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ON ETHICS, SUSTAINABILITY, AND OPEN ACCESS IN ARCHAEOLOGY

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On January 11, 2013, an Internet activist, Aaron Swartz (Figure 1) took his own life at the age of 26. Swartz faced severe criminal charges for attempting to mass-download scholarly articles. His tragic death still reverberates around a community of activists that value sharing of knowledge and a free and open Internet. His death also places a spotlight on the ethics of academic publishing practices, requiring us to reexamine how we conduct and communicate archaeology.

The story of Swartz's death involves JSTOR (http://www.jstor.org). Most archaeologists are familiar with the online journal repository, originally funded by the Mellon Foundation. In some ways, JSTOR is a resounding success, as it serves many scholars worldwide, including archaeologists. Unlike many digital scholarly communications initiatives, JSTOR is also financially "sustainable." It is held up as a model for how to do digital scholarship correctly. It serves a large community and does not have to come back year after year begging for more grant money. JSTOR's revenues come largely from subscriptions. If you do not have an affiliation with a subscribing institution to JSTOR, you do not get access to the vast majority of its resources. In other words, JSTOR sustains itself by setting up a "paywall." That paywall blocks some 150 million attempts to access JSTOR every year.

Swartz was allegedly caught attempting a mass download of some 4.8 million articles from the JSTOR repository via MIT's network. Although JSTOR did not pursue charges, U.S. prosecutors indicted Swartz with criminal hacking, and he faced 35 to 50(!) years in federal prison. Essentially, U.S. prosecutors charged Swartz with cyber-terrorism, all for downloading academic articles in a manner that did not damage MIT's network or JSTOR (according to expert witnesses involved in the case). According to Swartz's family, this legal hounding directly motivated his suicide.

This obviously is a tragic case, and another sad example of routine abuse of the legal system with regard to intellectual property and computer crime. JSTOR did not want to threaten Swartz with decades of prison time for downloading articles. But, in the end, that did not matter. He still faced a draconian prison term, roughly equivalent to the punishment for second-degree murder because he allegedly violated network "terms of service" contractual rules that JSTOR put into place around research materials.

The tragic case of Aaron Swartz highlights the ethical urgency of debating Open Access. However, before exploring this topic, we need to first introduce why Open Access (Figure 2) is even an issue. As defined by Peter Suber, one of the leaders of the Open Access movement, Open Access literature is ". . . digital, online, free of charge, and free of most copyright and licensing restrictions." The World Wide Web makes Open Access feasible by dramatically reducing dissemination and copying costs. Nevertheless, although the Web makes the sharing of content very inexpensive, producing high-quality information, including peer-reviewed literature, remains expensive. Debate over the direction of research publication revolves around how production, editing, and peer-review costs should be financed. The case of Aaron Swartz illustrates the high legal and ethical stakes involved in this debate.

Paywall Dangers and Peer-review Papers as Gray Literature

Swartz's case shows the dangers of our discipline's normative practice of fee-based (paywall) access to scholarship. Paywalls, enforced by "terms of service" and strong copyright laws, create a legal context with punishments in excess of those dealt to human traffickers. As outrageous as that sounds, Swartz's case shows how our legal institutions treat violations of network terms of service and copyright more seriously than *slavery*. It is unlikely that the SAA, the Archaeological Institute of America (AIA), or the American Anthropological Association (AAA) would want to press felony charges or long prison terms if someone illegally downloaded a journal article from one of their servers. JSTOR did not press for prosecution either. Nevertheless, Swartz faced spending the rest of his life behind bars.

Although many archaeologists would be saddened to hear of Swartz's case, they do not consider themselves to be "hackers." Writing a program to automatically download JSTOR articles lies well outside the skill sets and inclinations of most SAA members. Nevertheless, the legal implications of Swartz's case should still worry the SAA and its membership.

