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The Social Web and Archaeology's Restructuring: Impact, Exploitation, Disciplinary Change

Abstract: From blogs to crowdfunding, YouTube to LinkedIn, online photo-sharing sites to open-source community-based software projects, the social web has been a meaningful player in the development of archaeological practice for two decades now. Yet despite its myriad applications, it is still often appreciated as little more than a tool for communication, rather than a paradigm-shifting system that also shapes the questions we ask in our research, the nature and spread of our data, and the state of skill and expertise in the profession. We see this failure to critically engage with its dimensions as one of the most profound challenges confronting archaeology today. The social web is bound up in relations of power, control, freedom, labour and exploitation, with consequences that portend real instability for the cultural sector and for social welfare overall. Only a handful of archaeologists, however, are seriously debating these matters, which suggests the discipline is setting itself up to be swept away by our unreflective investment in the cognitive capitalist enterprise that marks much current web-based work. Here we review the state of play of the archaeological social web, and reflect on various conscientious activities aimed both at challenging practitioners' current online interactions, and at otherwise situating the discipline as a more informed innovator with the social web's possibilities.

Keywords: social web, archaeology, digital, heritage, social media, skill, labour, heteromation, neoliberalism, cognitive capitalism

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Archaeology as a profession and academic discipline claims to adopt and adapt to technological change with relative ease [1,2,3]. However, in the case of the take-up of the web, archaeology has struggled not only to establish good practice in the context of the vast social opportunities opened up by online spaces, but also to identify and negotiate the threats to individuals and the field at large that manifest in the communal and intimate aspects of the internet. Sociality itself is not unfamiliar to the archaeological project; indeed, it is arguably intrinsic to and inescapably intertwined with everyday practice. Debates on authoritative heritage discourse [4], and community, collaborative, indigenous, feminist and public archaeologies [5,6] have made overt the socio-politico-economic partialities of the discipline and their ramifications on scholarly, professional and everyday actions. The social nature of interpretation and dissemination has long been recognised as central to field archaeology and associated research—appreciated by practitioners for more than a century now, but especially over the past 40 years [7,8]. The responsibilities of archaeologists to the

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larger world, and their capacities to foster wider social change, have similarly been matters of extended concern (for recent examples, see Tarlow and Nilsson-Stutz and commentators [9]). Indeed, the very composition of the profession itself is a social affair: multidisciplinary in nature, with academic researchers and other experts converging on the subject, despite diverse specialisms from across the social sciences and humanities, sciences and engineering [10,11]. In other words, as archaeologists, we are experienced in working within large teams made up of practitioners from varied backgrounds, and in using methodologies developed from outside of our own discipline. Yet the internet reveals forms of human-to-human and human-to-non-human action and social engagement that stretch the field in complicated and still little-understood directions.

The web has developed quickly since its beginnings a quarter century ago when it emerged out of a predominately community-driven project [12] and, from there, continued to evolve along a social trajectory. This communal foundation of the Internet is especially apparent with the advent of so-called Web 2.0 and subsequently Web 3.0 technology, where concern for peer-to-peer collaboration, direct user intervention, data sharing and recombination (among other things) define the nature of the medium. Such dynamic, user-generated actions are manifest in everything from social networking sites (e.g. Facebook) to blogs (e.g. Wordpress), microblogs (e.g. Twitter) and wikis (e.g. Wikipedia), photo and video-sharing services (e.g. Flickr and YouTube), web-based crowdsourcing (e.g. ReCAPTCHA) and crowdfunding ventures (e.g. Kickstarter), online shopping (e.g. Etsy), gaming (e.g. GuildWars), dating (e.g. match.com) and education (e.g. edX)—what some have termed the “social web” [13]. Here we define the social web as parts of the Internet which are open to sharing content and information, structured in such a way that individuals can add to, edit, comment and remix content using a variety of interfaces, including those that are friendly to non-programmers and require only basic digital literacy.

