

Science Studies Elsewhere: The Experimental Life and the Other Within
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*This study is concerned with current images of Science Studies travelling to places outside Western Europe and North America. These images focus on the movement of Science Studies' formative concepts and ideas. They eclipse other formative aspects specific to the context in which this field was established. For example, Science Studies has analysed science within the conceptual architecture of modernity. Michel-Rolph Trouillot has claimed that modernity requires an alterity—a constitutive Otherness. Expanding on his work, this paper hypothesises that modern science requires an alterity against which its knowledge claims attain their full meaning. To test this hypothesis, Trouillot's concept of alterity ('Elsewhere') is applied to Steven Shapin and Simon Schaffer's paradigmatic book *Leviathan and the Air-Pump*. The analysis confirms that the philosophical programmes of Robert Boyle and Thomas Hobbes required a relation to Otherness. The 'New World', 'savages' and 'inferior creatures' figured as oppositional referents for casting and legitimising their knowledge claims. This paper further argues that Shapin and Schaffer also required the residual category of the 'ignorant stranger' as a crucial referent to frame their symmetrical historical approach to experiment. A Programme in Science Studies Elsewhere is proposed in relation to David Bloor's Strong Programme in the *Sociology of Knowledge*. This paper concludes that mainstream Science Studies constructs this field's Western European and North American history and identity by relegating the Rest of Science Studies scholarship to Dipesh Chakrabarty's imaginary waiting room of history. No matter how well the Rest assimilates or transforms Science Studies' formative concepts and ideas, it is bound to remain waiting as long as this room, Elsewhere, remains overlooked.*

Keywords: Alterity; Entangled Histories; Uneven Modernities; The Strong Programme; The Collective Blind Spot

Introduction

In 2010, the annual meeting of the Society for Social Studies of Science (4S) was held in Asia for the first time. The conference, entitled 'STS in Global Contexts', was jointly organised with the Japanese Society for Science and Technology Studies. The description of the conference reads as follows: '4S members will have a chance to experience, interact with and understand the cultural diversity of Asia. Furthermore, holding 4S in Asia opens the door to questions relating to universalities and cultural differences in STS concepts. This meeting will provide a good opportunity for reconsidering STS in global contexts as well as strengthening STS network worldwide'¹.

In 2007, three years before the 4S conference, the *East Asian Science, Technology and Society: An International Journal (EASTS)* was established to '[serve] as a gathering place to facilitate the growing efforts of STS networks from Northeast Asia, Southeast Asia, North America, and Europe to foster an internationally open and inclusive community'². In 2008, historian of science Warwick

Anderson described the establishment of *EASTS* as a signal for ‘[...] the emergence of novel sites for STS and the development of a broader community of scholars’ that ‘provides a guide to the travels of STS beyond Western Europe and North America’ (Anderson 2007, 249). At stake in this enterprise, according to Anderson, was nothing less than ‘to re-chart the map of STS for the twenty-first century’ (Anderson 2007, 249).

At first glance, these developments might not seem relevant to the work of the non-East Asian Science Studies³ scholar—questions relating to the travel of scientific concepts across cultural boundaries are typically assigned to the Science Studies subfields of anthropology of science, cultural studies of science, or post-colonial technoscience. But a closer look at Anderson’s expression of ‘the map of STS’ reveals that it is of central importance to mainstream Science Studies, because it begs the critical question of what the current map of Science Studies looks like. What kind of map does Anderson plot when he watches Science Studies travel beyond Western Europe and North America to East Asia? Science Studies is often described as an interdisciplinary field concerned with the ways in which modern science and technology influence society and how society, in turn, influences modern science and technology. Typically, this field is portrayed as an unfolding of an intellectual history that presents the work of Western European and North American scholars (e.g. Webster 1991; Edge 1995; Biagioli 1999; Collins and Evans 2002; Bucchi 2004; Yearley 2005; Turner 2008). Its standard genealogy bears distinct national footprints. Anderson’s map of Science Studies also charts the geographical travels of intellectual concepts and ideas and definitions of modern science and technology. From its origins in Western Europe and North America, the ideas and concepts of Science Studies are seen to be relocated, translated and assembled in local contexts, such as ‘Asia’.

However, it is precisely this classic image of scientific fields as composed of disembodied concepts and ideas that can be transported across contexts and time that has been criticised by Science Studies in recent decades. This image of the field of Science Studies disregards other formative influences on its content and course. In 1997 Aant Elzinga called attention to this paradox: Science Studies scholars ‘constructed their own past by positioning themselves programmatically in mostly cognitive terms, while ignoring their own broader historical and socio-political contextuality’ (Elzinga 1997). A few years later, Guggenheim and Nowotny (2003) introduced the notion of ‘the collective Blind Spot’ of Science Studies to capture this paradoxical condition: Science Studies’ standard genealogy, its academic self-portrait, stands in stark contrast to its own intellectual programme in which it has compellingly criticised the representation of knowledge fields as a cumulative sequence of intellectual achievements and individual biographies.

But what if the ‘canonical argument of co-construction between research and subject’ (Guggenheim and Nowotny 2003, 239) of Science Studies were to be applied to its own academic genealogy? What strategies and procedures have Western European and North American Science Studies scholars had to follow over the past forty years to succeed in casting and sustaining a legitimate object of study? What practices of knowledge representation have been used by Science Studies scholars to develop and legitimise a new academic field of knowledge? How would Anderson’s image of the travels of Science Studies change if it were to map context-dependent practices and strategies in addition to free-floating concepts and ideas? These questions are equally important to scholars working in East Asia, North America, Western Europe and other places.

This paper proposes a shift of attention from the standard narratives that have been used to portray Science Studies towards exploring alternative frameworks that consider its specific formative context. We are interested in the key strategies and practices that successful Science Studies scholars have adopted for constituting the field. One such practice or strategy that has contributed to Science Studies' achievements in academia is examined in greater detail in this paper. Just as in other fields in the social sciences and humanities, Science Studies has legitimised its programme by casting its object—science and technology—in relation to the *modern world*. *Modernity*, one of the central concepts of the social sciences and humanities, has provided the framework for constituting Science Studies' object of investigation and *raison d'être*, namely *modern science*.

The following pages examine some consequences of Science Studies' practice of studying science and technology within the conceptual architecture of modernity; as has been shown during the past decades, the concept of modernity is premised upon specific images of knowledge, science, politics and social order. The notion of 'Science Studies Elsewhere' is coined to draw attention to some of the resulting problems that have plagued this field despite its achievements in the Western Academy. The purpose is to contribute to understanding and positioning Science Studies better as an intellectual field of inquiry within the global social sciences and humanities. Unlike Science Studies, other fields of knowledge in the social sciences and humanities have started engaging with the theoretical challenges posed by recent debates and new insights concerning one of their foundational categories, modernity.

This paper is organised as follows. The next sections define key terms, formulate the research hypothesis, questions and the argument and introduce the case study (*Leviathan and the Air-Pump* (1985) by Steven Shapin and Simon Schaffer). To test the hypothesis, the concept of 'Elsewhere' is used to analyse this paradigmatic Science Studies book. Next the key questions and answers of Shapin and Schaffer's study are revisited. A Programme in Science Studies Elsewhere is subsequently proposed as a possible agenda to undertake further empirical studies. Finally, some conclusions are drawn about the implications of this analysis for the study of modern science and for the field of Science Studies specifically.

