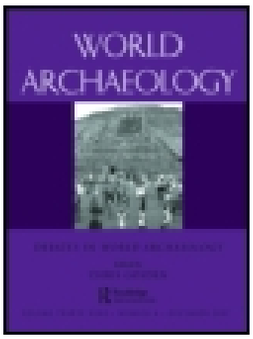

World Archaeology

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rwar20

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Jess Beck & Colin P. Quinn

To cite this article: Jess Beck & Colin P. Quinn (2023): Balancing the scales: archaeological approaches to social inequality, World Archaeology, DOI: 10.1080/00438243.2023.2169341

To link to this article: https://doi.org/10.1080/00438243.2023.2169341

Published online: 08 Feb 2023.

WORLD ARCHAEOLOGY
https://doi.org/10.1080/00438243.2023.2169341

Routledge
Taylor & Francis Group

Balancing the scales: archaeological approaches to social inequality

Jess Beck [a] and Colin P. Quinn [b]

[a]School of Archaeology, University College Dublin, Dublin, Ireland; [b]Anthropology Department, Hamilton College, Clinton, New York, USA

ABSTRACT

Archaeology lends a critical perspective to research on social inequality due to the field's unique access to deep history, emphasis on materiality, and explicit incorporation of multiple lines of evidence. This paper offers a concise overview of archaeological approaches aimed at students and scholars in other fields. We develop a categorization of disciplinary strategies, arguing that archaeologists address institutionalized inequality through examining inequalities in the accumulation of goods or resources (economic differentiation); access to resources or knowledge (social differentiation), and inequalities in action, the ability to make decisions for oneself or others (political differentiation). We illustrate these categories with reference to the distinctions between material, relational, and embodied wealth. We draw upon a broad range of geographic, chronological, and cultural case studies to illustrate the flexibility and utility of archaeological methods for answering questions about inequality in human societies.

ARTICLE HISTORY
Received 31 July 2022
Accepted 6 December 2022

KEYWORDS
Archaeology; inequality; wealth

Introduction

The popularity of Oxfam's annual calculation of wealth inequality reflects a growing public engagement with how inequality is distributed and understood. In 2022, Oxfam estimated that a new billionaire was minted on average every 30 hours during the first phase of the pandemic, while in 2023, 263 million people will face the prospect of living in extreme poverty (Thériault and Torres-Leclercq 2022). Recent economic shifts have led to decreasing intergenerational mobility, with contemporary cohorts faring worse than previous generations (Song et al. 2019). The problem, of course, is that economic disparities are echoed by disparities in political power, with the wealthy hoarding an outsized influence in societal decision-making (The Economist 2018).

Considering this "veritable boom of thinking about inequality" (Graeber and Wengrow 2021, 7), it is pertinent to ask how and why archaeological explorations of the concept are valuable. To date, disciplines such as economics, history, political science, public health, and sociology have dominated conversations about inequity, focusing on the entanglements between political power, economic resources, and human wellbeing that have arisen alongside the metastatic growth of global capitalism over the past 500 years. When faced with the 200,000-year sweep of human history, these disciplines typically situate discussions of inequality firmly within recent historical periods (Piketty 2022) or conceptualize ancient economies as proto-capitalist systems that operated according to an ideology legible within the modern economic sphere (Graeber 2014; Morris 2015).

CONTACT Jess Beck jess.beck@ucd.ie School of Archaeology, University College Dublin, Dublin, Ireland

Human societies, however, show evidence of social inequality some four thousand years before the emergence of capitalism, a period best understood with recourse to archaeological methods. Understanding where and when inequality becomes institutionalized – socially ordained through institutions such as cultural norms, political structures, and ideology – is key for understanding variability and change in human societies. Not all societies developed institutionalized inequality, and archaeology can uncover the creative solutions past human groups have developed for partitioning political power, ensuring equitable access to resources, and dissuading would-be tyrants (Graeber and Wengrow 2021).

