*Expanding Perspectives on Open Science: Communities, Cultures and Diversity in Concepts and Practices*
*L. Chan and F. Loizides (Eds.)*

*doi:10.3233/978-1-61499-769-6-6*

# Openness in Scholarship: A Return to Core Values?

Cameron NEYLON[1]
*Centre for Culture and Technology, Curtin University, Perth, Western Australia*

**Abstract.** The debate over the meaning, and value, of open movements has intensified. The fear of co-option of various efforts from Open Access to Open Data is driving a reassessment and re-definition of what is intended by "open". In this article I apply group level models from cultural studies and economics to argue that the tension between exclusionary group formation and identity and aspirations towards inclusion and openness are a natural part of knowledge-making. Situating the traditional Western Scientific Knowledge System as a culture-made group, I argue that the institutional forms that support the group act as economic underwriters for the process by which groups creating exclusive knowledge invest in the process of making it more accessible, less exclusive, and more public-good-like, in exchange for receiving excludable goods that sustain the group. A necessary consequence of this is that our institutions will be conservative in their assessment of what knowledge-goods are worth of consideration and who is allowed within those institutional systems. Nonetheless the inclusion of new perspectives and increasing diversity underpins the production of general knowledge. I suggest that instead of positioning openness as new, and in opposition to traditional closed systems, it may be more productive to adopt a narrative in which efforts to increase inclusion are seen as a very old, core value of the academy, albeit one that is a constant work in progress.

**Keywords.** openness, open access, cultural science, culture, club economics, collective action, knowledge, epistemology

## 1. The Many Strands of "Open"

"Open" is a contested and increasingly it seems polarized term. It is also highly contextual. A number of different efforts have been made to disentangle the various discourses that underpin the advocacy programs that operate under the banner of open, but there is, as yet, little consistency between them. Fecher and Friesike's "Five Schools of Thought" [1] sit uneasily beside Pomerantz and Peek's "50 Shades of Open" [2], and while they both refer to the Open Knowledge Definition, various Open Access declarations and the debate between Free and Open Source software there is no clarity of definition.

Arguably all of these roots and their more recent interrogations are strongly rooted in Anglo-American conceptions of scholarship and political economy. "Open" in scholarship borrows heavily from the movements for Free and Open Source Software (F/OSS) while sitting alongside the movements advocating Open Government and Open Data. All of these are rooted in Western and Anglo-American discourses, not

[1] Corresponding author, Centre for Culture and Technology, Curtin University, Perth, Western Australia; E-mail: cn@cameronneylon.net.

infrequently with a techno-utopian and neo-liberal slant. Coleman notes how the distancing of F/OSS discourses from "[…]movements predicated on some political intentionality, direction, or reflexivity or a desire to transform wider social conditions" nonetheless serves those political programs [3].

These discourses connect "open" in scholarship to networked communications systems and usually the web. The connection to F/OSS as the supposed historical root of openness often makes this explicit. This in turn connects "open" to broader discussions of collaboration that are also seen as being supported by networked communications infrastructures. Opportunities to be gained through engagement, both in open sharing of resources and in collaboration are assumed to provide equitable gains. Openness in these discourses is presumed to be uniformly positive for all who engage with it. The presumption of equitable opportunities for the traditionally disenfranchised and disempowered is a driving motivation for many engaged in Open movements.

At the same time Nathaniel Tkacz [4] that "openness" is almost always situated as an oppositional movement, one that opposes "traditional" and "closed" processes whether they be in government, reporting, property, or scholarly communications. He draws a thread from Popper's The Open Society via the neo-liberal discourses inspired by Hayek to the rhetorics of F/OSS and their successors.

> "Openness is conceived as a new mode of being, applicable to many areas of life and gathering significant momentum – 'changing the game' as it were. Once again, this 'spirit of open' is closely articulated with collaboration and participation" - Tkacz (2012)

In a move that is challenging for many who see themselves as advocating "the opens" Tkcaz traces these discourses, and particularly openness as "freedom" to the political agendas of libertarian politicians like Douglas Carswell (the British Conservative MP, better known today for first defecting to the UK Independence Party, and then leaving after it successfully campaigned for the UK to leave the European Union) and the US Tea Party movement. He argues that the freedoms being pursued are largely negative in the sense discussed by Holbrook [5]. Openness is generally the effort to be free *from* the restrictions of the status quo.