Modernity, Modernities, Alterity

Modernity, as a constitutive category of thought in the social sciences and humanities, has become 'a contested concept with a multiplicity of meanings which vary with actors and contexts' (Randeria 2002, 287). Classically, modernity was portrayed as a result of the economic, socio-political and cultural movements connected to the European Renaissance, the Reformation and the Scientific Revolution. These European developments were seen as a blueprint for modernity to be followed by the rest of the (non-modern) world. Mitchell (2000) describes the modern age as presenting 'a particular view of geography, in which the world has a single center, Europe [...] in reference to which all other regions are to be located; and an understanding of history in which there is only one unfolding of time, the history of the West, in reference to which all other histories must establish their significance and receive their meaning. [...] Historical time, the time of the West, is what gives modern geography its order, an order centered upon Europe' (Mitchell 2000, 7).

In the 1990s, the idea of modernity and its underlying images of Western progress and development were increasingly criticised. By the turn of the century, concepts such as *alternative*, *multiple* and

*plural modernities*⁴ had been proposed to overcome the confines of a singular conception of modernity. These concepts, in turn, have been criticised by scholars in post-colonial studies, cultural studies and anthropology. According to Conrad and Randeria (2002, 10), alternative or parallel forms of modernity reproduce the boundaries of the nation-state and Europe. Bhabra writes that ‘simply pluralizing the cultural forms of modernity, or recognizing the histories of others, does nothing to address the fundamental problems with the conceptualization of modernity itself’ (Bhabra, 2011, 655). On the contrary, such approaches continue to reinscribe the very categories and polarities that they seek to overcome. Modernity thus continues to provide what has been referred to as a ‘historiographical frame’ (Mitchell, 2000) or ‘grand narrative, within which the origin and diffusion of modernity within Europe is located’ (Bhabra 2011, 653). Randeria criticises this grand narrative for casting world history in terms of binary contrasts, which perpetuates the view of ‘European historical experience [...] as both unique and universal’ (Randeria 2002, 291).

In a similar vein, Mitchell (2000) proposes viewing modernity not so much as a stage of history but rather as its ‘staging’ (Mitchell 2000, 23). Importantly, this staging ‘involves the staging of differences’ (Mitchell 2000, 26). Often, this act is referred to as the construction of *alterity*. The requirement of constructing alterity for the genealogy of modernity has become the focal point of recent analysis in a variety of academic fields, such as post-colonial studies, anthropology, cultural studies and subaltern studies. Important contributions to this debate have been made by (among others) Edward Said (1977), Stuart Hall (1992, 1997), Homi Bhabha (1994), Gayatri Chakravorty Spivak (1988), Paul Gilroy (1993), Dipesh Chakrabarty (1992, 2002a, 2002b, 2008 [2000]), Valentin Mudimbe (1988), Mahmood Mamdani (1996), Michel-Rolph Trouillot (1991, 2002, 2003), Arturo Escobar (1994), Timothy Mitchell (2000) and Shalini Randeria (1999a, 1999b, 2002). These authors have been concerned with how to move beyond a relativist approach to the foundational binary constructions that have been characteristic of the discourse on modernity, such as modern/traditional, Western/non-Western, centre/periphery, civilised/primitive, or rational/irrational.

Entangled Histories and Uneven Modernities

Shalini Randeria has proposed two concepts to develop alternative historical perspectives to the classic conception of modernity: *entangled histories* and *uneven modernities* (Randeria 1999). She suggests replacing ‘the idea of a homogeneous Western modernity travelling, for the most part imperfectly, to the rest of the world’ with a ‘more messy and complex picture’ (Randeria 1999a, 1999b). This would address some of the problems that lie concealed in the binary concepts that have sustained the idea of modernity.

‘I would suggest replacing a “history of absences” (Mamdani 1996), as in discourse of modernisation theory, or a history by analogy, as in discourses of alternative modernities, by a relational perspective [on modernity] which foregrounds processes of interaction and intermixture in the entangled histories of uneven modernities (Randeria 1999a, 1999b)’ (in Conrad and Randeria 2002, 287).

Randeria’s notion of ‘entangled histories’ makes a case for substituting the binary categories of modernity with a new analytical framework in which the units of analysis emphasise the constitutive role of ‘the exchange and flow of ideas, institutions and practices’ (Conrad and Randeria 2002, 8). Her second concept, ‘uneven modernities’ specifies the focus of these new units of analysis. Rather

than identifying historical commonalities in this exchange and interaction, the framework aims to reveal ‘demarcations and fractures’ in the texture and constitution of the modern world (Conrad and Randeria 2002, 18/9).

In Science Studies, both the singular concept of modernity (e.g. Chambers and Gillespie 2000; de Laet and Mol 2000; Campion and Schrum 2004; Latour 1993, 2007; Hess 2001, 2007; Thompson 2008) and the relativist approach of multiple, plural or alternative modernities (e.g. Adams 2002; Redfield 2002; Anderson 2002; Harding 2008⁵; Anderson and Adams 2008) are prevalent. In the most recent *Handbook of Science and Technology Studies* (2008), Anderson and Adams lament that various attempts to pluralize the concept of modernity in the 1990s have been ‘largely ignored’ by scholars in science and technology studies (Anderson and Adams 2008, 183). Along with other Science Studies scholars⁶, they view the field of ‘post-colonial technoscience’ as a promising site for dealing with ‘the post-colonial critique that informs the anthropology of modernity’ (Anderson and Adams 2008, 183). Its objective, in their view, is to follow the movement of science and technology into new environments (Anderson and Adams 2008, 183) by pursuing ‘multi-sited histories of science’ (Anderson and Adams 2008, 192).

This focus on the traffic or travel of knowledge is an example of the kind of perspective that Mitchell (2000), Randeria (2002), Bhambra (2011) and others see as a historiographical frame or grand narrative of world history—a perspective in which the single conceptualisation of modernity ironically remains intact. The standard analytical procedure from this perspective, according to Randeria, is doomed to compare the Western with (the deficient) non-Western historical experience (Randeria 2002).

By introducing the notion of Science Studies Elsewhere, this paper applies concepts from post-colonial studies, anthropology and cultural studies to study the constitutive role of alterities in modern scientific culture. This is not simply an isolated intellectual exercise. On the contrary, it follows similar attempts to come to terms with the meaning of recent debates on modernity in other disciplines and fields in the social sciences and humanities, such as Costa (2005) and Boatcă et al. (2010) in Sociology, and Trouillot (1991, 2002) and Restrepo and Escobar (2005) in Anthropology. It appears that these critiques will likely reshuffle the territories of knowledge fields in the social sciences and humanities. It is time for the field of Science Studies to engage with and contribute to this process.

Elsewhere

One of the scholars concerned with the representation of alterity in the constitution of modernity is Michel-Rolph Trouillot. He has claimed that modernity ‘requires an alterity, a referent outside of itself—a pre- or non-modern in relation to which the modern takes its full meaning’ (Trouillot 2002, 222). Trouillot offers the concept of Elsewhere to study this alterity. Elsewhere designates ‘*a space of and for the Other that can be, and often is, imaginary*’ (Trouillot 2002, 225). This space figures as a constitutive requirement for modernity (Trouillot 2002, 224).

