CARTOGRAPHIC ABSTRACTION IN CONTEMPORARY ART

SEEING WITH MAPS

CLAIRE REDDLEMAN

Cartographic abstraction in contemporary art

In this book, Claire Reddleman introduces her theoretical innovation "cartographic abstraction"—a material modality of thought and experience that is produced through cartographic techniques of depiction. Reddleman closely engages with selected artworks (by contemporary artists such as Joyce Kozloff, Layla Curtis, and Bill Fontana) and theories in each chapter. Reconfiguring the Foucauldian underpinning of critical cartography towards a materialist theory of abstraction, cartographic viewpoints are theorised as concrete abstractions. This research is positioned at the intersection of art theory, critical cartography and materialist philosophy.

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"Cartographic visions and the Apollo's eye organized, ordered, quantified, and defined the spaces of the modern world. How do we make sense of a *contemporary* world in which surveillance cameras, drones, and satellites are no longer strange but are our everyday reality? Claire Reddleman's inspired book brings together critical cartographic studies with the work of artists whose creations depend on maps, drones, and related tools. This, the resulting book, generates theoretical tools for grappling with uncertain times."

—James Housefield, University of California, Davis

Cover image: Joyce Kozloff, *Targets* (2000), interior view (detail).
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Introduction: From Critical Cartography to Cartographic Abstraction

Rethinking the Production of Cartographic Viewing Through Contemporary Artworks

We see with maps. Using maps to create complex visual understandings of the world is an activity that most of us are so used to that we do not tend to consider *how* the maps we read help us form these understandings. Map use has become a thoroughly commonplace activity, whether we are navigating in a city using a smartphone, planning a journey across the country, or looking at artworks that include images of maps in an art gallery or on an artist's website. The specifically cartographic way in which we create spatial and visual understandings of the world is the subject of this book. I offer a new theoretical framework for understanding how we go about the complex process of 'seeing with maps'. I use this idea of seeing with maps to claim two things—that maps are deeply concerned with creating a sense that we can see the world by using them and to assert a commitment to further John Berger's important claim that "[o]ur vision is continually active, continually moving, continually holding things in a circle around itself, constituting what is present to us as we are" (1972/2008, p. 9). Vision is an active process, constituted by a range of means, including map use, and it is the process of how we see with maps that I focus on here. The cartographic image implies and constitutes its viewer using distinctive visual techniques that can usefully be investigated through considering contemporary artworks that take up, explore and disrupt cartographic 'ways of seeing' (Berger, 1972).

This book proposes a theory of cartographic abstraction as a framework for investigating cartographic viewing and does so through exploring a series of contemporary artworks that are engaged with cartographic abstraction in different ways. I bring together close readings of these artworks—by Joyce Kozloff, James Bridle, Trevor Paglen, Layla Curtis and Bill Fontana—with materialist approaches to abstraction. This is an interdisciplinary investigation concerned with enlarging the current possibilities for critically understanding viewing and subjectivity in the area of cartographic imagery. I aim to push beyond the highly productive framework of critical cartography to articulate a new approach to understanding cartography's effects in the world. In order to do this, the new theoretical proposal that I put forward and use throughout this book is 'cartographic abstraction'.[1]

Cartographic abstraction is a material modality of thought and experience that is produced through techniques of cartographic depiction. It is the more-than-visual register that both posits and produces the 'cartographic world', or what John Pickles has called the 'geo-coded world' (2004). By this I mean the naturalised apprehension of the earth as a homogeneous space that is naturally, even necessarily, understood as

regular, consistent and objective. I argue for interpreting cartographic techniques of depiction as themselves abstract and cartographic abstraction as such as the modality of thought and experience that these techniques produce. Abstraction within capitalism comes to be socially real and material, taking place outside thought. It is this identification, of abstraction existing outside of the thought and consciousness of individuals that I pursue in terms of cartographic ways of seeing and knowing.

Arising from Marxian theory, the concept of abstraction is needed now because it enables cartographic processes to be re-assessed and understood in terms of their contribution to making social and physical worlds. While many critics have noted and discussed abstract processes as central to the making of cartographic imagery, particularly projection, symbolisation, scale and generalisation (Monmonier, 1996; Jacob, 2006; Wood and Fels, 2008; Wood et al, 2010), I build on these insights to put forward a theory of cartographic abstraction, particularly concerned with cartographic viewing. By cartographic viewing, I mean the encultured practice of apprehending the world through the reading, viewing and interpreting of cartographic imagery, principally 'the map', but also images, and especially artistic images, that use or engage with cartographic techniques.

I therefore refer to 'the cartographic image' throughout this study in preference to 'the map' in order to engage with imagery addressing 'cartographic techniques' through which the world is rendered as an image. 'Cartographic abstraction', then, is the central critical term that is proposed, explored and theorised across the chapters that follow. Both the theoretical content and the method of this research contribute to moving forward the terms of debate in Marxian theory and suggest a new approach to making use of Marxian theory in relation to visual art.

The group or constellation of visualisation practices that I consider in this study all share processes and capacities that may usefully be identified as 'cartographic'. In the context of the capacity of place names to order the space of the map, to effect the "spatialization of knowledge" (Jacob, p. 201), Jacob articulates a description of cartography that encompasses the field of theoretical concern to which I contribute the framework of cartographic abstraction:

> The inscription of toponymy on the map is one reason the earth cannot resemble its maps. Never will the earth appear to the eye of a satellite or the aerial observer as something covered with toponyms. The mimetic process stops where writing begins [. . .] The cartographer creates a world: not the natural world, but a cultural world, invested by one language among other possible ones, attesting to an organized space, punctuated with meaningful and constructed places, invaded by a reticulation of proper names that bear witness to the appropriation of space through chains of metaphors, fields of knowledge, components of individual or collective mythology, and the declension of lexical variations.
>
> (Jacob, p. 206)

Following Jacob, the cartographic image is concerned with 'spatializing knowledge', with 'creating a cultural world', with 'attesting to an organized space', with constructing meaningful places and with the 'appropriation of space'. Place names, or toponyms, as one cartographic practice, "result from a point of view on space, a particular position of the body and the gaze, a selection from among many possible correlations" (Jacob, p. 204). I argue that cartographic imagery at large may also be characterised

this way, as always a selection, and a categorisation, always an active process of pro-ducing visual conceptions—visualisations—that posit and structure a 'point of view on space' that is complex, constructed and abstract. Therefore, cartographic abstrac-tion is not exhausted by considering viewing; rather, giving sustained attention to the ways in which cartographic viewing and visualisation posit the viewing subject enriches an area that has not yet been fully explored and may contribute to further work on the role of abstraction in cartographic 'ways of seeing'.

I propose a series of viewpoints that are posited by the relations of viewing enacted by the selected artworks themselves. I analyse these viewpoints in relation to modes of cartographic viewing offered by theorists. Through close readings of cartographic art-works, I expand the current possibilities for understanding cartographic abstraction and its effects through proposing a range of viewpoints that are both deployed in and themselves problematise cartographic viewing. I connect cartographic abstraction to debates about abstraction in Marxist and materialist approaches to philosophy, argu-ing for interpreting cartographic viewing as an abstract practice through which sub-jects are positioned and structured in relation to the 'viewed'. This study discerns 'real abstraction' functioning in a particular area of 'the operations of capitalism'; that is, modes of visual and epistemological abstraction that we can identify by exploring art-works concerned with cartographic depiction and conceptualisation. This approach to abstraction explores how cartographic knowledge can be theorised through rec-ognising cartographic abstraction as a material modality of thought and experience.