They are negative in two ways. First they are absolutist in nature, but secondly they frequently make little sense except in the context of the fight against an existing status quo. Open only exists as a contrast to closed and, as Tkcaz traces in many examples, and other critics have noted, the implementation of open leads to it becoming – or being co-opted by – the status quo. The old open becomes the new closed that a new generation will battle against.

Constructed this way, openness can never win. The old "open" is the new "closed". We see this cycle in criticisms of "open-washing", of the power of those groups who control the definitions of open in software, and in the development of open government and open scholarly communications agendas. From offices of open government, to the Open Source Institute and the Public Library of Science, once an advocate of open has achieved stability and a measure of power they become a target, not just for reactionary forces but for their erstwhile allies.

Tkcaz argues that this means that any open agenda always has enclosure as its endpoint, that the underpinning rhetoric, being negative inevitably sows the seeds of its own demise. In his words:

> "If we wish to understand the divergent political realities of things described as open, and to make visible their distributions of agency and organising forces, we cannot 'go native', as a young, anthropologically-minded Bruno Latour once wrote, meaning that we cannot adopt the language used in the practices we wish to study. To describe the political organisation of all things open requires leaving the rhetoric of open behind". - Tkacz (2012)

In this paper I want to argue that while Tkcaz's challenge needs to be taken seriously, that it is not fatal. The key to this lies in understanding how meso-scale political organization, and the inevitable inclusion and exclusion that arises from group formation, interacts with individual (micro-scale) and macro-scale political economics. To do this I will draw on strands of economics, political economy, and cultural studies to seek to show how the oppositional stance and boundary work necessary to define groups can nonetheless be harnessed to aspirations for inclusion and interoperability.

In particular, I want to examine the political and epistemological challenges raised by the inclusion of knowledge-workers from traditionally "peripheral" positions with respect to power centres of traditional Western scholarship. Understanding how a wider range of knowledge-making groups can interact productively and equitably ultimately requires an understanding of how these groups are sustained and how their differing cultures affect their interactions. My aim is to sketch a route towards how three differing framings might be aligned to develop a philosophical underpinning for open agendas. In doing this my focus is on scholarship, but the argument can be developed for much broader application.

## 2. Cultural Science as a Model

Central to my argument is the need for an enhanced focus of scholarship on the formation, culture, and sustainability of groups. Many arguments founder on the way they move directly from individual micro-economic concerns to a global macro-level argument. The need for "meso-level" analysis in a range of different disciplines has emerged over the last decade. Here I draw on the model of "Cultural Science" developed by Hartley and Potts(6).

Cultural Science seeks to be an evolutionary model of groups and culture. The unit of analysis is a group or community that shares culture. Hartley and Potts name this culture-defined group a "deme" borrowing from both biological (an interbreeding community) and political (the "demos") terminology. The key to the model is that demes do not merely "share" culture, they are *made by culture*. Culture makes the group and the group enacts and articulates the culture.

Culture is not, in this formulation, the aggregate product of the individual actions or behaviours of members of the group but the thing which draws in members of the group through creating common narrative and meaning. Demes can be seen as a parallel concept to Fleck's "Knowledge Collectives" [7] and Ravetz's [8] or Kuhn's "communities" [9].The primary difference lies in the underlying concept of how demes are formed and sustained.

Any given person may be a member of multiple demes, and demes can be embedded within other demes. As an evolutionary model it poses serious challenges of complexity in analysis, although arguably no more than the emerging complexity of selection operating at many different levels in biological systems. The key question for

survival of a deme is how effectively it competes with other demes in the environment it finds itself in.

In the book "Cultural Science" [6] Hartley and Potts emphasize conflict between demes. More recently this has been developed to acknowledge that conflict need not be violent or existential (although it frequently is). We argue that it is through *productive* conflict that knowledge (or more generally capacities to act) are created. Demes may build internal capacities that allows them to act *on* other demes, that is to do violence, but they may alternately build capacities that enable them to interact productively with other demes to create new capacities. Without seeking to provide a strict definition at this stage, we can consider shared capacities that span more than one deme to be shared knowledge.