Archaeologists regularly lament the inaccessibility of CRM research locked in "gray literature" reports, and a number of archaeologists have worked to make such reports more publicly available. Yet, to anyone outside of journal paywalls, *mainstream publications are as inaccessible as gray literature.* Many researchers, particularly our colleagues in public, CRM, and contract archaeology or those struggling as adjunct faculty, either totally lack or regularly lose affiliations with institutions that subscribe to paywall resources such as JSTOR. Many of these people beg logins from their friends and colleagues lucky enough to have access. Similarly, file-sharing of copyright-protected articles is routine. Email lists and other networks regularly see circulation of papers, all under legally dubious circumstances.

Many of us have encountered these underground networks for sharing research but have not considered the risks associated with sharing research outside of official channels. To note that this situation endangers many SAA members is no hyperbole. While Table 1 provides much more background information, below we highlight some of the legal risks involved in conventional publishing:

- Sharing logins to gain access to university library systems can involve grave legal risks. It involves the same sort of violations of terms of service that made Aaron Swartz face up to 50 years in prison. For instance, JSTOR's terms of service (that Swartz allegedly violated in his felony charges) specifically prohibit actions such as sharing logins.
- Sharing papers (mainly in email, but also social networking sites) also carries risks, mainly in civil and not criminal law. This could change if the "Stop Online Piracy Act" (SOPA) passes, making many more copyright crimes felonies. Already, mass copyright lawsuits with financially ruinous penalties happen—even involving 100,000 people at a time, including children.
- Law Professor John Tehranian (2007) published a study in which he calculated a jaw-dropping $4.5 billion (the "b" is no typo!) in potential copyright liability involved in routine academic research and instructional activities over the course of a single year.

Copyright has expanded over the years into a more-or-less absolute and perpetual property right. In fact, no U.S. copyrighted works entered into the public domain last year. It is already illegal for even libraries to circumvent technological copyright protections (DRM) to archive and preserve electronic books and

Figure 1. Swartz participated in a number of digital civil liberties efforts, including the campaign to block SOPA from becoming law (credit: Wikimedia Commons, Creative Commons Attribution, Share-a-Like License; source: http://en.wikipedia.org/wiki/File:AaronSwartzPIPA.jpg).

Table 1. Informative Links

Topic	Links and References
JSTOR	• The Mellon Foundation's account of its role with JSTOR: http://www.mellon.org/news_publications/publications/jstor-a-history • Jennifer Howard, writing for the Chronicle of Higher Education, on JSTOR's access issues: http://chronicle.com/blogs/wiredcampus/jstor-tests-free-read-only-access-to-some-articles/34908 • JSTOR's terms of service: http://www.jstor.org/page/info/about/policies/terms.jsp
Aaron Swartz's criminal case and death	• MIT's paper The Tech on Swartz's indictment: http://tech.mit.edu/V131/N30/swartz.html • Lawrence Lessig (IP attorney, faculty Harvard Law School, friend of Aaron Swartz) on the criminal case and conduct of Aaron Swartz's prosecutor: http://lessig.tumblr.com/post/40347463044/prosecutor-as-bully • NBC news report on Aaron Swartz's family's reaction to his suicide: http://usnews.nbcnews.com/_news/2013/01/13/16485181-family-of-aaron-swartz-government-officials-partly-to-blame-for-his-death • Alex Stamos, cyber-crime expert and expert witness on the Swartz case: http://unhandled.com/2013/01/12/the-truth-about-aaron-swartzs-crime/ • Ian Millhiser on comparing the punishments Swartz faced with punishments for violent crimes: http://www.alternet.org/10-awful-crimes-get-you-less-prison-time-what-aaron-swartz-faced
Open Access	• A canonical definition of Open Access by Peter Suber: http://legacy.earlham.edu/~peters/fos/brief.htm • Special issue on Open Access in archaeology, edited by Mark Lake, published in the paywall journal World Archaeology: http://www.tandfonline.com/toc/rwar20/44/4 • Office of Science and Technology Policy (Whitehouse) open access memorandum: http://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf • Harvard University calls for open access: http://arstechnica.com/science/2012/04/harvard-library-advises-its-faculty-to-go-open-access/ • Nature's editor on open access: http://www.guardian.co.uk/science/2012/jun/08/open-access-research-inevitable-nature-editor • Summary of AAA issued a report (available only to AAA members) on the lack of sustainability of open access in anthropology: http://aaanet.org/press/an/0507/davis.html • Mixed reactions to the Finch Report (UK) open access recommendations: http://legacy.earlham.edu/~peters/fos/newsletter/09-02-12.htm#uk-ec
Law and "Terms of Service"	• The Electronic Frontier Foundation (EFF), a civil liberties group, on Terms of Service: https://www.eff.org/deeplinks/terms-of-%28ab%29use
Copyright's expanding scope	• How copyright term extensions led to nothing entering the public domain in the US: http://web.law.duke.edu/cspd/publicdomainday • Mass litigation and massive fines for copyright infringement: https://www.eff.org/wp/riaa-v-people-five-years-later • Media industry lobbying in trade agreements: http://www.theatlantic.com/technology/archive/2012/02/why-an-international-trade-agreement-could-be-as-bad-as-sopa/252552/ • A library legal assessment of SOPA: http://www.librarycopyrightalliance.org/bm~doc/lca-sopa-8nov11.pdf • Georgia State fair use news and commentary: http://www.educause.edu/focus-areas-and-initiatives/policy-and-security/educause-policy/issues-and-positions/intellectual-property/georgia-state-copy
Business practices in scholarly publishing	• Boycott efforts protesting Elsevier's lobbying for copyright expansions and stiffer punishments: http://www.guardian.co.uk/science/2012/feb/02/academics-boycott-publisher-elsevier • Cathy Davidson (director of HASTAC, a digital humanities center) commenting on Swartz's death and academic publishing: http://hastac.org/blogs/cathy-davidson/2013/01/15/tragedies-scholarly-publishing-2013 • Guardian editorial on "academic publishers make Rupert Murdock look like a socialist": http://www.guardian.co.uk/commentisfree/2011/aug/29/academic-publishers-murdoch-socialist