As reviewed below, archaeologists and heritage specialists have been contributors to the social web for two decades now, experimenting with its possibilities and shifting disciplinary values in the process (e.g., see review in Walker [14]). But despite these engagements, critical theorising around the social web in archaeology is rare—limited to a handful of current researchers, and lagging far behind the broader digital culture and media studies scholarship. Discussions of the power, labour, consumption and capitalistic control that fuel much archaeological web-based engagement are often nonexistent or undertheorised by developers, users and other implicated parties. We would suggest that this predicament is a combined consequence of the relative novelty and rapidly developing nature of the social web (as well as its still-growing and changing user base)—rather than a callous neglect. However, such lack of attentiveness puts the discipline (and, indeed, the world more generally) in a precarious position for the future. This article aims to examine such precariousness by contextualising archaeology’s applications of the social web and articulating the major associated gaps in knowledge that demand in-depth study by disciplinary practitioners. We take a purposefully argumentative stance, seeking to provoke debate both about the use of the web itself and about the obligations of archaeologists to the world at large. To this end, we conclude by reflecting on efforts by a small but growing number of practitioners to critically (re)structure our applications of the social web in the present and for the years to come.

The Nature of the Social Web in Archaeology

While initial attempts have been made at a history of digital archaeology [15,16,17], including, most recently, a preliminary trial by Graham and Watrall [18] to digitally derive a history of digital archaeology (using the tools of the internet itself to enable its telling), a comprehensive account of the archaeological *social web* has yet to be written (but see Kansa *et al.* [19] for an overview of Web 2.0 in archaeology; also Jeffrey [20]). A scan of the literature, however, demonstrates that archaeologists are not strangers to sharing, mashing up and otherwise testing the limits of internet technologies. These experiments have arguably become increasingly focused on facilitating open, transparent, inclusive and participatory transactions, and as such have necessarily harnessed the social web to meet disciplinary and broader human needs (either by investing in existing commercial or open source services, or by building bespoke applications). Shaped in tandem

with larger political, economic and social agendas (for an articulation of some such agendas see Sayer [21]), such work seems to be implicated in a fundamental restructuring of the world views of professionals from archaeology and cognate disciplines (e.g., museum studies) which negotiate cultural heritage. Borrowing from Phillips' reflections on Wikipedia use for museums, "In this new landscape, effective stewardship is increasingly connected with openness—both in shared research content and in community dialogue" [22]. We therefore see archaeological and heritage practitioners variously applying and analysing Facebook [23], Twitter [24], Flickr [25], Pinterest [26], volunteer geographic information systems [27], blogging [28,29], crowdfunding and crowdsourcing [30,31], wikis [32], online courses [33,34], and free and open source software [35], amongst a boundless array of other digital social media, to these ends. In many instances, authors present particular projects where the social web has been deployed for archaeological and cultural heritage management or communication; however, the degree to which this work reflects on or evaluates practice (or theorises more broadly) is variable. For the most part, such applications are reported as independent case studies, complemented by only a scattering of preliminary efforts to synthesise and cast a critical gaze upon their operation [for examples of the latter see: 36,37,38], and even fewer ventures into longitudinal analyses of online archaeological engagements [but see 39]. Otherwise, serious analytical enquiries are limited to a handful of recent and soon-to-be-completed PhD dissertations [40,41,42], and Colley's in-progress manuscript on digital communications in the discipline [43]. Walker [14] describes the current scene as one based primarily on "speculation and reliance on anecdotal evidence", where "the permanent effects of social media on archaeology and its publics are unclear", especially owing to a lack of empirical research.

Building upon Walker's findings, we would also suggest that understanding of the professional and general audiences participating in the archaeological social web is mixed, primarily based on small samples of 10s of respondents [e.g., 44] to several hundred respondents [e.g., 45,46], collected via questionnaires. Taking these into account, and assessed in concert with the larger interdisciplinary literature, all that seems clear about social web engagement in archaeology is that it *may* have the capacity to foster a series of very productive relationships and spaces for knowledge-making and knowledge-sharing. Such capacity is made possible, in particular, by the users themselves; as Kansa [38] describes it, the user is "extra value," enabling the generation of new content, crowdsourcing and retrieval of data, remixing of data, and quality control. A plethora of researchers both outside and inside of archaeology go further, speaking of associated advantages, from data portability and scalability, to alliance formation on one-to-one, one-to-many, and many-to-many levels.

Troublesomely, despite its possibilities, there are massive chasms in archaeologists' expertise with, and understandings of the application and consequences of, the social web. Kansa's [38] own classification of users as "extra value" provides an indicator of the problems, which we suggest generally fall under three themes, including inexcusably low levels of knowledge about the impact of the social web on individuals, archaeology's disciplinary cultures, and wider – global – political economies. Below we discuss each of these gaps in knowledge in turn.

