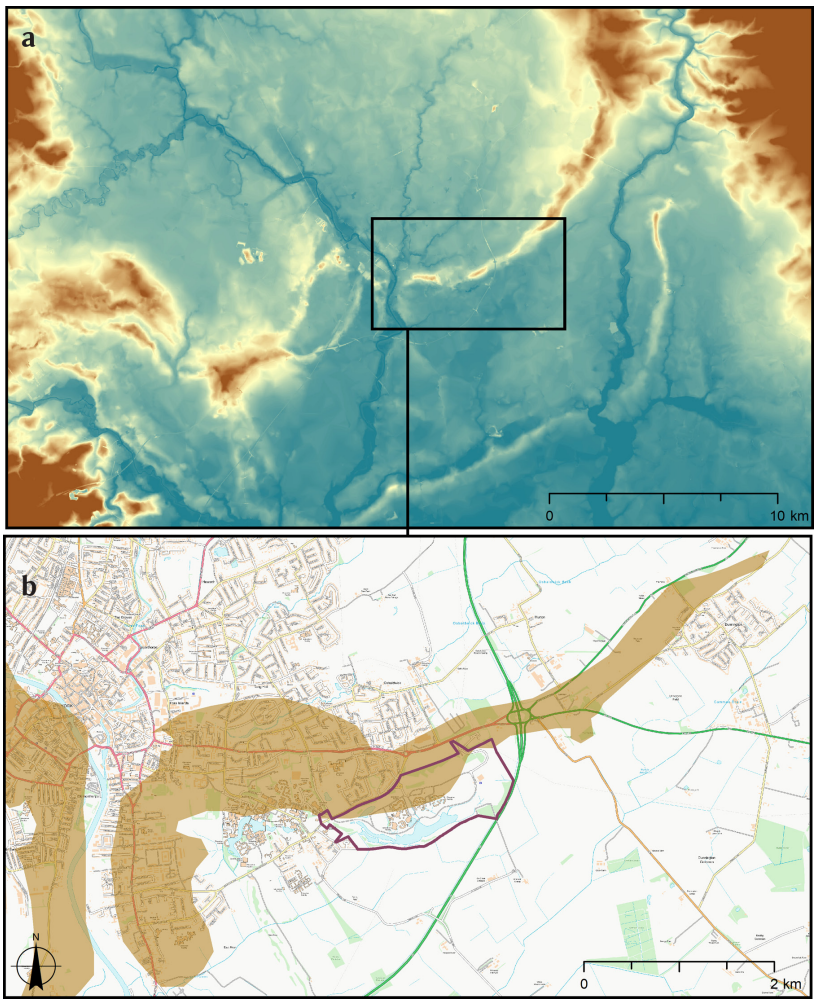

Figure 1: a. (top): The Vale of York (blue central area, river channels in darker blue) with higher ground of York moraine crossing Vale (brown). The Dales lie to the west and The Yorkshire Wolds to the east (both dark brown). (Source: OS Terrain 5 DTM (© Crown copyright and database rights 2018 Ordnance Survey). **b.** (base): position of Heslington East site (purple outline) on southern edge of glacial moraine (brown): Source: H Goodchild and Britice Glacial Map V2.0., Clark, C. et al. 2004).

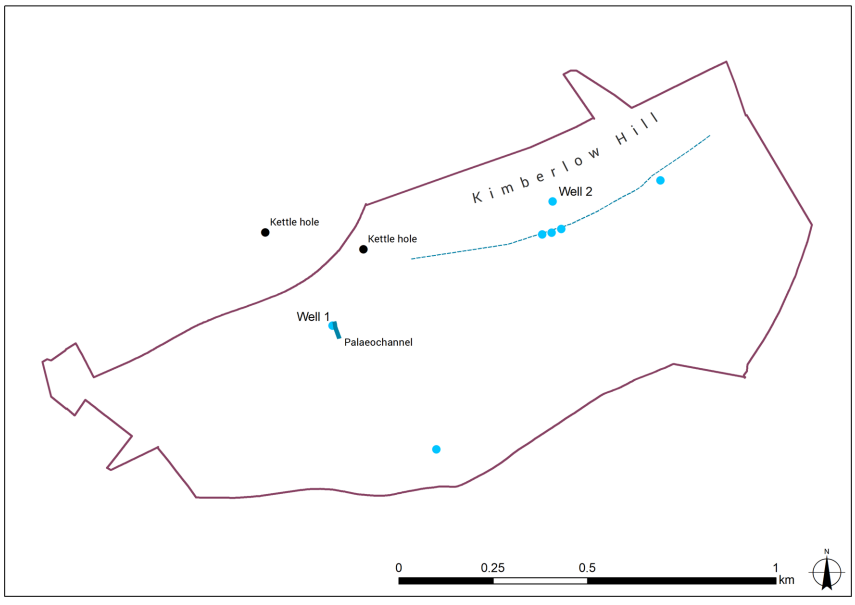

Figure 2: Position of Well 1 and Well 2 (blue dots: other wells; blue dashed line: 22m springline) (Source: H Goodchild).

Wells were being dug into this landscape from at least the start of the Bronze Age, concentrated along the springline noted above and in a lower area to the west, where a palaeochannel associated with glacial melt had been gradually filling up in the course of the Bronze Age. The form of wells ranged from unlined scoops, often early in the sequence, to those with a variety of wickerwork, plank, and stone linings implying a range of technical knowledge and investments. Early wells seem to involve the watering of stock, with cobbled areas to enhance access, whilst some were later converted for human use (e.g. Well 1, below). Further, in their construction, use, and demise, these features embodied a complex combination of functional and ritualistic activities.