Given its unique access to millennia of human history, archaeology has the capacity to challenge contemporary understandings of institutionalized inequality as either 'natural' or inescapable by revealing a past punctuated by alternative forms of social organization. Indeed, a growing body of archaeological literature undermines the unilineal logic that ties social complexity inextricably to institutionalized inequality (Becker and Juengst 2020; Fargher, Blanton, and Heredia Espinoza 2010; Green 2021), a framing that has reached its apotheosis with the publication of *The Dawn of Everything*, the most-discussed popular archaeology book of the last decade (Graeber and Wengrow 2021).

The eager public reception of grand narratives of human history underscores that it is incumbent upon archaeologists to move beyond our disciplinary bubble and enter ongoing debates about the nature of institutionalized inequality in human societies. This paper provides a concise overview of how anthropological archaeologists theorize and measure inequality, charting how we define and document material traces of social differentiation. There is a rich disciplinary history of archaeologists of diverse theoretical orientations drawing upon different lines of evidence to investigate the emergence and consequences of inequality in human societies across the globe (see Cerasuolo 2021; Flannery and Marcus 2012; Kohler and Smith 2018; Paynter 1989; Price and Feinman 1995, 2010). Rather than an exhaustive overview, we provide a guide and jumping off point for archaeology students and scholars in other disciplines who are considering incorporating archaeological approaches into their own work. In so doing, we hope that this paper 'balances the scales' by demonstrating that archaeology offers a perspective on social inequality distinct from and complementary to that of sister disciplines in the social sciences.

Archaeological approaches to inequality

The topic of inequality is popular in no small part due to its conceptual malleability. One of the most well-known formulations is the 'capability framework' developed by economist Amartya Sen, who distinguishes between equality of outcomes, in which individuals possess comparable levels of material wealth, and equality of opportunity, which occurs when people have the freedom to choose their own ways of life (Sen 1992). Researchers in global development focus on quantifiable differences in material wealth, legal and human rights, or living conditions including education, health, and nutrition (Afonso, LaFleur, and Alarcón 2015). Scholars in public health, in contrast, have offered a more holistic conceptualization, emphasizing that any understanding of inequality requires acknowledging the inherent biocultural nature of humans through highlighting how social systems have biological consequences for human communities (Krieger 2005, 352).

While acknowledging the utility of these competing concepts, constructing a working formulation of inequality for archaeologists requires acknowledging several disciplinary realities. First, archaeological research is inherently material. Any approach to inequality must therefore be focused on uncovering tangible traces of social differentiation in the human past. Second, the

archaeological record encompasses periods with written history and periods without written history. Our research demands the incorporation of multiple lines of evidence to understand both the more material dimensions of inequality, such as differences in health or wealth, and more imperceptible manifestations of inequality, such as differential ritual authority or political power. Third, our field is innately concerned with understanding time. The archaeological record is a palimpsest of time, space, and materiality, and disentangling this complex web requires balancing trade-offs between representativeness, resolution, and contemporaneity (Bailey 2007). Despite the tortuous nature of disciplinary chronologies, the archaeological record is unique in its ability to access the deep history of the human past.

To provide a coherent explanatory framework for our overview, we build on anthropological work by Bowles et al. and define inequality as 'persistent ascribed differences in access to economic resources and other valued ends' (2010, 8). This definition incorporates key components of disciplinary understandings of inequality while remaining flexible enough to deploy across the vast span of archaeological deep time. Here, 'ascribed' status assigned at birth is distinguished from 'achieved' status – social differentiation due to skill or effort. This framing likewise underscores the importance of stability over time, a characteristic emphasized by other archaeological investigations of 'durable' inequality (Price and Feinman 2010; Smith, Kohler, and Feinman 2018). By including both material wealth and 'other valued ends,' this definition also encompasses multiple permutations of social inequality, ranging from the material to the ideological.