Lack of Awareness of Effects on Users of the Social Web in Archaeology

Web-based media have been extolled for their many promises—represented as "trailblazing means to decentre, equalise, liberate and democratise the discipline, advancing feminist and postcolonial agendas through their shared, multivocal, interactive, nonlinear formats" [47]; or as tools with the "potential for transforming the means of networking and communication in archaeology, and challenging traditional disciplinary expertise" [14]. However, their actual on-the-ground impacts are far more debatable. Published case studies and reviews of social web applications in archaeology and heritage (e.g., uses of blogs and related social media, crowdsourcing and crowdfunding sites, Massive Open Online Courses (MOOCs), etc.) tend to report on their successes, providing minimal – if any – discussion of faults, and essentially no deconstructive discourse whatsoever that acknowledges the larger critical media scholarship (for a similar critique see Walker [14]). Typically, social web projects are characterised as part of a "paradigm shift" [22] or a "new era" [48], and by and large they are positively assessed as means towards inclusion, access and

better communication. They are praised for their capacity to cultivate “open authority,” where collaborative communities of contributors provide the chance for institutions to be “inspired by the bustling bazaar” [22] (Phillips speaking of Wikipedia). They are recognised for their subversive but empowering potential to “counter official heritage narratives,” enabling “renewal and recreation” above stasis and regulation [49] (Pietrobruno speaking of YouTube). The language used to describe these projects is dramatic, with some archaeologists hinting at profound personal impacts, including the “capacity to change lives” [50] (Austin speaking of blogging). But their evaluations tend to be driven by quantitative measures, whereby impressive participation counts arguably eclipse attention to the specifics of their operation. As Alcock et al. [33] note with respect to their *Archaeology’s Dirty Little Secrets* MOOC, “the scope and intensity of the response has been overwhelming: more than 40,000 students enrolled from countries worldwide; 682,000 videos watched; 25,000 exercises submitted; 8,300 forum participants.”

Meta-analyses of these projects are rare – a predicament that relates, in part, to the relative recentness of their enactment, and arguably, too, to issues with data mining [51]. For instance, Twitter is useful not only for the textual and pictorial information that it contains in the form of individual messages (or ‘tweets’), but for the network structure underneath the surface. A Twitter user account can include connections to others’ activities within the network via tweets, made possible by mechanisms such as hashtags and usernames. These connections do not have to be reciprocated by other users, and Twitter ties do not therefore necessarily mirror real world links. Such complexity necessarily, then, has implications for both accessing and assessing data.

Problematically, as discussed below, a range of *other* fields of practice, from geography to communications studies, have already seriously queried the successes of the social web, suggesting to us that archaeology’s engagements might be unnecessarily naïve. Such naivety is surprising given the discipline’s long-standing concern for communications with different publics [52,7,53]. We do wonder, then, whether the overblown affirmative rhetoric that usually characterises the social web’s description might dissuade researchers from engaging in critical dialogue. Walker [54] is overt about this possibility, speaking of the silencing effect of the “utopian” discourse of participatory web work in archaeology and heritage. Walker [14,54] is one of only a handful of practitioners to systematically interrogate such work, demonstrating its real potential to actually heighten or cement inequalities, maintain existing lines of authority, and exploit participants.

Walker’s analyses complement the extensive research of Richardson [55,41] who has documented tenacious digital divides and digital illiteracies in online archaeological activities, and who is clear about the insular audiences and precarious (e.g., under-resourced, under-staffed, under-trained, under-strategised) social web practices of professional and academic archaeology and heritage institutions (see especially Richardson [41]). As Richardson [41] writes of such participatory web activities in UK archaeology, “Organisations have little strategic planning in place to manage the requirements of staff time, technical ability and communications policy involved in the creation and sustainability of these types of projects effectively.” She goes on to conclude that “we must question whether participatory media can fundamentally change, open, or even threaten the authority of archaeological organisations and academic knowledge...Multiple perspectives on archaeological interpretation and meaning are not apparent within the framework of the participatory web, frequently because they simply do not exist in the UK” [41].