Figure 2. The Public Library of Science originally designed this Open Access logo and released it to the public domain using the Creative Commons Zero public domain dedication (source: Wikimedia Commons: http://en.wikipedia.org/wiki/ File:Open_Access_logo_PLoS_ white.svg).

other media. Worse, Elsevier, the world's leading commercial scientific publisher, lobbied in favor of SOPA, a bill that would have made copyright infringement, even without a commercial motivation, a *felony* offense. That would have put many routine library activities, including preservation of the published archaeological record, at grave risk.

The evidence is clear that current intellectual property rules carry significant legal risks for everyone. It is worse for researchers at the margins of the profession who lack their own institutional logins. Essentially, paywalls create a criminalized underclass of researchers who bend and break rules to participate in their professional community. It is a perverse travesty that we have relegated essential professional communications to a quasi-legal/illegal underground, when supposedly we are a community dedicated to advancing the public good through the creation of knowledge about the past. Like it or not, this legal context shapes academic communication and shapes its ethics.

Moving beyond Narrow Visions of Sustainability

If you are lucky enough to have a stable university affiliation, copyright and terms-of-service issues may seem removed from your reality or daily concerns. University libraries typically insulate faculty from the escalating costs of publication because libraries, not faculty, do the purchasing (or, more truthfully, the renting, because once a library stops subscribing, access to back issues also ceases) of access to commercial and semi-commercial publication repositories. Faculty members take access largely for granted. This mindset is pervasive. We are certain that many reading this paper may dismiss its concerns thinking: "If it ain't broke, don't fix it."

But publication is broken and desperately needs to be fixed.

Recently, Jason Baird Jackson (2010) asked: "Last year, did you get paid nothing to work hard for a multinational corporation with reported revenues of over a billion dollars?" He was referring to scholars that write, edit, and perform peer-review services for journals managed by commercial giants like Elsevier, Springer, Wiley Blackwell, and Taylor & Francis. His question highlights some uncomfortable truths about scholarly communication. Publicly sponsored research, often conducted by scholars at public universities, gets written up, edited, and reviewed without direct compensation, only to become commercial intellectual property that universities must purchase, at exorbitant and rapidly growing prices (3–5x the rate of inflation), back from publishers (Kansa 2012). The largest commercial science publishers routinely see profit margins in excess of 30 percent, making the industry more profitable than the oil business. That profitability comes from dominating the circulation of knowledge—knowledge that is mainly created through public dollars in the form of grant-funded research.