We argue that archaeologists generally understand inequalities to result from three domains of social and material differentiation: differences in accumulation, access, or action. In broad strokes, *accumulation* refers to economic differentiation through the concentration of resources or valued ends, *access* implies social differentiation through obtaining or controlling resources or knowledge, and *action* indicates political differentiation, specifying who has the ability to make decisions about their behavior of and the behavior of others (Figure 1, Table 1). Such categories are heuristic; durable social inequalities can and do unfold across more than one domain. For example, emerging elites amongst hunter-fisher-foragers of the Pacific Northwest leveraged differential access to productive salmon fishing locales and exchange networks for exotic raw materials (access) to amass food resources and raw materials (accumulation) and used their conspicuous consumption and distribution in a ritualized feasting setting to create social debt and recruit artisans and household members (action); ultimately exacerbating inequalities within a community (Hayden 1997). These processes took place in a dynamic social and ecological landscape that produced imbalances between population and resources – due to rapid population growth, migration, and climate change – that ultimately remade cooperation networks and allowed for relationships predicated on inequality to emerge (Prentiss et al. 2018). Distinguishing these domains, however, acknowledges while they are entangled, there is significant diversity in how inequality was created and maintained in the past. Our framework provides a structured approach to organizing the sometimes unwieldy corpus of literature addressing inequality in archaeology.

Finally, in their work on intergenerational patterns of inequality, Bowles et al. identify three categories of wealth – material, relational, and embodied (Figure 2, Table 1) (Bowles, Smith, and Borgerhoff Mulder 2010, 9). Our paper echoes these distinctions to illustrate the flexibility of archaeological approaches for uncovering different permutations of inequity in the past. While differential accumulation, access, and action are the social processes that can create inequality, the categories of wealth identified by Bowles et al. provide a way to understand how these social processes become materialized in the archaeological record. Our overall aim