This research is complemented by other disciplinary analysts who identify problems with data security, longevity, circulation, sustainability, and interoperability through web-based media [20,39,56]. Moreover, the lesser-spoken outcomes of the suite of instabilities associated with the archaeological social web are *not* emancipation and egalitarianism, but actual disempowerment and abuse. For instance, Hill [57] has published on her experiences of “public ridicule” and “being compromised professionally”, primarily at the hands of online comments on media outlets, for coverage of her contemporary archaeological fieldwork at a campsite in the Forest of Dean, UK. These experiences led her to critique the current research infrastructure in the UK that privileges ‘impact’, knowledge transfer, access and accountability—a similar discourse to that which typifies social web applications overall. As she writes, “I wonder whether they [i.e., the ‘impact’ agendas] can sometimes leave us exposed. Starting from a position of great naivety, I was burned by my entanglements with the press...I still feel that there is little that I could have done to control it – except by

choosing not to engage...Self-doubt, often central to academic practice, can be amplified by such events to the extent that they take on a life of their own" [57].

Hill is, in fact, conservative in her estimation of the dangers of media engagement, a point testified to in recent research by Perry et al. [45], which documents the widespread social web-based abuse of archaeology, heritage and museums professionals, and the virtually nonexistent architecture of protection, prevention and penalisation for such abuse. Paralleling trends outside of the discipline, practitioners engaged with online media are often subject to victim-blaming, institutional obliviousness, and employer incompetence, contributing to their suffering on physical, psychological and social levels. Although such findings are reported across a variety of fields of practice, the archaeological social web scholarship has yet to examine the subject with much empirical rigour.

Lack of Theorisation of the Epistemological and Ontological Implications of the Social Web for the Discipline of Archaeology

Discussion of shifts in the nature of the discipline itself, mutating as it is with the deployment of the social web, is similarly sparse (but see Lake [58]). Yet the social web's very use makes obvious the holes in our understanding of archaeology's transformations. Limp [56] anticipated such transformations when, several years ago, he wrote that archaeologists "will need fundamental institutional and sociological changes to create a setting where the promise of the technological tools can actually be realized." More recently, Huvila [26] has become one of the few practitioners to state outright that social media are altering the epistemological architecture of the discipline. By his reckoning, this includes shifts in everything from what we consider to be archaeological knowledge to what we conceive of as work. He makes the case that, given such impact, archaeologists now have a professional obligation to become adept at social web usage, because without honing this expertise – and without contributing directly to its workings – professionals put themselves at risk of becoming irrelevant, losing their place as commentators on their own field of practice. As Huvila puts it, "A premise of all social media is the lack of an intrinsic primacy of traditional hierarchies of authority. Archaeology is discussed in some sense on the different social media services with or without archaeologists. This does not imply that professional archaeologists need to engage in all conceivable forms of social media, but [non-engagement] inherently limits the legitimacy of the critique from the part of non-users" [26].

The fact that the broader structural consequences of social web applications in archaeology have gone undertheorised is perturbing on multiple levels. As per Law [59], "Methods practices are performative. They help to enact the world that they describe." Use of these applications as methods of practice necessarily affects the practice itself and all of its various relationships in the universe: it generates new worlds to live in and negotiate. These reverberations are, in fact, made very clear in the larger critical media and web studies literature, which is rarely cited in social web-oriented archaeological project descriptions. Indeed, many such descriptions (e.g., of archaeological blogging efforts; but see Morgan [60] as an exception) have no citations whatsoever, suggesting that intellectual integrity and cumulative knowledge-making play little part in our social web practices. Colley [61], however, in her discussion of digital heritage ethics, spells out the dozens of other disciplines that *have* been contributing to truly critical conversations on the subject, and is unequivocal about the structural changes prompted by digital engagement. As she states, "digital communication technologies blur boundaries between public and private and workplace and home and impact on heritage practitioners as private citizens and consumers" [61].