The concept of cartographic abstraction builds on critical cartography's project and moves beyond it. Therefore, it is worth considering what critical cartography has already given us in the way of critical tools—and their limitations—before moving on to consider what cartographic abstraction has to offer.

Critical cartography broadly developed from the 1980s onwards, and scholars working in this area have been concerned to critique the prevailing positivistic and objectivist epistemology in cartographic practice and theory. This development has taken place in parallel with the emergence of geographical interest in Western Marx-ism and vice versa from the 1970s, particularly in the French context (Soja, 1989). Work in critical cartography has more often found its inspiration in the work of Michel Foucault and Jacques Derrida rather than Karl Marx, as I do. Denis Wood and J.B. Harley are notable initiators of the critical cartographic tradition, both of whom drew on Foucault and Derrida, and power-knowledge and deconstructivist approaches more broadly (Jacob, 2006, p. xvi), to frame their influential critiques of cartography's effects, its conventional interpretation and its discursive frameworks.

Although Harley and Wood offer a convenient chronological starting point for a survey of the critical cartographic field at large,[2] instead I want to offer a focussed consideration of issues and debates in critical cartography that lay the groundwork for my subsequent discussion of the abstract viewpoints produced through cartographic imagery. I briefly consider some of the most prominent areas of concern for critical cartography before moving on to detail the more particular critical and theoretical discussions from which I draw and to which I respond in offering my own analyses of cartographic viewing.

A historian of cartography, J.B. Harley, may be credited, alongside Denis Wood, as one of the key early theorists of critical cartography, applying a Derridean approach to deconstruction and a Foucauldian emphasis on power-knowledge relations to the analysis of cartographic imagery and its history. Harley's position on the question of

how to define the map acknowledges that "locating human actions in space remains the greatest intellectual achievement of the map as a form of knowledge" (Harley and Laxton, 2001, p. 35) while insisting on the need to move away from understanding the map as mirror of reality or ideologically neutral view of the world.

Harley introduces a concern with the social aspects and implications of cartography, asserting that

> For historians an [. . .] appropriate definition of a map is 'a social construction of the world expressed through the medium of cartography.' Far from holding up a simple mirror of nature that is true or false, maps redescribe the world—like any other document—in terms of relations of power and of cultural practices, preferences, and priorities.
>
> (ibid, p. 35)

Although this approach to defining the map displaces the need for definition onto a secondary term, cartography, Harley's emphasis on interpreting maps in their socio-historical contexts and reading them as bound up with social and epistemic power has been highly influential.[3] Harley also argues for recognising the importance of both the textual aspects of maps and interpreting maps as texts: "Within the frame of one map there may be several texts—'an intertextuality'—that has to be uncovered in the interpretative process" (ibid, p. 38). Identifying the map as a "signifying system" (ibid, p. 45) opens it to processes of interpretation developed through structuralism, an approach also pioneered by Denis Wood. Harley draws on Raymond Williams work, 'The Sociology of Culture', to claim the map as part of a signifying system "through which 'a social order is communicated, reproduced, experienced, and explored.' Maps do not simply reproduce a topographical reality; they also interpret it" (ibid, p. 45).

Many authors writing in this field contribute to an unfolding debate as to how we may usefully define 'the map'. Some approaches emphasise the map as a graphic representation first and foremost, problematising the inclusion of 'maps' that also display three-dimensionality or that rely on gesture and ephemeral materials, or what Fredric Jameson has influentially termed cognitive mapping;[4] other definitions foreground the map's common function as a navigational device, causing difficulty with how to classify images commonly regarded as maps but without a navigational function, such as medieval world maps, *mappae mundi*. Many definitions anchor the map to the discipline of geography, positioning it as *the* geographic image, depicting part of the Earth's surface in two-dimensional form. In this vein, Jeremy Crampton has interpreted mapping as primarily an approach to "making sense of the geographical world" (2010, p. 12), acknowledging this as a very loose working definition. For Crampton, we cannot define the map, but that is not seen as a critical obstacle. Rather than 'seeing through' maps to a posited underlying reality, instead maps are means of constructing knowledge and "making a world" (ibid, p. 44). Crampton draws a distinction between institutionalised mapping and "a parallel series of mappings that were not scientific" (ibid, p. 21) or not claimed as a site of the production of scientific knowledge. Cartography as a discipline is in 'disarray', but the actual making of maps is thriving.

Christian Jacob has also taken a more open-ended approach to the question of definition, seeing the study of maps as a thoroughly interdisciplinary endeavour (2006, p. 3) that must necessarily be approached without dogmatic attitudes and definitional

boundaries. Thus, "as a product of technology, a cultural artefact whose materialisation and uses cannot be reduced to a unique and transhistorical model, the map is now seen as a complex object that can be submitted to a theoretical approach" (ibid, p. 6). Art historian Svetlana Alpers has also remarked on the difficulty of defining what may be understood as a map in the sixteenth century Dutch context: "[t]he reach of mapping was extended along with the role of pictures, and time and again the distinctions between measuring, recording, and picturing were blurred" (1987, p. 68).

Jacob looks to the question of method to help define the map. He identifies his methodological approach as empirical, offering theoretical responses and directions in response to "the documents themselves" (2006, p. 7). While this approach seems to offer more scope for making theoretical responses to a wide range of 'cultural artefacts' identified with mapping, it remains problematic. Jacob's empirical method still depends upon a pre-existing concept of exactly which objects should be subjected to such an approach; again the question of definition is deferred. That said, another of Jacob's definitional remarks is more helpful—that the map may be "essentially envisaged as a symbolic mediation between humans and their spatial environment, but also between individuals who can communicate through this visual medium" (ibid, p. 8). Though still not yet definitive, this formulation emphasises the central role of symbolic processes in mapping, as well as bringing in the idea of mediation, describing the human subject as crucially divided or separated from their spatial environment and requiring an intermediate entity or process to enable interaction and interpretation.

One question arising from this idea of the map as symbolic mediation is the debate as to whether practices associated with mapping, as well as maps themselves, may be understood as transhistorical or as more culturally particular. Jacob's view admits the broadest possible range of cultural artifacts into the category of maps, while Wood takes a more delimited view, seeing cartographic theorists, in particular Harley and David Woodward, as being guilty of "conflating maps and mapmaking with such universal human, even such animal abilities as orientation, wayfinding, and other aspects of spatial intelligence, even though these are *not* what maps and mapmaking are most often used for" (2010, p. 19, emphasis in original). Wood argues persuasively that the fifteenth century should be seen as a key turning point in the history of maps, marking the beginning of an exponential increase in their production, circulation, use and cultural and political impacts. Rather than a form of expression of a universal human cognitive function, Wood interprets map production as arising in particular cultures in response to developing needs for communication and depiction. For Wood, to transhistoricise map production and use is to mistake the map for the spatial cognitive abilities that it extends and develops.