This landscape seemingly employed mixed farming from an early date (animal dung assemblages, but also a saddle quern, were recovered from one well). Features adjacent to wells included wattle-lined gulleys and wooden cylinders to channel water, with nearby pits suggesting artisan production in the vicinity. Environmental evidence shows that woodland comprising a range of species either developed around the wells or had been retained there even when the wider landscape was cleared for pasture or cereal cultivation. These watery nodes had a fundamental impact on landscape development, for example when setting out early boundaries to control stock movement or then enclosing it more systematically (see Well 1, below). In a sense, then, water may have been accessed from active springs at the start of human engagement with this landscape, but it had later been 'stilled' (or so it must have seemed from the surface). It was now the animals and people who 'flowed' across the landscape, and they did so in increasingly controlled ways. In similar vein, Feldman Weiss (2010) discusses how people and things moved across the Ephesus townscape as part of the 'performativity of place'.

Two wells (hereafter W1 and W2) are considered below in detail (**Figure 2**). They have been chosen because of their positions (W1 at the western margins of the site and in a low area above the silted palaeochannel noted previously, W2 at its centre and higher up on a hillside); their date (W1 runs from c.800 BC to c.AD 200, covering the transition into the Roman period, whereas W2 was constructed after AD 300 and fell into disuse well before AD 400); and their highly individual histories.

W1 was lined initially with wattle, a broken shovel being included into that lining alongside a red deer bone. The latter was interpreted in excavation as an animal caught in the weave but this seems unlikely given the lack of associated bones, whilst the shovel would not have provided a very effective form of revetment. Both items, therefore, may have been deliberately woven into this first lining, one representing wild resources, the second the sort of rudimentary object that would have been needed to tame nature, whether to plant crops or dig boundary ditches.

A few centuries later, a ditch was set out running south from W1, the first boundary seen on the site. Its southern terminal contained a decapitated human skull, the head of a male, 26–45 years old, killed by long-drop hanging (hence a quick death). This act had been followed by careful removal of the head, placed face-down immediately in a watery, anoxic environment which had allowed the soft tissue remains of the brain to survive (O'Connor et al. 2011): clearly, the significance of creating such boundaries was recognised as requiring formal dedication. This ditch formed one side of an early drove way, then became an element in the development here of full-blown field systems during the Iron Age (**Figures 3** and **4**).

W1 was re-dug and re-lined on various occasions, cobble surfaces laid nearby to facilitate access being interleaved with waterborne sediments suggesting foul conditions and dung deposition, thus pastoral usage. By the end of the Iron Age it had been enclosed and augmented by the construction of a stone well head, tank and steps leading down to the water, changes suggesting an emphasis on human over animal access. This was also a period when, although damp woodland dominated in the vicinity of the well, the landscape beyond was increasingly open and occupied with grasses and sedges, a context which continued uninterrupted into the Roman period.

By the 3rd century AD, however, W1 had fallen out of use, human activity moving to a focus c.650 m to its north and east. Although the well itself had now been sealed by aeolian sands and silts precluding water access, a variety of atypical finds continued to be inserted into these natural accumulations. These included two highly polished jet earrings of presumed Iron Age date (jet, assumed to be from Yorkshire coastal sources, was employed in many items of Roman female jewellery but earrings are, surprisingly, absent from such assemblages: Allason-Jones 1989: 29). Also deposited nearby was the more complete example of only two fragments of early Roman glass bangles from the site (although rare at Heslington East, these are common across Yorkshire: Price 1988: 351). The bangle derived from the upper fills of a long-used Iron Age ditch in the vicinity of W1 i.e. from an Iron Age/Roman transitional horizon. It could thus be argued that jet earrings, archetypically Iron Age, and a glass bangle, archetypically early Roman, were being deposited here as landscape use changed fundamentally: structured deposition in damp places of former significance, the one artefact type ending a cultural tradition, the other ushering in its replacement. Some centuries later,

Figure 3: W1 (water-filled area) in the course of excavation, showing associated cobble areas and complex ditch systems (to its left) associated with this feature (Source: York Archaeological Trust).

Figure 4: Field systems as existing at Iron Age/Roman transition, articulating with W1 (Source: H Goodchild).

artefacts were still being deposited in the naturally-formed horizons sealing W1 in the form of two coin hoards dated to the middle of the 4th century AD.

The shift in activity at Heslington East, from prehistoric farming activity in the west to a 3rd and 4th century AD focus at its centre, contextualises the second well to be discussed here, a substantial, masonry-lined feature, W2 (**Figure 5**). Inserted in a seemingly anomalous position 75 m north of the main spring line and higher up the hillside (**Figure 2**), it thus had to be dug down to a depth of over 4.5 m to access the water table. Its construction was broadly contemporary with monumental development nearby, including a masonry tower and a building with hypocaust. each with associated burials. These, the first structures at Heslington East lacking any clear link to agricultural production, were set within a newly-defined landscape enclosure.

The construction, use and demise of W2 are detailed elsewhere (Roskams et al. 2013) but, like W1, involved a combination of ritual and routine practices. In summary, its carefully-laid lining of newly-quarried stone also incorporated an intrusively-positioned, reused roof finial: a stone moved from heights to depth, but designed to be still visible afterwards. The lowest fills suggest regular cleaning and maintenance initially, before an episode occurred when scrub and heathland were evident in the vicinity and insects and frogs/toads began falling into the well. At the same time, the yew staves and ash base of a bucket were deposited here (its mount and handle were missing — perhaps still functional, so recycled) alongside a virtually complete jar (a type with a regular wear pattern on its base, suggesting a distinctive function, perhaps related to holding/storing water). The latter two objects are best interpreted as the discard of water-raising

Figure 5: W2 at end of its investigation showing stone base and coursed stone lining (Source: OnSite Archaeology).

equipment, with the whole horizon implying that W2 was now being taken out of service. The deposition of parts of two adult pig skulls in the same strata would have fouled the water source but, as these animals were represented by only the left sides of roughly removed mandibles, this choice might hint at something more than functional discard.