These entanglements in ethics, politics, labour, personhood, capital and commerce are well-documented. Although there is evidence that participation in the social web can be motivated by altruism and generosity [62, 63] and may be implicated in the development of creativity, care, courage and public responsibility, among many other traits [47], there is seemingly equal evidence to suggest that it embroils participants in an opposite set of economies. Various critiques of wiki technologies [64] show that even they, with their "universal collective good" as supposedly manifest in Wikipedia, are marked by interference, control, limited engagement, fragmentation, non-neutrality, and aversion to responsibility (see overview in Moon; also Restivo and van de Rijt [65,66]). MOOCs—with their supposedly revolutionary possibilities for

educational reformation and democratisation of learning—have similarly been the subject of substantial recent conversation [67]. This conversation indicates that they may be ensnared in divisive social class politics, as well as in the (ongoing) corporate commodification of the university, and the destabilisation of the professoriate. As per Meisenhelder [68],

The potential of MOOCs to contribute to further unbundling of faculty work, to even more reliance on contingent faculty, to the weakening of faculty intellectual property rights, and even to the elimination of faculty work altogether are serious concerns with implications beyond simply their negative effects on faculty members as individuals.”

Whether or not such critiques are hyperbolic in their nature is difficult to untangle, because larger issues of work, power, and control tend to be glossed over or entirely ignored in the evaluations of these media [69].

Lack of attention to such dynamics is especially apparent in archaeology, where most social web projects – especially citizen science initiatives premised upon crowdsourcing of data (see Smith [70] for a comprehensive review) – are unapologetic about their reliance on free labour and contributors’ uncompensated giving of time and intellectual content. Arguably, this predicament relates to the long history of enrolment of volunteers, amateurs, beginners and enthusiasts in the discipline, but here it is complicated by the rhetoric of online openness, freedom and democracy (more below). That rhetoric, in fact, appears to conceal demonstrable inequities and potentials for exploitation, with crowdsourcing seemingly more likely to benefit expert establishments before implicated publics [14]. For example, Smith [70] calls crowdsourcing a “powerful solution” to “both the professional labor bottleneck and the desire for public engagement.” Bonacchi et al. [71] discuss its emergence “less than a decade ago in the commercial sector, where companies had been looking for ways of out-sourcing labour to potentially interested workers around the globe.” Here the distinction between crowdsourcing and outsourcing escapes problematisation, as do the after-effects on our intellectual cultures and disciplinary economics. Sylaiou et al. [48], describing volunteered geographic information programmes in archaeology, tellingly write that “Crowdsourcing applications must be *designed carefully to give the impression* that participants volunteer and are not working for free” (emphasis ours), hinting at the exploitative politics that inevitably underlie such work.

Outside of archaeology there is evidence that these projects, which claim to provide genuine opportunities for engagement, are often not providing any actual learning experiences at all, instead using amateurs or beginners as ‘workhorses’ [72] to complete tasks which require little or no skills development. While the situation in archaeology/heritage seems better structured—iterative, well-scaffolded for users, and responsive to their experiences (see for example Bonacchi et al. and also Ridge [30,63])—it is notable that, beyond the work of Richardson [41]; also see Walker and Owens [14,54,73], the discipline seems oblivious to its implication here in neoliberal politics and the capitalist knowledge economy [74,75]. From this perspective, such projects – and any social web initiatives that make use of corporate Internet platforms – only work because of their reliance upon “the exploitation of users’ unpaid labour, who engage in the creation of content and the use of blogs, social networking sites, wikis, microblogs, [and] content sharing sites for fun and in these activities create value that is at the heart of profit generation” [76]. The insidious nature of such engagement resides in the fact that users are often not only unconcerned by, and financially uncompensated for, their direct capital-building activities, but also seemingly alienated from their own exploitation, usually because it is disguised as ‘play’, public ‘good’ or community development. As Fuchs and Sevignani [76] put it, “exploitation does not tend to feel like exploitation because digital labour is play labour that hides the reality of exploitation behind the fun of connecting with and meeting other users.”

While such claims of exploitation might be perceived as polemical, it is surprising that archaeology is mostly mindless of the issues, especially given that volunteer labour and the discipline’s concern for embracing ‘amateur’ contributions [77,78,79] have long been matters of debate. Such contributions are foundational to the field of practice—they enabled its establishment and they continue to sustain it today [70,80]—yet they also sit anxiously within the disciplinary structure. This is obvious, for instance, in offline community archaeology excavation projects where the actual integration of volunteer diggers into the work can be problematic and tokenistic [81,82,83]. But far from tokenism, via the social web, volunteers

are regularly drawn into the project of resolving profound internal organisational problems: bureaucratic, personnel and workflow oriented. Returning to Smith [70], they are actually harnessed as antidotes to the “professional labor bottleneck”—deployed to complete backlogged work and “resource-intensive tasks” [63]; to conduct research, curate and manage resources [71]. As Noordegraaf et al. [84] candidly put it, the situation “has clear organizational appeal in an age of austerity.” Although increasingly wrapped in the virtuous costume of ‘public engagement’, these volunteers seem more and more to be engaged to do the everyday workplace tasks of archaeological and heritage practitioners, but with no pay, no security, and no other affordances associated with normal working life.