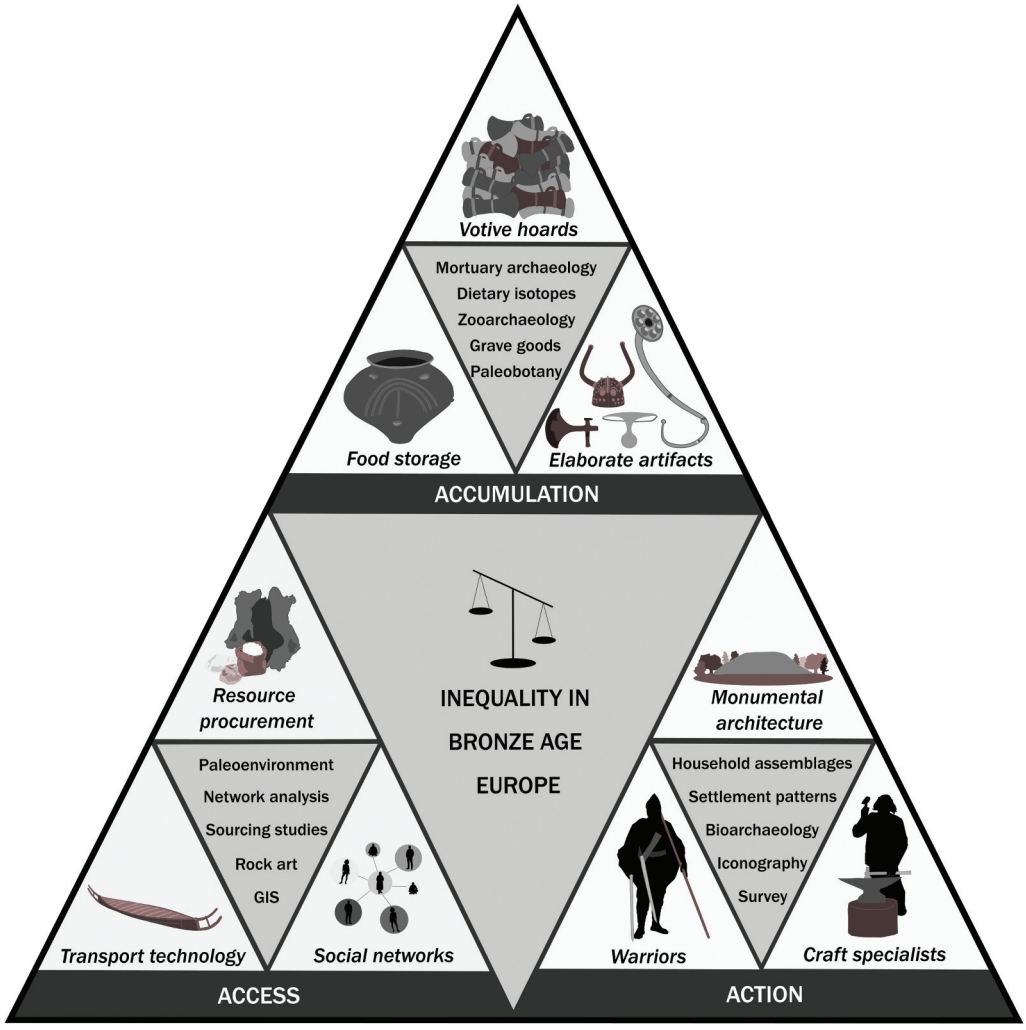

Figure 1. Domains of inequality as materialized in Bronze Age Europe. The central triangle for each domain lists lines of evidence that would allow for the archaeological investigation of inequalities in accumulation, access, or action.

Table 1. Domains of inequality.

Domain	Definition	Examples
Accumulation	The concentration of resources or valued ends.	Votive hoards; grave inclusions; production and storage of surplus.
Access	The ability of people to receive or access resources or valued ends, which can include specialized or ritual knowledge.	Ritual architecture; distinctions in mortuary treatment; resource procurement bottlenecks.
Action	The ability to make decisions on behalf of oneself or others.	Political power and economic autonomy.

is to chart the diversity of archaeological approaches to inequality while demonstrating how underlying theories about social dynamics shape disciplinary research design.

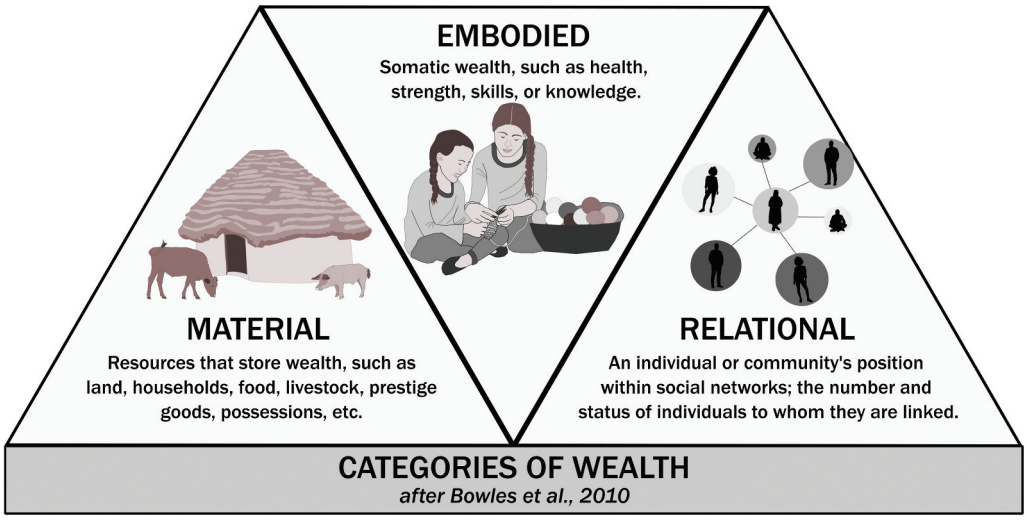

Figure 2. Categories of material wealth, after Bowles et al., 2010.