The next horizon in W2 included a very large cobble stone, its dumping here clearly precluding further water access, and also yielded long-circulating, and sometimes unusual, pottery. The bones of butchered cow and horse, immature dog, deer and calf, alongside an adult cow skull and a large antler, were also chosen for deposition at this point. This distinctive combination of young and old, and of wild and domesticated animals, seems likely to relate to annual cycles of rural production, with domesticates being culled and deer being hunted at particular times of the year. The whole assemblage is best interpreted as the deliberate 'closure' of W2. Later silt deposits, forming in near stagnant water, were interleaved with the gradual collapse of the well's lining, before the well's complete demise. Layers of a much later, post-Roman, date then accumulated in the hollow which formed above it.

Both wells therefore show a complex interaction of functional and ritual dynamics in the course of their construction, use and demise and each experienced changing relationships with the surrounding landscape, processes that they both influenced and were influenced by. These diverse ways of controlling access to water at Heslington East are, in turn, likely underpinned by distinct understandings of the relationship between culture and nature: different cosmologies. Three important implications drawn from this evidence are explored next.

Discussion

The first issue seems relatively uncontroversial. Merrifield (1987) once complained that Roman archaeologists, in exploring their evidence, were predisposed to favour functional over 'magical' dynamics. Assuming he is right, does the complex interaction of sacred and profane in the well described above mean that we should collapse the distinction between the two? All of these deposits formed in a social context, and many could be seen as involving 'structured deposition' Garrow (2012). The latter proposes that, in defining such deposits, a number of characteristics might be relevant ('*ceremonial, deliberate, formal, formalised, intentional, non-utilitarian, odd, peculiar, placed, ritual, selected, special, symbolic, token and unusual*': 2012: 93). Garrow portrays this diversity of definition to be advantageous, allowing the notion of 'structured deposition' to be adaptable. On the contrary, I suggest, the Heslington evidence implies that tying down the meaning of the term and, more importantly, differentiating 'specially placed' deposits from prosaic discard is vital. It helps us to understand not only diversity of human response but also the complex interaction of different human intentions imprinted on the landscape (Roskams et al. 2013).

The second question concerns giving agency to plants and animals, as Latour demands, and to water and associated landscape processes within this, as advocated by Edgeworth and Walsh respectively (see opening discussion): how far can we push this notion without falling into animism? A recent discussion (Strang 2014) claimed that, as water permeates all human bodily experience and lies of the core of human/non-human relationships, entities such as rivers must have agency. This reiterates Latour's example of two rivers, the Atchafalaya and Mississippi, which intersect each other at different heights. The higher can 'resist capture' (2014: 9) by the lower due to human intervention (a dam built by the US Army Corps of Engineers). For Latour, this relationship makes the rivers protagonists with goals.

A later part of Strang's commentary then draws out parallels between water and trees, proposing that the fundamental nature of trees – how and where they grow etc. – can have significant implications for defining their relationship with human agents, often in quite intimate and detailed ways. This notion also underlies Graham's (2018) recent discussion of place-making in Roman cemeteries, exploring how a stationary culture of physical monuments might confront, and interact with, seasonally changing nature, in the form of plants and trees. Plants thus turn into full agents (have '*planty agency*': Lodwick 2017: 154), with, for example, the colour and smell of flowers through which they attract pollinating insects seen as part of an '*embedded purposeful agency*' related to their need to reproduce (Jones and Cloke 2008: 81).

In putting meat on the bare bones of Latour's theories, these commentators raise two important matters. One, the more general, is the argument that our interpretations need to reject *any* analytical category with relational properties because it would exhibit an unacceptable Cartesian dualism. In this light, let us consider the content of, and relationships within, Bennett's previously-described '*swarm of [actant] vitalities*' (2010: 32) in terms of her themes of efficacy, trajectory, and causality. Any exploration of such 'swarming' components would have first to be identified in some way, most obviously by defining different elements relative to each other — exactly what the argument on relational properties prevents.

Allowing such a principle to stand would, in effect, preclude meaningful examination of dialectical relationships in the world. Hybrid geographies (Whatmore 2002), by collapsing analytical categories entirely as a point of principle, only add to this impasse.

More specific is the plea to move beyond a nature/culture dichotomy (Descola 2005). This usually results in complete amalgamation, their interplay thus comprising a '*constant process of becoming*' (Rohl 2015: 6). Yet nature remains a collection of elements that interact according to the laws of physics. Furthermore, within the class of sentient beings, animals have thoughts about things and a small minority use tools, a few of these even manufacturing them. Yet only humans can think about their thoughts and those of other humans, and employ complex linguistic codes linked to wide-ranging concepts in open-ended combinations. Only they can produce composite tools with functionally integrated components and use such items to manufacture more tools: humans alone are capable of such abstraction. Strang's non-human actants (2014: 139) may be able to '*enable and support, or resist and disrupt, human intention*' (Harvey 2012: 117), yet they do not, themselves, *have* intentions. Human society is, simultaneously, both a fundamental part of nature, yet separate from, and irreducible, to it. Hence, in seeking to understand the world, distinguishing between plants, animals and humans is important.

The third, related matter concerns 'ANT' and the social context of interaction. The idea of human agents having 'intimate and detailed' relationships with nature, noted previously, relates closely to Ingold's (1993) attempt to reconcile nature and culture. For him, landscape is not land, nature or space, rather '*the world as it is known to those who dwell therein*' (1993: 156). His resulting notion of 'taskscapes', much employed in archaeological interpretation, comprises activities based on indigenous knowledge which result from regular engagement with a landscape. Furthermore, such dwelling takes place over time (cf. above on time replacing space in 'new materialism'), with any chronological divisions — daily, weekly, annually — being defined in relation to collectively-performed tasks. Ingold relates this perspective to the production of music and art, the audience acting back on production to make dwelling, in the sense first articulated by Heidegger, always a '*work in progress*' (1993: 162).

