Science Blogging Below-the-Line: A Progressive Sense of Place?

15

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Introduction

Drawing on our research on the 'badscience' blog network (Riesch and Mendel 2014), this paper will discuss the construction of this community and how this case study can contribute to our understanding of the geographies of new media and of social research methodologies more broadly. We will look at the spaces that this blogging community interacts with – the physical national location of the network, its interactions with the existing mainstream media spaces in the UK and the virtual above- and below-the-line spaces that allow bloggers and commentators to construct their community (as well as delineating outsiders).[1] We argue that both positive and negative interactions between bloggers and commentators can enhance community networks, bootstrap individual bloggers to higher prominence and thus

[1]"Below-the-line" refers to the space in a blog or increasingly online newspaper article, where people can comment and discuss the issue in the main blog post or article ("above-the-line"); these comment spaces are usually situated below the main post or article.

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enhance their readership and general visibility within and eventually beyond the network. Despite recent worries about uncivil comments and 'trolling' (Brossard and Scheufele 2013), we will argue that the below-the-line interaction on blogs can be a sign of vitality both for the community and the individual site – and can be important for building a progressive sense of place.

Science Blogging

Science blogging is increasingly prominent in academic discussion, and considerable hopes are attached to it. Articles on the virtues of science blogging have appeared in several 'high impact' scientific journals (e.g. Bonetta 2007; Schmidt 2008; Nature 2009); in addition *Nature* featured a regular column (now discontinued) 'from the blogosphere'. The Royal Geographical Society (with IBG) guide to Communicating Geographical Research Beyond the Academy (Gardner et al. 2010) discusses blogging as one option, giving David Campbell's online work on photography, politics and conflict as an example. More recently, Kitchin et al. (2013) discuss the virtue of their own academic blogging in geography as a public engagement tool. There are many reasons why scientists and researchers blog: blogging has been viewed as an inexpensive and accessible outlet for academics to communicate their research directly to the public, bypassing the stringent demands of publishers in terms of turnaround time and editorial control. As such, blogs are increasingly being written by academics as part of their daily activities either on a personal or on an institutional level. In his response to Kitchin et al. Graham (2013b: 79) however outlines some reservations about whether academic blogging really can create new public geographies, due to for example uneven access to the internet and the fact that a very few established voices will always be able to be "much louder, present and visible than others" (see also (Hindman 2008), below). While there is scope for much interesting work on arts and social science blogging, this chapter will focus on science blogging, drawing on our aforementioned research on the 'badscience' blogging community (see (Riesch and Mendel 2014)).

Alongside the increasing prominence of science blogging there are also real concerns and risks linked up with science blogging. Bell (2012: 259) discusses "the characterization of science blogging as a space of cliques and clubs". There are worries that the spaces of science blogging might be exclusionary in problematic ways and that some voices might be silenced. In his survey of political blogs in the US, Hindman (2008) has found that although anybody with the necessary time and resources can set up a blog, blogs' readerships and therefore influence follow a power-law such that the relatively few very influential blogs receive almost all of the attention. The social make-up of these influential bloggers, Hindman found, is remarkably elitist: they were even more likely to be white, middle-class, male and Ivy-league educated than the average mainstream newspaper columnist. This means that initial high hopes over the democratic tendencies of blogging offering a voice for all sections of society are quite unrealised, prompting Hindman to title his study "the myth of digital democracy". While a large number of people are able to set up a

blog, getting people to read and interact with a blog requires significant resources – for example, it can be invaluable if the blogger knows the right people and has the kind of job which allows them to spend considerable time on their online activities.

Similar issues apply to science blogs. The science blogs which get by far the most traffic and – not unrelated to this – have the most influence tend to be written by people, though not necessarily scientists, who either had their employers' approval (such as Ed Yong[2]) or who have enough of a developed media profile to draw substantial traffic (such as Ben Goldacre[3] or Martin Robbins[4]). Breaking into this very prominent group of science bloggers is itself a difficult task. Indeed, many of the most prominent science bloggers have a mainstream media presence already (such as Goldacre again) and additionally science bloggers such as Robbins, "Grrlscientist"[5] and Jon Butterworth[6] now have regular blogs at *the Guardian* (a national UK broadsheet). This suggests that the line between mainstream media and blogs is very blurred at least at the successful end of the spectrum – in content, readership and the profile of the bloggers themselves.[7]

Within the very competitive environments surrounding blogging, constructing networks is crucial if a new blogger wants to have their voice heard. Science blogging networks can function as powerful social advancement tools for aspiring bloggers, bringing their blogs more visibility – because when your voice is being listened to (and crucially, linked to) by more prominent writers then the chances of getting heard rise. For this reason, spaces below-the-line are often important in the development of blogging communities: commenters (who very often maintain their own blogs themselves) interact with the blogger, establish a relationship and in some cases become acquaintances and friends, not just with the blogger but with other commenters, and therefore the interactions between bloggers and their commenters merit special attention, both in terms of the physical and virtual spaces[8] they are situated in and in the way these contribute to a wider identity for the community of bloggers.

