

the NSA's archiving of all of our private emails, telephone calls and Skype conversations no matter where we live in the world highlights this question in perhaps even starker forms.

I find myself thus in the awkward position of being both on the cutting-edge of using tweets as sources in the history of science, and as a technological curmudgeon at the same time. Not having a Twitter account myself, I am nevertheless concerned about shifting practices that – while they are a boon to the historian – may also lead to troubling losses of privacy or to challenging questions about liminal spaces such as the conference room. Is there still a space to workshop one's ideas before they become distributed in fixed and permanent form, through tweets not of your own making? (Twitter enables all the same risks of mischaracterisation as other more traditional forms of audition, only with a broader and permanent reach.)

The question of whether tweets are public and whether tweets are sources is thus inherently related to the question of how tweets are like and not like publications – and to whether a conference paper, or a roundtable contribution, is something that should be shared beyond the doors of the room. I have, after all, edited this very piece – initially given as a conference presentation – prior to its publication in the form in which you are now reading it. But soon you will be able to go back and recover the entire session's Twitter feed for yourself. Which is the more accessible or better text? For which purposes?

Let me conclude these musings by finishing with a few final thoughts from my world of practice. There seems to be something appropriately reflexive in the case of my own Twitter-inclusive research on synthetic biology, in that Twitter is but the latest mechanism that synthetic biologists have used to share their thoughts with each other in digital form. In the early years of the field, around 2005, one collective dream was to have all laboratory notes, discussion notes and data, available online through what was called OpenWetWare. This radical kind of open-source documentation of the field matched the ethos of one of the founders of synthetic biology, who routinely included a signature at the end of his email saying that any emails sent to him could be made publicly available, and also matched one of the initial proposed names for the field. It has thus seemed only appropriate and eminently suitable that Twitter – founded in 2006 and 'built on open source software, from the back-end to the front-end' – be used to study the field that even as late as 2005 was being called 'open source biology'. In sum, I would tweet:

A liminal moment. Twitter now central for history, but resurrects old question about ephemera & archives that far exceed 140-character limit.

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Some Comments on 'Social Media Trends in Medical History'

In what follows I wish to briefly discuss some ideas that came to me while reading the seven papers in the series 'Social Media Trends in Medical History'. It would be impossible, in the space allotted to me, to adequately discuss the majority of the insights and experiences the authors offer. I thus urge interested readers to engage directly with the original papers.

In August 1991, Tim Berners-Lee gave the public access to the first World Wide Web server and the WWW was born. This initial version of the Web was very different from what we see today. In the early years, passive readers consumed static content, generated by a few actors and placed on servers by dedicated webmasters. Over time, Web 1.0 – as it was retroactively termed – gave way to Web 2.0, an ecosystem in which readers actively participate in knowledge generation and critique.¹ This Internet gave us the social media we know today, where sites like Twitter, Facebook, YouTube and Wikipedia (to name but a few) allow readers not only to comment on, but also to interactively create, content. Like Topsy in *Uncle Tom's Cabin*, the Web just 'grow'd'.

Nowhere is this transition from 'passive' to 'active' consumption more apparent than in the development of Wikipedia. The roots of Wikipedia lie in Nupedia, an earlier attempt to make knowledge freely available to non-specialists. Built on a traditional academic model, Nupedia's reliance on editors, peer-reviewers, experts and a seven stage review process slowed the development of entries so that between March 2000 and September 2003, a mere twenty-five complete articles were available online for passive consumption by the general public.² Wikipedia came into being in January 2001 as an attempt to accelerate this editorial process. By the end of the year, Wikipedia offered approximately 20 000 articles (albeit of varying quality). By 2003, Nupedia had been overtaken by its fertile offspring, and the site was shuttered.³

The roundtable that generated the papers in the 'Social Media Trends in Medical History' series would not have been conceivable a decade ago, when social media was in its infancy. Facebook was founded in 2004 and was initially geared towards college students. Twitter would not appear until two years later. The reach of these two technologies alone is astounding. Twitter has 274 million users, an impressive number that is overshadowed by the 1.28 billion users who use Facebook.⁴ These numbers speak to the first of two themes contained within this series of papers that I wish to address: the broadening of both contributors and audiences that these technologies allow.

