

In “A Social History of Truth: Civility and Science in Seventeenth-Century England”, Shapin applies the framework of Bloor’s “Strong Program”, which advocates for a treatment of “social relations as an external, independent factor and scientific judgment and content as a dependent outcome” (Longino; sec. 4), to English natural philosophy. In particular, he emphasises that trust is the dominant factor responsible for the transformation of mere belief into collective knowledge, and, thus, truth. In doing so, Shapin argues against the definition of truth as being a singular objective fact, rather asserting that “truth is a social institution” (Shapin; 6).

Accepting that truth is communally created should not mean that science, defined here as the “pursuit and application of knowledge and understanding of the natural and social world following a systemic methodology based on evidence” (“What is science?”), is invalid. Rather, acknowledging that truth is communally defined, multiple and socially situated can enrich scientific study through inviting consideration of many truths stemming from diverse global communities. Here, we shall adopt the Cambridge English Dictionary definition of valid as “based on truth or reason; able to be accepted” (“valid”). Thus, enhancing the validity of, and trust in, science requires an interrogation of how truth is currently being produced and how this process may be changed to more inclusive ends.

This paper, in particular, will explore both the dangers of seeing “natural truth” as static, singular or separated from “social truth” and the merits of adopting Shapin’s view of truth as a “hybrid entity”, through the lens of geographical study.

1. Cartography

Maps “are bound up in layers of power relations” (Drake; 909), and, in acting as “extensions of other forms of communications about space and place” (909), they dismantle

the claim of objectivity or single, unbiased truth. For example, the Mappa Mundi, one of the earliest versions of a world map communicated not only topography, but the global dominance of European religion by placing “Jerusalem at the centre of the world” (911). Moreover, the ubiquitous Mercator projection map is perhaps one of the best examples of the merging of space and power, ‘social knowledge’ and ‘natural knowledge’. Bound up in colonialism and highlighting the “imperial legacy of cartography” (911), the map “has great distortion of area in the high latitudes” (Tyner; 459), minimising the size of equatorial nations and inflating the size of the global North, attracting criticism from Arno Peters who argued that it promotes Eurocentricity (Krupar; 94). A more glaring cartographic projection of Eurocentric ideas comes in the form of Sir Halford Mackinder’s Heartlands map, used to illustrate his theory of the methods of global dominance, in which the Mercator projection was modified so that Europe was literally placed at the centre of the world (Tyner; 461). Evidently, mapping epitomises the hybridity of knowledge and truth, merging the representation of natural features, such as oceans and mountains, with that of social ideas about power, expansion and control. A vision of truth as permanent and undebatable encourages the communication of political messages to be left overlooked, unchallenged and accepted. This risks legitimising worldviews as universal facts, undermining the validity of (social) science itself.

Accepting Shapin’s perspective on truth, instead, and adopting the “Strong Program” analytic framework enables this monolith of knowledge to be challenged, confronting the power structures embedded and communicated within cartography by extension. This form of knowledge diversification is known as countermapping, defined as “any effort that fundamentally questions the assumptions or biases of cartographic conventions, that challenges predominant power effects of mapping, or that engages in mapping in ways that

upset power relations” (Hazen and Harris; 115). On a global scale, countermapping is exemplified by the Mercator alternatives created by Richard Edes Harrison, who created maps of various orientations and foci as the in-house cartographer of Fortune Magazine. This formed part of a larger protest against the “geographical cant” created by the dominance of the Mercator projection map, whose exclusive use in education, by virtue of being seen as the world’s true map, created “blind spots” in geographical theory and political commentary (Harrison ; 10).

On a smaller scale, countermapping can be exemplified through Meghan Kelly’s work on the Syrian experience of borders. Here, Kelly uses participatory cartography, defined as a “combination of participatory research methods with formal cartography” (Drake; 913), to create counter maps.

Kelly first interrogates the portrayal of borders themselves. Despite being a social construction, they are placed on maps alongside natural features, solidifying their standing as an innate feature of the Earth. Here, the hybridity of knowledge is simultaneously used to transgress geographic boundaries, with ‘social’ becoming ‘natural knowledge’, and at once ignored to legitimise this transgression, with once-‘social knowledge’ being presented as purely ‘natural’, ignoring the human creation of the concept. It is, therefore, taken as a fact that borders are unwaveringly present, becoming part of place identity. These delineations on a map extend to personal identity too, with cultures created around belonging on a particular side of a border being a prominent feature in political and literary discourse, as touched on, for instance, by Ash Amin in his book ‘After Nativism’ and Diana McHendry in her poetry collection ‘Borderers’.

Aside from denoting the presence of a border, cartographic representations communicate ideas about the nature of a border. For example, Kelly argues that “continuous lines are convenient symbols for borders because of their perceived permeance and uncontested fixity; they appear static, essential and unexperienced” (Kelly; 37). This contention about borders aligns with Shapin’s criticism of seeing the truth as fixed and uncontested. Furthermore, in his criticism of how knowledge is socially generated, Shapin argues that “Communities making truth-judgements ... create an automatic bias in favour of their own stock of current knowledge. [They] assume that all people live in a common external world and this world has a determinate structure. So the notion of truth can point to ‘what the world is like’ and therefore the culture that corresponds to it” (Shapin; 4). The existence of a uniform cartographic presentation of borders is contingent upon assuming this “common external world”, neglecting the various ways in which people can experience borders, undermining their validity in best representing the global experience.