With the Cultural Science model in hand we can make some assertions about demes that do this successfully. They will have aspects of culture that promote productive interactions – *productive conflict* – across demic boundaries. These demes will invoke narratives and norms, and enact and articulate those norms, where they come into contact with differing view points. Such a set of norms might be expected to include acceptable modes of disagreement, agreed approaches to seeking resolution, a commitment to considering – indeed seeking out – alternative perspectives, and approaches for agreeing to disagree where resolution cannot be achieved.

## 3. An Epistemological Framing of Western Science Knowledge Systems from Cultural Science

If we were to look for an example of such a deme we would likely rapidly arrive at the Western Scientific Knowledge System (WSKS) as an example of a culture that has achieved both continuity in time and dominance over many other systems. We might note the set of cultural elements sketched out above align quite closely to Merton's Four Norms [10] and to other (claimed) normative aspects of Western scientific culture. It could be further noted that the WSKS has a form of fractal organization in which discipline and subject and topic boundaries create opportunities for conflict at many different scales.

Finally, and crucially, we might note that the cultural elements that define the WSKS describe narrative and cultural *aspirations* not necessarily *practice*. Obviously if there is "too much" of a gap between the claims a deme makes about its practice and actual practice then the internal consistencies will build up and lead to failure. However it is also the case that a perfect alignment is not necessary.

This idea that aspiration towards enacting norms and demic narrative can be of value, even when those aspirations cannot be completely achieved, is also developed by Collins and Evans in *Why Democracies Need Science* [11]. They make a different kind of argument for the value of WSKS in democracies and this has tensions with my argument that will discussed below. What we can adopt directly is the flow of their argument that by recognizing that there is value in the group level aspirations we can reconcile the tools and knowledge developed by both "Wave One" and "Wave Two" Science and Technology Studies (STS).

The so-called Wave One of STS uncritically accepted the value of Western Science and sought to examine how this value was created. Merton in particular worked on showing how individual human frailties could be ameliorated by shared norms and strong institutions that supported the creation of scientific knowledge. The

overall group dynamic was assumed to be positive and ultimately objective. Wave Two STS critiqued this position noting that group dynamics was clearly related to power, that expertise and stakeholders from outside the academy were often discounted, and that the social context could determine both the process and outcomes of knowledge creation.

To reduce it to slogan form Wave Two showed that groups and institutions could never approach the objectivity and perfection assigned to them by Wave One. In parallel development of philosophy and epistemology that consistently showed that claims of WSKS to generating "truth" could not be demonstrated to be provable. The strong version of these two strands of scholarship led some to the other extreme. Because knowledge and the WSKS institutions supposed to be safeguarding it could not be shown to be provably reliable it follows that we must reject all authority.

Cultural Science, in common with the "Wave Three" proposed by Collins and Evans [11], offers a middle route. First we observe that a recognizable culture and community of WSK creation has persisted over (at least) several centuries. This evolved community has continuity and therefore its supporting culture has continuity. Through analysis of historical and contemporary narratives we can identify some elements of this culture that appear to persist: a valuing of observation, critique of claims, and interestingly an aspiration to civility in resolving disputes. Robert Boyle [12] writes in the 17th century responding to a critic with whom he has had no previous correspondence:

> "[I will answer Linus' objections] partly, because the Learned Author, whoever he be (for 'tis the Title-Page of his Book that first acquainted me with the name of Franciscus Linus) having forborne provoking Language in his Objections, allowes me in answering them to comply with my Inclinations & Custom of exercising Civility, even where I most dissent in point of Judgement." - Boyle (1662)

Many of the social points Boyle makes about practice in his works, including issues of reproducibility and effective communication are in fact much more comprehensible than his actual observations and theories. These are situated in a language and theoretical framework that is largely incomprehensible to us today. Arguably this shows that while the emerging culture of 17th century Natural Philosophy is recognizably the same as that of modern science, the actual knowledge is lost to us as the Thought Collectives, to use Fleck's language [7], have changed too radically.