Intellectual property barriers and cost escalations certainly do not help small publishing houses specializing in books and monographs or society publishers such as the SAA. The cost escalations of the big commercial science publishers translate to fewer funds to buy humanities and social science books and journals (Davidson 2013). It is self-defeating for archaeology's professional societies to fight Open Access, since they are simply helping to perpetuate cost-escalations in the areas of publishing in STEM (science, technology, engineering and medicine) fields that university administrators prioritize over the humanities and social sciences. Our professional societies need to consider this larger economic reality when determining their positions on Open Access (Kansa 2012).

The negative impact of publication's costs increases and other dysfunctions diffuse widely, making them difficult for faculty to notice. But they do contribute to the general bloat of overhead and costs that leaves less room and money for teaching and research. In a recent case, Cambridge University Press, Oxford University Press, and SAGE Publishers sued Georgia State University (GSU) over e-reserves to curtail "fair use" (limitations in copyright law to allow research, instruction, critique, and free speech). The suit was dismissed, but at the cost of over $3 million in legal fees to GSU. In dismissing the case and siding with GSU, the judge ordered the plaintiffs to cover the university's legal fees. However, the publishers

have filed appeals, and the legal bills continue to pile up as the matter remains unresolved. Depending on the outcome of the appeals, GSU may still end up saddled with the high costs of defending "fair use" from legal challenge.

For perspective, $3 million could have fully endowed a new professorial chair in archaeology, relieved some student debt, funded research, bought archaeological monographs, or supported new high-quality, peer-reviewed Open Access publishing venues. Worse, the high costs and risks of defending against such charges, even when dismissed(!), creates a chilling effect across all higher education institutions. Fair use has a great deal of ambiguity, making it very risky to defend in court (Lessig 2004:187). Although the publishers lost in the first round of this case, they still signaled to universities the threat of future litigation. This will no doubt motivate university administrators to make it much more cumbersome and costly for faculty and students to exchange publications in instructional settings.

The Georgia State case highlights the dangers of thinking too narrowly about "sustainability." Fixating on narrowly defined notions of sustainability leads to what economists call a collective action problem. Each individual project or organization tries to survive so they have a strong incentive to monetize their intellectual property (via paywalls and absolutism in copyright). Damaging negative externalities (legal risks and costly barriers) are problems for others. Thus, the current system pits the interests of professional societies and publishers against those of society members, students, adjuncts, CRM researchers, libraries, funding agencies, and the public.

Despite all of these dysfunctions, professional societies representing archaeology typically undermine or avoid Open Access and cling to paywalls. They do so out of fear, not malice. They worry that a loss of subscription revenue will make it impossible to support editing and peer-review activities essential to quality publication. They also worry that they will lose dues-paying members should publications be openly available. Although these are valid concerns, Open Access financing models and years of experimentation teach us that the *status quo* of paywalls need not be an ugly necessity (Suber 2012:Chapter 7). Some points:

- **Green Open Access.** In a February 22, 2013 statement, the White House Office of Science and Technology Policy (OSTP 2013) endorsed a "green" model of Open Access, where copies of peer-review publications become available in Open Access repositories after an embargo period. Green Open Access enables publishers to profit on exclusive access for a limited time.[1] Unfortunately, most green models have a limitation in that even after articles are publicly available, they are still under "all rights reserved" copyright. This can still inhibit reuse and make reuse costly and legally risky. Routine reuse such as duplication of a previously published image for comparison as well as innovative approaches such as text-mining still can be stymied in costly and complex licensing and permissions negotiations (Kansa 2012). Nevertheless, green models will surely be an important step forward from the current *status quo*.
- **Article processing fees (Gold Open Access).** Article processing fees, such as the $1,350 charged by the Public Library of Science (PLoS) for immediate, free-of-charge, Open Access publishing in their peer-reviewed journals, represent the most widely known model. This level of expense is far too high for archaeology, a field struggling with limited grant budgets (which rarely include funds for publication). But smaller, author-side fees may be feasible by subsidizing publication costs from other sources. Such subsidies may be an ethical necessity, since any fee to publish represents a barrier. Publication fee structures may need to be modeled like SAA membership dues, with different costs charged to researchers at different career stages and affiliations.
- **Membership fees.** PeerJ, an important new commercial publisher, thinks it can make a profit by publishing free and open peer-review papers financed with only $495 in membership dues levied on contributing authors per year. That price-point has greater feasibility than PLoS charges, but most archaeologists will still need subsidized support. The recently launched PeerJ is currently only focusing on biomedical sciences, so its application to archaeology needs more investigation.
- **Redirection and subsidies.** The points above indicate that subsidies likely need to play an important role in financing Open Access. The most obvious source for such subsidies comes from redirecting