The justification for such engagements with volunteers is seemingly tied to the motivation for individual volunteerism itself. In other words, organisations provide opportunities to volunteers knowing that volunteers seek social rather than economic benefits, including personal fulfilment and socialisation [85]. These incentives seem to unite both offline and online volunteer communities, but the actual realisation of their purported benefits via online crowdsourcing is debatable; per Walker [14], “The gains for disciplinary and institutional centers are far clearer.” Indeed, as noted above, the web arguably worsens the predicament (with its obfuscating ‘free’ and ‘democratic’ rhetoric), whilst also providing the means to cast a needed critical gaze upon it (e.g., Johnson’s [86] adoption of the #freearchaeology hashtag on Twitter to initiate an expository dialogue about the harm of free labour). Archaeologists are increasingly calling attention to unsustainable structures of employment, poverty, inequality and exploitation within the field [87,88,86], using the social web itself to plead for an ethical sensibility as regards fair workplace and pay policies. However, the place of the online world and social web-based work in facilitating these structures goes mostly unspoken, which, for us, is a matter of urgent concern.

What is more, the social web stretches the limits of (paid and unpaid) work even further, extending it into the home itself, into off-hours, and into one’s social life—effectively colonising and appropriating most aspects of human existence (cf. Crary [89]). The kind of ‘cognitive capitalism’ that manifests via the social web, then, is pervasive and pernicious. To invest in it as a profession means that archaeological organisations and archaeologists themselves have an attendant duty of care to be asking critical questions about its impacts. As Parikka [90](critiquing Boutang) puts it,

What are the harmful downsides of communicative brainwork, such as exhaustion? How does exploitation of non-work hours extend the reach of the corporation to the wider social field of our thinking, doing and gesturing, and harnessing ‘free time’ as part of value accumulation for the corporation? Indeed, isn’t cognitive capitalism merely describing a situation of rather cynical colonisation of time and affect that reaches the most intimate spheres of subjectivity?

By this reckoning, humans become computational parts (what Ekbia and Nardi [91] call “heteromation” – as opposed to automation) where, recalling Kansa [38], their “extra value” is turned into profit for others. Such ‘value’ comes in the form of their spare time, their objectification, their privacy, personal information, unwaged labour, leisure hours, and thus appropriation of the totality of their home and working lives. In return, their ‘profit’ is little more than affective engagement (after Ekbia and Nardi [91]), whereas those who control the social web platforms variously earn money, institutional advantage, intellectual reward, power and even further control of knowledge and exchange systems. Moreover, these profit-makers can often camouflage such gain as a contribution to human wellbeing (cf. Owens’ “ethical crowdsourcing” [92]).

As Ekbia and Nardi [91] point out, even the broader human computational scholarship has been slow to grapple with the consequences of these dynamics. This is highly problematic, especially as those of us who are one-step-removed from such scholarship increasingly invest in systems of heteromated practice. We must, then, begin to critically engage with this practice, because it portends changes to professional bureaucracies and workplace social ties [93], and indeed it continues to heighten archaeology’s complicity in the deeply unequal economies that produce the “precariat” (i.e., insecure labourers with no expectation of stable employment, few if any benefits and weak rights, who are usually educated but regularly required to work voluntarily or during their off-hours, and otherwise at poorly-remunerated rates) [91,94,95]. It is worth reiterating that archaeology has long colluded in these inequalities (e.g., see reflections by Moshenska [96]).