Central to Wood's approach to the analysis of maps, and particularly the question of their periodisation, is "the map's origin in the rise of the state" (ibid, p. 19). Using a definition that emphasises a continuous tradition of European mapping from the early modern period to the present day, he argues that to define the map as primarily a representation is to comply with the map's presentation of itself as a politically and socially neutral form of imagery. The 'representation view' is "a projection, as it were, of the map itself, *the map as it would like to be understood*" (ibid, p. 18, emphasis in original). The map projects or provides not only its content but also guidance as to how that content should be interpreted.

The role of cartographic production in the formation and consolidation of the nation-state has been widely discussed. Geoff King (1996) argues that while maps

have a practical necessity in, for example, national defence, they are equally concerned with establishing and naturalising the nation state as such as an idea and an ideological form.

An important body of contemporary theoretical and visual work in geography centres around the idea of 'experimental geographies'. This idea has been particularly championed by artist and geographer Trevor Paglen. Paglen positions experimental geography as a call for the importance of thinking in terms of the production of space, in a Marxian lineage via Henri Lefebvre's theories on the production of abstract space (Lefebvre, 1991 and Stanek, 2008). This emphasis, for Paglen, enables those thinkers and activists who are critical of cartography's power relations to move beyond critique to real politics and transformative action.

This work draws on earlier and ongoing work in critical geography, notably championed by David Harvey, particularly in his 2001 work, *Spaces of Capital: Towards a Critical Geography*, as well as Marxian accounts of postmodernity such as Edward Soja's influential assertion of the centrality of space to geography and critical theory in his 1989 work *Postmodern Geographies: The Reassertion of Space in Critical Social Theory*. The distinct lineages of critical cartography and critical geography are clearly marked in Paglen's frequent insistence on the very distinct concerns of cartography and geography.

While Paglen does not regard the map as a privileged object of contemporary geographical inquiry, his work takes up David Harvey's commitment to the political necessity for critical approaches to geography. In this light, Paglen's experimental approach to critiquing space and geographical knowledge production is complementary to critical cartography's account of power and the role of the map in the production of such 'geographical knowledges'.[5] Paglen's approach to cartography as being severely limited is also seen in critical cartographic work that foregrounds cartographic principles and techniques as necessarily involving distortion and loss.

As Mark Monmonier dramatically frames the issue, "[n]ot only is it easy to lie with maps, it's essential. To portray meaningful relationships for a complex, three-dimensional world on a flat sheet of paper or a video screen, a map must distort reality" (1996, p. 1). Attending to the technical procedures used in cartographic production, Monmonier's provocatively titled *How to Lie with Maps* (1996) has provided an influential account of the multiple processes of selection and 'distortion' that are at the heart of the mapping process. Monmonier identifies three techniques used in all maps—"scale, projection, and symbolisation. Each element is a source of distortion" (ibid). The necessary selectivity of the mapmaking process is no longer regarded as unproblematic or apolitical. Selection functions at every stage of production, from the choice to survey and produce a map in the first place, as opposed to another form of account, depiction or record, to the choice as to what will appear, what will not and what forms those appearances and non-appearances will take. While Monmonier's framing of the issue is perhaps the most forthright, the issue of deception in cartography has also been extensively critiqued by Wood (1992, 2010).

Denis Cosgrove also argues that compilation is an aspect of selection, the process of compiling survey data into appropriate forms to be drawn onto the map. For Cosgrove, the conventional story of cartography as a progressive development from "art to science" (2008, p. 161), or from subjectivity to objectivity, is a story that in part functions to allay 'cartographic anxiety'[6] about the potential distortions and problems in compilation. Cosgrove argues that many of the decisions that go into this process

are cast as 'scientific' when they are actually arbitrary and shaped by needs that are more cultural and ideological.

Cosgrove identifies important shifts in "cartographic historiography" (2008, p. 155), including "detailed exposure of the normalizing and often ideological authority of maps" (ibid), the question of cartography's scientific claims to making objective representations having been challenged "with recognition of the inescapable imaginative and artistic character of cartographic process and products" (ibid), and mapping having come to be recognised as a "complex cultural process" (ibid) that needs to be understood in relation to its contexts of production. The map is an outcome of processes, and it generates further processes through its circulation and reception in the world.

I therefore engage with existing ideas and scholarly work not only under the rubric of critical cartography, but, more widely, work addressing abstraction in cartographic production; ways of understanding the status of cartography as representation, text, historical artefact, discourse and site of knowledge production, thereby interrogating the cartographic claim to objectivity and epistemological access to a posited 'real'; cartography in circulation, including contexts of use and readership; and cartographic viewing. I examine a series of practices through which a range of modes of cartographic viewing is produced and discuss them with emphasis on the differing viewpoints that come to be constituted through cartographic practice.

Viewpoints as Abstractions and Reflexivity in Cartographic Viewing

One of the most important ways in which cartographic abstraction functions and has effects in the world, and on we who read maps and interpret cartographic imagery, is that processes of abstraction posit what I will call 'viewpoints'. Such viewpoints—'a point of view on space, a particular position of the body and the gaze'—are themselves cartographic abstractions (as nouns or entities), and they are also processes of the modality of thought and experience that I am calling cartographic abstraction. To name the viewpoints in question—the view from nowhere, the panoptic view, the Apollonian view, the drone's eye view, the god's eye view, the antipodes and immersive installation viewing.

The view from nowhere is the familiar cartographic view from above all points of the mapped terrain simultaneously—non-perspectival, and highly abstract (and therefore extremely useful); the panoptic view or panoptic viewing is the kind of viewing that is at work in the Panopticon—disciplinary and internalising; the Apollonian view (or viewing) is how we picture the earth from outside, as a body in space; the drone's eye view (or drone viewing) is the complex and networked way in which military drones picture terrain and human subjects; the god's eye view is the fantasy of viewing from all positions in both time and space; the antipodes (admittedly a slightly awkward fit as a 'point' from which to view) enables the remote conceptualisation of globally distant lands and persons; and immersive installation viewing is an original analysis of how we can view cartographically from *within* a depiction.

Some of these viewpoints are already in existence in popular discourse—the god's eye view, the drone's eye view, the antipodes; some have arisen in critical and theoretical discourse—the zenithal gaze (Söderström, 1996), panoptic viewing (Foucault, 1977), the Apollonian gaze (Cosgrove, 2001)—while the view from nowhere is an

idea that has quite a broad popular usage to describe the concept of an objective, disinterested view.[7]

I examine these viewpoints in more detail in what follows, paying particular attention to the ways in which they posit and structure their viewing subject, how they affect cartographic visualisation and what effects they have on each other and the 'cultural world' of which they are a part.

Positing viewpoints is not the only way in which cartographic abstraction works. Remote viewing, cartographic silence and the cartographic grid are also examples of cartographic abstraction, but they do not work through the same process of positing a viewpoint into which the viewing subject is positioned. Rather, they support the ability of cartographic imagery to produce meaningful depictions of the world through, respectively, enabling the conceptual viewing of places that are distant from the viewer; producing 'silences' by choosing what not to include in any given cartographic depiction; and organising our conception of the globe as a regular sphere—which it is not.