library subscription income to directly underwrite Open Access publication costs. The particle physics community recently made this shift: libraries, physics journals, and other stakeholder came together to form the SCOAP3 (http://scoap3.org/) consortium that now directly finances Open Access publishing. This kind of approach needs to be explored for archaeology.

Open Access does not represent an unachievable, utopian position. On the contrary, Open Access is a viable strategy to overcome a myriad of dysfunctions plaguing academic publishing that range from extremism in copyright to price-gouging by monopolistic publishers. Our professional societies serve their memberships poorly when they call into question the financial feasibility and sustainability of Open Access without addressing or even acknowledging the dysfunctions of the current publishing *status quo.* Even Harvard University, the wealthiest academic institution in the world (and an organization not known for its radicalism), claims that it can no longer afford scholarly publications. Harvard recently began urging its faculty to publish in Open Access venues. The editor of *Nature,* one of the most prestigious titles in scientific publishing, also believes a shift to Open Access is inevitable.

Despite all of these recent developments, the leadership of the SAA, AIA, and AAA still cling to the notion that Open Access represents a threat to sustainability. We disagree, and argue that paywall business models show signs of deep trouble when they motivate suing customers (as illustrated in the GSU case) and out-pricing even the deepest pockets of Harvard University.

Leadership and the Public Interest

The authors of this paper are all very well aware of the costs of publication. Two of us (Kansa and Whitcher Kansa) run Open Context (http://opencontext.org), an Open Access publisher of archaeological data. Developing and undertaking editorial and peer-review processes to publish higher-quality archaeological data provides us with a good understanding of the real labor costs involved in publication. Goldstein, a former editor of *American Antiquity,* one of the flagship journals in archaeology, also has substantial experience and expertise with the cost and effort required in publication.

However, publication costs make up only a fraction of the larger costs of doing quality archaeological research. Good research requires costly training, facilities, access to remote locations, workers, labs, equipment, curation, and site conservation. Often, these costs are financed through public funding or publicly regulated philanthropy. But even in cases where research costs are not directly financed through public support, field work is a highly regulated activity. Archaeological field work is almost universally governed or, in the case of cultural resource management (CRM), *mandated* by public laws and agencies.

In other words, there is a clear public interest in archaeological research, and it extends to the dissemination of that research. In recognition of this, archaeological dissemination practices should work toward building public knowledge goods. The Open Access critique of *status quo* publishing is that conventional publishing models subvert the public interest and do not produce public goods, despite public mandates and financing of research. Conventional publishing channels public support of research exclusively into private hands.

Archaeology's professional societies should not be dragged kicking and screaming toward sharing the outcomes of their publicly supported and publicly regulated research. If archaeology does not seriously engage with the Open Access issue, it runs the risk of alienating many of its stakeholders. Granting agencies, libraries, universities, the press, and members of the public all increasingly recognize the costs and other dysfunctions of paywalls and restrictive intellectual property barriers in scholarship. We see clear evidence for increasing pressure and momentum for change. In response to a White House petition, signed by over 65,000 people, the Obama administration recently announced a new policy directing all federal granting agencies to require Open Access to peer-review papers within a year of publication. In addition, the "Fair Access to Science and Technology Research Act" (FASTR) is now working its way through Congress, and there are similar bills pending in the legislatures of three states.