It is significant here that, when Ingold comes to consider a specific example of art, Bruegel's painting The Harvesters, he is explicitly not concerned with the historical context of its production, only with the complex ways in which it might be viewed (i.e. consumed) subsequently. This lack of focus on production is problematic immediately one attempts to contextualise how human agents engage with nature, whether in Ingold's intimate detail or with fleeting superficiality. Marzano (2014), for example, describes how Rome's military expansion not only seized booty and slaves but led to the arrival of new plant varieties in the city, partly due to an increased practical interest in growing better varieties of fruit, partly as symbols of military conquest. These plants, being more than just souvenirs, changed tastes and lifestyles, becoming an element of elite self-representation in a dialogue with the development of public gardens (*op cit.*, 195 Cf Wood (2010) on *Horti* in the City of Rome). They played a role in '*Rome's new imperial status as cultural arbiter and collector*' (Spencer 2010: 141). In other words, ideological structures concerning nature were being created in particular circumstances and by specific sections of society (here, elites) to achieve certain ends.

In many accounts promoting non-human agency, one gets little feel for this collective context and the social level at which it operated. Thus Lodwick's discussion of the 'planty agency' of box trees accepts that the wide range of meanings associated with plants are '*historically situated and are contingent upon interactions with events and people, which in turn varies depending upon a wide range of factors such as status, age and gender*' (2017: 154). Yet talking of meaning being historically situated and contingent, without giving any guidance of how to frame those historical situations, prevents us from stepping beyond descriptive, albeit detailed, accounts. Incidentally, this failure to explain detailed difference applies equally to its opposite, arguments for long-term continuity. Thus Fulford's (2001) description of 'structured deposition' claims to see pervasive rituals independent of urban/rural settings and Iron Age/Roman periods. Yet he offers no frameworks to contextualise such long-term stability.

Similarly, Graham's (2018) discussion of place-making in Roman cemeteries describes how mourners may have engaged with the complex interactions between built monuments and growing trees in a cemetery, no doubt bringing with them sets of ideas about the culture/nature interactions taking place there. Yet, necessarily, such ideological structures will be different from those guiding people who maintained that space. For the latter, the growth of trees may have to be dealt with through pruning, and the monuments, far from being timeless cultural givens to set beside seasonally-changing nature, will have required repair and maintenance to produce that 'timeless' quality. Equally the feast of the Parentalia will not be, for gardeners, an annual opportunity for place making/remaking to engender social cohesion, rather a point in the year requiring a

dedicated programme of preparatory work. This is not to say that maintenance staff lacked ways of thinking about the interaction of culture and nature, merely that such frameworks were constructed in quite different circumstances from those, of whatever social order, who visited the cemetery to mourn their ancestors.

When we return to water, similar considerations apply. Campbell states that the ordinary people who lived in riverine settings had fundamental connections to that river which they '*both needed and feared. And they have left few memorials.*' (2012: 143). Strictly speaking, of course, the latter point is inaccurate, because the memorial to these lower orders lies in archaeological evidence for their labour, and the systems which maintained, or failed to maintain, control of river flow. More important, Campbell accepts that '*what you thought about rivers depended on who you were and what you did*' (2017: 23). Yet his subsequent list of interested parties — '*historians, geographers, poets ….. and lawyers*' – excludes anyone directly concerned with working in those riverscapes: 'watery perspectives' are being defined by a restricted section of Roman society. This is understandable when, as here, he is deploying epigraphic evidence and legal texts. It is much more problematic, however, when trying to synthesise and interpret archaeological evidence written into the landscape by the people dwelling there.

Walsh confronts this issue more directly than most. His discussion of the Barbegal aqueduct system first argues, in Latourian vein, that trees can have agency '*in that they have creative capacity'* (2008: 552). Yet he then poses the pivotal question: who controlled the labour in the work-a-day jobs dealing with the impact of erosion and sedimentation there? These tasks may have involved local workers operating within Ingold's 'embedded knowledge', but what if landowners imported 'alien' slave labour to carry out maintenance tasks?

Drainage of the Pontine Marches is also interpreted in terms of water, soils, vegetation and animals having agency (Walsh et al. 2014). Yet few commentators would portray such non-human agents as acting from knowledge, raising the issue of how environmental know-how was applied and by which particular human agents. Such a project, comprising a state-organised work programme involving canal construction, landscape centuriation, and setting out of the Via Appia, must have been planned from above. Thus it would have been conceptualised in terms of 'Roman' awareness of wetlands, involving measurement and survey, perhaps noting problematic mosquitoes and disease. Yet subsequent maintenance of the system was in the hands of local people, and wetland conversion was not always long-lasting. Its eventual failure could relate to external factors (climate change, colluviation, a lack of state resources), or simply because local labour prioritised other duties or actively resisted the initiative.

Either way, state officials would have seen the culture/nature interactions involved in this project very differently from wetland dwellers. These hints of social divisions in such schemes resonate with later, better-documented resistance, for example those who opposed attempts by the Vatican and Mussolini to tackle such marshy zones. Yet, in the end, these are hints at conflict, not determined efforts to theorise them and consider their interaction in specific, historical ecological, frameworks.

I return, finally, to the Heslington East landscape, remembering the sheer volume of water needed to produce grain and animal products here, and the dire consequences of failing to do so. Most water for crops would have come from rain, but periods of drought would still need to be catered for. In addition, animals need greater regularity of supply, and water had to be either brought to them or they to it on an almost daily basis. As with all wells, the digging of W1 near the start of the Iron Age implies technical knowledge, engineering skills, and access to water-lifting kit, probably alongside control, existing or anticipated, of the immediate landscape. Putting this human intention into action required some understanding of the water table in digging the feature, and a grasp of how water flow could be catered for when revetting its sides (naturally this knowledge could be imperfect — well linings often failed — but could also advance: detailed human engagement with nature can solve problems and so modify future behaviour, something lacking in 'non-human agents'). It should be no surprise that the first phase of such an enterprise incorporated in its lining tame and wild elements (the shovel and deer bone): taming wild water was exactly what that well was intended to do.