The critical concerns of the research are reflected in the methodology I use to explore and analyse both the cartographic viewpoints and the artworks that open out these theoretical concerns. This research occupies a thoroughly interdisciplinary position at the intersection of critical cartography, art theory, critiques of visuality and debates in Marxian approaches to epistemology. I draw on existing critical approaches to the problem of cartographic 'power' to forward my approach, which foregrounds power in terms of the constitution and re-constitution of modes of viewing that are formative of the viewer as well as the viewed. I therefore draw on existing critiques of cartographic viewing that arise not only in work that positions itself as concerned with cartography but also in work concerned with visuality more broadly, representation and visualisation, relations of power and domination between viewer and viewed and methods of remote visualisation. Abstraction has so far received limited theoretical treatment in terms of critical cartographic discourse, and I use the interdisciplinary situation of this research to expand and extend this cartographic interest in abstraction into a more fully developed theoretical framework.

A central critical concern of this research, then, is with the reading and viewing of cartographic imagery, in contrast to the concern, foremost in critical cartographic work, with the making or production of such imagery. I therefore focus on the experience of the subject who interprets, reads, views and experiences cartographic imagery, including artistic imagery. With this critical concern in mind, in each chapter I offer a subjective and experimental account of the viewing encounter with the cartographic and artistic image. I emphasise the viewing experience in order to consider the interested character of cartographic imagery in fostering particular viewing positions through which the viewed is rendered legible and intelligible to the viewer with a range of purposes in viewing such images.

This way of engaging with cartographic images embraces political, artistic and geographic practices and images; this innovative approach is called for by the complexity of the cartographic image and artistic images that address cartographic ways of seeing and knowing. The object of study is not concerned with having its effects in one specific disciplinary area, or rather, one area of living, seeing, knowing and theorising, and accordingly the critical approach must be able to embrace this multiplicity. As part of this endeavour I am concerned with what it means for me to view, attempting

to consider my viewing experiences theoretically, as a viewing subject, and considering how this sheds light on how 'the viewer' more generally is posited through cartographic ways of seeing and knowing.

My concern with cartography began through encountering artistic appropriations of recognisably cartographic imagery, which led me to consider cartography's effects through the register of hegemony. Following the Gramscian interpretation, I understood cartographic production as hegemonic in the sense that popular assent is secured for the knowledge claims made by institutional and state-led forms of mapping. Cartographic art, in this context, could be positioned as offering a site of resistance to cartography's hegemonic domination of consciousness and to its wider role in the dynamics of colonialism and imperialism. This resistance may be framed in terms of developing 'contrapuntal cartographies'. This idea takes up Matthew Sparke's (1998) adaptation of Edward Said's (1994) concept of contrapuntal readings in order to emphasise the subtlety of submerged discourses in understandings of imperialism. Some of the nuance in this framing of the critique of cartography's hegemonic tendencies is lost in the recent emergence of 'counter-mapping'. While very usefully anchored in social and political critique, this mode of resistant practice tends to focus on the production of cartography (for example mapping 'from below') rather than addressing the much more commonplace and widely shared practice of cartographic viewing.

Through engaging in theoretically and critically interpreting artistic cartographic imagery, I increasingly found the need to engage reflexively with my own viewing. I recognised the positioning of my own viewing, both physically and critically, as central to the interpretations I was formulating. By 'physically and critically' I mean to encapsulate a range of experiences: viewing artworks online, remotely, via a screen, as well as being physically present to other artworks; viewing as someone with trained habits of thought, interpretation and valuing (with a background in art history and fine art, as well as critical theory); viewing repeatedly; re-considering some artworks long after first encountering them; 'actively' viewing in the sense of reading, looking up place names online and in gazetteers; viewing with duration as reading leads the eye around the cartographic image in a non-linear manner; and viewing interestedly, seeking to generate 'knowledge' through the encounter with the image.

Alongside these more individualised concerns, which to a certain extent take the viewing experience to be something that goes on while one is alone, I was concerned to explore the relationship between individualised reading and interpreting on the one hand and the larger social level on the other. That is, where critical cartography—at the risk of oversimplifying an increasingly diverse field—opens out very important critiques of, for example, the nation as a socially constituted and spatialised political form, I became interested in understanding more deeply the 'person' who exists within such a formation.

In exploring how it might be possible to attend to both the 'social scale' through which subjectivity is mediated and the personal level at which perception and interpretation are experienced, I turned to a slow, detailed approach to writing about artworks, as well as to the theoretical framework of real abstraction. This affords the recognition that consciousness, thought and perception are at once mediated, constituted and delimited through the social reality of commodity exchange relations (Sohn-Rethel, 1978), but also that the 'site' at which these abstract relations are experienced and lived through is the particular, embodied person. While this problematic is, of course,

very extensive and cannot be adequately addressed by a single book, it provides the motivating framework for this study. I pursue in depth the question of how the mediating power of capitalist abstraction operates in terms of the cartographic rendering of the world as image and how the viewer of such imagery may be partially theorised.

Where critical cartography has been very concerned to address issues at the higher level, then, such as Pickles's important emphasis on attending to 'the subjects we become', I attempt to push this forward to start to take account of the particularity of viewing as a subject whose viewing is always also constituted in and through the map or the cartographic image. This provides a rich framework for critical inquiry into some of the visual aspects of social modalities of abstraction,[8] treating the image as a site of inquiry into material processes of abstraction, processes of abstraction that are not confined to the visual and so should not be studied using one disciplinary approach. In the context of a 'perverted' and 'inverted' reality (Loftus, 2015) we need more innovative and multivalent approaches to visual images that are engaging with some of the methods through which this reality is formed and how it continues to be reproduced.

The artworks gathered here provide an opportunity to inquire into visual ways of knowledge making, visual techniques and the resulting artefacts, working with the understanding of or working with a theoretical commitment to the recognition of social abstractions. What is needed now is work that explores ways of fleshing out and expanding on what we can do with the framework of social abstraction, to attempt to find ways of analysing how subjects are mediated by and constituted through particular modalities of abstraction. The framework of cartographic abstraction arises from consideration of the works in conjunction with my emphasis on social abstraction and also necessarily shapes the further theorising that I engage in. The purpose of identifying distinct or distinguishable modalities of cartographic abstraction is to make it possible to consider their effects, whether, for example, enabling the visualisation of persons living on the other side of the world, or underwriting visualisations of particular lands as empty of meaning and inhabitants or making possible the visualisation of the earth as a body in space, a coherent abstraction that goes on to authorise and support political understandings and uses of the iconic earth.

I have selected the artworks that I consider in the following chapters on the basis of the interest they seem to take in ways of seeing, viewing and knowing, treating visual ways of knowing as complex, intricate and involved in taking up physical and conceptual positions in relation to what is seen, whether that is a photograph of a sky at sunset, or a walk-in globe, or a grid of digital webcam images.

The series of viewpoints through which this study is organised have emerged as a way for me to articulate some of what cartographic abstraction produces and how it proceeds. I have not set out to develop a theory of, for example, Apollonian viewing as such; rather, the attempt to explore how cartographic viewing renders the world and co-constitutes the viewer has led me to engage with existing work that approaches this question. Some of the formulations that I have concretised as viewpoints have been proposed by others, and I have taken up and extended them. This has, in turn, led to my being able to use the idea of the abstract viewpoint as such to examine situations of viewing that are not already understood in this way.

Seeing With Maps

In the chapters that follow, I first engage in close readings of the selected artworks, leading to theoretical proposals relating to the cartographic viewpoints. Chapter 5 then takes an overview of the theoretical proposals regarding cartographic abstraction emerging from the four preceding chapters and outlines relationships between cartographic abstraction and the Marxian problematic of real abstraction.