The details of this idea that there is a recognizable scientific culture that persists over time, and provides sustainability and continuity to a community of practitioners require much work and are beyond the scope of this paper. If the idea is provisionally accepted then we must immediately ask the crucial question, what is it that makes this culture sustainable? Clearly this will be a mix of historical contingency, social context, and power relationships. But the central claim is that elements of the culture have contributed to that sustainability.

I want to suggest that one element that has contributed is a form of *openness*. It manifests historically in different ways but the valuing of observation, and of critique, the importance of effective communication and more recently efforts towards inclusion both in access to the outputs of research and influence over its conduct, can all be read as a valuing the testing of claims by exposing them across the boundaries of the community. We can use the rich literature on the nature of research communities, and their disciplinary splits and divisions, from Fleck [7], through Kuhn and Ravetz [8], but

also to Latour [13] and Wave Two STS and indeed on to the work of Collins and Evans [11] on expertise in Wave Three, to understand how the culture of WSKS creates a myriad of hierarchical boundaries across which claims can be tested, while also driving interoperability across those boundaries by articulating shared values.

The Cultural Science framing suggests that Western Scientific Culture is doing two different things. Firstly at a high level, it creates interoperability though shared values. Secondly it drives the creation of new disciplinary groups at all scale levels creating boundaries across which knowledge claims can be tested. We can suggest that this culture, and at least some of the groups it has created, has thrived over time because it is well situated to creating productive conflict where groups interact. From the process of peer review, a managed form of a conflict in which one research group's claims are tested by another, through to the insights that arise when whole disciplines clash as they come into contact, what emerges, as Ravetz noted is more abstracted, more general, and more widely used than what was initially created within the group.

My suggestion is that it is the various forms of openness that act to maximize the productivity of those conflicts. This is not to say that these values are perfectly enacted. As Wave Two STS tells us, scholars are embedded in social contexts and power structures laced with bias, assumptions and exclusions. Indeed, the tension between the necessary boundary work that defines the group, and the productivity of interactions that arise from relaxing those boundaries, is the key to understanding what is being created, what value it has, and to who.

## 4. The Economic and Political Sustainability of Knowledge Clubs

While I have sketched out an argument for explaining the sustainability of Western Scientific Culture as a whole, to examine the question of how institutions and groups operate we need to examine the sustainability of the overlapping and hierarchical groups that make up the larger deme. We use the term "Knowledge Clubs" [14] to refer these groups that have a commitment to generating knowledge with value beyond their boundaries, which is underpinned by these elements of openness.

The use of "clubs" is deliberate and has two motivations. Firstly, it emphasizes the tension between the definition of boundaries and the need to operate across them. Secondly it draws on the strand of economic theory that examines how groups can sustain the production of collective goods. The narrative for Knowledge Clubs within the WSKS is that knowledge is being created for the good of all. But such goods, Public Goods in economic terms, cannot support the sustainability of the club itself. This implies that the culture-made group is also capable of generating value, or utility, *for the group itself*.

Buchannan's [15] work on the economic sustainability of clubs is central here. Buchannan identifies a class of goods that are neither public or nor private, but are important in sustaining groups. In modern terminology these are goods that are non-rivalrous (they can be shared out without diminishing them) but are excludable (it is easy to prevent non-group members from benefiting from them).

Where a group generates private goods (such as money) that are passed to individuals then engagement is easy to explain. If a group only generates public goods then a classic collective action problem ensues. Such a group can only be sustained if it is non-rational from an economic perspective. While this is by no means impossible – it can be argued that Wikimedia solves the collective action problem for public good

creation of a free encyclopedia by relying on donations from non-(economically) rational actors – evidence suggests this can only operate at the extremely large scales where a sufficiently large number of such actors can be found.

Clubs in Buchannan's terms are sustained by this intermediate class of goods, which are termed club goods. I have previously argued that we can see knowledge as such a club good. Knowledge is created by and within groups. It is non-rivalrous, in Jefferson's memorable language "…he who lights his taper at mine, receives light without darkening me", but on its creation it is exclusive and excludable. Firstly, because it is only available to the group, but later the choices of how, and where to communicate it, what language to use, restrictions to access all create forms of exclusion.