Several centuries later, a decapitated human skull was placed in the first ditch to run south from W1. This linear feature demarcated access to its water, dividing a resource that had previously been accessible from all sides. Given the preservation of the brain inside this person's skull, his planned long-drop hanging must have happened nearby, although we will never know whether it used one of the trees evidenced in the vicinity or the well superstructure itself. A later droveway along this ditch line implies that the original feature might signal the point at which different herds were first defined in this landscape, creating the need for differentiated water access. Such a development would have exposed social tensions, perhaps necessitating the creation of mechanisms to reconcile competing claims over animal ownership: no small matter. W1 was later enclosed, seeming to now emphasise human over animal access. This took place when more subdivided field systems were developing and the blend of pastoral and agricultural elements were changing, another source of tension for any farming community.

W1 fell out of use perhaps a century after the nearby fortress at York was set up: whatever forces had ensured its repair or refurbishment over previous centuries, they were sufficiently tenacious to combat the immediate impact of the imperial authority that had arrived, with bodies of armed men, on the very doorstep of the people who occupied this landscape. Following the well's demise, its former position was still commemorated with the insertion of possible transitional objects of Iron Age and Roman jewellery in the vicinity. Finally, some centuries later still, the site of W1 saw the deposition of coin hoards, a type of activity then familiar across the Roman Empire.

W2, in contrast, was dug over 650m to the northeast of W1 in the now-focal, central part of the site at roughly the same time as other monumental development occurred in the adjacent landscape. It was qualitatively different from any earlier wells here in terms of form (regular stone lining, but with a dissonant element — the finial), position (high on a hillside, 65m upslope from a spring-line employed for many centuries beforehand), depth (that siting required it to be dug to over 4.5m to reach water) and life span (at most a century, and arguably only several decades — much shorter than almost every other Heslington well). It suggests the arrival of a community seeking new forms of landscape control in a place distanced from previous agricultural zones.

These people, inserting W2 where water access was difficult, invested in the solidity of stone derived from a distant source that they presumably had some control over. They also had access to a prestigious building whose roof they could dismantle, at least partially, to remove its finial. Whereas other wells had employed timber that could have come from local woodland, the choice of stone created a more solid feature, yet also one which, if it failed, would have been more difficult to repair. Mechanisms were nonetheless put in place to keep W2 almost entirely free of silt during its life time.

The demise of W2 involved dumping specialised water-lifting kit in the redundant feature, accompanied by two pig mandibles to deliberately (and perhaps 'ritually') spoil the water source. The next horizon saw a large stone blocking access, accompanied by the deposition of unusual, residual pottery types and faunal material representing young and old, wild and domestic, animals. This act of 'closure' seems to indicate a concern with birth, growth and death in relation to landscape productivity. Such an event, clearly separate stratigraphically from the action that first took W2 out of service, could even have been undertaken by a different group of people. Later still, stagnant water accumulated here as its stone lining gradually failed, a return of natural processes as insects and frogs/toads fell into it and moss grew on it sides, before its stone lining collapsed completely. Over later centuries, far into the post-Roman period, a hollow in the ground above W2 was still sufficiently prominent to allow 'Anglo-Saxon' pottery to accumulate there.

At every turn, therefore, these wells were part of wider struggles in the surrounding landscape, such tensions being visible archaeologically during their construction, use, and demise: water resources were part of social conflicts, each outcome a product of battles inherited from the past and new ones arising when adjusting to changing circumstances.

Conclusion

These speculative interpretations of W1 and W2 at Heslington East could be questioned at many points, yet are nonetheless consistent with the current evidence. More important, they propose developments that must have challenged existing understandings of the relationship between culture and nature in the farming (and later, perhaps, non-farming) communities that built these wells and exploited the adjacent landscapes. Thus the cosmological frameworks of these inhabitants must have been modified and reconstituted in the light of changing material circumstances and the contradictions embedded therein: the workings of power in society. Steinberg, despite generally supporting Latour, has criticised him for not connecting with such issues (2002: 800), and the discussion of nature/culture relationships in the above studies of Roman gardens, cemeteries and wetland landscapes demonstrate this failing, with descriptions of complexity and difference replacing concrete understanding of social conflict.

A necessary starting point in taking matters forward would be to define different forms of exploitation and resulting class divisions. These issues could be explored using Marxist tools of analysis, an approach that defines different class societies as a product of how producers act collectively on nature (the 'forces of production') linked with the distinct way in which non-producers extract surplus from them (the 'relations of production'), thus generating contexts for social turmoil (see Roskams 2006 and forthcoming, plus references, for a fuller discussion of historical materialism and Antiquity). Perhaps this gap in understanding is inevitable, however: those advocating both the 'cultural/linguistic turn' and its seeming opposite, the recent 'materialist turn' have denied themselves the option of turning to Marx, at least if they are to remain true to their philosophical frameworks and the political context of their writing.

Hornborg (2014) is another to criticise Latour's neglect of general social contexts, this time concerning global inequalities today, raising the far more important, current implications of this oversight. If, for example, the cause of the US invasion of Iraq can become '*vague*' (Bennett 2010: 32) and the swarm of invasion *qua* invasion turns into an 'actant' in its own right, then the Bush regime can be absolved of any responsibility for prosecuting that war (Malm 2018: 78ff). Beyond specific conflicts, tackling the crisis of global warming requires an analysis of the changing relationship between social and natural forces. Collapsing that distinction not only lets current rulers off the hook but also limits our ability to define a clear strategy: if the Carbocene replaces the Anthropocene (LeCain 2015), oil and gas become our focus, not the people getting them out of the ground. As a banner at a recent climate change conference reminded us, '*Ice has no agenda — it just melts*'.