‘The claim that someone—someone else—is modern is structurally and necessarily a discourse on the Other, since the intelligibility of that position—what it means to be modern—requires a relation

to Otherness. The modern is that subject which measures any distance from itself and redeploys it against an unlimited space of imagination' (Trouillot 2002, 226).

While the study of alterity and the Other may be encountered in a variety of scholarly and disciplinary approaches, Trouillot's emphasis on space (rather than place) and imagination in defining the notion of Elsewhere introduces an interesting shift of perspective. From this point of view, Science Studies Elsewhere does not simply refer to far-away places, nor is it merely a call to include peripheral voices to achieve a more representative cultural composition of Science Studies scholarship. Instead, similar to Trouillot's work, the expression Science Studies Elsewhere is coined to map an analytical terrain that claims that *modern science, too, requires an alterity, a referent outside itself (a premodern or non-science) in relation to which modern science takes its full meaning*. If we adopt Trouillot's framework, the intelligibility of modern science requires a relation to Otherness.

This kind of shift in perspective is effectively described in Marie Louise Pratt's analysis of travel writings on encounters with 'bushmen' in Southern Africa in the eighteenth century. She claims that this encounter involves not only a confrontation of Europeans with 'unfamiliar Others' but also with 'unfamiliar selves' (Pratt 1992, 140) because they are not explicitly anchored '[...] either in an observing self or in a particular encounter in which contact with the other takes place' (Pratt 1992, 140). The travel writings are a mode of 'Othering', a normalising discourse 'whose work is to codify difference [...]' (Pratt 1992, 139). Similarly, Stuart Hall has said that although the Other appears to be 'banished to the edge of the conceptual world, constructed as absolute opposite, negation', it concurrently appears at the very centre (Hall 1992, 221).

Trouillot's Elsewhere, as space rather than place, encompasses both the (often imaginary) Other outside and the Other within. To investigate this space, Trouillot suggests studying two related geographies or lenses through which to read modernity, the *geography of management* and the *geography of imagination* (Trouillot 2002). The geography of management refers to 'the elaboration and implementation of procedures and institutions of control both at home and abroad' (Trouillot 2002, 234). These processes are intertwined with the geography of imagination which emphasises space rather than place. The geography of imagination maps 'two complementary spaces, the Here and the Elsewhere, which premised one another and were conceived as inseparable' (Trouillot 1991, in Trouillot 2002, 222). Just like modernity, I submit that modern science, too, can be mapped by studying the relation between the geography of imagination and the geography of management.

The Argument

Science Studies Elsewhere is not proposed as a call to equalise the global political economy of Science Studies (this important case has long been made, though undoubtedly it would need to be restated). Instead, I argue that Trouillot's notion of Elsewhere can call attention to characteristics of science that have remained systematically eclipsed and that it discloses important sites for future Science Studies. Science Studies has assumed a particular 'gaze' on science, rooted in this field's particular North Atlantic socio-political, institutional and epistemic heritage, and its positioning within the paradigm of modernity. If science requires an alterity, a referent outside itself, and if Science Studies fails to demonstrate that it has considered this alterity in its study of science, then its 'gaze' is likely to have led to a reinscription of the alterities that have been constitutive of science.

The key, then, is not to seek ways to return this gaze by pluralising the set of authors, problems or empirical sites in the field of Science Studies. It becomes necessary to analyse the Elsewhere, *the space of and for the Other that can be, and often is, imaginary*, in both science and Science Studies.

Against this background, this paper asks the following questions. What happens if we move ‘the gaze’ of Science Studies to Trouillot’s Elsewhere? What insights can be gained from this shift in the study of modern science in general, and for the field of Science Studies in particular? The following threefold hypothesis is presented to pursue these questions. First, Science Studies has been replicating the alterities that have constituted modern science. Second, this reproduction presents an obstacle to the field’s advancement and positioning within the social sciences and humanities. Third, the notion of Science Studies Elsewhere offers the field new approaches to the study of modern science. Thus, the objectives of the paper are 1) to apply the notion of Elsewhere to a paradigmatic case study from the field of Science Studies, 2) to test and demonstrate the analytical potential of the notion of Elsewhere, and 3) to consider the implications of this analysis for the study of modern science and for the field of Science Studies.

This hypothesis will be tested with a case study of a seminal Science Studies publication, *Leviathan and the Air-Pump: Hobbes, Boyle and the Experimental Life*, by Steven Shapin and Simon Schaffer (1985). Their work has been widely cited in Science Studies circles and beyond, and it continues to influence scholarly debates and approaches in the field. It is important to state that the object of this study is not to criticise the brilliant work undertaken by Shapin and Schaffer some 25 years ago. On the contrary, their book provides an excellent foil to probe the notion of Science Studies Elsewhere, 25 years later.

Elsewhere in Hobbes and Boyle’s Philosophical Programmes

The Case Study: The Experimental Life

Shapin and Schaffer’s book deals ‘with the historical circumstances in which experiment as a systematic means of generating natural knowledge arose, in which experimental practices became institutionalized, and in which experimentally produced matters of fact were made into the foundations of what counted as proper scientific knowledge’ (Shapin and Schaffer [1985] 2011, 3). The authors proposed a new approach to studying one of the ‘great paradigms’ of historians of science, who regarded Robert Boyle as ‘a founder of the experimental world in which scientists now live and operate’ (Shapin and Schaffer [1985] 2011, 5).

Shapin and Schaffer’s study departs from the postulate in the history of science that the historian and the 17th-century experimentalist Robert Boyle share a culture. Although the authors do not challenge this postulate, they do challenge the historical ‘member’s account and its associated self-evident method’ (Shapin and Schaffer [1985] 2011, 5) that historians of science usually produced. Instead, they propose a new approach to studying experiment, that of ‘playing the stranger’ to ‘the culture of experiment’ (Shapin and Shaffer [1985] 2011, 6). Their key methodological challenge, therefore, is to specify how the historian can ‘play the stranger to experimental culture, a culture we are said to share with a setting in the past and of which one of our subjects is said to be the founder?’ (Shapin and Shaffer [1985] 2011, 6). Despite this shift of focus to ‘culture’, Shapin and Schaffer emphasise

their positioning in history rather than anthropology and present their book as ‘an exercise in the sociology of scientific knowledge’ (Shapin and Schaffer [1985] 2011, 15).

Shapin and Schaffer’s historical approach to experimental culture is to cast the ‘great paradigm of experimental procedure’ in terms of a controversy within the social context of 17th-century Restoration England. This controversy took place between two principal protagonists—Robert Boyle and Thomas Hobbes—in England in the 1660s and early 1670s (Shapin and Schaffer [1985] 2011,7). Shapin and Schaffer prefer a symmetrical handling of rejected and accepted knowledge over controversy to rectify what they view as an asymmetrical, standard historiographical strategy of naming Boyle as the winner of the Boyle/Hobbes controversy (Shapin and Schaffer [1985] 2011, 11). For this purpose, Shapin and Schaffer attempt a member’s account of Hobbes’s ‘anti experimentalism’ (Shapin and Schaffer [1985] 2011, 13) and a stranger’s account of Boyle’s experimental programme. In this way, Shapin and Schaffer evoke three positions of historical knowing: the historian as member of experimental culture, the historian as artificial (playing, pretending) stranger to experimental culture, and the (non-) historian as genuine (ignorant) stranger to experimental culture.