We intuitively understand that knowledge held exclusively by a group, whether the scholars who originated it, or the community that subscribes for access to a specific – closed – journal, will not create as much value as it might. This is also consistent with the epistemological model sketched out above, where it is the process of exchange and translation amongst groups, which makes knowledge both more general and more valuable. We therefore have systems, including our systems of scholarly communication, in place that support the process of making knowledge more like a public good, removing various forms of exclusion piece by piece.

This process of investment in making club-good knowledge more public-like, a process of "public-making", however raises the same collective action problem. Why would a Knowledge Club voluntarily give up a good, indeed invest in reducing the exclusivity that allows them to maintain control? Part of the answer is that we are actually quite selective about the modes of control we give up. Traditionally communication through a journal or a book is directed at and accessible (for many different meanings of the word) to a very select, and identifiably demic, group. Part of the answer is one of culture – and as we shall return to, values – that guide our practice as scholars.

Neither of these answers however will suffice for our economic framing. An economic framing suggests that the club is involved in an exchange where it gains something in return giving up exclusivity. That something must be a club or private good and there are in fact a range of these that can be identified. Some of these are quite abstract goods; recognition, prestige, and membership within disciplinary knowledge clubs. Some are much more concrete; jobs, professional advancement, and funding both for further research and personally.

## 5. An Economic Framing: Institutions as the Underwriter of the Public-Making Exchange

An important aspect of this exchange process to note is that the immediate benefits of the exchange are the more abstract and nebulous ones, recognition and attention. The more concrete, and more widely exchangeable goods take longer. These are individual benefits such as positions and salaries, and for demic groups recognition as a discipline and strand of scholarship that should be a visible part of a research institution. The coupling between public-making and these longer term benefits is something that we believe in. It is a part of our culture. But from an economic perspective there is a distinct risk that the investment in public-making may not in fact pay off.

In financial terms these kinds of risks can be managed if there is an underwriter available. In the research community this underwriting is managed by institutions acting as a – partial – guarantor that the knowledge club's investment in public-making will be convertible in an understood and predictable way into these concrete club and private goods. Institutions, both in the sense of research performing organizations such as universities, but also in the broader sense used by Ostrom [16] of "...the prescriptions that humans use to organize all forms of repetitive and structured interactions", provide the assurances that support the risks of investing in public-making for the knowledge club.

There is, therefore tension at the heart of our institutions. Their purpose is (in part) to promote public-making, but they do this through acting as a guarantor in a transaction which provides excludable goods. The university itself is an exclusive club and needs to be to support the realization of benefits that arise from prestige and authority. To be predictable and therefore effective as guarantor institutions must necessarily be conservative in both the forms of public-making they support and recognize and in the rewards they award as a result of those activities. But to realize the full benefits of public-making they may need to be adaptable and even radical in a rapidly changing world.

Ostrom [17] showed that the way to understand institutions that resolve collective action problems is to see them as developing through a process of evolution. And that coordination at large scale required the development of hierarchical layers of organization. In turn the development of these layers provides stability and resilience to the system as a whole. All of this emphasizes that our institutions (in the sense of research organizations) should be expected to be resistant to change – should in fact be designed to be stable.

This analysis has implications that spread far beyond scholarly communications. In its role as a guarantor for the provision of club goods, which have as a core characteristic exclusivity, the institution is continually policing boundaries. This means working to protect the identity of the existing clubs, including their historical lack of diversity, it means policing the boundary of what counts as "scholarly" in terms of both work and outputs, and it means a focus on protecting existing and historical markers of prestige and authority.

As scholars we also reinforce this backwards looking boundary work whenever we rely on our research organizations to act as the guarantor of benefits that we exchange for public-making. Our continuing engagement with "traditional" modes of public-making and scholarly communication are both driven by our acceptance of the social contract we have with our institutions and act to reinforce that system.

As is often the case with economic arguments, this one appears to arrive at a profoundly depressing conclusion. Not only must we expect, indeed rely on, our institutions to be conservative, but this appears to open up a gaping hole between the harsh economics and the value of an open culture that the epistemological argument implies. The Cultural Science framing implies diversity is key to generalizing knowledge, whereas the economic argument seems inevitably to point to institutions that will slow the increase in diversity, both of activities and participants.