Social theory will only play a limited role in altering what is now happening to the planet. At the very least, however, we should demand that its conceptual apparatus should be an aid, not a hindrance, to deciding 'What is to be done'. In short, in Malm's pithy, if trite, phrase (2018: 118), we need '*less of Latour and more of Lenin*'.

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The author has no competing interests to declare.

References

Ancient Sources

Plato (Translated by C. J. Rowe 1993) *Phaedo*. Cambridge: CUP.

Modern Sources

Aldrete, G. 2007. *Floods of the Tiber in Ancient Rome*. Baltimore: Johns Hopkins University Press.

Allason-Jones, L. 1989. *Ear-rings in Roman Britain*. BAR British Series 201. Oxford: British Archaeological Reports.

Althusser, L. 1971. *Lenin and Philosophy and Other Essays*. London: New Left Books.

Asdal, K. 2003. The problematic nature of nature: the post-constructivist challenge to environmental history. *History and Theory* 42/4: 60–74. DOI: https://doi.org/10.1046/j.1468-2303.2003.00257.x

Bennett, J. 2010. *Vibrant Matter: A Political Ecology of Things*. London: Duke University Press. DOI: https://doi.org/10.1215/9780822391623

Blair, I. et al. 2006. Wells and bucket chains: unforeseen elements of water supply in Early Roman London. *Britannia* 37: 1–52. DOI: https://doi.org/10.3815/000000006784016666

Bravard, J-P. 2017. River adjustment to change: the Rhone in France during the Roman period. In T. Franconi 2017c (ed.): 33–46.

Bruun, C. 1991. *The Water Supply of Ancient Rome: A Study of Roman Imperial Administration*. Helsinki: Finnish Society of Sciences and Letters.

Callinicos, A. 1989. *Against Postmodernism: A Marxist Critique*. Cambridge: Polity Press.

Campbell, B. 2012. *Rivers and the Power of Ancient Rome*. Chapel Hill: University of North Carolina Press.

Campbell, B. 2017. Watery perspectives: a Roman view on rivers. In T. Franconi 2017c (ed.): 23–31.

Clark, C. et al. 2004. Map and GIS database of glacial landforms and features related to the last British Ice Sheet. *Boreas* 33(4): 359–375. DOI: https://doi.org/10.1111/j.1502-3885.2004.tb01246.x

Clark, G. 1944. Water in antiquity. *Antiquity* 18(69): 1–52. DOI: https://doi.org/10.1017/S0003598X00018238

Crumley, C. 2006. Historical Ecology: integrated thinking at multiple temporal and spatial scales. In A. Hornborg and C. Crumley (eds) *The World System and the Earth System*. Walnut Creek: Left Coast Press: 15–28.

Derrida, J. 1967. *De la Grammatologie*. Paris: Éditions de Minuit.

Derrida, J. 1973. *Speech and Phenomena, and Other Essays on Husserl's Theory of Signs*. Evanston: Northwestern University Press.

Descola, P. 2005. *Par-delà Nature et Culture*. Paris: Éditions Gallimard.

Edgeworth, M. 2011. *Fluid Pasts: Archaeology of Flow*. Bristol: Bristol Classical.

Empson, M. 2014. *Land and Labour: Marxism, Ecology and Human History*. London: Bookmarks.

Evans, H. 1982. Agrippa's water plan. *American Journal of Archaeology* 86(3): 401–411. DOI: https://doi.org/10.2307/504429

Feldman Weiss, C. 2010. Performativity of place: movement and water in second Century A.D. Ephesus. In A Moore et al. (eds) *TRAC 2009: Proceedings of the Nineteenth Annual Theoretical Roman Archaeology Conference*. Oxford: Oxbow Books: 66–74. DOI: https://doi.org/10.16995/TRAC2009_66_74

Franconi, T. 2017a. Introduction: Studying rivers in the Roman world. In: T. Franconi 2017c (ed.): 7–22.

Franconi, T. 2017b. *Pater Rhenus:* the hydrological history of Rome's German frontier. In: T. Franconi 2017c (ed.): 85–96.

Franconi, T. (ed.) 2017c. *Fluvial Landscapes in the Roman World.* Journal of Roman Archaeology Supplementary Series 104. Portsmouth, Rhode Island: Journal of Roman Archaeology.

Fulford, M. 2001. Links with the past: pervasive "ritual" behaviour in Roman Britain. *Britannia* 32: 199–218. DOI: https://doi.org/10.2307/526956

Garrow, D. 2012. Odd deposits and average practice: a critical history of the concept of structured deposition. *Archaeological Dialogues* 19(2): 85–115. DOI: https://doi.org/10.1017/S1380203812000141

Goodchild, H. forthcoming. De Agri Cultura Experientia: from modern agronomy to Roman economic analysis. TRAC publication.

Graham, E-J. 2018. "There Buds the Laurel": nature, temporality and the making of place in the cemeteries of Roman Italy. *Theoretical Roman Archaeology Journal* 1(1): 3. DOI: https://doi.org/10.16995/traj.147

Harvey, P. 2012. Knowledge and experimental practice. A dialogue between anthropology and science and technology studies. In R. Fardon et al. (eds) *The SAGE Handbook of Social Anthropology Vol. 2*. London: SAGE: 115–129. DOI: https://doi.org/10.4135/9781446201077.n43

Haug, B. 2017. 360 days of summer: experiencing the fluvial in Egypt's The Fayyūm. In: T. Franconi 2017c (ed.): 139–158.