The central argument of the book is that the Hobbes–Boyle controversies show that ‘[...] solutions to the problem of knowledge are embedded within practical solutions to the problem of social order, and that different practical solutions to the problem of social order encapsulate contrasting practical solutions to the problem of knowledge’ (Shapin and Schaffer [1985] 2011, 15). Shapin and Schaffer conclude that the Restoration polity and experimental science shared a common form of life and that ‘the practices involved in the generation and justification of proper knowledge were part of the settlement and protection of a certain kind of social order’ (Shapin and Schaffer [1985] 2011, 342).

The New World, ‘Inferior Creatures’ and ‘Savages’

Shapin and Schaffer conclude that both Hobbes and Boyle’s philosophical programmes shaped the nature of early modern philosophical life and experimental culture. This paper claims that their philosophical programmes required an alterity, a referent outside themselves, a pre- or non-science in relation to which their programmes attained their full meaning. What alterities do Hobbes and Boyle’s philosophical programmes require? What is the complementary Elsewhere to the Here of their philosophical programmes that both premised one another and were conceived as inseparable? What Others inhabit the Elsewhere in Hobbes and Boyle’s philosophical programmes?

Trouillot gives a name to the Elsewhere that was required for the emergence of modern Europe. He describes the ‘discovery’ of the New World, America, as the creation of Europe’s ‘still unpolished alter ego, its elsewhere, its Other’ (Trouillot 1991, 23). Indeed, Trouillot considers ‘The Conquest of America [...] as Europe’s model for the constitution of the Other’ (Trouillot 1991, 23). Stuart Hall (1992) identifies an explicit connection between the quest for order in Europe and the construction of a *modern identity*. According to Hall, this identity was formed not only by ‘the internal processes that gradually moulded Western European countries into a distinct type of society but also through Europe’s sense of difference from other worlds—how it came to represent itself in relation to these “others”’ (Hall 1992, 189). Hall’s approach corresponds to Trouillot’s views on ‘the West’s vision of order’, which ‘from its inception required two complementary spaces, the here and the elsewhere,

which premised one another and were conceived as inseparable' (Trouillot 1991, in Trouillot 2002, 222).

Because Shapin and Schaffer's book is concerned with the emergence of early modern science in 17th-century England, Trouillot's specification of Elsewhere for early modernity may be transferred to our case study: Elsewhere is the New World, America. Although Shapin and Schaffer do not mention the New World, or its inhabitants in their book, other researchers have studied Hobbes and Boyle's connections with the New World and their images of its inhabitants. They have shown that Hobbes and Boyle used the expressions '*savage*' (Moloney 2011) and '*inferior creatures*' (Irving 2008), respectively, to designate the populations of the New World in their work.

Elsewhere in Robert Boyle's Natural Philosophical Programme

Boyle never travelled to the New World. However, he held influential positions in various colonial institutions in the New World: the English East India Company, the Council for Foreign Plantations and the New England Company (Irving 2008, 1). He also held stocks in the Hudson's Bay Company (Irving 2008, 1). Although he never visited America, Boyle maintained a network of informants including travellers, tradesmen and colonial officers who provided him with first-hand information about the New World. The verification of knowledge and information from the New World in 17th-century England was a serious practical problem to natural philosophers. Their 'gentlemanly reliability' was established by considering their 'associations with England's colonies' (Irving 2008, 70).

Boyle's primary motivation, however, was not to establish new commonwealths in the New World, to derive profit or to gain first-hand knowledge from informants (Irving 2008). Managing these interests served his primary goal, the re-creation of 'The Empire of Man over Inferior Creatures'⁷ (Irving 2008, 1). In Boyle's tract, *Of the Usefulness of Experimental Natural Philosophy*, Boyle considers travellers to be vital to 'the natural philosopher's epistemic project of creating man's empire of knowledge' (Irving 2008, 14)⁸. This project was 'part of a programme for a model life as an experimental philosopher and as a Christian' (Irving 2008, 77). His model for the natural philosopher was 'the Christian Virtuoso' (Irving 2008, 78). Irving demonstrates that both the Royal Society and the Hartlib Circle viewed the New World as a source of useful knowledge for natural philosophers and they established overseas channels of communication accordingly (Irving 2008, 69).

Because Boyle never travelled to the New World, and because there were no established procedures to verify knowledge at the time, Boyle's expression 'inferior creatures' must be classified as a figure of his imagination. The role of 'inferior creatures' in his philosophical programme and the space this expression occupied in his claims for knowledge, however, are not imaginary. Its assimilation into his body of knowledge is what Pratt referred to as a normalising discourse that codifies difference by omitting the 'observing self' in its textual production of the Other (Pratt 1992, 140).

Mapping and relating the Geography of Management and Imagination of Boyle's philosophical programme reveals the direct connections and entanglement between scientific institutions such as the Hartlib Circle and the Royal Society, and colonial institutions such as the English East India Company, the Council for Foreign Plantations and the New England Company. The specific

geography of Boyle's imagination required finding a slot for the inhabitants of the New World, inferior creatures, and a model of their absolute opposite, the experimental natural philosopher.

Elsewhere in Thomas Hobbes's Philosophical Programme

Just like Boyle, Hobbes never visited the New World, and just like Boyle, Hobbes was directly involved with colonial institutions in the New World. As secretary to Lord Cavendish, Hobbes was professionally acquainted with the New World through their 'joint involvement with the Virginia Company' (Moloney 2011, 197). Hobbes's direct connection with colonial affairs gave him access to 'detailed reports of the Amerindians' (Moloney 2011, 197).

Hobbes used the New World as a crucial referent in his seminal work on political sovereignty. He built an account 'of the sovereign authority of civilized states that presupposed its absence among the primitive societies of the New World' (Moloney 2011, 199). His analogy between sovereign individuals in a state of nature and sovereign states in the European family of nations necessitated the denial of statehood to savage societies (Moloney 2011, 199). Assigning 'savage societies' to nature meant to classify their social structures and institutions as pre-political (Moloney 2011). Moloney points out that this kind of theoretical mapping fed into 'the ideologies Europeans used to rationalize the global order they were bringing into being' (Moloney 2011, 190). He writes that 'Hobbes built a theoretical bridge between the chaos of the colonial periphery and the order that ought to characterize the internal structures of, and the external relationships among, European states' (Moloney 2011, 190).

By inscribing 'savages' as inhabitants of 'the anarchic periphery' of the New World, Hobbes assigned them a backward space in both time (before sovereign states) and place (outside sovereign states). By theorising 'savage anarchy [...] as the only alternative to, the very outside of, civilized states' (Moloney 2011, 202), Hobbes contributed to the development of those binary oppositional concepts that have sustained the idea of a European modernity. Instead of viewing these binary constructions as agents in developing modernity as a stage in history, they can be seen as casting modernity as historiographical frame for staging difference (Mitchell 2000).