In Chapter 1, 'Reconfiguring the view from nowhere: collage and complicity in *Targets* by Joyce Kozloff', I begin by contextualising my study of cartographic abstraction with reference to critical cartography, examining its deconstructive critique of cartographic power, which began in earnest in the 1980s. The question of how and whether to define the map gives the initial context for my wider proposal to engage with cartographic processes and the imagery they produce in terms of practices of abstraction. Selection, distortion and loss of particularity are necessary but not neutral factors in the possibility and efficacy of cartographic visualisation and are examined in the context of the existing critique of cartographic power. 'Contrapuntal cartographies' have developed from these theoretical critiques, including practices and modes of depiction that seek to undo some of the power relationships that are now seen as embodied in cartography. These contrapuntal approaches engage primarily with cartography as a practice of and a means of access to power. I both draw on and diverge from these 'activist' approaches to situate the theory of cartographic abstraction as an alternative approach to addressing and contesting the violences engendered by cartographic visualisation.

Targets problematises and critiques the cartographic view from nowhere through a critical redeployment of the panoptic view. I interpret *Targets* as combining aspects of the cartographic view from nowhere and the tension surrounding the idea of embodiment in the debate over panoptic viewing and viewing 'from nowhere'. In order to relate theoretical models of viewing to the experience of viewing as a person, I explore the question of how *Targets* may be 'read' as an approach to encountering and responding to the work as a viewer-reader. I draw on ideas of encountering installation art as an embodied experience to interpret and begin to theorise my own 'remote viewing' of this artwork.

I use a close reading of a selected area of *Targets* to open out questions of map interpretation in light of the recognition of maps as irreducibly both graphic images and texts. Closely linked to this subjective approach to interpretation, I explore the new, 'deconstructive', collaged cartography of the globe as performed by *Targets*; attention is also given to the cartographic silences created through the active de-selection of cartographic imagery. The viewing position formed in the artwork offers an identification with an imagined viewing position of the United States, conspicuous by its non-depiction in this re-worked 'world map'.

The view from nowhere is a highly abstract viewpoint and is the signature viewpoint of modern cartography. It operates by compiling, or synopsising, a view that is non-perspectival so that we see all parts of the mapped terrain as though from directly overhead simultaneously. Images that use this viewpoint therefore enact a view that cannot be understood to *position* the viewer anywhere in particular and therefore may be said to position the viewer nowhere.[9]

Focussing on *Targets* as enacting a panoptic viewing position, it is through reading the work's imaginative geographies that critical reading of the power in the panoptic

and view from nowhere is both forwarded and nuanced. I argue for reading both panoptic viewing and Apollonian viewing as cartographic abstractions that are both undermined and reconfigured in the abstract viewing position staged by *Targets*.

I deploy 'panoptic viewing' here as a mode of viewing that is 'layered over' more properly cartographic modes, as an approach to artistically critiquing the view from nowhere. I do not, therefore, propose it as a mode that is itself cartographic. Rather, it is a mode of viewing that comes into play within the artwork and is then able to reflect panoptic elements existing in cartographic viewing practices. The panoptic view renders the viewed subject legible to its coercive and disciplinary gaze. Arising from Foucault's (1977) analysis of Jeremy Bentham's eighteenth-century proposal of the Panopticon as a form of prison, the idea of 'the panoptic' has been widely used and extended, not unproblematically, to areas of 'disciplinary' viewing more broadly. The expanded form, 'panopticism', has been described as "the universal imposition of technologies of control", whereby "[t]he power to see, the power to make visible, is the power to control" (Levin, 1993, p. 7). Panoptic viewing enacts a disciplinary power on the viewed subject, such that the subject comes to internalise the function of the apparatus and use 'their own' agency to shape their conduct in conformity with the requirements of the 'guard', or the apparatus itself. In relation to cartographic viewing, panoptic viewing theorises the directedness of power from the position of the viewer toward the viewed—initially. The internalisation of this disciplinary gaze in the viewed subject perpetuates the dynamic of domination and submission. The directionality of the panoptic view is lateral, or horizontal, in contrast to the more typically cartographic approach of viewing from above.

Panoptic viewing also turns on the notion of inhabitation, in the form of the figure of the guard who is thought to inhabit the position of control at the centre of the apparatus; however, the unknowability of the embodied status of the central position (from the point of view of the subject consciousness) is the source of the panoptic view's disciplinary efficacy. The panoptic view's mobility is very limited; while the question of the presence or non-presence of a viewer could be seen in terms of the viewer's mobility into and out of the viewing position, it largely works through forming a viewing position from which all that is relevant may be surveyed and surveilled from one static position. Panoptic viewing is not generally applied to geographic or cartographic questions and is discursively produced in other disciplinary formations (including critical theory at large and surveillance studies more particularly) and 'imported' here for the purposes of critical analysis.

In contrast, the 'Apollonian gaze', or 'Apollo's eye'[10] (Cosgrove, 2001), describes a viewpoint that is positioned outside the earth, at the level of a 'god', from which the earth is viewed as a spherical body, either fully or partially seen. The NASA images of the 'Blue Marble' are one of the most resonant instances of this viewpoint being used to visualise the earth in space (Kurgan, 2013; Cosgrove, 2001). The effectivity of this viewpoint, for Cosgrove, is to enrol practices of viewing and conceptualising the earth, from a point outside it, in discourses of globalisation. The directionality of the Apollonian gaze is from outside the earth, 'downwards' or 'inwards', apprehending the planet as an object in space. Like the zenithal gaze, this viewpoint is also conceptually inhabitable; while its name draws on the idea of the (or a) god's eye view, the Apollonian gaze has also fostered the development of technological means to enable viewing of the earth from space and, in this sense, its own inhabitation by technological bodies and viewing apparatuses.

The Apollonian gaze is conceptually positioned at the height of a body in orbit around the earth, and this also endows it with a high degree of mobility. The earth may be conceptually and physically viewed from 'above' any area of its surface. In this way, the extreme 'height' of the Apollonian gaze gives way to being 'outside' the coordinates of 'above' and 'below', although this viewpoint frequently produces images that perpetuate the cartographic conceit of identifying north with the top of the image. The technological character of this viewpoint is initially cartographic and subsequently actualised through the development of space flight and satellite photography (Parks, 2005).

In terms of legibility, the Apollonian gaze renders visible the earth as a whole, as an entity in space. It is a substantially cartographic viewpoint, then, constituted also through technological and particularly photographic practices. The temporality of this viewpoint is nuanced; from its position external to the earth, multiple time zones may be viewed simultaneously. However, in visualising the earth as an object in space, at least half of the earth's surface remains obscured from visibility. In this way, the Apollonian gaze performs both an enhanced invisibilising and a necessary obscuring simultaneously. In contrast to the cartographic view from nowhere, panopticism and the Apollonian gaze both invoke notions of embodied viewing, while the view from nowhere remains more abstract, uninhabitable and unrealisable through technological development.

These distinctive cartographic viewpoints—the view from nowhere, the panoptic view and the Apollonian view—are brought together in the complex viewing environment of *Targets* by Joyce Kozloff. In this work, the abstract viewpoints are brought into play together, showing them as abstractions in which the viewer actively participates. This enables an analysis of how these modes of viewing come together to constitute a renewed viewing position for the viewer of the artwork, enabling an experience of complicity in viewing abstract cartographic depictions of aerial military violence.