With regards to broadening of contributors, Katherine Bachynski has recounted how Ta-Nehisi Coates, a blogger at *The Atlantic*, has successfully leveraged his audience to obtain 'information about a topic he is unfamiliar with, placing current events in historical context, and structuring conversations around particular primary or secondary texts'.⁵ In so doing, he received feedback from professionals and amateurs, with many comments providing un-sourced information that required subsequent verification. That said, Coates clearly provided a forum where knowledge production and consumption was being democratised to a degree. It strikes me that there are two things at work here – firstly, the appeal to a (virtual) audience for information and, secondly, the engagement between

¹ The term 'Web 2.0' was coined by Darcy DiNucci in 1999 and gained popularity in 2004. See D. DiNucci, 'Fragmented Future', *Print*, 53, 4 (1999), 32: 221–222.

² I was the editor for History of Science and Technology for the duration of the project. If memory serves, no HST entries ever appeared due to the length of the review process.

³ The Wikipedia articles on Nupedia and Wikipedia are useful resources. See <http://en.wikipedia.org/wiki/Nupedia> and <http://en.wikipedia.org/wiki/Wikipedia>, last accessed 1 September 2014.

⁴ Numbers for Twitter as of July 2014 and Facebook as of March 2014. See <http://en.wikipedia.org/wiki/Twitter>, <http://en.wikipedia.org/wiki/Facebook>, last accessed 11 September 2014. A survey of all 32 members of my academic department revealed that 25 had a Facebook account while 14 were on Twitter. Of the latter, only four actively tweeted while the rest passively followed others.

⁵ K.E. Bachynski, 'Kickstarting Scholarship: Crowdsourcing as a Historical Tool', *Medical History*, 58, 3 (2014), 469–72.

professionals and the public (or specialists and non-specialists, if you prefer). Of course, one can do one without the other. Recently I asked my Facebook audience for literature on the history of the development of pharmaceuticals targeted to specific racial groups. Within minutes, historians whom I knew professionally were providing me with information and – in many ways more importantly – tagging other historians whom I did not know and asking them to provide more information. Within the space of thirty minutes I had amassed an eleven-page bibliography. Such is the power of social media crowd-sourcing even with a strictly professional community.

The second area is the broadening of audience. Many readers may contribute to the comments section on a blog post, but experience shows that the vast majority do not. The same holds for tweets. However, although passive, these readers are affected in some way by the information they receive and often choose to share. Given that the sharing mechanisms built into social media allow for rapid dispersal of a post/tweet/update, one's ideas can quickly spread into a different and often more diverse community. In this way, it may make sense to talk of multiple audiences for a piece of information. An academic who uses social media will, without fail, end up reaching a broad and diverse, non-specialist, audience.

In a 2008 essay, historian Graeme Gooday and his co-authors (of which I was one) asked 'what can historians of science add to this public discourse about science education? Obviously they can provide historical analyses that place current public and scientific controversies in perspective. Equally important, they can correct misguided attempts at revisionist history that misinform the public about science'.⁶ Currently public controversies exist about topics such as climate change, the safety of vaccination, the use of stem cells, and the possibility of human cloning. Historians and social scientists have studied the development of the scientific *status quo* on these and other issues. To borrow a phrase from Nathaniel Comfort, the opportunity now exists through social media to contribute 'serious history to public discussions'⁷ and to reach an audience that would have been unheard of a decade ago.⁸

Emerging from these two themes is a third one: the ability to create non-standard historical narratives. As Clarissa Lee notes, social media can be 'a form of outreach on history of science at the margins'.⁹ Broadening of both contributors and audiences inevitably leads to the inclusion of marginal or previously hidden voices and challenges to traditional historical narratives.

Despite the diversity of social media, two appear – to me at least – to be the most used: blogging and Twitter. They are, of course, two very different modes of discourse, the former allowing for more thoughtful, longer writing while the latter seems to encourage more immediate and gnomic expression. Jaipreet Viridi-Dhesi has described her experiences tweeting at conferences while Luis Campos discusses the value of reading tweets that originate from a conference that one is (or is not) attending.¹⁰ Indeed a literature

⁶ G. Gooday, J.M. Lynch, K.G. Wilson and C.K. Barsky, 'Does Science Education Need the History of Science?', *Isis*, 99, 322–30.

⁷ N. Comfort, 'My Own Private Ishkabibble', *Medical History*, 58, 4 (2014), 631–3.

⁸ In one sense this broadening of audience allows for the development of scholarly activism, ie. an outwardly directed act that aims to be for the good of scholars and the public. One can interpret aspects of the broadening of contributors as often being more inwardly directed, ie. perhaps ultimately benefiting the scholar and/or the scholarly community more than the general public.