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[2]http://blogs.discovermagazine.com/notrocketscience/

[3]http://www.badscience.net/

[4]http://www.guardian.co.uk/science/the-lay-scientist

[5]http://www.guardian.co.uk/science/grrlscientist

[6]http://www.guardian.co.uk/science/life-and-physics

[7]There is a long history of such blurring – one might note, for example, Allan's (2006: 13–4) discussion of Time Magazine's moves towards "electronic dialogue" in the 1990s.

[8]A note on our terminology; we use 'physical' spaces to refer to spaces in the bloggers' offline world (for example, which national borders they fall within) and 'virtual' spaces to refer to the spaces in the online world (e.g. blogs, blog-networks, online newspapers and their below-the-line spaces on which users can comment), which the bloggers use to write their contributions and interact with other bloggers or commentators. Clearly, these are not discrete categories: instead, we would follow Zook and Graham (2007a) in acknowledging the existence of "complex and hybrid spaces made up of multifarious entangled elements of the virtual and physical environments". However, this is the best – or the least bad – way we have found to distinguish such spaces.

'Badscience' Blogs

The 'badscience' blog network developed in around 2007 as a community of bloggers from the below-the-line commentators (and later the attached community forum) of the UK-based blog 'badscience' by science blogger and Guardian columnist Ben Goldacre. People who commented on Goldacre's blog often either already had their own blog or were encouraged – by Goldacre and other members of the developing community – to start their own. Our research is ethnographic in the sense that both of us have been active in this community since the inception, and we have interacted with the community through contributing our own comments, starting our own blogs as well as developing relationships and used these connections to enhance our own blogging and academic networks. As well as this ethnographic approach, we draw on an e-mail-based qualitative study with bloggers from the community (see Riesch and Mendel 2014) for further details of our approach.

While below-the-line interactions are important for this community, such interactions are not always – and perhaps not even mostly – positive interactions between a blogger and their readers. This is likely to be especially true for a science-blogging community that foregrounds active conflict with an assortment of 'quacks', science-illiterate public figures and other purveyors of 'bad' science. Negative comments and reader reactions create certain problems for and risks to bloggers. Risks are not necessarily to bloggers' physical safety, though some comments do threaten violence or death.

There is also risk to the safety of the blog or to the blogger's way of life more broadly, i.e. through threats of libel action or complaints to the bloggers' professional body (which has been a very concrete issue for several 'badscience' bloggers: see our analysis of the risks of science blogging in Riesch and Mendel (2014: 66–67)). However, while we acknowledge these problems and risks – and, clearly, would not argue that threats of violence or death are positive ways to interact online – the chapter will look at how the community analysed here can serve as an example of the generative potential of spaces below-the-line.

Gender and Online Abuse

In addition to more general risks, there are clearly gendered aspects to much online abuse. The activist, journalist and blogger Laurie Penny (2011) sums this up vividly when she describes how:

> You come to expect it, as a woman writer, particularly if you're political. You come to expect the vitriol, the insults, the death threats. After a while, the emails and tweets and comments containing graphic fantasies of how and where and with what kitchen implements certain pseudonymous people would like to rape you cease to be shocking . . . An opinion, it seems, is the short skirt of the internet. Having one and flaunting it is somehow asking an amorphous mass of almost-entirely male keyboard-bashers to tell you how they'd like to rape, kill and urinate on you.

Helen Lewis (2011) describes a range of abuse received by women bloggers, arguing that:

> While I won't deny that almost all bloggers attract some extremely inflammatory comments – and LGBT or non-white ones have their own special fan clubs, too – there is something distinct, identifiable and near-universal about the misogynist hate directed at women online . . . What does it feel like to be subjected to regular rape threats or death threats? To have people send you emails quoting your address, or outlining their sexual fantasies about you? That's the reality of what many female bloggers experience.