Hindess, B. and Hirst, P. 1975. *Pre-Capitalist Modes of Production*. London: Routledge and K. Paul.

Hindess, B. and Hirst, P. 1977. *Mode of Production and Social Formation: An Auto-Critique of Pre-Capitalist Modes of Production*. London: Macmillan. DOI: https://doi.org/10.1007/978-1-349-15749-5

Hingley, R. 2000. *Roman Officers and English Gentlemen: The Imperial Origins of Roman Archaeology*. London: Routledge.

Hodge, A.T. 1984. How did Frontinus measure the Quinaria? *American Journal of Archaeology* 88(2): 205–216. DOI: https://doi.org/10.2307/504996

Hodge, T. 1992. *Roman Aqueducts and Water Supply*. London: Duckworth.

Hornborg, A. 2014. Technology as fetish: Marx, Latour, and the cultural foundations of capitalism. *Theory, Culture and Society* 31/4: 119–140. DOI: https://doi.org/10.1177/0263276413488960

Ingold, T. 1993. The temporality of the landscape. *World Archaeology* 25(2): 152–174. DOI: https://doi.org/10.1080/00438243.1993.9980235

James, E. 2008. The rise and function of the concept "Late Antiquity". *Journal of Late Antiquity* 1(1): 20–30. DOI: https://doi.org/10.1353/jla.0.0003

Jones, O. and Cloke, P. 2008. Non-human agencies: trees in place and time. In C. Knappett and L. Malafouris (eds) *Material Agency: Towards a Non-Anthropocentric Approach*. Dusseldorf: Springer: 79–96. DOI: https://doi.org/10.1007/978-0-387-74711-8_5

Jones, R. and Robinson, D. 2005. Water, wealth and social status at Pompeii: The House of the Vestals in the first century. *American Journal of Archaeology* 109(4): 695–710. DOI: https://doi.org/10.3764/aja.109.4.695

Knappett, C. 2013 (ed.) *Network Analysis in Archaeology: New Approaches to Regional Interaction*. Oxford: Oxford University Press. DOI: https://doi.org/10.1093/acprof:oso/9780199697090.001.0001

Laclau, E. and Mouffe, C. 1985. *Hegemony and Socialist Strategy: Towards a Radical Democratic Politics*. London: Verso.

Latour, B. 1991. *Nous n'avons jamais été modernes: essai d'anthropologie symétrique*. Paris: La Découverte.

Latour, B. 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.

Latour, B. 2014. Agency at the time of the Anthropocene. *New Literary History* 45(1): 1–18. DOI: https://doi.org/10.1353/nlh.2014.0003

Laurence, R. 2006. *Roman Pompeii: Space and Society*. London: Routledge. DOI: https://doi.org/10.4324/9780203132357

LeCain, T. 2015. Against the Anthropocene. A neo-materialist perspective. *International Journal for History, Culture and Modernity* 3(1): 1–28. DOI: https://doi.org/10.18352/hcm.474

Leveau, P. 2011. Le Rhône à Arles: risque environnemental et franchissement. *Provence historique* Tome LXI, Fascicule. Fédération historique de Provence. Provence.

Leveau, P. 2012. Le drainage des dépressions fermées en Provence et dans la vallée du Rhône. Un bilan et les enjeux de la recherché. In: V. Ropiot, C. Puig, C. and F. Mazière (eds) *Les plaines littorals en Méditerranée nord-occidentale. Regards croisés d'histoire, d'archéologie et de géographie de la Protohistoire au Moyen Âge*. Montagnac: Éditions monique mergoil: 169–194.

Leveau, P. 2017a. Environmental risk in the lower Rhone valley: high water levels and floods. In: T. Franconi 2017c (ed.): 47–67.

Leveau, P. 2017b. Milieux humides et sociétés en Provence littorale à l'époque romaine. Un essai d'écologie historique. *Provence Historique: étangs, marais et deltas en Provence*. Tome LXVII, fascicule 262, Fédération historique de Provence: 313–350.

Lodwick, L. 2017. Evergreen plants in Roman Britain and beyond: movement, meaning and materiality. *Britannia* 48: 135–173. DOI: https://doi.org/10.1017/S0068113X17000101

Malm, A. 2018. *The Progress of this Storm: Nature and Society in a Warming World*. London: Verso.

Marzano, A. 2014. Roman gardens, military conquests and elite representation. In: K. Coleman, and P. Derron (eds) *Les Jardins dans l'Antiquité*. Fondation Hardt pour l'Etude de l'Antiquité Classique, Tome LX. Cambridge: Cambridge University Press: 195–244.

Mattingly, D. 2006. *An Imperial Possession: Britain in the Roman Empire*. London: Penguin Books.

Merrifield, R. 1987. *The Archaeology of Ritual and Magic*. London: Batsford.

O'Connor, S. et al. 2011. Exceptional preservation of a prehistoric human brain from Heslington, Yorkshire. *Journal of Archaeological Science* 38(7): 1641–1654. DOI: https://doi.org/10.1016/j.jas.2011.02.030

Ortloff, C. and Crouch, D. 2001. The urban water supply and distribution system of the Ionian city of Ephesos in the Roman Imperial period. *Journal of Archaeological Science* 28: 843–860. DOI: https://doi.org/10.1006/jasc.2000.0604

Pearce, F. 2006. *When the Rivers Run Dry: What Happens When our Water Runs Out?* London: Transworld Publishers.

Price, J. 1988. Romano-British glass bangles from East Yorkshire. In: J. Price and P. Wilson (eds) *Recent Research in Roman Yorkshire*. BAR British Series 193. Oxford: B.A.R.: 339–366.

Purcell, N. 2017. A second nature? The riverine landscapes of the Romans. In: T. Franconi 2017c (ed): 159–164.