Arguably framing the opportunities presented by developing technologies as "new" forms of scholarly communication that are "different", aligning ourselves with the oppositional discourse that Tkacz [4] describes, is counterproductive. This offers a potential solution, that is to situate and to design these "new" practices as simply a more effective expression of old values. Successes in innovation in scholarly

communication and open practice are often associated with small changes, with far superior but more radical opportunities often failing. Can we avoid the problems of conservatism, or at least speed up the uptake of new tools and practices, and also the oppositional discourse of openness by describing openness as an *old* value?

## 6. Framing Openness as a Core Value of the Academy

The economic analysis above paints a very harsh and transactional picture, but the reality is of course more complex. The institutions that are taking the role of guarantor spread beyond our research organizations to those broader "institutions" that are part of our research culture. Indeed, we can tie the sustainability of Western Science culture in part to its role in sustaining the cultural institutions that underwrite this exchange of knowledge. That is, our reliance on this exchange as scholars is underpinned by our self-identification as scholars, our identification with the demic group. It is deeply tied to the *values* that we hold. In these final sections I will argue that it is through a framing of openness as a value core to Western Science culture that we can both work for change within our institutions as well as enhance the diversity of our communities and therefore the value of the knowledge we create.

Shapin and Schaeffer [18] in their dissection of the historical conflict between Robert Boyle and Thomas Hobbes and the founding of the UK's Royal Society describe Boyle as deploying three technologies. The three technologies; the material technology of the experiment, the literary technology of printing and dissemination, and a social technology – the scientific culture and institutions in our terms – that defined the interactions of scholars. These various technologies underpinned claims made by Boyle and other natural philosophers to openness and similar claims are made to this day. Openness to criticism and critique, openness to contributors from any place or walk of life, and openness through the accessibility of printing and disseminating accurate descriptions of the experiments.

Shapin and Schaeffer's important contribution is to critically examine these claims and to show that in practice Boyle and others involved in defining and creating the culture and institutions of science that continues to this day fell a substantial distance short of their aspirations. Boyle sharply circumscribed what he would accept as legitimate criticism, claims and evidence from those of more noble birth were to be preferred over that from commoners, and access to the halls and demonstrations of the Royal Society were certainly not open to all. Indeed, it is only in the past 25 years that a ban on women (at least those who are not Fellows) entering the headquarters of the Royal Society was lifted.

Here we see again exactly the tension that has played out through this discussion. A claim of openness, and a narrative that this openness sits at the core of the value system, that is not quite realized in practice. The building of institutions that seek to enhance openness – the Royal Society holding formalized meetings, open to members, in the place of private demonstrations – that are nonetheless exclusive. Membership of the club, whether the Royal Society or other National Academies, has always been a marker of prestige and authority, even as the actual criteria for membership have changed radically over the years. Yet what is passed down to us today, is less that exclusive gentleman's club and more the core values that it sought to express.

Move forward 200 years from the 17$^{th}$ to the mid-19$^{th}$ century and a debate was raging in the United Kingdom about who could contribute to the conduct of science.

Lightman [19] reveals what might appear to our 21st century eyes as a startlingly modern debate on the interest "that not alone scientific readers, but those of every class, [...] to approach the source from whence this species of knowledge is derived". Lightman describes the growth of popular science journals to meet this demand. It is perhaps a sign of the strength of the tension we are discussing that the most visible survivor of this growth is the journal *Nature* which has been so entirely co-opted by our scholarly culture as an institutional signal of internal club prestige, that it can stand symbolically for the entire system of journal hierarchies.