More recently, the journalist Caroline Criado-Perez has faced extremely hostile, threatening and abusive misogynistic comments on Twitter following her involvement in the successful campaign to have more historically important women represented on the back of British banknotes (Criado-Perez 2013).[9] There have been significant discussions of questions around gender and science blogging as a reaction to the way that men outnumber women in many spaces, and how such spaces and networks might shut out female voices (see Munger 2010). In a particularly unfortunate example, one such discussion occurred in association with the behaviour of a prominent science blogger (Raeburn 2013). Clearly, science blogging does not escape the problems of abusive behaviour online, nor the gendered nature of much of said abuse. However, while this may be a problem within the wider science blogging community, the theme of explicitly gendered abuse within the 'badscience' community did not arise from our research.

Clearly, though, we would not want to disregard the issues caused by such abuse. It is therefore worth reflecting on how our own positionality may have influenced what we did and did not find. Morrowa et al. (2015) note that in their online research work they "were all already positioned – by virtue of privileges across age, education, language, and geographic location, among others – to feel comfortable and literate in the online environments to which we had access". Likewise, we were positioned by a range of factors from education to gender to location to feel relatively comfortable in the online environments discussed in this paper. Morrowa et al. (2015) argue that "the researcher's relationship to online data cannot be seen as one-way (i.e. the researcher is 'taking' data from online spaces that function like archives of discourse) . . . the researcher's position at points of connection between virtual and material worlds must also be taken into consideration"; they call for a "virtual-material positionality". With this in mind, we should acknowledge that our own positions in the communities discussed here and in broader academic and other communities may have limited what we found – for example, as men we may have been less likely to encounter certain types of gendered abuse (ranging from our physical appearance being criticised to threats of sexual violence) and research participants may have felt less comfortable sharing concerns about such abuse with us.

We are aware that there are significant ethical issues here – it is likely that privilege associated with our genders means that we have not fully experienced some of the gendered abuse and threats that can spring from below-the-line, and

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[9]Criado-Perez (2014) has given examples of some of the abuse she faced in a recent blog.

clearly we do not want to write a defence of threats of rape, murder etc. However, as argued below we also see real progressive potential in online comment spaces. Penny (2014) acknowledges that "yes, the internet is dangerous for women. But that doesn't mean that the answer is to sit quietly with your legs and laptop shut like they want you to do." We would hope that very real problems with online abuse can be viewed as issues to be resolved in lively discussion spaces – for example, with abusive commenters being actively challenged, being excluded from discussion spaces, or being reported to law enforcement agencies for certain types of threats – rather than such abuse being viewed as a reason for closing down these spaces entirely.

Geographies of Science Blogging

Science blogging has led to the development of some interesting geographies. Graham (2013a: 179) criticises how the metaphor of cyberspace "constrains, enables and structures very distinct ways of imagining the interactions between people, information, code and machines through digital networks." For Graham (2013a: 179) "'Cyberspace' [is] both an ethereal alternate dimension which is simultaneously infinite and everywhere (because everyone with an Internet connection can enter), and as fixed in a distinct location, albeit a non-physical one (because despite being infinitely accessible all willing participants are thought to arrive into the same marketspace, civic forum, and socialspace). 'Cyberspace' then becomes Marshal McLuhan's . . . 'global village'." Graham (2013a: 177) argues that "geographers should take the lead in employing alternate, nuanced and spatially grounded ways of envisioning the myriad ways in which the internet mediates . . . experiences." It is in that spirit that we hope these geographical analyses of science blogging can contribute to the academic literature.

Globalisation has been described as "the accumulating consequences of 'the annihilation of distance', i.e., the improvement in techniques of, and the rapidly reducing costs of, transportation and communication" (Dore 2001: 6). For McLuhan (1994: 3), "we have extended our central nervous system itself in a global embrace, abolishing both space and time as far as our planet is concerned". McLuhan (1994: 93) goes on to argue that "[o]ur specialist and fragmented civilization . . . is suddenly experiencing an instantaneous reassembling of all its mechanized bits into an organic whole. This is the new world of the global village". Cairncross (1997) hailed the 'death of distance' more than 15 years ago, viewing "the Communications Revolution" as life-changing. Dodge and Kitchin (2001: 5) note arguments that that "network technologies of cyberspace are forging connections and virtual groups that potentially subvert the primacy of national boundaries. These borders are relatively meaningless to logical connections and data flows that operate on a global scale. The question in these cases is therefore: 'How much sense do existing political borders of the material world make when mapping cyberspace?'" These arguments and questions may leave one uncertain as to whether online networks such as the one analysed here offer a move beyond (conventional) geography.