Rogers, A. 2012. Water and the urban fabric: a study of towns and waterscapes in the Roman period in Britain. *International Journal of Nautical Archaeology* 41(2): 327–339. DOI: https://doi.org/10.1111/j.1095-9270.2012.00347.x

Rohl, D. 2015. Place theory, genealogy, and the cultural biography of Roman monuments. In: T. Brindle et al. (eds) *TRAC 2014. Proceedings of the Twenty-Fourth Theoretical Roman Archaeology Conference, Reading 2014*. Oxford: Oxbow Books: 1–16. DOI: https://doi.org/10.16995/TRAC2014_1_16

Roskams, S. 2006. The urban poor: finding the marginalised. In: W. Bowden et al. (eds) *Social and Political Life in Late Antiquity*. Late Antique Archaeology 3.1. Leiden/Boston: Brill: 487–531. DOI: https://doi.org/10.1163/22134522-90000053

Roskams, S. (forthcoming) Marx, Marxism and Antiquity. In: I. Milevski (ed.) *Historical Materialist Perspectives in Archaeology in the 21st Century*. Boston: Brill.

Roskams, S. et al. 2013. A Late Roman Well at Heslington East, York: ritual or routine practices? *Internet Archaeology* 34. DOI: https://doi.org/10.11141/ia.34.5

Roskams, S. and Neal, C. (forthcoming) *Landscape and Settlement in the Vale of York: Archaeological Investigations at Heslington East, York*. London: Society of Antiquaries.

Scott, E. 1993. Writing the Roman Empire. In: E. Scott (ed.) *Theoretical Roman Archaeology: First Conference Proceedings*. Worldwide Archaeology Series 4. Aldershot: Avebury/Ashgate: 5–22. DOI: https://doi.org/10.16995/TRAC1991_5_22

Shanks, M. and Tilley, C. 1987. *Re-constructing Archaeology: Theory and Practice*. London: Routledge.

Shaw, B. 1982. Lamasba: an ancient irrigation community. *Antiquités africaines* 18: 61–103. DOI: https://doi.org/10.3406/antaf.1982.1085

Spencer, D. 2010. *Roman Landscape. Culture and Identity*. Cambridge: Cambridge University Press.

Steinberg, T. 2002. Down to Earth: nature, agency, and power in history. *The American Historical Review* 107(3): 798–820. DOI: https://doi.org/10.1086/532497

Stephens, G. 1985. Civic aqueducts in Britain. *Britannia* 16: 197–208. DOI: https://doi.org/10.2307/526400

Strang, V. 2014. Fluid consistencies: material rationality in human engagements with water. *Archaeological Dialogues* 21(2): 133–150. DOI: https://doi.org/10.1017/S1380203814000130

Taylor, R. 1997. Torrent or trickle? The Aqua Alsietina, the Naumachia Augusti, and the Transtiberim. *American Journal of Archaeology* 101(3): 465–492. DOI: https://doi.org/10.2307/507107

Thomas, D. 2003. Wells as signatures of social change. *Assemblage* 7.

Thomas, R. and Wilson, A. 1994. Water supply for Roman farms in Latium and South Etruria. *Papers of the British School at Rome* 62: 139–196. DOI: https://doi.org/10.1017/S0068246200010060

Walsh, K. 2008. Mediterranean landscape archaeology: Marginality and the culture–nature 'divide'. *Landscape Research* 33(5): 547–564. DOI: https://doi.org/10.1080/01426390802323773

Walsh, K., Attema, P. and de Haas, T. 2014. The Pontine Marches (Central Italy): A case study in wetland historical ecology. *BABESCH* 89: 27–46.

Walsh, K. et al. 2017. Archaeology, hydrogeology and geomythology in the Stymphalos valley. *Journal of Archaeological Science: Reports* 15: 446–458. DOI: https://doi.org/10.1016/j.jasrep.2017.03.058

Webster, J. and Cooper, N. 1996. *Roman Imperialism: Post-Colonial Perspectives*. Leicester: University of Leicester.

Whatmore, S. 2002. *Hybrid Geographies: Natures, Cultures and Spaces*. London: SAGE.

Whiting, M. 2017. Gift of the Orontes: fluvial landscapes in northwest Syria in late antiquity. In: T. Franconi 2017c (ed): 127–137.

Wikander, O. 2000. (ed.) *Handbook of Ancient Water Technology*. Boston: Brill.

Williams, T. 2003. Water and the Roman city: Life in Roman London. In: P. Wilson (ed.) *The Archaeology of Roman Towns: Studies in Honour of John S. Wacher*. Oxford: Oxbow Books: 242–250.

Wilson, A. 2003. Irrigation technologies: foggaras, wells and field systems. In: D. Mattingly (ed.) *The Archaeology of Fazzan Volume 1: Synthesis*. London: The Society for Libyan Studies: 235–278.

Wilson, A. 2017. Rivers, wadis and climate in North Africa: torrents and drought. In: T. Franconi 2017c (ed.): 111–125.

Wittfogel, K. 1957. *Oriental Despotism: A Comparative Study of Total Power*. New York: Yale University Press.

Wood, I. 2008. Barbarians, historians, and the construction of national identities. *Journal of Late Antiquity* 1(1): 61–81. DOI: https://doi.org/10.1353/jla.0.0007

Wood, S. 2010. *Horti* in the city of Rome: Emulation and transcendence in the Late Republic and Early Empire. In: A. Moore et al. (eds) *TRAC 2009: Proceedings of the Nineteenth Annual Theoretical Roman Archaeology Conference*. Oxford: Oxbow Books: 75–90. DOI: https://doi.org/10.16995/TRAC2009_75_90

Woolf, A. 2007. Shared waters: conflict and cooperation. *Annual Review of Environment and Resources* 32: 241–269. DOI: https://doi.org/10.1146/annurev.energy.32.041006.101434

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