In an illustration that progress is clearly not linear Lightman also discusses the positioning of Darwin – whose beard today stands as a (not particularly inclusive) symbol of a professional scientist – as a demonstration that amateurs can contribute to science. Lightman quotes Grant Allen, a 19th century popularizer of science describing Darwin as "merely an amateur, a lover of truth, who was impelled by curiosity". The professionalization of the academy through the 20th century alongside the celebration of Darwin as a key figure in the history of science seems to have necessitated an assumption of his place as a "real scientist". If we are to aspire to be part of the club that included Darwin then we must necessarily place him in that club. Arguably this was a backwards step in a trajectory of gradually implementing greater openness. Lightman notes that the "...appropriation of [...] Darwin as [an] iconic figure [...] served to undermine the participatory ideal of the 19th-century popularizers and reflected the increasing power of professionalization". That is, the evolution of the professionalized institutions, that stabilize and allow the scaling of the culture of Western Science created exclusion, even in the way that we create and describe iconic figures.

It would be straightforward to follow the gradual opening up of aspects of our institutions and culture through the 20th and 21st century. Examples could be given from increasing access to tertiary education, the public funding of research, through open access, the shift from "public understanding of science" through "public engagement" to "responsible research", to issues of data availability and citizen science. However my point is to establish the deep roots of this agenda. Despite, or even in some cases because of, the limitations in putting it into practice, the idea that critical contributions to scholarship will come from outside has persisted. Indeed a case for the inverse can be made, that the culture of Western Science has persisted precisely because a commitment to openness, to public-making, is one of its core values.

## 7. An Aspiration to Openness as a Conservative Position

I began by noting that openness refers to many different things, and that as many others have noted, that the narrative associated with this variety is frequently one of new-ness, of technological possibilities, and of opposition to a status quo. As Tkacz notes this can lead to a cyclic inevitability as openness eats itself and becomes the new status quo, the new establishment.

I want to flip this on its head. In Boyle's writings we see the concern for completeness of description, for reproducibility and for a commitment to observations, wherever they come from as the final arbiters. In the 19th, and again in the 20th and 21st centuries we see movements arise in which contributions are sought from anyone. In Merton's norms [10] of communalism and universalism, Popper's conception of falsifiability [20], and Kuhn's idea that scientific revolutions are precipitated by the build up of external information [9], even in Latour's model for the gradual expansion

of the collective [13] we see repeated attempts to articulate the importance of openness to claims and ideas from the outside as a core part of the social activity of science.

Clearly this value is quietly ignored at least as frequently as it is found in practice, but the aspiration is a common thread. Indeed the institutionalization of imperfection may be critical in solving the economic problem of sustaining knowledge-making clubs that choose to invest in public-making. The argument made here has only provided the barest sketch of how Knowledge Clubs interacting may be engaged in both economic exchanges and productive general-knowledge producing conflict. If the most significant insights come from across boundaries then the boundaries themselves are also of value. A deeper analysis may provide a route to identifying the ways in which this tension can be managed both to create value in the economic sense and to maximize the public-good nature of generalized knowledge.

It is therefore the aspiration to openness, and its adoption as element of the identity and core values of the researcher, its centrality to our culture, that provokes us to attempt to move across boundaries and to create knowledge. That "full openness" or "total inclusion" can never be achieved is the consequence of an imperfect world. The aspiration to seek it still has value. In this sense the argument aligns with the claims for Elective Modernism made by Collins and Evans [11]. However my conclusion is diametrically opposed.

Collins and Evans state that the scientific community must be protected so that its value system, its culture in our terms, can operate without disturbance. I argue here that disturbance is fundamental to its function, that the process of generalizing knowledge requires that new efforts are constantly made to break down barriers and reduce exclusion. Nonetheless the institutions that underwrite the exchanges fundamental to public-making do need protection. Understanding how they can change at an optimal pace remains a challenge.

Part of the answer may lie in the problem. It may be that an argument can be made that this tension is fundamental, that progress towards greater openness is a return to core values, that such progress must underpin any claim of real progress arising from Western Science. In that sense situating openness as a profoundly conservative position may be a viable political move. In the end the answer is not that openness is any one thing, it is that it is many different expressions of one underlying process. That it proceeds through cycles of change, institutionalization and reaction is then unsurprising. And if that is correct then we can start to pull the threads together that will allow us not merely to respond the institutions and culture that we have as they evolve around us, but to design them.