However, distance, nationality and material political borders do continue to have an influence in online spaces. Graham et al. (2012) have mapped the uneven geographies of Internet access in different countries and the same group (2013) have begun to look at the countries where georeferenced tweets were sent. In terms of more specific case studies, one might note for example that Hine (2000: 115) finds that links between online spaces (for example forums, Usenet newsgroups) and offline geographies (for example, of national identity) were sometimes – though not universally – made in online discussions of the Louise Woodward case,[10] showing that there is no clear binary opposition between online and offline spaces. Paulussen and D'heer (2013) find that online media can allow 'hyperlocal' news coverage. For Thurman et al. (2012) there remains a demand for local news websites, although there are questions about whether organisations working on a 'big media' scale can deliver this. Research in the 'badscience' blogging community supports this idea that – if distance is dead – it remains a rather lively corpse. The bloggers from the 'badscience' community who responded to our survey were overwhelmingly UK-based and largely based in one part of the UK (see Riesch and Mendel (2014: 59). The concerns they discuss are often UK-based – for example, the regulation of 'alternative' medicine in the UK. While some in this community would describe themselves as sceptics/skeptics – and some practices are similar to what is described as skepticism in the US – there are also significant differences which seem to fall along geographical lines. For example the 'bad science' community, in contrast with many US skeptics, tends to show little interest in debunking unconventional beliefs linked to ghosts and 'psi', while creationism – a huge topic on US science blogs – remains rather marginal in Britain. Geographically specific activities and norms can persist, even in communities which very much rely on the virtual spaces of the Internet. We would thus follow Graham's (2013a: 181) argument that while the "internet is characterised by complex spatialities which are challenging to understand and study . . . that does not give us an excuse to . . . ignore the internet's very real, very material, and very grounded geographies."

Territory, Borders and Space

This aforementioned influence of distance, nationality and material political borders means that what is seen in this community is not a straightforward deterritorialisation – not 'just' a move to virtual spaces. Instead of networks replacing territory or acting in a deterritorialised way, they interact with and overlay territories in complex ways (Mendel 2010: 740–1; Painter 2009). For example, many members of this largely UK-based blogging community share a common interest in UK law and regulation. This is not entirely surprising, as being based inside UK national

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[10]Louise Woodward was a British au pair working in Massachusetts, who was controversially convicted in 1997 of the murder (later reduced to involuntary manslaughter) of the baby in her care. The case attracted a lot of media interest in Britain at the time.

territory means that they and those close to them may be especially affected by this: vulnerable to the libel laws in place in different parts of the UK, and relying on the protection of UK law. As Smith (2005: 51) argues, then, "[p]ower is never deterritorialized; it is always specific to particular places. Reterritorialization counters deterritorialization at every turn". It is thus the case that "movements of deterritorialization and processes of reterritorialization [are] always connected, caught up in one another" (Deleuze and Guattari 1998: 10).

There are also virtual and material boundaries that define the community and which provide it with a sense of identity which strengthens community cohesion as well as delineating outsiders. In the case of the 'badscience' blogs, one of these boundaries is implicit in the name itself, with 'bad science' situated as external (though it should be noted that the name was chosen by Goldacre himself long before the community established itself and therefore reflects more of an implicit rather than consciously chosen boundary/identity). The 'badscience' blogs distinguish themselves from a wider community of science blogs (with whom they nevertheless interact) by their activist focus of fighting against perceived 'bad' science (see Riesch and Mendel 2014: 63–6). The emphasis on direct activism and campaigning against 'bad' science therefore turned this blogging network into a particularly active locus for boundary work, which Gieryn (1999) analysed as the collective effort of scientific and other communities to differentiate themselves from outside groups and thus establish a collective epistemic authority.

Our research in the 'badscience' community showed that, for some community members, distance is also an issue insofar as it is possible to meet with other members. While a number of members were either unable to meet others face-to-face or preferred not to, face-to-face meetings were one aspect of this community. Proximity (to allow face-to-face meetings) is still an important part of community construction.

Our research thus indicates that, rather than the virtual spaces of this blogging community floating freely away from non-virtual territories and spaces, material distance continues to play a role – we have certainly not seen its annihilation. Instead, it would be better to think about an interplay or interaction between online and offline spaces. Virtual spaces can overlay the offline: enabled and constrained by the material but also opening up new possibilities.