The view from nowhere is re-performed as a viewpoint that is not objective or disinterested but instead is actively constitutive of viewing relations that enable political and military domination.

In Chapter 2, 'Re-visualising the drone's eye view: networked vision and visibility in works by James Bridle and Trevor Paglen', I take two critical artworks as the starting point for theorising the drone's eye view as a cartographic abstraction. I offer a subjective and exploratory reading of each artwork and consider the modes of visualisation that are at stake in terms of their making a critical response to the phenomenon of drone viewing.

The 'drone's eye view' is configured rather differently to the other, more clearly cartographic, abstract viewpoints considered here. This viewpoint denotes the contemporary and historical phenomenon of remote viewing through a range of technological practices carried out by means of remotely piloted military aircraft. I use the term 'drone's eye view' to denote and include the range of practices that are enrolled in and constitutive of the remote viewing capacities performed through the use of drones, as well as the abstract viewpoint thus created and the capacities that are frequently attributed to these remote viewing practices. While 'drone's eye view' is already in use in popular and critical discourse, I specify it here in terms of its capacities to visualise landscape, territory and abstract space and to construct persons and places as targets. I take up the idea of the drone's eye view, like the god's eye view, from popular

usage and attempt to expand its conception of what and how a drone 'sees'. Gregoire Chamayou argues that military drones perform a 'networked' view (Chamayou, 2015, p. 2), and Derek Gregory (2014a) pays close attention to the material practices through which drone viewing is produced, based on the live interaction that takes place among operators, other pilots in the battle-space, analysts and particularly the video feeds which are analysed and used to inform operational decisions immediately. I build from their analyses to conceptualise the drone's eye view as being far from an isolated position of weaponised agency but rather a dispersed, networked and fully material mode of viewing and acting at a distance.

The drone's eye view is a viewing 'position' of lethal power, as well as a certain kind of intimacy on the part of the viewer. Autonomy is increasingly a central feature of media and critical discussion of drone capacities; more than a fantasy of the removal of the human viewer-operator from danger, drones are increasingly seen (in existing drone discourse) as a means of both enhancing human capacities and compensating for human deficiencies. In this register, autonomy is represented as an inevitable and beneficial technological development.

I argue that the god's eye view confers on the drone's eye view a tendency to work towards greater autonomy and more totalising power. The embodied status and the role of habitability are nuanced questions in this viewpoint. While the human 'inhabitant' of the operator's position is removed from directly inhabiting the viewpoint and so is removed from direct danger, the viewpoint is also produced through the embodied and positional labour of many workers. A materialist reading of the drone's eye view emphasises the necessarily embodied and distributed character of its production. The height of the drone's eye view is variable, and while emerging forms of weaponised and non-weaponised drones are increasingly able to operate at human height, critical discussion has so far focussed mainly on the higher-altitude mode of drone viewing, which is also characteristic of contemporary military practices.

In relationship to the drone's eye view, I articulate a conception of the cartographic god's eye view as it becomes imbricated with technological modes of viewing that perform varying levels of embodiment in their practices. I argue for interpreting the god's eye view in the particular register of cartographic abstraction and examine the role of cartographic abstraction in producing and reproducing the wider imaginaries that facilitate the present expansion of 'unmanned' aerial violence.

The god's eye view, I argue, is a 'high level' abstraction that functions to organise, produce and delimit a range of other abstractions that are themselves both more particular and distinctively cartographic. The god's eye view imagines the capacity to view from 'nowhere in particular' (Gregory, 2014a), similarly to the view from nowhere, to be outside of both time and space and to confer authority and power on the viewing position thus constructed.

The god's eye view is an idea that has arisen from and in a range of discourses, and I consider it here in terms of its construction through and manifestation in the cartographic register. John Pickles asserts that "[t]he cartographic gaze is dominated by a commitment to modelling a God's-eye view" (2004, p. 80); here the idea of the god's eye view is identified with 'the cartographic gaze', with cartographic viewing as such. Trevor Paglen similarly generalises the god's eye view as "the cartographic viewpoint" (Paglen in Bhagat and Mogel, 2008, pp. 44–45). I want to be more specific and identify the god's eye view as 'authorising' or underwriting, in other more particular cartographic abstractions and forms of viewing (including the Apollonian gaze

and the zenithal gaze), the investment of the ideas of omnipotence and omniscience into viewing from a conceptual height. The height of the god's eye view is conceptual rather than physical, and it lays claim to functioning at any and all heights above the viewed subject. It is non-mobile, as everything may be viewed and known from its position of 'nowhere in particular'.

The god's eye view performs a totalising viewing position that constructs the viewed as knowable and legible. The viewpoint is constructed as invulnerable to time, to subjectivity, to positionality and to the viewed. It connotes an apparently non-human or extra-human position of agency, purporting to be fully objective. In cartographic depiction, this often takes the form of viewing from above the viewed subject. The viewing dynamic is of a 'god' objectively viewing the subject from above and outside. In terms of embodiment and positionality, the god's eye view is de-embodied while still figuring the 'position' of a consciousness. That is, it is not conceptually inhabitable by a body but still maintains the notion of being a consciousness in that it is able to cognise, to view and to know (the viewed subject).

The god's eye view is situated as both a colloquial cultural shorthand for a view that is all-seeing and all-knowing and as a trope in philosophy of mind that addresses the question of objectivity. The god's eye view is further theorised as an abstraction that is produced and reproduced partly through cartographic abstraction. Cast in this light, the god's eye view emerges as a complex, enduring and adaptive cultural construction that supports the contemporary emergence of the drone's eye view.

In Chapter 3, 'Remote viewing and cartographic abstraction and the antipodes: three artworks by Layla Curtis', I elaborate a conception of the cartographic and cultural figure of the antipodes as a cartographic abstraction. This argument focuses on close discussions of three artworks by Layla Curtis concerned with visually presenting antipodal, or diametrically opposite, relations between places. From these readings I draw out a series of visual and conceptual themes: the anticipatory conceptualisation of antipodean inhabitants, non-production of knowledge about viewed places and relationships between artistic production methods and cartographic production methods and technological character. These critical themes are then re-examined in the context of antipodal theory, which I interpret in support of the proposition of antipodal relations and 'the antipodes' as a cartographic abstraction.

As a cartographic abstraction, I theorise 'the antipodes' as a specification of the higher-level cartographic mode of remote viewing. The term 'antipodes' initially named both the inhabitants and land whose existence opposite the known world was theorised by ancient Greek philosophy (Hiatt, 2008; Goldie, 2010). Through the introduction or incorporation of the cartographic grid, the antipodes developed into a de-particularised geometric form able to construct 'diametrically opposite' locations on the earth's surface as related. As with the god's eye view and the panoptic view, 'the antipodes' is an abstraction that finds expression in multiple practices and forms, including literature (Blythe, 2014), and I focus here on the cartographic aspects of the antipodes. Antipodal relations, or 'the antipodes' as a cartographic abstraction, becomes a productive, enabling factor in the formation of knowledge relating to antipodal locations on the part of the viewer. The viewing position is posited and structured as one through which 'knowledge' is produced of abstractions and abstract relations in the conceptualisation of remote and unknown regions of the globe.