Kelly challenges this through her countermapping project. Using the participatory method of conducting personal interviews, Kelly presents the refugee experience of borders as differential, through avoiding cartographic “aggregation” and showing “any type of border experience ..on the central map for its individual page”, highlighting non-traditional borders such as “the home, the neighbourhood and the body, which may otherwise go unseen” (Kelly; 41). This type of presentation dismantles the notion of border experiences being universal and unchanging. A greater appreciation of differential struggles can work to challenge power structures and improve the migrant experience. For instance, Esposito’s work on differential migrant treatment in the EU highlights the sentiment of migrants “arriving from the Middle East and Africa” being “otherized”, while Ukrainians are “accepted” (Esposito; “Limitations of Humanity”) Drawing on Edward Said’s concept of

‘imaginative geography’, which describes how “a group of people living on a few acres of land will set up boundaries between their land and it’s immediate surroundings on the one hand, and on the other, a land beyond theirs which they call ‘the land of the barbarians’”, it’s evident that such dichotomous divisions may have led to the favouring of nearby Ukrainian immigrants (from ‘their land’) compared to Middle Eastern or African immigrants, characterized as descending from ‘the land of the barbarians’, separated by multiple borders, both those that are imaginatively defined and cartographically created. With each type of borders influencing the other, the blurred nature of social and natural knowledge is evidenced.

Truth is clearly a hybrid entity, so acknowledging and taking strength in this could improve validity. Taking the earlier definition of validity as being characterised by the extent to which something is “based in reason”, it follows that considering multiple perspectives rather than applying one universal rule enhances the validity of maps, borders and our understanding of the world, improving, thus, the validity of geography.

2. Climate change

There are scenarios, however, where it would be helpful for one single truth to prevail. Anthropogenic climate change is one example where, although the extent of impact will vary spatially and temporally, effects will be felt universally. A common agreement that climate change will cause a third of the planet to face water stress by 2050 (UN Environment Program) or that “the population experiencing extreme heat conditions ... is projected to nearly double by 2050” (Lizana et al.) would be useful in the fight against increased environmental and social damage.

However, it could be argued that the science around this isn't seen as valid universally, as the global consensus around the degree to which anthropogenic climate change is "able to be accepted" varies. For example, US President Donald Trump, an avid climate change denier, has deemed this knowledge to be invalid and has "revoked a foundational scientific ruling that greenhouse gases are a threat to public health, demolishing the legal underpinning of the Environment Protection Agency's (EPA) authority to act on climate change under the Clean Air Act." (Cahill). Other politicians, both domestically and abroad share his views. At the 2025 Conservative Party Conference, Kemi Badenoch branded herself a "net zero sceptic". Meanwhile, during a BBC Breakfast interview on the 24th of May 2024, Richard Tice, former Reform UK leader, falsely claimed that "net zero will make zero difference to climate change", also stating "the idea that you can stop the power of the sun or volcanoes is simply ludicrous". In Germany, far-right party AfD enjoys the title of "the only major [German] party to outright reject the scientific consensus behind human-induced climate change", with "some of their anti-climate protection messages" finding "support in the wider population" (Kyllmann).

Arguing against climate change denial may appear as an endorsement of one singular narrative, a rejection of Shapin's hybridity theory of truth or an abandonment of the belief that multiple voices are needed to improve science's validity. However, this argument is not one that supposes that climate change science should remain unchallenged or immutable. Indeed, the science should be questioned.

As "what we know of comets, icebergs and neutrinos irreducibly contains what we know of those people who speak for and about these things", so too is what we know of sea levels, carbon and climate bound up in social relations. Thus, all "natural knowledge" about

climate change should be scrutinised. The divide between the global north and global south, for instance, in generating global knowledge should be probed and bridged. Who can be sure that claims about climate change in the global south are reflective of local realities if “rich countries, historically the largest greenhouse gas emitters and less vulnerable to climate change, publish >80% of climate research articles” (Skelton et al. ; 3)? How are countries in the global South meant to adapt to sea level rise if “geoid models that are developed and performing relatively well in reflecting local sea-level height in the Global North... in other regions of the world ... perform less well”, with glaringly obvious faults being consequently observed – “the approach, for example, placed half of the entire Mekong Delta already well below present-day sea level”(Seeger and Minderhoud)?

Evidently, knowledge creation needs to be democratized, with participatory methodologies, referred to above, perhaps providing a means to ensure that knowledge generation is not concentrated solely in the North.

In conclusion, we can see how Shapin’s argument of hybridity can enhance validity. Through acknowledging the blurred nature of truth and the social context in which all knowledge, facts and truths are generated, dominant power structures can be unveiled and opposed and trust in findings can be increased. Shapin’s fears about “a body of knowledge which members of our own culture routinely recognise as having special claims to truth” (Shapin; 5) can be abated, if we allow more diverse communities to contribute to scientific conversation. Doing so would increase the reasonability, acceptability and thus validity of science.

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