Place

In this context, place remains important. Blog posts reacting to particular political events, or to particular national news media and celebrity figures, provide a common focus on particular physical places. This is important for the commenters' own ideas and blogs to be heard. The connection between reacting to nationally important issues and the commenter having their own voice amplified and thus building up their own place within the blogging network is important because of the networked construction of authorial credibility that the bloggers rely on to distinguish themselves from the overwhelming majority of blogs that are rarely read.

We argue in Riesch and Mendel (2014) that a networked construction of credibility can offset potential credibility loss when often-anonymous blog-authors cannot (or do not want to) appeal to their professional expertise to establish their authority to discuss a subject. The mutual bootstrapping of blogs within the network that we described above works in this particular national context, and as noted above several bloggers have indeed found a voice that then transmitted onto national newspapers through either the occasional comment piece,[11] a regular blog or column or even a transitioning into a professional or semi-professional science writer.[12] These developments have stayed substantially national in character through the media outlets that they broke into (*the Guardian* featuring very heavily here because it was the outlet of Goldacre's original column, through a very loosely left-of-centre political outlook shared by the majority of 'badscience' bloggers, and through *the Guardian*'s active championing of blog-style commentary, especially in their Science coverage).

This transitioning from blogger to more conventional media commentator is intricately linked with the place provided by the community network and its facilitation of particular types of action. This is very much a socially and relationally constructed idea of place, with certain blogs being seen as increasingly credible places for debate due to their place in a broader network of links and authority. Successful writing for conventional news platforms can in turn brings more success and visitors to the original blog, starting a virtuous cycle. In this sense the virtual places of below-the-line blog comments and community forums may allow the hoped-for democratic advantages of new media, such as giving a space to marginalised voices – if they were really present to start with – to be partially abandoned for the well-known and still far more influential spaces of traditional media. Therefore we might reconceptualise new media spaces and places as emerging not just in competition with the harder-to-access spaces of conventional media, but also as a catalyst to engagement with them.

One might then question to what extent the virtual places of science blogging can offer what Massey describes as a progressive sense of place. For Massey (1993: 67) one can view a place through "not some long internalized history but the fact it is constructed out of a particular constellation of relations". The type of virtualised place discussed here, while not without history, is clearly relational. However, the nationally- and regionally-focussed and often-anonymous nature of this community means that it might lack some other characteristics of a global place.

Massey (1993: 66–7) draws on the example of Kilburn High Road, and argues that it is "impossible even to begin thinking about Kilburn High Road without bringing in half the world and a considerable amount of British imperialist history. Imagining it in this way provokes in you . . . a really global sense of place".

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[11]For example, David Colquhoun has written various Guardian pieces – including http://www.guardian.co.uk/science/2011/sep/05/publish-perish-peer-review-science and http://www.guardian.co.uk/science/2013/jun/02/medical-cure-health-quackery-david-colquhoun

[12]For example, Martin Robbins or Frank Swain.

One question coming out of our research on the 'badscience' community – raised by the community itself – was that of diversity and outreach. This leads back to Bell's (2012: 259) discussion of "the characterization of science blogging as a space of cliques and clubs". The very name of the 'badscience' community defines it in opposition to bad or pseudo science, emphasising an outside. The focus on British concerns might also represent a relative narrowing of the sense of place. Because so many of the community members blog pseudonymously, it is often difficult to get a sense of where people are from and broader cultures – so this might appear to be a place which is both exclusionary and geographically limited.

However, this community is also – as part of its campaigning nature – outwards-looking: aiming to engage with 'quacks', but also to engage with some of the harms done by 'bad science'. It is possible that particular constellations here may feed into progressive actions which move this beyond being a place for any closed clique. However, this is not a straightforward, tightly-managed move to academic 'impact' or participatory democracy. Instead, this is an outwards-looking approach that is shaped by the community's somewhat conflictual place-making. Such conflict is especially apparent when one looks at 'trolling'.

"Trolling Makes You More Stupid": Spaces, Places and Methodologies Below-the-Line

The important role of comments and below-the-line spaces in our case study links to concerns springing from Brossard and Scheufele's (2013) *Science* commentary on uncivil online comments. This work has been used to question whether 'web 2.0' spaces and places are 'good' ones for science communications, and also led to discussions of whether allowing comments on science communication blogs and other sites is conducive to what is perceived as good understanding and discussion. However, what generally qualifies as desirable understanding within science communication is still a contested topic in the field (for an overview see Bauer et al. 2007).