The cartographic abstraction of the antipodes constructs the image of the antipodean other in terms of both persons and lands, as well as in contributing to the

material production of practices of discovery and colonial domination (Hiatt, 2008; Williams, 1988). The abstraction of the antipodes has also had an epistemological and a historical role in the production of knowledge of the West's global others. The viewpoint's directionality is from the known (world) toward the unknown (world) traditionally, and following the antipodes' alteration by the cartographic grid, this directionality is de-particularised to any opposite points on the earth's surface without the hierarchical power structure of the traditional formulation.

The antipodes is engaged in the implication of bodies and places through having theorised their existence prior to 'discovery', that is, encounter with the West. In this sense the cartographic spatial relationship between the viewer and the viewed combines both horizontality, in terms of living on the earth's continuous surface, and elements of the god's eye view, particularly in terms of the influence of theology on geographic thought. The antipodes figures the viewed as necessarily remote from the viewer. In so doing, it historically formed one of the conditions of possibility for the West's subsequent 'mobilisation' (in the form of colonialism and imperialism) into the location of the antipodes. It is the only cartographic abstraction analysed here that understands itself to be concerned with theorising as opposed to reflecting that which already exists.

In Chapter 4, 'Signification in the soundscape: Bill Fontana's *River Sounding*', I focus on a sound sculpture by sound artist Bill Fontana and describe this installation as performing a mode of cartographic viewing that 'immerses' the viewer within the viewed space as it depicts an abstraction of the River Thames within a subterranean architectural space. I interpret the formation of a 'viewpoint' of the visitor within this work in terms of cartographic abstraction, in its construction of a mode of viewing that is positioned *within* the cartographic rendering rather than above and outside it. Focussing on critical themes that emerge from a close reading of the embodied experience of the art installation, I argue that the presentational rhetoric associated with the artwork, of 'returning the river to the building', deploys a particular history of human management as the desired interpretative framework for the visitor to bring to bear in engaging with the artwork. This framework is put forward rhetorically, while in terms of cartographic abstraction functioning in the work, what is evoked is a temporally and spatially delimited imaginary of the Thames, drawn from 'surveying' key locations of mechanical and architectural intervention along the tidal length of the river.

I further interpret 'sonic symbolism' as an operative mode of representation in *River Sounding* and argue for reading the sonic register of the installation as continuing an indexical relationship with the source locations of the audio recordings. Building on this analysis of sonic symbolism, I read *River Sounding* in terms of its presentation of a 'soundscape' of the River Thames. This soundscape itself has a complex and shifting relationship with the visual register of representation in the work. Through both registers, the visitor is positioned as 'immersed' within a situated viewpoint with a complex relationship to the geographical object of the artwork, the River Thames. Where the cartographic view from nowhere has been theorised as totalising, appropriative and de-embodied, the installation view is here theorised as situated, particularised and positioned within the cartographic abstraction of the imaginary of the Thames, as opposed to adopting a conceptual position that is 'above' all cartographically viewed areas simultaneously.

Without positing an abstract cartographic viewpoint with which the work engages, instead I bring forward a particular setting in which cartographic viewing is staged—in the

form of a multimedia installation—as an opportunity to consider the possibilities and limits of engaging with cartographic abstraction in the register of viewing. With this particular analysis, I aim to push beyond the (productive) trope of the viewpoint-as-abstraction and consider some ways in which viewing can be mediated cartographically as well as in the sonic register of an installation work.

In the final chapter, 'Cartographic abstraction: a material modality of thought and experience', I outline some proposed relationships between the modes of cartographic abstraction at work in the formation of a nuanced range of viewpoints that are both deployed in and themselves problematise modes of cartographic viewing. Through the readings of critical cartographic artworks in the preceding chapters, a range of critical issues in cartographic viewing has been identified, including remote viewing, embodiment, artistic and cartographic selection, cartographic imaginaries, knowledge production and relationships among cartographic abstractions.

I develop the theoretical aspect of cartographic abstraction further, connecting it with the debates about abstraction in relation to Marxist and materialist approaches to philosophy. I indicate the methodological possibilities that come from approaching the problematic of real abstraction in the way that I have throughout this study, that is, as a central modality of the reproduction of capitalist social relations that may be critically explored through investigating its relationship to visual modes of abstraction, focussing particularly on cartography. I demonstrate the relevance of critically approaching the Marxian-informed concerns with 'visualities' and the production of appearances in connection with commodity fetishism and the exchange abstraction.

An exploration of cartographic abstraction that is grounded in interpreting artworks gives access to a more detailed account of the functioning of real abstraction in the contemporary social formation. This approach to abstraction seeks to make visible some of the ways in which cartographic visualisation can be theoretically interrogated through drawing on the theoretical problematic of real abstraction.

In this light, I develop some of the theoretical concerns arising from critical cartography, then rearticulate my theoretical proposals in the more particular area of the abstract viewpoints that cartographic depiction instantiates and enacts. I then address a series of issues arising from more philosophically and particularly materialist accounts of abstraction. Here I articulate a trajectory of thought engaged in theorising the materiality of abstraction and interpret cartographic abstraction in terms of real abstraction, or 'materialism without matter'.

Throughout the book, I examine cartographic abstraction through a close engagement with artworks that engage in critical confrontations with particular modes of cartographic abstraction. This way of working enables me to propose a developed theory of cartographic abstraction that opens out the current concerns of critical cartography into the more helpful philosophical terrain of materialism. Cartographic abstraction emerges as a valuable critical framework through which to examine cartographic modes of the production of visualisations that enable complex and violent material processes. This framework has significant implications for practices seeking to address and redress some of the forms of domination that are presently enacted (whether in whole or in part) through cartographic means. In contrast to the existing paradigm of resistant cartographies, this research identifies cartographic abstraction as a material modality of thought and experience through which resistant practices may seek to intervene in the ongoing production and reproduction of forms of viewing that both foster and constitute abstract relations among persons, things and places.

Cartographic abstraction gives us a new approach to understanding how maps and other images using cartographic techniques of depiction—so ordinary in contemporary life—actively position and constitute us as viewers and interpreters. This book offers a theoretical framework and a practical approach to thinking with artworks that enables the large-scale social effectivity of cartographic ways of seeing to be held in view simultaneously with the particularity of individuated, always partial, viewing and interpretation.

Notes

1   I hope the reader will bear with me if at times it seems like there is a lot of use of the word 'abstract', and perhaps in places that feel unnecessary—for example, in saying 'an abstract geometrical grid'. We might say, of course a geometrical grid is abstract—but because part of the aim of this book is to name and bring into general thought something that is as a whole in this indistinct area of 'of course', something that is so normalised for us as fluent map readers, I try to be as clear as possible about when a particular feature, device or form is abstract and label it as such.

2   For a guide to critical cartography and its background, see Jeremy Crampton and John Krygier (2006) 'An Introduction to Critical Cartography'.

3   See Black, 2000b, pp. 18–19, and Pickles, 2004, pp. 47–49. For a less positive discussion of Harley see the introductory essay to Harley's posthumous collection of essays, *The new nature of maps*, by J.H. Andrews (Harley and Laxton, 2001).