Mapping and relating the Geography of Management and Imagination of Hobbes's philosophical programme reveals that Hobbes's involvement and connections to colonial institutions in the New World is meaningful for his philosophical programme. Hobbes's theory necessitated what Trouillot has termed 'the Savage slot' (Trouillot 2003), an Otherness against which core concepts of his philosophical programme (and their superiority) came to make sense in 17th-century Restoration England. Hobbes's 'savage' is not just a figure of the imagination that he projected into the New World that would correspond more or less to a reality. The use of the 'savage' in his philosophical programme becomes what Homi Bhabha has referred to as a 'strategy of representing authority' (Bhabha 1994). This strategy assigned backwardness in time and instantiated an order (of sovereign citizenship) against which variations can be discussed.

What is Experiment?

The above analysis shows that Boyle and Hobbes's philosophical programmes necessitated an Elsewhere as referent against which their knowledge claims could attain full meaning and legitimacy. But it is not clear whether this approach offers new answers to Shapin and Schaffer's principal research questions (What is experiment? What were the historical circumstances in which modern experimental life became institutionalised?). Shapin and Schaffer do not define experiment. Instead, they describe characteristics that typify the phenomenon of experimental practice: experiment is *a solution* (to the problems of knowledge and social order); experiment is *a cultural practice* (brought about through consensus produced by historical judgement); and experiment is *a form of life* (shared by the politics and science of the Restoration society, which judges what will best establish order). The following sections will present new insights from this study on Elsewhere with respect to these characteristics.

Experiment as Solution to Knowledge and Order

The analysis has shown that Hobbes and Boyle used the expressions 'the savage', 'wilderness' and 'inferior creatures' to populate Elsewhere in their respective philosophical programmes. At the most basic level, the analysis suggests an essential complement to Shapin and Schaffer's central tenet of viewing Hobbes and Boyle's programmes as solutions to the problems of knowledge and social order. Experimental practice as a solution to the problems of knowledge and social order is at the same time a solution to the problems of *non-knowledge* and social *disorderliness*. As will be discussed later, this is not merely another exercise in symmetry.

Experiment as Cultural Practice

Shapin and Schaffer are interested in explaining the beliefs and practices of experimental culture (Shapin and Schaffer [1985] 2011). Representing the beliefs and practices of a specific culture sets the boundaries for its cultural identity. According to Corbey and Leerssen (1991b, vi), 'the circumscription of cultural identity proceeds by silhouetting it against a contrastive background of Otherness'. Van Alphen shows that descriptions of alterity '[...] are never based on a 'real' Other, but on a denial of the self, of the observer's identity' (van Alphen 1991, 3).

Thus, examining experiment as culture and practice means representing cultural identity, and the portrayal of cultural identity requires a contrastive background of Otherness that cannot be based upon a 'real' Other but must be based on an imaginary projection that constitutes the self. Hobbes and Boyle used 'savages' and 'inferior creatures' as means to formulate '[...] an ideal, desired identity' (van Alphen 1991, 3): the civilized (European) state and the model experimental philosopher. To view experiment as culture, therefore, not only implies the need to connect what happens inside the experimental laboratory with social conventions and formative socio-historical contexts; it also entails a shift towards the geography of imagination that evokes 'the twin concepts of alterity and identity' (Voestermans 1991, 221).

Why is this difference important? Shapin and Schaffer regard *the process of social consensus* on Boyle and Hobbes's knowledge claims as the driving force in producing historical judgement in favour of experimental life. This paper considers the *construction of a modern European identity* as the key to the successful insertion of both Hobbes and Boyle's programmes into the specific

circumstances of Restoration England. Experimental practice becomes a device to construct meaning, a site of enunciation to inscribe difference and sameness.

Experiment as a Form of Life

Shapin and Schaffer depict experiment as a form of life. In their view, the ability of this form of life to establish social order was judged by the context of Restoration society. Boyle's experimental form of life, however, was not proposed simply as an optional form of life among others but as a *model* form of life, the 'Christian Virtuoso' (Irving 2008). Blending the figure of the experimental philosopher with the Christian composed a model identity that allowed Boyle to bestow his programme with a sense of social, political, cultural, economic and religious utility.

Furthermore, Boyle's model form of life was cast against the contrasting forms of life of 'inferior creatures'⁹. Its aim was to recover 'man's knowledge of the natural world' to 'exert dominion over the Creation' (Irving 2008, 78). The order sought by Hobbes and Boyle's philosophical programmes concerned not only the battles of the English nation outside the confines of the 17th-century laboratory, but also its (Christian) handling of the encounter with the New World. The idea that 'Dominion and knowledge [...] go hand in hand' (Irving 2008, 78) was shared by natural philosophers, especially the members of the Royal Society, at the time. This blending can be seen as an 'attempt to subdue the strangeness of the Other in cognitive terms' (Corbey and Leerssen 1991b, viii).

Accordingly, the model experimental life was developed in the context of the construction of the identity of Western European nations vis-à-vis the New World—and their struggle for colonial power. Its particular social imaginary (Appadurai 1999), therefore, formed part of the larger process of inventing early modern selves of modernity. Randeria has referred to this identity as the precursor stage of the European Self ('*Vorstufe des europäischen Selbst*') (Randeria 1999b, 374). To produce the coherence and sameness of this identity, Boyle and Hobbes's philosophical programmes needed to project alterity and tame difference.

One might be tempted to conclude that these new answers to Shapin and Schaffer's questions simply require Shapin and Schaffer's historical record to be complemented by extending the context of Restoration society to other geographical regions, such as the New World, or to other cultures, designated wrongly as 'savages' or 'inferior creatures'. Is this really all that happens, however, if we acknowledge that modern science requires 'an alterity, a referent outside itself, a pre- or non-modern' in relation to which modern science attains its full meaning? A shift takes place that moves beyond focusing on linear processes of inclusion or travel to focusing on processes of co-constitution and entanglement (Randeria 2002). The replication of these alterities does not simply happen by overseeing historical realities that have now been uncovered by a newer generation of scholars, such as Moloney, Irving, and others. The replication of alterities lies concealed in Shapin and Schaffer's particular approach to experiment: by viewing and treating experiment as a cultural heritage of modern science.

Experiment as Heritage

In addition to these explicit characteristics, Shapin and Schaffer's analytical approach implies a significant assumption that informs their approach to experiment: their distinction between member's

and stranger's accounts assumes that Boyle's experimental programme shaped a cultural practice that has a *historical lineage* reaching back to its *origins* in 17th-century England. Experimental practice is thus represented as tradition or *cultural heritage*¹⁰. Shapin and Schaffer re-inscribe the image of early modern experimental practice as a culture with directional historical footprints that can be extrapolated and traced through time and across space. This image provides the backdrop to their proposition for a new approach to the question: 'How can the historian play the stranger to experimental culture, a culture we are said to share with a setting in the past and of which one of our subjects is said to be the founder?' (Shapin and Schaffer [1985] 2011, 6). Shapin and Schaffer propose the research methodology of 'playing the stranger' to 'the culture of experiment' (Shapin and Schaffer [1985] 2011, 6):

'We need to *play* the stranger, not to *be* the stranger. A genuine stranger is simply ignorant. We wish to adopt a calculated and an informed suspension of our taken-for-granted perceptions of experimental practice and its products. By playing the stranger, we hope to move away from self-evidence. We want to approach "our" culture of experiment as Alfred Schutz suggests a stranger approaches an alien society, [...]' (Shapin and Schaffer [1985] 2011, 6).