The 'badscience' blogging community emerged from discussions in the comments below Ben Goldacre's *Bad Science* blog and, subsequently, from discussions in a forum associated with that blog. This is particularly interesting given the current concerns about comments and online communication, and the type of research in which these concerns find their strongest justification. Anderson et al. (2013) argue that while "[o]nline communication and discussion of new topics such as emerging technologies has [sic] the potential to enrich public deliberation . . . online incivility may impede this democratic goal." This research study – and concerns springing from it – has been widely discussed in diverse fora from *the Guardian* (Bell 2013) to *Science* (Brossard and Scheufele 2013). Perhaps the most striking response was (as flagged up by Bell's Guardian piece) the headline on the *Liberal Conspiracy* blog proclaiming that "New study shows trolling makes you more stupid" (Hundal 2013). However, we found that 'trolling' can have positive effects relating to community cohesion and collective identities, as the community gathers around shared norms and values and shared, sometimes stereotyped, conceptions of the outsider (Hogg and Abrams 1988) and constructs particular boundaries (Gieryn 1999). This, in

turn, strengthens the individual blogger in their confidence and ability to broadcast their message more broadly through the stronger intergroup identity. This includes 'trolling' in both directions: as well as being the 'victims' of 'trolling' on their own blogs and forums, 'badscience' bloggers – through their direct activist focus on 'quacks' and other 'bad' scientists – were also often seen as trolls themselves. This is worth analysing further both as a counter-example to some common concerns about online comment spaces and as a contribution to methodological debates.

The Great British Sport of Moron Baiting

One of the 'badscience' community sub-forums promises "action, and all the fun of the fair: quackery, scare stories, miracle cures, iffy adverts, passing banter and the great british [sic] sport of moron baiting..."[13] While community members would not view what they do as trolling – and the content-rich and analytical nature of even quite conflictual engagements is at odds with general views of trolling – some of the targets of their activism and some of the readers did experience their actions as uncivil (concerns which in extreme cases materialised as threats of libel or other significant action).

This in turn creates a community spirit that rallies around the risks posed by "moron baiting", and also allows the individual blogger to distribute risks they might have been reluctant to take on had they been blogging on their own (which we discuss in more detail in Riesch and Mendel 2014). An offended party may be less likely to threaten libel action against 20 bloggers than against one, while the community provides help and advice should individual bloggers nevertheless find themselves in trouble.

There is also a novel type of place-making and territoriality in play here: online spaces become seen as something to defend, for example from libel threats. There are progressive aspects to making and defending places where ideas can be criticised in ways which might otherwise be blocked by, for example, the UK's then libel laws.

"Chicken-Flavoured Nipple Biscuit": The Afterlife of Uncivil Comments

Alongside a community ethos which can feed into quite conflictual online engagements, robust interactions also took place the other way round: with, for example, uncivil comments on 'badscience' bloggers' sites. One interesting example (briefly discussed in Riesch and Mendel 2014: 71) is a comment on one of the 'badscience' blogs – *jdc325* was asked "ARE YOU A CHICKEN-FLAVOURED NIPPLE BISCUIT".[14] This comment was clearly not a useful contribution to the debate in

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[13] http://badscience.net/forum/

[14] http://jdc325.wordpress.com/2008/09/12/dodgy-supplements-for-serious-diseases/

any conventional, substantive sense. The post in question was not about nipples, biscuits or chicken, and there is no good reason to think the author might be any of these things. In context, it was also clearly uncivil – for example, the contributor chose to give "yo [sic] momma [sic] sucks eggs out [sic] leemer [sic] bung holes" as their name when posting the comment. It would thus seem to be a clear example of 'trolling'. However, this comment had a life beyond its initial posting and therefore the effects of the incivility were not so negative as one might expect.

When the comment was initially posted, it was quickly absorbed into a larger discussion thread – if anything, helping to generate wider discussion. The community was able to take on this comment as a running joke: helping to enhance community cohesion. When we shared Riesch and Mendel (2014) with the community, two members expressed their pleasure that we had included this example in the article – suggesting the role that such trolling/being trolled plays in community cohesion. Being able to joke about this comment also helped feed into broader discussions about social research and related themes.

Engaging with this trolling also helped to build a particular type of place for discussion: one where, in common with other aspects of the community ethos (e.g. 'moron baiting'), swearing and incivility is something to engage with – in often humorous ways – rather than necessarily to censor. This is in contrast to some more 'official' spaces of science communication, which despite the currently dominant two-way engagement rhetoric are often still very much dominated, owned and hence censored along a top-down model.