Accumulation

The cliché of an intrepid explorer discovering a forgotten tomb full of 'wonderful things' is over a century old. Though the typical archaeologist is more likely to spend their time surrounded by ceramic sherds, fragments of bone, and splinters of debitage than golden idols, there is a kernel of truth to this popular myth. Inequality in material wealth *can* be archaeologically identified through the differential distribution of artifacts across space.

Take, for example, the sumptuous golden artifacts clustered in specific graves at the Eneolithic cemetery of Varna, Bulgaria (c.4500 BCE), or the eight thousand terracotta soldiers who guarded the tomb of Emperor Qin Shihuangi in Xi'an, China (c.287 CE). Accumulations need not be associated with specific individuals or communities; in the votive hoards of Bronze Age Europe, costly ingots and metal objects were deliberately withdrawn from circulation and deposited outside of settlements. Accumulation can even provide benefits when the accumulated goods are widely distributed, as when aspiring elites compete for followers through sharing food and possessions during feasts, behavior preserved in assemblages of butchered animal bones, plant remains, storage pits, and ceramic vessels (Hayden 2009).

Archaeological traces of accumulation encompass more than objects themselves, as architecture and mortuary treatment act as proxies for the accumulation of human labor. For example, while cremation pyres leave paltry traces in the archaeological record, they represent an accumulation of time and energy in the effort needed to gather the wood for the pyre and the production of grave goods. Similarly, substantial attention has been devoted to assessing differences in the size of households and storage pits within or between communities, as such disparities are arguably linked to inequalities in material, embodied, and relational wealth (Ames and Grier 2020; Kohler et al. 2017).

Accumulation can also refer to concentrations of people that produce inequalities in relational wealth. More densely populated settlements consolidate far-reaching networks of social connections as well as particular kinds of knowledge. Larger sites can act as regional centers, concentrating people, goods and specialists while directing the flow of taxes or tribute from surrounding settlements. Such

unequal tributary relationships are visible archaeologically through site size hierarchies and the production and distribution of artifacts or subsistence resources.

Finally, embodied inequalities in accumulation are archaeologically perceptible through studies of subsistence. Isotopic analyses of carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) allow archaeologists to examine differences in consumption of plant types and marine food, and to assess varying trophic levels between individuals and communities (Tykot 2004). While isotopic evidence paints a broad and general picture of subsistence resources, recent advances in the analysis of pottery residues and human dental calculus (calcified plaque) permit a more detailed examination of what past people were eating (Suryanarayan et al. 2017; Warinner et al. 2014). As training in these methods increases and costs decline, the incorporation of such detailed dietary analyses will become more common in archaeological studies of inequality.

The most popular strategy for measuring differential accumulation in archaeology is the Gini coefficient. Drawn from economics, this method quantifies unevenness in the distribution of a characteristic across a population. A coefficient of 0 reflects a uniform distribution, while a coefficient of 1 reflects complete concentration.[1] Gini coefficients standardize distributional unevenness across disparate datasets, can be applied to conventional foci of material inequality (i.e. burials, household artifact assemblages, public works) and are relatively easy to understand and implement. Despite the analytical flexibility of the Gini coefficient, archaeological limitations include the need for a representative sample, the interpretive pitfalls of relying on univariate measures, and the potential for similar scores to conceal considerable differences in the magnitude of inequalities between groups drawn from different cultural and temporal contexts (Peterson and Drennan 2018, 58–59).

Access

Differential access to information, technology, or resources is another domain through which inequalities can manifest archaeologically.