This methodology presupposes that the philosophical programmes of both Boyle and Hobbes form part of the cultural heritage of experimental practice (because each was offered as a solution to the problems of knowledge and social order) and that these programmes can be studied by applying a methodology from the Strong Programme in the Sociology of Knowledge (Bloor 1991 [1976]): the principle of symmetry.

This paper argues that by treating experiment as a cultural heritage shared by the historian of science, the 17th-century experimentalist, and Boyle, Shapin and Schaffer replicate the alterities that constitute modern science. Who is the genuine stranger in Shapin and Schaffer's approach to experimental culture? What is he/she ignorant of? In what sense is he/she not believable¹¹? What is inherent in his/her views that allows the two Science Studies scholars Shapin and Schaffer to evaluate and assign to him/her the status of the ignorant?

Because Shapin and Schaffer do not elaborate further on the genuine, ignorant stranger, we can only speculate about his/her identity. A few characteristics, however, are evident: the genuine, ignorant stranger designates the opposite, the negative necessary to frame their approach to experimental culture. The genuine, ignorant stranger, therefore, is a device to construct meaning. He/she is not based on any empirical, analytical or theoretical studies on the nature of his/her ignorance or lack of credibility. Therefore, he/she has to be classified as a fiction of Shapin and Schaffer's imaginary geography of experimental culture. This 'complete stranger' to experimental culture is the necessary device that allows Shapin and Schaffer to speak about 'culture': if he/she did not exist (in their geography of imagination), there would be no outside of experimental culture, and the very notion of 'culture' would lose its meaning.

Shapin and Schaffer apply the principle of symmetry to two types of knowledge: rejected and accepted. The analytical web of member's and (portrayed) stranger's accounts, however, eclipses the historical complementarity of representing knowledge against its opposite, that is, non-knowledge.

To eclipse this dimension is to replicate the alterities that constitute experimental life and thus modern science more generally. This is not just another level of symmetry: the added value of making visible the alterities of modern science lies not in the claim for an equal treatment but in the claim for a need to focus on the ways in which the twin pair of identity and alterity comes into being, functions, interacts, and changes.

Shapin and Schaffer's approach may be viewed as an example of what Dipesh Chakrabarty has termed the 'transition narrative' of 'historicism' (Chakrabarty, 2008 [2000]). This transition narrative expresses a 'historical construction of temporality' in which the modern is separated from the pre-modern by historical time (Chakrabarty 1992, 13). It also records the assumed cultural distance between the West and the non-West. This 'mode of thinking about history' assumes that 'any object under investigation [retains] a unity of conception throughout its existence' (Chakrabarty 2008 [2000], xiv). The transition narrative inscribes a "first in Europe, then elsewhere" structure of global historical time' (Chakrabarty 2008 [2000], 7) that 'situates the modern individual at the very end of history' (Chakrabarty 2008 [2000], 10). The mode of writing history as a transition narrative, in Chakrabarty's theory, represents a rehearsal of the split between the modern and the pre- or non-modern: '[...] this split is what is history; writing history is performing this split over and over again' (Chakrabarty 1992, 13). Performing this split relegates the colonial subject to an 'imaginary waiting room of history' (Chakrabarty 2008 [2000], 8).

Shapin and Schaffer's examination of experimental culture as heritage may be viewed as a rehearsal of Chakrabarty's transition narrative, which relegates the ignorant stranger to experimental culture to the imaginary waiting room of history. Their book re-enacts a social imaginary in which experimental practice as culture is cast against an outside referent (Elsewhere). To view experiment as a cultural heritage means to replicate its constitutive alterities, to extrapolate and reproject them through time, all the way into the present—to perform the split of historical writing over and over again. Just as Randeria posits for modernity (Randeria 2002), the idea of modern science travelling to the rest of the world must be replaced by a more messy and complex picture. This picture might be referred to as entangled experimental culture, or as uneven modern sciences.

The above discussion shows that the analysis of Elsewhere in Hobbes and Boyle's philosophical programmes offers new insights into the central questions of Shapin and Schaffer's book. Science Studies appears to reproduce the alterities that have constituted modern science by replicating Chakrabarty's "first in Europe, then Elsewhere" structure of global historical time' (Chakrabarty 2008 [2000], 7) and by inscribing this time as a measure of cultural distance. This performance of Chakrabarty's historical split within the body of Science Studies presents an obstacle to the advancement of this field, because it prevents the genuine, ignorant stranger from Science Studies' own Elsewhere from entering this field of knowledge.

The Programme in Science Studies Elsewhere

Can general implications be drawn from the above analysis of Elsewhere in the paradigmatic case study of *Leviathan and the Air-Pump* for Science Studies' approach to modern science? Shapin and Schaffer's study is 'an exercise in the Sociology of Scientific Knowledge' (Shapin and Schaffer [1985] 2011, 15). It has been called 'one of the most celebrated products of the Strong Programme' (Longino 2002, 18). Bloor's Strong Programme will be used as referent for formulating a

Programme in Science Studies Elsewhere (Bloor [1976] 1991). This programme employs Randeria’s concepts of *entangled histories* and *uneven modernities* (Randeria, 1999a, 1999b) to put into effect and interpret Trouillot’s notion of Elsewhere for the study of modern science. Elsewhere makes the entangled processes and practices that inscribe sameness and difference in modern science visible. The following four tenets propose starting points to introduce this shift (Fig.1).

The Programme in Science Studies Elsewhere

1. It would be entangled; that is, concerned with the constitutive role of Elsewhere in the practices and processes that shape knowledge claims in modern science.
2. It would be relational with respect to claims for chronological primacy and universality in modern science. The shaping of binary categories of historical thinking about modern science (modern/traditional, rational/irrational, knowledge/non-knowledge, etc.) will require relational (rather than oppositional) explanation.
3. It would be uneven in its style of explanation. Its units of analysis would foreground demarcations and fractures in the social imaginary of modernity to explain, say, true and false beliefs.
4. It would be contestable. In principle, its patterns of explanation would have to allow critique that contests knowledge claims on the Here and the Elsewhere. This is a response to the need to develop and debate entangled modes of explanation.

<p>The Strong Programme in the Sociology of Scientific Knowledge</p>
<p>It would be causal, that is, concerned with the conditions which bring about belief or states of knowledge. Naturally, there will be other types of causes apart from social ones which will co-operate in bringing about belief.</p>
<p>It would be impartial with respect to truth and falsity, rationality or irrationality, success and failure. Both sides of these dichotomies will require explanation.</p>
<p>It would be symmetrical in its style of explanation. The same types of cause would explain, say, true and false beliefs.</p>
<p>It would be reflexive. In principle, its patterns of explanation would have to be applicable to sociology itself. Like the requirement of symmetry, this is a response to the need to seek for general explanations. (Bloor [1976] 1991)</p>

Fig. 1: The Programme in Science Studies Elsewhere in reference to the four tenets of Bloor’s Strong Programme in the Sociology of Scientific Knowledge.

1. It would be **entangled**; that is, concerned with the constitutive role of Elsewhere in the practices and processes that shape knowledge claims in science.

Shapin and Schaffer's first tenet for the Strong Programme, causality, leads them to inquire into the historical circumstances in which modern experimental life became institutionalised. Their aim is to make visible a direct causal connection between Restoration society and the rules, procedures and conventions that define experimental practice in the laboratory.