Lack of Consideration among Archaeologists for the Ramifications of the Social Web on Academic and Worldwide Political Economies

Archaeology is perhaps most obviously bound into such economies in its use of digitally-enabled crowdfunding, where (extending from long-standing reliance upon philanthropy and sponsorship in the discipline) individuals commit their own personal monies to specific archaeological projects via an online system (see Piscitelli [97] and also Sayer [21] for discussions of the process). Donors tend to be offered incentives for their contributions (e.g., in the form of physical gifts, prizes or actual experiences), and their donations are often mediated by an internet platform that takes its own cut of the funds (e.g., Kickstarter, Indiegogo). The discipline's engagement with crowdfunding is regularly treated by its users in a purely instrumentalist fashion, and is often portrayed in a singularly positive light. Even where hints of its problems present themselves, archaeologists tend to gloss over the details or speak only superficially of potential threats. Sayre [80], in describing his hesitations in first applying crowdfunding to archaeological research, writes merely that "The initial decision to turn to crowdfunding from Indiegogo struck me as a big leap. These fundraising efforts seem designed to encourage us to wear silly hats and offer odd incentives to potential donors." Piscitelli [97], in recounting a feeling of being pressured to contact his crowdfunders for additional monies, skates over any critical interrogation of the transactional relationship that is formed between donor and archaeologist. Lisa Westcott-Wilkins, managing director of the UK-based archaeological crowdfunding company DigVentures, is cited by *The Independent* as suggesting that crowdfunding is effectively the only way forward for the discipline: "grants and charitable donations are not the answer... archaeologists must find new funding paradigms if they want financial security" [98].

Such claims parallel the existing scholarship on the topic, wherein archaeology is regularly represented as now reliant upon crowdfunding to secure its long-term existence. As per Smith [70], "Academic and professional use of crowdfunding is likely to become a necessity in the near future, given recent dramatic cuts in government support and research institutions' expectations for entrepreneurial engagement with donors." That virtually no practitioners have voiced any concern whatsoever about the ramifications of such practice on larger disciplinary and global political economies is disturbing. Sayer [21] is one of the few researchers to question its ethics, noting (with respect to a model wherein donors pay to participate in 'community' archaeology projects) that it "has been economically and morally justified as providing a public service," yet it "enters into wider moral debates about who the past belongs to and the right to charge people for involvement in excavations of their own heritage." Rather than an inclusive public service, Sayer [21] is clear that the approach might actually been seen as the opposite: one which "actively excludes the wider public through its pricing structure." Indeed, this model literally turns the archaeological record into a marketable commodity, therein harking back to Colley's [61] comments that, in so doing, it inevitably intersects with ethics. However, the number of archaeological crowdfunding initiatives that have articulated a robust ethical standpoint is unclear. Instead, the standard state of affairs seems to be blind adoption of such initiatives, and an apathetic acceptance of the fact that cultural custodians (including the public sector more generally) are increasingly relieving themselves of their cultural duties, whilst simultaneously spinning it as civic engagement (cf. Owens [73]). Arguably, this devolution of the heritage sector parallels broader political trends, such as the UK's localism agenda (e.g., see Jackson et al. [99]). Here we see the strategic aims of archaeology groups changing owing to national efforts to craft the "Big Society," wherein local authorities and organisations are delegated more and more responsibility for decision-making and governmental affairs. As is evidenced in Jackson et al.'s [99] case study of the Mellor Archaeological Trust, the heritage sector has been directly influenced by the Big Society's promotion of volunteerism as a solution to the withdrawal of economic support for services.

Perhaps the biggest concern here is the long-term impact of these economic models (crowdfunding and crowdsourcing included) on the world. While Owens [92] might dispute the collusion of the cultural heritage industry in the work of the "digital sweatshop"—arguing, instead, that we can advance an "ethical crowdsourcing" in cultural heritage which fosters human welfare—there are many unanswered questions about how such projects contribute to *literal* welfare (if at all). Ekbja and Nardi [100] aptly describe the predicament:

With little or no contribution coming from heteromated labor to Social Security, Medicare, unemployment insurance, and other future-oriented investments, these protective resources will be steadily and surely depleted. Deeper in its long-term implications than simple wage contraction, this trend takes away the last residues of security (e.g., jobs, savings, pensions), essentially foreclosing the future for a large portion of the population.

Owens [92] rationalises crowd-work in the heritage sector by suggesting that it offers belonging, identity and self-worth to participants. As he writes of these contributors, “After people’s basic needs are covered, they tend to be primarily motivated by things that are not financial.” Our concern is that the literature indicates that the sector is *not* actually meeting the basic needs of its own existing workforce (nor its workforce-in-training), and instead is knowingly turning to unpaid, unskilled, unprotected, uninformed labourers to fill its organisational deficits, including to supply its own funding.