Formal aspects of material culture – such as crafts or technology that require specialized training – can act as proxies for access to knowledge, a form of embodied wealth. Green (2020), for example, has focused on seals – incised artifacts crafted to leave impressions on clay – in Mesopotamian cities of the third and fourth millennium BCE. He argues that the circumscribed distribution of seals in temples and palaces, as well as their manufacture on difficult-to-work materials, suggests restriction of this technology as a form of elite administrative control. Arnold (1993) likewise contends that the technologies underlying plank canoe construction among the Chumash (c.1200–1300 CE) comprised a powerful set of ritual specifications controlled by elites, who used this knowledge during periods of resource stress to consolidate their power. Similar dynamics unfolded in Bronze Age Europe, where the control of knowledge concerning metal production fueled an elite hierarchy founded upon the construction and consumption of elaborate metal objects (Earle et al. 2015). Such specialized knowledge is not always technical. Restrictions in access to ritual architecture such as tombs or monuments with enclosed or inaccessible interiors can signal the territory of religious specialists with access to arcane knowledge. In the above cases, embodied wealth in the form of knowledge and artisanal skills leaves material traces, identifiable archaeologically as spatial concentrations of tools, raw materials, and finished objects or inaccessible architecture.

Inequalities in access to material wealth can be identified through sourcing studies, scientific techniques for identifying where raw materials were obtained based on their geochemical composition. Such research in Copper Age Iberia (c.3250–2250 BCE) demonstrates that local populations had access

to amber from Sicily, ostrich eggshell from North Africa, and ivory from both African and Asian elephants (Lillios 2020). In the Peninsula, these exotic raw materials are most often found at mega-sites or ritual centers rather than small villages, showing unequal access to these transcontinental exchange networks. In their political-economic analysis of trade networks during the European Bronze Age (c. 2nd millennium BCE), Earle et al. (2015) argued that the variable continental distribution of key resources such as furs, metals, and amber was exploited by elites, who accrued economic and political power through their control of geographic bottlenecks and transportation technology.

The ability to access different goods or raw materials may also demonstrate relational wealth through underscoring the reach of an individual's social networks. Relational information can be preserved in artifact style (Wiessner 1983) or sourcing studies. For example, far-flung networks circulating mica, obsidian, and copper are well documented across North America, with concentrations of such exotic materials found at settlements such as Poverty Point (c.1650–1150 BCE), Ohio Hopewell sites (c.100 BCE – 400 CE), and Cahokia (C.1050 CE). Wright and Gokee (2021) have argued that such assemblages were important not merely as a form of accumulation; such collections demonstrated access to "diverse forms of knowledge embodied by people and things" (Wright and Gokee 2021, 33).

If exotic materials are collected by particular individuals, they too may accrue unique strands of knowledge through their experience of other 'realms' (Helms 1988). Such travelers are occasionally identifiable in burials that contain concentrations of exotic raw material, foreign artifacts, or geochemical traces of distinct regional affiliations preserved in skeletal remains. This is the case for several burials from the Bronze Age landscape surrounding Stonehenge (c.2300–1500 BCE) including the 'Amesbury archer,' and the 'Boscombe Bowmen,' individuals buried with unique grave goods whose skeletons preserve geochemical signatures of early life mobility (Chenery and Evans 2013). The mortuary realm is a key arena for investigating inequality in access. In funerary treatment, differences in relational wealth preserved in ancient DNA can overlap with disparities in material wealth symbolized by mortuary treatment and distinctions in embodied wealth preserved in human remains. Recent studies examining the funerary treatments afforded to individuals based on their age, sex, and kinship highlight the potential of new methods of ancient DNA analysis to further untangle social organization in the past (Mittnik et al. 2019).

Action

The propensity for self-commemoration amongst the ruling classes has been noted since Shelley described Ozymandias' "two vast and trunkless legs of stone" abandoned in the desert (1818). Such self-promotion is a boon to archaeologists, for elites betray their presence through their elaborate tombs, temples, palaces, and aggrandizing monuments (Green 2021, 161). These monuments provide material evidence of the inequities in decision-making authority between high and low status individuals. Controlling others' actions, including narrowing the types of choices they can make, is another way inequality was created and maintained in the past.