The study of Elsewhere in Hobbes and Boyle's philosophical programme shifts the analytical focus away from causal linkages in the study of experimental culture to the entangled processes that produce scientific meaning and knowledge against a contrastive alterity. The analysis inquired after the Elsewhere of Boyle and Hobbes's philosophical programmes, the oppositional referents outside (and within) themselves, the pre- or non-modern science in relation to which their philosophical programmes attain their full meaning. The complementary Elsewhere to the Here of their philosophical programmes was the New World, the necessary alterity for the construction of the beginnings of a common European self, both of which premised one another and were conceived as inseparable. 'Inferior creatures' and 'savages' were the relational Others that inhabited the Elsewhere in their programmes.

Elsewhere can serve as an analytical tool to emphasise the entangled processes and practices of othering that have shaped modern science.

2. It would be **relational** with respect to claims for chronological primacy and universality in modern science. The role, function and effects of dichotomies (such as modern/traditional, rational/irrational, knowledge/non-knowledge, etc.) as categories of historical thinking about knowledge claims will require explanation.

Shapin and Schaffer's approach to studying experiment aims at delivering an *impartial* account of rejected (Hobbes) and accepted (Boyle) knowledge. Their distinction between member's and stranger's accounts allows them to reveal causal links between Hobbes and Boyle's respective knowledge claims and historical judgements in seventeenth century England. In their historical approach, the imaginary figure of the 'genuine', 'ignorant stranger' is assigned a permanent place to occupy outside of experimental culture from the time of its inception in early Europe all the way through to the present. He/she fills the necessary slot, personifies the indispensable (historical) absence against which the presence of Shapin and Schaffer's knowledge claims can be contrasted and instantiated.

Shapin and Schaffer's inscription of the oppositional members and strangers to experimental culture is a rehearsal of Chakrabarty's 'transition narrative'—an inscription of historical time as a measure of cultural difference (Chakrabarty 2008 [2000]). This rehearsal feeds on replicating Elsewhere. Shapin and Schaffer's 'ignorant stranger' is assigned to Chakrabarty's 'imaginary waiting room of history' (Chakrabarty 2008 [2000]:8). He/she is waiting there for modern science and its experimental culture to travel to him/her so that he/she can acquire membership in the universal

experimental culture. However, he/she can never become a member of this heritage because he/she is doomed to represent the contrastive outside against which the inside identity of experimental culture is constituted. Shapin and Schaffer's impartial approach of 'playing' the 'ignorant stranger' may be seen as a rhetorical device for performing Chakrabarty's historical split, the historical construction of a temporal axis that constantly reconstitutes the outside (Chakrabarty 2008 [2000]) of modern science.

The Programme in Science Studies Elsewhere claims that the dichotomies of Bloor's Strong Programme (truth and falsity, rationality or irrationality, success and failure) form part of a historiography of science and knowledge that depends upon the twin concepts of alterity and identity. The relational approach to modern science seeks explanations for the processes and practices that inscribe such opposing categories of historical thinking. Emphasising the role of Elsewhere in the making of modern science is an attempt to work against Chakrabarty's perpetual historical split by shifting the attention to the relational entanglement of the dichotomies of modernity that have favoured certain knowledge claims over others.

3. It would be **uneven** in its style of explanation. Its units of analysis would foreground demarcations and fractures in the social imaginary of modernity to explain, say, true and false beliefs.

Shapin and Schaffer apply a *symmetrical* style of explanation to the knowledge claims of Boyle and Hobbes to deliver an impartial account of the two sides of the dichotomies truth/falsity, rationality/irrationality, success/failure.

The analysis of Elsewhere in Boyle and Hobbes's philosophical programmes has shown that solving the problems of knowledge and order necessitated a contrastive background of non-knowledge and disorderliness (the New World, its 'inferior creatures' and 'savages') to legitimize knowledge claims. But this contrastive background of alterity does not simply introduce another analytical level in need of symmetrical inspection. A symmetrical explanation of the contrasting knowledge claims of Hobbes/Boyle and 'inferior creatures'/'savages' is bound to generate a 'history of absences' (Mamdani 1996). Symmetrical postulates on the foundational, binary oppositions of modernity reinscribe how difference has been codified in modern science.

The Programme in Science Studies Elsewhere proposes to replace Bloor's symmetrical style of explanation with an uneven style of explanation. It attempts to shift the focus away from approximating an ideal image of the symmetrical neutral view from nowhere to deconstruct modern science. It does not attempt to eliminate skewed power relations of divided or shared histories. Neither does it simply try to establish historical commonalities between Boyle and Hobbes's philosophical programmes, experimental practice, the Royal Society, travellers, tradesmen and colonial officers to the New World, the English East India Company, the Christian Virtuoso, 'savages', and 'inferior creatures'. The uneven style of explanation seeks new units of analysis that provide transversal accounts of knowledge claims to investigate the practices and processes that underlie the binary categories of modernity.

Following Randeria (2002), the shift in style of explanation involves a change of perspective on the status of modern science: instead of representing a historical-philosophical category of modernity,

modern science becomes an agent in staging the social imaginary of modernity. The Programme in Science Studies Elsewhere seeks to reveal the messy demarcations and fractures in the texture and constitution (Conrad and Randeria 2002) of this agency. Studying the unevenness of the foundational categories of modern science opens the scene for alternative social imaginaries of knowledge.

4. It would be **contestable**. In principle, its patterns of explanation would have to allow critique that contests knowledge claims on the Here and the Elsewhere. This is a response to the need to develop and debate entangled modes of explanation.

Bloor's last tenet on reflexivity specifies that Shapin and Schaffer's patterns of historical explanation of experimental culture would have to be applicable to sociology itself. Shapin and Schaffer do not address this tenet in their study. However, from the point of view of Science Studies Elsewhere, Bloor's fourth tenet illustrates the vicious circle of explanation within which Science Studies has been operating. At the outset of this paper, calls were quoted to address Science Studies' paradoxical condition of representing itself by means of an intellectual genealogy that remains detached from its 'broader historical and socio-political contextuality' (Elzinga 1997) while at the same time arguing for the co-construction between research and subject for other knowledge fields (Guggenheim and Nowotny 2003). Could not a reflexive perspective provide a solution to this paradoxical condition? Would not the application of Science Studies' standards and explanations to its own programmes and concepts provide an analytical framework for examining its own co-construction?

A reflexive perspective is bound to reproduce Science Studies' knowledge claims on Here and the Elsewhere. This perspective would have to remain caged within this field's foundational assumptions on modernity. New approaches are necessary to challenge these assumptions. In this paper, Elsewhere was proposed as an analytical tool for demonstrating an alternative way of framing the phenomenon of experimental culture and practice. The Programme in Science Studies Elsewhere proposes that debates on alternative ways of framing science be a constitutive requirement for Science Studies in the future. Suggesting that the Programme be *contestable* is to accentuate the added value of engaging with such alternative ways of mapping the Here and the Elsewhere of knowledge claims.