It is thus the case that a clearly uncivil comment which – insofar as it is useful to write about 'trolling' – offers a clear example of this practice did not have a straightforwardly negative impact. Clearly, this incivility may have affected readers' interpretations of the blog post in question (and there are not-unreasonable concerns which might prompt many to censor this type of comment on a science blog post or to avoid reading this type of comment). However, such comments and incivility also have life beyond where they are posted – they can feed into particular types of community action.[15]

"[T]he Tulips Were Actually Quite Lovely": The Good Old Days of Trolling

The above example illustrates how 'trolling' comments can sometimes be recirculated and sprout new activities in unexpected ways. A further instance of this is how, when discussing the above example of 'trolling' on Twitter, we were surprised that this discussion elicited a type of nostalgia.[16] Discussing 'trolling' in the past, another blogger (who frequently writes about science, medicine and technology)

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[15]In the spirit of self-reflexivity, one should note that this paper itself can be seen as drawing on various below-the-line discussions and is also offering a different space to recirculate this 'trolling'.

[16]See https://twitter.com/JoBrodie/status/400401592366546946

referred to her "favourite rude comment".[17] Again, the comment she is referring to seems a clear example of trolling insofar as one can talk about such a practice: rather than engaging with the substance of the blogger's writing, the comment calls her "fat" and an "ugly fucker" and tells her that her "blog is utter shit and nobody cares about your pictures of glittered tulips".

However, this comment once again does not have a purely negative effect. At the time, it also attracted a more supportive comment for the blogger. However, more striking is that about a year later it seemed to be a source of nostalgia: cited as a favourite example of 'trolling', and leading into discussions of how "the tulips were actually quite lovely" and the use of an older Twitpic widget. While clearly such comments are potentially upsetting and may affect how readers interpret blog posts they can also – as shown in this example – feed into the construction of stories about community history. By becoming part of a shared history and allowing nostalgic reminiscence, nipple biscuits and glittered tulips feed into the development of community identities that can persist over time.

Trolling Methodologies: Trials and Observation

The two case studies in this chapter thus offer a helpful input to methodological debates: serving as additional evidence of how qualitative, ethnographic and observational work can provide different information to quantitative work which relies on randomised trials as its key data source, and of why it is important to use such qualitative work in order to develop a fuller understanding of our social reality. Even if – when tested in trial situations – uncivil comments do polarise views in problematic ways (see Anderson et al. 2013) social media does not only lead to once-only interactions. Instead, social media offers user engagement in which trust (or antipathy) is built up over time and in which users become content-generators as well as consumers. Ethnographic approaches have considerable potential for analysing such places and interactions: as indicated for example by Hine's (2000) aforementioned work on online ethnography, Parr's (2011: Chapter 6) work on virtual communities, self-help and mental health and Brown, McGregor and Laurier's (2013) development of ethnomethodology to analyse mobile device use 'in the wild'.

As shown in our research, many of those engaging in (more or less civil) debate below-the-line will also be active in different ways in these and other spaces: in the context looked at here, everything from starting their own science blogs to activism such as filing ASA (Advertising Standards Authority, UK) complaints about problematic science claims in advertising. Rather than 'trolling' simply making one more stupid, it is plausible that arguing and 'shouting' online can be part of activism and of some aspects of (atypical) public engagement. Community –

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[17]http://brodiesnotes.blogspot.co.uk/2011/12/watch-out-for-some-pr-about-nuratrim.html?show
Comment=1337961933934#c3515788642144422809

and the medium- and long-term patterns of interactions which help constitute community – are thus important factors that often get insufficient attention when 'trolling' and incivility is being discussed. The 'badscience' community strengthens the individual blogger when they engage in an aggressive, activist, manner or when they face incivility, and in turn the community is strengthened in some ways.

While there is clearly a place for research that focuses on single interactions with discussions of science – for example, trialling differing conditions for viewing online science articles – this paper therefore also adds to the evidence that there is a need for complementary research that provides a longer-term view of the social context. Interactions with online discussions of science need to be theorised as very much as interactions – as ongoing processes that take place in a broader social context, and in which readers can also be or become content producers – rather than as one-time situations in which readers respond to online material.