Whatever claims archaeologists and heritage practitioners might wish to make about the democratising effects of the social web, we wonder – in line with Haklay’s [101] discussion of neogeography – if these are more of a “delusion” which mistake ‘cyber-libertarianism’ for democracy. As per Haklay [101], “Democratisation evokes ideas about participation, equality, the right to influence decision making, support to individual and group rights, access to resources and opportunities...” But the evidence that archaeological social web projects are truly supporting human rights or advancing equality is tenuous at best. Indeed, the physical and social impacts of the larger media technology industry (which powers the social web) are themselves threatening the democratic project—wreaking what Parikka [102] calls “obscene” effects upon the globe. These effects are unaccounted for in the extant scholarship, suggesting that archaeologists have little sense of the worldwide material and economic fallout of their social web work and, hence, are unprepared to comment on its democratising nature.

Navigating the Future of the Archaeological Social Web

We are not in doubt of the productive possibilities that the social web could offer to archaeology as a field of practice. However we *do* question the capacity of the discipline to negotiate such possibilities with so little rigorous understanding of their dimensions and impacts. Our applications of the social web have direct effects on users, our discipline, and ourselves; and, despite a wider failure to take account of the more negative of these effects, various archaeologists and cognate specialists have been pioneering ethically-committed, critically-aware approaches to online interactions which have the potential to reframe archaeology more generally. We see their activities not merely as instantiations of ‘good practice’, but as vital demonstrations of conscientious engagement with the media. Among the work being carried out is the development of evaluation frameworks for social web projects in archaeology that go beyond quantitative counts—drawing qualitative measures into nuanced efforts at examining positive and negative outcomes [40,41]. Others (often in tandem with evaluation efforts), for instance Huvila [26], Morgan and Eve [103], Insole and Piccini [104], Richardson [41] and Walker [14,54], are spearheading meaningful interchanges with the critical media studies scholarship (wherein the repercussions of the social web are more richly theorised), weaving its findings into new archaeological social web endeavours. Such work has, among many positives, the upshot of lessening what Parikka [90] refers to as the “language of the fabulous, the spectacular” in archaeologists’ descriptions of engagement with the internet. Still others are involved in the study and articulation of policies for safely adding to, editing and taking down social web content, and for prevention of, protection from, and penalisation for harm caused by social web usage [45]. And some (e.g., the Society for American Archaeology, Cambridge University, University of York) are generating and delivering explicit, theoretically-grounded training for archaeology/heritage students and professionals in social web applications where information on these various conscientious interventions is circulated among practitioners, and from whence larger disciplinary cultural change might be born. In the future, we also expect we might see the emergence of ethical codes of practice or statements of intent with respect to social web applications that directly reflect on risks and acknowledge fair pay and working conditions. These statements would make obvious an awareness of potential socio-politico-economic problems (individual, institutional, disciplinary or globally-relevant) that could manifest from web-based modes of engagement.

Taken together, such work points towards a reorientation of web-based archaeological engagement into an approach that is critically-informed and future-oriented. As such, it pushes our gaze towards the conclusions of theorists like Ekbia and Nardi [100] who caution against the kind of unapologetic endorsements of heteromation that are common in and beyond archaeology:

We understand the deeply gratifying affective rewards of many heteromated systems and have engaged them ourselves... but it is also necessary to consider the socioeconomic trajectory that unpaid labor or poorly paid microwork entails for our collective future.

Put differently, the social web extends far beyond a series of communicative platforms. It entangles archaeology in relations of production, consumption and world-making that have deep repercussions not only for what we know about the past, but for who we are as people in the present and in times ahead. If we exploit it, then one might make the argument that we have a consequent professional obligation to critically familiarise ourselves with this online landscape, and to restructure our interventions in the discipline to meaningfully and ethically accommodate it. This would mean extending the nature of our training, our toolkits, and our theoretical and political-economic sensibilities, as a handful of practitioners are already doing. We would suggest it also means conscientiously contesting investment in practices that compromise fair pay, fair working conditions, social equality, and basic human rights. The advantages of such extension are far-reaching, including the folding of archaeology into larger global programmes of social critique and cultural design (programmes that, while often unspoken, have long underlain our work). The result is a discipline that is dedicated to the past, but that is at once firmly committed to the world today and the world to come.

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