Control over labor – a form of relational wealth – is a key ingredient in the recipe for inequality in action. Archaeologists can use the material record to investigate who produces resources and how labor relations are organized. Labor investment can be communicated through the skill and training needed to produce objects, such as the specialized knowledge required to carve ivory, forge metal, or dye and weave textiles – a form of embodied wealth. In the Inka Empire of Andean South America (c.1400–1600 CE), for example, the state demanded cloth as part of corvée labor production and employed full-time specialist weavers (D'Altroy and Earle 1985). Craft specialists were often attached

to elite households and reliant upon others for food and other necessities. The subsequent imbalance in authority pervaded all aspects of social life.

The organization of human labor can materialize archaeologically. Human skeletons preserve experiences of sustained, repetitive activity through osteoarthritis, the degradation of bone that occurs when joint-protecting cartilage wears away. Trauma indicating oppression, enslavement, or sacrifice also leaves its mark in the form of perimortem fractures. Forced migration and enslavement in historic New York, for example, produced distinctive demographic distributions and patterns of paleopathology among people buried in the African Burial Ground (Blakey & Rankin Hill, 2016). Forced migration can also be detected by bioarchaeologists through morphological traits linked to population affiliation and isotopic signatures of geology ($^{87}Sr/^{86}Sr$) or water sources ($\delta^{18}O$), which preserve in teeth and bone. Specialized socioeconomic identities linked to labor, such as weavers or warriors, can be reinforced in mortuary practices by including 'tools of the trade' as grave goods.

Inequalities in action may also manifest in monumental construction projects. Burial mounds such as Yamnaya kurgans in the Bronze Age Carpathian Basin would have been labor intensive to construct and may have been reserved for only a small subset of the population (Heyd, Kulcsár, and Preda-Balanica 2021). Building large fortifications may have also provided an opportunity to signal differential access to labor between communities, as has been argued for hillforts in prehistoric Ireland (O'Driscoll 2017). Assessing the labor relations at play in the processes of monumental construction can be complicated, however. The shared experience of collective labor is often a catalyst for building community amongst workers. At the same time, the process is exclusionary; marking differences with those not associated with the monument or its construction (Goodale, Quinn, and Nauman 2022). As a result, monumental architecture is in part evidence of collective action and need not always be the product of forced labor.

Poverty Point, a ritual center in Louisiana, USA dating to 3600–3100 BCE, is an example of the complexity of the relationship among monumental construction, labor, and inequality. Mound A at Poverty Point is approximately 22 m in height and 238,500 m^3 in volume. The mound took one to three months to build, requiring a work force of between 1,000 and 3,000 people (Ortmann and Kidder 2013). While some form of centralized coordination was required to construct this impressive monument, the lack of archaeological evidence of permanent leadership – in the form of opulent burials, differential concentrations of wealth, or structures on mound summits – suggests that the project was not undertaken at the behest of an emergent elite. Instead, the push and pull of ritual aggregation and communal involvement in monument construction may represent a form of institutional flexibility, a strategy that moderated the ambitions of would-be elites while fostering novel opportunities for social, economic, and cosmological engagement for regional populations (Sanger 2023).

Material manifestations of political power are one clear sign of inequalities in the capacity for action, the ability to make decisions on behalf of oneself or others. In European prehistory, the communication of ascribed political power often occurs in the mortuary realm, as in the Bronze Age site of La Almoloya, in Murcia, Spain (c.1650 BCE), where an adult male and female were buried together with an array of emblematic artifacts, including jewelry, weapons, and a silver diadem. This burial is more striking given its placement within a massive, bench-lined hall argued to represent one of the oldest palaces in Europe (Lull et al. 2021).

Iconography in the form of statuary, monuments, murals, or inscriptions, is another forum for communicating political power. Well-known archaeological examples include the elaborate reliefs portraying the accomplishments of Maya rulers (c.200–900 CE), the pyramids of Old Kingdom Egypt (c.2650–2130 BCE) built to house deceased dynasties, and the Behistun inscription (521 BCE) of

western Iran, which depicts King Darius I towering over vanquished enemies and a string of captives. The chains of production underpinning such symbols – from who commissions them, to who crafts them, to who acts as their audience – reinforce a system in which a small number of political elites can influence the thoughts and actions of a much wider swath of society.