If this is true then we are perhaps living in a time of unprecedented opportunity for science and for scholarship. There are profound challenges to adapting our institutions to interact productively with differing knowledge systems, but we are perhaps for the first time well placed to do so. By understanding how tension between boundary work – and its exclusionary tendencies – and the value of diverse perspectives we may be able to improve, by design, on our institutions. If we can develop a narrative thread within our culture that this is merely the extension of an ongoing process that has served the academy well, then we arguably make this gradual and high imperfect progress a highly conservative position. This may offer us the best opportunity to accelerate the progress we are making on access, inclusion, and diversity and build a more generally valuable, and accessible knowledge system that truly includes the insights and perspective of those beyond the walls of the academy.

## References


[1] Fecher B, Friesike S. Open Science: One Term, Five Schools of Thought. In: Bartling S, Friesike S, editors. Opening Science [Internet]. Heidelburg: Springer; 2014 [cited 2016 Jan 19]. p. 17–47. Available from: http://papers.ssrn.com/abstract=2272036

[2] Pomerantz J, Peek R. Fifty shades of open. First Monday [Internet]. 2016 Apr 12 [cited 2017 Jan 16];21(5). Available from: http://firstmonday.org/ojs/index.php/fm/article/view/6360

[3] Coleman G. The Political Agnosticism of Free and Open Source Software and the Inadvertent Politics of Contrast. Anthropological Quarterly. 2004 Sep 3;77(3):507–19.

[4] Tkacz N. From open source to open government: A critique of open politics | ephemera. ephemera: theory & politics in organization. 2012;12(4):386–405.

[5] Holbrook JB. We Scholars: How Libraries Could Help Us with Scholarly Publishing, if Only We'd Let Them. In: Bonn M, Furlough M, editors. Getting the Word Out: Academic Libraries as Scholarly Publishers. ACRL; 2015. p. 43–54.

[6] Hartley J, Potts J. Cultural Science. London ; New York: Bloomsbury 3PL; 2014. 266 p.

[7] Fleck L. Genesis and Development of a Scientific Fact. New edition edition. Trenn TJ, Merton RK, editors. Chicago u.a: University of Chicago Press; 1981. 232 p.

[8] Ravetz J. Scientific Knowledge and Its Social Problems. Reprint edition. Oxford: Oxford University Press; 1971. 449 p.

[9] Kuhn TS. The Structure of Scientific Revolutions. 2nd Revised edition edition. Chicago, Ill: University of Chicago Press; 1970. 222 p.

[10] Merton R. Science and technology in a democratic order. Journal of Legal and Political Sociology. 1942;1:115–26.

[11] Collins H, Evans R. Why Democracies Need Science. Cambridge, UK ; Malden, MA: Polity Press; 2017. 200 p.

[12] Boyle R. A defence of the doctrine touching the spring and weight of the air propos'd by Mr. R. Boyle in his new physico-mechanical experiments, against the objections of Franciscus Linus ; wherewith the objector's funicular hypothesis is also examin'd, by the author of those experiments. Oxford: Thomas Robinson; 1662.

[13] Latour B. Politics of Nature: How to Bring the Sciences into Democracy. Cambridge, Mass: Harvard University Press; 2004. 320 p.

[14] Potts J, Hartley J, Montgomery L, Neylon C, Rennie E. A Journal is a Club: A New Economic Model for Scholarly Publishing [Internet]. Rochester, NY: Social Science Research Network; 2016 Apr [cited 2017 Apr 8]. Report No.: ID 2763975. Available from: https://papers.ssrn.com/abstract=2763975

[15] Buchanan JM. An Economic Theory of Clubs. Economica. 1965;32(125):1–14.

[16] Ostrom E. Understanding Institutional Diversity. Princeton: Princeton University Press; 2005. 376 p.

[17] Ostrom E. Governing the Commons: The Evolution of Institutions for Collective Action. unknown edition. Cambridge ; New York: Cambridge University Press; 1991. 298 p.

[18] Shapin S, Schaffer S. Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life. With a New introduction by the authors edition. Princeton, N.J: Princeton University Press; 1985. 448 p.

[19] Lightman B. Popularizers, participation and the transformations of nineteenth-century publishing: From the 1860s to the 1880s. Notes Rec. 2016 Dec 20;70(4):343–59.

[20] Popper KR. The logic of scientific discovery. London: Hutchinson and Co; 1959.