Conclusion

The analysis of Elsewhere in the philosophical programmes of Boyle and Hobbes has confirmed the hypothesis that modern science requires a referent outside itself, a pre- or non-modern science in relation to which it attains its full meaning. Shapin and Schaffer's approach to experiment as culture and practice in *Leviathan and the Air-Pump*, also relies on the oppositional contrast between member's and stranger's accounts. Their symmetrical account of the Hobbes/Boyle controversy in terms of rejected and accepted knowledge puts into effect the residual category of the 'genuine', 'ignorant stranger', the outside to the culture of experiment. The genuine, ignorant stranger represents a rhetorical device for legitimising their historical method and serves as a critical referent in relation to which their historical knowledge claims attain full meaning. He/she is an imaginary construct, an inhabitant of *Leviathan and the Air-Pump*'s Elsewhere. This appropriation of a heritage of experimental culture (by contrasting it with its absence, Elsewhere) promulgates the grand narrative of modernity in which experimental life appears with a European site of origin spread over

time and place. Shapin and Schaffer's study thus replicates the alterities that have constituted modern science.

Rather than thinking of experiment as culture and practice that is contrasted with its absence, Elsewhere, this paper suggests that it be thought of as a category that shapes historical thinking, as an agent in constructing Europe as subject. Trouillot's notion of Elsewhere may be used as a conceptual tool to call attention to characteristics and procedures of science that have remained systematically eclipsed. Science Studies Elsewhere delineates a terrain for inquiry into knowledge claims that views the construction of alterity and identity as key strategies of modern science. To study these strategies, a Programme in Science Studies Elsewhere is proposed in reference to David Bloor's Strong Programme in the Sociology of Knowledge, which provided the theoretical backbone to Shapin and Schaffer's methodological approach to experiment. Where Bloor proposes a causal, impartial, symmetrical and reflexive Strong Programme, this paper proposes an entangled, relational, uneven and contestable Programme.

The above analysis might be dismissed as providing material that is relevant only to specialist fields like the anthropology of science, cultural studies of science, or post-colonial technoscience. However, Science Studies Elsewhere attempts to move beyond the project outlined by post-colonial technoscience, the pluralising rhetoric of which ironically cements the universal historical narrative of a uniform modernity and its European heritage. Its primary object is not to analyse modern science through the lens of the cultural or historical diversity ascribed to plural or alternative modernities. It does not propose to develop strategies for overcoming or doing away with Elsewhere as a device for the construction of meaning in scientific practice. Nor does it challenge its function in the scientific quest for cognitive hegemony—such approaches would not address the basic problems and assumptions that underlie the key explanatory categories of modernity (modern/traditional knowledge, public/private sphere, etc.) (Bhambra 2011). The challenge is not to recognise the difference of Shapin and Schaffer's genuine, ignorant stranger but to question his unrivalled status and function as an oppositional referent to sustain the imaginary geographies of identity and coherence in modern science.

Viewed through Trouillot's lens on Elsewhere, the field of Science Studies does not much resemble the heterogeneous, multi-sited, diverse interdisciplinary field it has been promoted as. Rather it appears as a homogeneous, concerted re-inscription of the assumptions and binary categories that underlie the grand narrative of modernity. As in other fields in the social sciences and humanities, Science Studies has built its academic identity by casting its object of study in relation to the concept of modernity, a now contested concept. Its contested status requires fresh perspectives that are able to ask new questions. The Programme Science Studies Elsewhere posits the need for a cognitive shift in perspective on modernity as the imaginary frame against which Science Studies has legitimised its subject. It seeks to move the analytical focus of Science Studies to studying and contesting the strategies that have successfully established claims on modern science and knowledge.

But why should Science Studies perform this move? On what grounds would it be sensible to compromise Science Studies' present course, given its relative success in the past? Why should a seemingly abstract expression such as Science Studies Elsewhere be taken seriously? This paper argues in favour of undertaking research on Science Studies Elsewhere as an exercise in addressing

what Elzinga (1997) and Guggenheim and Nowotny (2003) have referred to as the ‘paradox’ and the ‘collective Blind Spot’ of Science Studies, respectively. Anderson’s (2007) vision of re-charting the map of STS for the twenty-first century cannot commence as long as Science Studies eclipses its collective Blind Spot.

However, a plain collage of Science Studies’ genealogy against its specific Western European and North American social, political and cultural context will not assist in better understanding Science Studies’ specific conditioning nor will it do away with the collective Blind Spot. The formative context for Science Studies was given not only by the sum of the internal social, political and cultural specificities of North America and Western Europe, but also by the conceptual confines of the assumptions that underlie the grand narrative of modernity. These assumptions rely on imaginary geographies that produce a space for the Other, Elsewhere. The travels of Science Studies to other countries, as envisioned by Anderson in the Introduction, appear as a rehearsal of Chakrabarty’s ‘first in Europe, then elsewhere’ (Chakrabarty 2008 [2000], 7) structure of global historical science. This transition narrative recreates the binary categories of thinking about the modern world: modern/traditional, public/private and Western/non-Western. It situates the North American and Western European Science Studies scholar at the very end of history and consigns the Rest of Science Studies scholarship to Chakrabarty’s ‘imaginary waiting room of history’ (Chakrabarty 2008 [2000]).

Corbey and Leerssen claimed that there are various ways in which Otherness can be portrayed and that the use of cultural alterity ‘[...] does not by definition imply a denigration of the Other’ (Corbey and Leerssen 1991b, vii). Science Studies Elsewhere provides an analytical terrain for seeking such alternative ways of casting knowledge claims. Perhaps the Elsewhere of modern science is more easily discerned by the inhabitants of the (at times imaginary) spaces it has produced, such as that of Shapin and Schaffer’s genuine, ignorant stranger to experimental culture.

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¹ <http://www.4sonline.org/meeting/10>

² http://muse.jhu.edu/journals/east_asian_science_technology_and_society/

³ Following Hess, ‘Science Studies’ is used here as an umbrella term ‘because it has come to be used colloquially as a broad and inclusive name for the field’ (Hess, 1997:3). It will be used here interchangeably with ‘STS’.

⁴ See Knauff (2002) for an overview of relevant literature on these concepts.

⁵ Sandra Harding has recently drawn attention to the ‘under-addressed’ modernity/tradition binary in Science and Technology Studies (Harding 2008, 7).

⁶ Special Issue on Postcolonial Technoscience in *Social Studies of Science*, Vol. 32, No. 5/6 (Oct–Dec, 2002), Special Issue on Postcolonial Technoscience in *Science as Culture* 14(2) (2005).

⁷ R. Boyle, Some Considerations Touching the Usefulness of Experimental Natural Philosophy, Part II (1671), in M. H. Hunter and E. B. Davis (eds.), *The Works of Robert Boyle*, 14 vols. (London: Pickering and Chatto 2000), vol. 6, p. 406 (Irving 2008).

⁸ See also Irving, 2008:69.

⁹ Likewise, Hobbes's model of civilised states both presupposed and required the denial of statehood to savage societies.

¹⁰ 'Thus, historians start with the assumption that they (and modern scientists) share a culture with Robert Boyle, and treat their subject accordingly: the historian and the seventeenth century experimentalist are both members' (Shapin and Schaffer [1985] 2011, 5).

¹¹ Shapin and Schaffer's methodology rests upon the assumption that both Hobbes and Boyle's philosophical programmes were believable (see Shapin and Schaffer [1985] 2011, 13). This claim is contrasted against the genuine ignorant stranger, who by implication is not believable and carries something inherent in him that prevents a different evaluation.