⁹ C. Lee, 'Historical Personalities: Tweeting Standard Narratives in the History of Science', *Medical History*, 58, 4 (2014), 627–8.

¹⁰ J. Viridi-Dhesi, 'Dialogues on Disability: Social Media as Platforms for Scholarship', *Medical History*, 58, 4

is beginning to form about the utility of Twitter in such academic sessions.¹¹ Clarissa Lee gives examples of Twitter accounts being used to bring historical personages to life. There are other things one can do with Twitter. For example, Amy Shira Teitel (an historian of space flight, @astVintageSpace) ‘live’ tweeted the moon landing of Apollo 11 in July 2014. It is probably only a matter of time before some intrepid soul tweets Charles Darwin’s voyage on *H.M.S. Beagle!*

Luis Campos raises some interesting questions regarding audience and privacy. Are speakers to assume that their words – spoken in a closed conference room – are being communicated to a worldwide audience? Should tweeters explicitly ask for permission to broadcast a given talk? Should societies develop policies on social media use at their conferences? There appears to be a whole bundle of issues that need to be untangled.

As Campos notes, the Library of Congress is archiving tweets in an effort to preserve these ephemeral productions. Yet this may not be enough for future historians. Many tweets provide links to further content, be it a webpage or image. Often this content link is shortened using a service such as Ow.ly. A future historian will face a number of problems. (1) If the shortening service is not active, how can she decode the link? (2) Even if it is still active, will the website hosting the content still exist? (3) If the website exists, will the content still exist? Lastly, (4) will the content be machine-readable? In an ideal world, all of the Internet could be archived. At the risk of taking this line of thought too far, I would just note that such a Library of Internet Content would require archiving of programs to read the content and thus also machines to run those programs. It may be that, in the future, the text of a tweet is decipherable, but what it refers to is unknowable. But perhaps I am worrying too much.¹²

Durability and privacy are not the only aspects of social media that can be problematic. Sean Cosgrove nicely points out some of the responsibilities that come with using social media and specifically mentions ‘maintaining is a collegial and productive digital space’.¹³ As anyone who has spent time on social media can relate, discussions held without moderation can often devolve into non-collegial, non-productive arguments. As a number of authors have noted, moderation of comments is time-consuming and indeed many bloggers do not allow any comments on their posts, thus perhaps weighing civility against broadening of participation. It is also worth noting that use of social media by academics has increasingly – in the United States at least – come under the scrutiny of administrators raising the issue of freedom of speech particularly in relation to statements regarding controversial non-academic topics.¹⁴

(2014), 628–31; L. Campos ‘Tweets as Sources in the History of Contemporary Science’, *Medical History*, 58, 5 (2014), this volume.

¹¹ This paper also offers a useful primer on Twitter and some further literature on the platform and academic conferences. It ends with some advice for making conferences more Twitter-friendly: K. O’Flaherty and R. Gee, ‘Inviting Coworkers: Linking Scholars of Atlantic Canada on the Twitter Backchannel’, *Acadiensis*, XLI, 2 (2012), 143–52.

¹² These problems have received some attention and have been termed ‘link rot’ (2 & 3) and ‘bit rot’ (4). I have been party to discussions in historical societies where the decision was made to only use HTML text on their websites so as to better allow future historians to access the material independently of technological change.

¹³ S. Cosgrove, ‘Sounding Out Social Media’, *Medical History*, 58, 3 (2014), 472–4.

¹⁴ C. Potter, ‘Click (Dis)Like: Why Social Media Use Is Now A Professional Issue’, *Tenured Radical*, posted 26 December 2013, last accessed 10 September 2014, <http://chronicle.com/blognetwork/tenuredradical/2013/12/click-dislike-why-social-media-use-is-now-a-professional-issue/> M. Meranze, ‘We Wish We Weren’t In Kansas Anymore: An Elegy For Academic Freedom’, *Los Angeles Review of Books*, posted 4 March 2014, last accessed 12 September 2014, <http://lareviewofbooks.org/essay/wish-werent-kansas-anymore-elegy-academic-freedom>.

It is hard to imagine that Berners-Lee could have foreseen how his brainchild would develop and what it would allow participants to create and share. The increased availability of tablet computers and smart phones has allowed information producers to slip the bonds of the desktop and to be able to work in non-traditional ways, places and times. What the future holds for social media is practically impossible to predict, but one can certainly say that it is here to stay within the academy.

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