Archaeology needs to better acknowledge and adapt to this new realty (Lake 2012). Not all models of Open Access would necessarily be in the interests of the SAA or its members. For example, the UK government-sponsored Finch Report recommended some Open Access policies that may be very difficult to apply in the cash-strapped humanities and social sciences. That is why the SAA and other professional societies representing archaeologists need to step ahead of the issue. Instead of entrenching themselves in a moribund and unsustainable *status quo* of paywalls, archaeological societies should take the opportunity to help shape policies that implement Open Access in a manner that promotes and does not diminish our discipline.

Recommendations for the SAA

The transition to Open Access will not be easy, but it is necessary. Fortunately, the SAA can take some immediate, if incremental, steps to address the challenge of improving publication and making it more equitable. Below we list some recommendations to guide the SAA to better align the communication of archaeological research to the SAA's own ethical principles, many of which read like a call for Open Access:

- **Gain experience with Open Access.** The SAA needs to better understand the opportunities and costs associated with Open Access. It needs to experiment and learn exactly how to run a sustainable peer-reviewed Open Access publishing service. This experience will give the SAA the needed understanding to better articulate policy recommendations to our financial backers. The SAA need not do this alone. It can partner with other societies, university library groups developing scholarly communications infrastructure, or other commercial or nonprofit Open Access publishers.
- **Refrain from lobbying against or weakening Open Access.** Both the AAA and the AIA joined with monopolistic publishers like Elsevier in lobbying against Open Access (Kansa 2012). These actions debase these scholarly societies and put them into the camp of commercial giants that promote oppressive intellectual property laws that further commoditize knowledge; harm research, teaching, and free-expression; and endanger their own memberships.
- **Seek legal protections for researchers, students, and the public.** The SAA also can make a public statement calling for a more equitable and just balance in computer-security and copyright law and in the interpretation of such laws with regard to scholarly works. Legal frameworks governing publication need to better reflect our values and protect researchers, instructors, students, and other members of the public in accessing and using published research.
- **Encourage quality and prestige in Open Access archaeology.** Even if the SAA does not launch its own Open Access titles, the SAA leadership should encourage greater professionalism and professional recognition for Open Access. The SAA should encourage senior scholars to join editorial boards of Open Access journals and should provide peer-review and other services to Open Access titles to increase their prestige, acceptance, and quality.
- **Publicly endorse Open Access as a goal to work toward.** The SAA can issue a public statement that Open Access represents a goal for the organization, even if it is currently not financially feasible. The SAA needs to investigate funding and organizational requirements to sustain quality Open Access publishing and make it a goal to build the public support and financial resources needed to adopt publication models that better promote the common good of public knowledge. In other words, if we cannot finance Open Access with currently available funding, the SAA needs to make sustainable Open Access to peer-reviewed publications the goal of future fundraising and public policy campaigns.

Conclusions

Media industries have pushed for "the best laws money can buy" (Samuelson 2005) and have pressured legislative bodies and law enforcement agencies to enact stricter controls, more intrusive surveillance, and harsher (actually oppressive) punishments for copying. Unfortunately, these laws not only apply to popular music and movies, they also govern scholarly communications. This transformed legal context, together with massive industry consolidation, makes conventional research publishing very different and much more costly and legally dangerous than the pre-Internet era.

Something is obviously very wrong when a majority of researchers lack the means to legally participate in their own discipline's communications and when university presses sue universities over e-reserves. The current situation works to nobody's interest, except for large conglomerates such as Elsevier. Professional societies need to openly acknowledge the costs and draconian legal risks of our current publishing model. If Open Access is too difficult to finance with our existing resources, we need to clearly communicate to public and private granting foundations and other financial supporters the damage done by privatizing research and under-investing in the public good. Pretending that all is fine and well with our current paywall approach to publishing will do nothing to solve our discipline's finance problems. It will only perpetuate a crippling and dysfunctional publishing system that enriches monopolistic media conglomerates, commoditizes our intellectual outputs, and deprives us of intellectual freedom in teaching and research.

Open access offers a publishing model far better aligned to our needs and values. It is time for our discipline to work toward Open Access and a more optimistic and equitable vision for archaeology in the twenty-first century.

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Note

1. Gold Open Access is a more open approach, where peer-reviewed papers are immediately available, free-of-charge, under liberal licensing conditions.