Discussion & conclusions

The case studies we highlight illustrate the breadth of archaeological approaches to identifying and explaining inequality in the past. We introduce three interconnected domains of social differentiation used to understand inequality in archaeological analyses: accumulation of wealth, access to information, resources, or social networks, and the capacity for action, the ability to make decisions on behalf of oneself or others. Using such distinctions, archaeologists have developed a robust toolkit with which to document quantitative and qualitative differences in material culture and embodied experiences within and between communities. As other disciplines in the social sciences and humanities increasingly recognize the importance of material experiences of inequality, archaeology provides flexible theoretical and methodological frameworks for understanding the deep history of human social organization (Graeber & Wengrow, 2021; Kohler and Smith 2018; Price and Feinman 2010; Shryock and Smail 2011).

Though the focus in this paper has been on how inequality is experienced materially in people's daily lives, exploitative relationships are only socially tolerated when justified by ideology. Elsewhere we have described how people legitimize or contest inequality through institutions such as religion, funerary ritual, and cultural norms (Quinn and Beck 2016). Egalitarian institutions tamp down social differences and inhibit the perpetuation of inequalities through practices such as food sharing and the redistribution of material wealth. In contrast, hierarchical societies justify inequality through cultural practices that facilitate ranking, such as religious beliefs in which leaders are seen as divine intermediaries positioned above the rest of the populace. The long-term and global perspective offered by the archaeological record means archaeologists are uniquely positioned to identify where and when ideological institutions allow societies to diminish, solidify, or amplify inequalities.

Finally, archaeology has the power to challenge contemporary understandings of institutionalized inequality as the inevitable solution to the problems posed by living in complex societies. A growing body of research emphasizes the surprising mutability of past human societies regardless of subsistence practices or political organization, undermining the argument that social inequality is structurally inescapable. The archaeological record offers abundant evidence for human groups self-consciously resisting the consolidation of elite power, whether through the broad distribution of key technologies (Green 2021), the development of inclusive mechanisms to incorporate newcomers (Beck 2020), or the deliberate destruction of material wealth to render it uninheritable (Wright 2014). The ability of the archaeological record to preserve evidence of such tensions and dissonance is a considerable strength; these data produce novel insights about the tempo and tenor of human social change (Quinn and Beck 2016).

Archaeologists must be advocates for the material record which contains forms of social organization for which we have no modern analog. While in the past our discipline has focused on understanding complexity – one might argue that the arc of heritage bends toward hierarchy (Borck 2018) – current trends suggest a growing attention to agency and adaptability as core characteristics of human societies. In a present riven by increasing wealth inequality, political factionalism, global pandemics, and consequences of climate change that differentially impact rich and poor communities, an appreciation of the flexibility of past human societies has clear implications for our future.

Notes

1. For example, ten people are given a total of one hundred euros. If each person receives €10, the Gini coefficient is 0; if one person receives €73 while the remaining nine people are given €3 each, the Gini coefficient is 0.63.

Acknowledgments

Catherine Tan (Vassar College) provided a sociological perspective on an initial draft of this paper. The manuscript was improved by constructive feedback from two reviewers and the editors of this special issue.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributors

Jess Beck is an Ad Astra Fellow and Assistant Professor in the School of Archaeology at University College Dublin. Her research focuses on bioarchaeology, social inequality, and knowledge production.

Colin P. Quinn is an Assistant Professor of Anthropology at Hamilton College. His research interests center on emergent inequality, human-environment interaction in mining landscapes, and social transformations.

ORCID

Jess Beck http://orcid.org/0000-0002-7387-2307
Colin P. Quinn http://orcid.org/0000-0003-2825-3790

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