Trolling Places

Our case study of the 'badscience' blogs illustrates that these blogging networks develop not only through above-the-line posts and the virtual spaces afforded by below-the-line commentary and other interactive forums, but also linked in with territorialised national spaces in ways which can lead commenters to take part in largely national rather than international interactions. Even with such online communities, then, distance is clearly not dead – it is better to think about complex interactions between the virtual and material. Zook and Graham's (2007a: 468) concept of "DigiPlace" is useful insofar as it

> provides a focus on the ways in which the physical, tangible world combines with virtually accessible information and creates not a fixed setting for interaction, but a lived, fluid, and subjective space, shaped by space, time, and information. In other words, DigiPlace represents the simultaneous interaction with software (information) and 'hard-where' (place) by a individual. It is a way to conceptualize the scales of everyday life, and simultaneously to imagine the differences and interdependencies of place.

Everything from geographical shaping of search engine results (see Zook and Graham 2007b) through to common interests shaped by physical places can perpetuate a tendency for the users to stay roughly within their geographical area in the material they read online. For Zook and Graham (2007b: 1323) "while Internet users can in theory circumnavigate any and all discourses they encounter, they are highly likely to utilize hubs, e.g., search engines that have enclosed the Internet via their ranking and indexing methodology." The 'badscience' blog and forum community can itself be seen as a part of this construction of place: directing the other members of the community largely to debates relevant to their geographical location.

This chapter has illustrated how 'trolling' and being 'trolled' helped build and fortify the community: by providing rallying points, a shared history and common enemies. This community stayed largely UK-based because these community-building processes were mostly focussed around things happening in the UK rather than elsewhere.

Conclusions

There are diverse aspects to the spaces and places of science blogs and their below-the-line and forum discussions, as illustrated by the case study used here. This can build up communities and enhance the voices of individual bloggers by attaching these voices to other blogs, broadening readership and social networks. Simultaneously, though, these spaces can be used as platforms for those who vehemently disagree and would like that space or activity to be shut down. Such blogging can also provide places in which 'trolls' can play: for example, seeking to provoke a response from communities or simply to offend. To understand such interactions, it is important to move beyond trials of single-instance below-the-line interactions in order to consider ongoing and potentially-productive developments.

A key question here, and one that we do not have a firm answer to, is what this means in terms of the places of science blogging: whether there is the development of a progressive sense of place or of narrow, exclusionary fighting. Uncivil comments can seem to make online spaces more exclusionary, and in some cases may quite clearly have this effect: for example, a web page (or academic article) referring to nipple biscuits may be inaccessible to some people behind web filters in settings such as schools or people may close down blogs or Twitter accounts after torrents of abuse. However, we would also argue that there is more positive and progressive potential in spaces that allow some degree of 'trolling' and incivility. Thinking back to Massey's metaphor of the bustle of Kilburn High Road, we would defend the noise, arguing and joking – and, indeed, the 'trolling' – which finds a place in the below-the-line spaces of science blogging. An empty, quiet, ordered road might be less likely to offend than the bustle of a busy city high street, but it also lacks much of what makes life in these communities so appealing. Likewise, it may be in the noise and shouting – and, sometimes, vulgar abuse – of above-the-line blogging and below-the-line comments that the joy of a community is found, rather than in attempts to construct calmer and more sterile spaces designed for various conceptualisations of online participatory democracy. While Penny (2014) acknowledges the dangers of gendered online abuse, she also emphasises the opportunities presented by online spaces where she "realised that I wasn't alone. There were other people out there who felt quite like I did. There were other weird kids, other queer kids, other angry feminists, other nerds and anarchists and people who wanted to rearrange the world to suit our notion of what was just and right." We would emphasise the value of diverse, noisy and messy online spaces where people can meet and act and organise.

The academic literature on science communication has moved from a Public Understanding of Science model towards a Public Engagement with Science one that foregrounds scientists' need to engage and enter into a meaningful dialogue with the public and where the very concept of a boundary between the public and the experts is seen as problematic and blurred (Bauer et al. 2007). By closing off comments – by trying to limit what branches off from science discussion online and blocking critical, uncivil or 'trolling' statements – we see a move

back towards a more hierarchical approach to science communication, where communicating 'balanced' information is prioritised over more active engagement. Such an approach offers fewer spaces for shouting, off-topic rambling and offence – while potentially 'cleaner' looking, it lacks the excitement and bustle of a thriving high street or community, and offers fewer opportunities to build a more progressive and open sense of place.

We would, then, argue that there may be more progressive potential in the noise of less-regulated online spaces than in more closed and censored places without the same space for comment. This bustle may keep places active, draw people in, challenge ideas and open new opportunities. As with a bustling high street, the occasional raised voice or expletive is as much a part of the life of a place as more restrained and 'serious' conversations. It is out of this below-the-line bustle that a more progressive sense of place and of community might (or might not) develop.

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