4   See Fredric Jameson, *The geopolitical aesthetic: Cinema and space in the world system* (Indiana University Press and BFI Publishing, Bloomington and London, 1992), in which Jameson elaborates the notion of 'cognitive mapping'. As Alberto Toscano and Jeff Kinkle write, "[s]uch an aesthetic called for the imperative elaboration of a cultural and representational practice adequate to the highly ambitious (and, Jameson suggests, ultimately impossible) task of depicting social space and class relations in our epoch of late capitalism or postmodernity" (2014, p. 7).

5   The relationships between Foucault's work on spatiality and geography, knowledge and the critique of power have been elaborated by Stuart Elden and Jeremy Crampton (2007).

6   The term 'cartographic anxiety' was coined by Sankaran Krishna (Krishna, 1994; Rao, 2012) initially to describe the tensions in cartographic-political practices involved in the establishment and definition of the Indian state after partition, in terms of the discrepancy between cartographic representations and the social practices which enact those representations. The term was later enlarged upon by Derek Gregory (Pickles, 2004; Gregory, 1994) "to refer to the foundational and objectivist epistemologies of modern cartography that assume the separation of subject and object, knower and world. This 'observer epistemology' leads to deep anxiety about how we know and represent the world, how we know it to be true, and how we decide what to do in the face of such 'objective knowledge'" (Pickles, 2004, p. 195). The phrase 'cartographic anxiety' is also taken up by Crampton (2010, p. 177) and is now in common use in the literature.

7   More particularly in the philosophy of mind the 'view from nowhere' indicates the problem of objectivity and its relation to subjectivity. See Thomas Nagel, *The view from nowhere* (Oxford University Press, New York, NY, and Oxford, 1986) for discussion of the complex philosophical question of objectivity as an approach to formulating knowledge of the other from outside of the subject's experience or position. For a history of the emergence of the idea of objectivity in science, see Lorraine Daston and Peter Galison, *Objectivity* (Zone Books, New York, NY, 2010).

8   In Chapter 5 I discuss a range of approaches that have been taken in terms of articulating abstraction as a feature of social life, that is, made between and among people rather than being a function of thought alone. In that context, I also briefly consider Henri Lefebvre's (1991) central theoretical contribution to this area, the framework of space as a concrete abstraction.

9   In earlier work on this subject, I have used the term 'synoptic view' to indicate what I am here calling 'the cartographic view from nowhere'. Neither option is completely free from

drawbacks. I initially favoured 'synoptic' because of its meaning of "furnishing a general view of some subject", "taking a combined or comprehensive view" (Shorter Oxford English Dictionary). The idea of 'synopsis' and the term 'synoptic' have been used by a range of thinkers in connection with visuality and particularly cartography. Some of these uses carry with them the sense that the author is attempting to find an appropriate vocabulary rather than using the term in a specific and delimited way, such as Lisa Parks's mention of "synoptic relations" in the context of militarised aerial viewing (2005, p. 97). Denis Cosgrove uses "the synoptic vision" (2001, p. 27) in reference to views of the whole earth, picking up the sense of 'forming a synopsis', or overview, but without a determinate meaning. Denis Wood frames the relationship between collage and cartographic presentation as "the usual inert, synoptic view" (2008, p. 195). While I argue that this viewpoint is far from 'inert', Wood nonetheless uses 'synoptic view' here to designate an image that is the result of processes of compilation and collage, material practices of image production.

The term 'synoptic' places more emphasis on the process of synopsis, or compilation, while the term 'view from nowhere' places more emphasis on what is effected by the resulting image. I think that either handle for this idea works just as well. However, other authors have put forward more uses of the term 'synoptic' in recent years (see particularly Jason Weems, *Barnstorming the prairies: How aerial vision shaped the Midwest* (University of Minnesota Press, Minneapolis and London, 2015) that make me think it is clearer to shift to the term 'view from nowhere'. The differences in how it is being used are such that it is preferable to move to an alternate term rather than attempt to impose a uniformity of meaning where that does not exist. The view from nowhere is preferable because it foregrounds the abstractness of the conceptual viewing position, which sees as though from nowhere. This has the advantage of being less obscure and hopefully more intuitive and underscoring the 'objectivity effect' that this cartographic viewpoint is able to create.

10 The terminology of Apollo and Apollonian is somewhat cumbersome. Denis Cosgrove has put forward these terms, drawing on the figure of the mythical Greek sun-god Apollo, who drove his chariot across the sky on a daily basis, pulling with him the sun. Apollo has been attributed many symbolic roles, but it is specifically his identification with Helios, the Greek sun god, in which capacity he was identified as 'Phoebus (Radiant) Apollo' (Hall's Dictionary, 1974/2000, p. 26), to which Cosgrove refers. Interestingly, one of Apollo's less-frequent attributes in classical sculpture is a globe, symbolising his universality (ibid).

1 Reconfiguring the View From Nowhere

Collage and Complicity in *Targets* by Joyce Kozloff

In a globe turned inside out, the viewer stands, surrounded by painted maps showing countries subjected to aerial bombardment by the USA between 1945 and 2000. This installation—*Targets* (2000), by Joyce Kozloff—will form the focus of this chapter. I propose to take *Targets* as a thing to think with, about some of the ways in which cartographic imagery distinctively structures our understandings of the world and its geographical and political relations. In this chapter, I examine the process of interpreting an artwork remotely, consider viewing from nowhere, panoptic viewing, Apollonian viewing and the idea of cartographic silence as abstractions that enable us to 'see with maps'.

The 'view from nowhere' is the signature viewpoint of cartography, whereby the viewer is positioned as though directly above all viewed points at once. Panoptic viewing is a form of disciplinary viewing of the subject, derived from Foucault's reading of the panopticon, and Apollonian viewing is the now-realised fantasy of viewing the earth from space. Reading *Targets* critically enables an analysis and a disruption of the view from nowhere itself, as a central form of abstraction in the process of meaning-making within cartography.

I first introduce *Targets* and place it in the interpretative context of the rest of Kozloff's significant cartographic oeuvre. I then explore the question of how the artwork may be 'read' as an approach to encountering and responding to the work as a 'remote viewer'. The idea of remote viewing is a recurring idea in the book and here indicates my own method of viewing online and through documentation rather than in person. I draw to some extent on Harriet Hawkins's approach to encountering installation art as an embodied experience, an approach that I look to both take up and to complicate, in that my 'encounter' with *Targets* is formed through images printed in books and made available online—as the ways in which so much contemporary viewing takes place.

I put forward a method of interpreting an installation artwork, remotely rather than in person, to emphasise the remote aspect of cartographic viewing, whereby knowledge is produced without any physical access to the place that is known. I offer a close reading of selected areas of *Targets* to open out questions of map interpretation in light of the recognition of maps as irreducibly both graphic images and texts; this irreducible character is part of what lends cartography and cartographic art to an interdisciplinary critical approach. In this reading I retain an emphasis on *Targets* as fully an artwork in its own right to avoid interpreting it reductively as either a series of linked maps or as merely an illustration of a political point.

Closely linked to the exploratory approach to written interpretation that I take here, I explore the newly juxtaposed cartography of the globe as performed by *Targets*. I also pay attention to the cartographic silences created through the active de-selection of cartographic imagery. I suggest that the viewing position formed in the artwork fosters an identification with an imagined viewing position of the United States, which is conspicuous through its non-appearance in this 'world map'. *Targets* is described by the artist as featuring maps relating to US bombing campaigns since 1945, and thus the 'missing' element linking all the depicted places is the US. Taking up J.B. Harley's notion of cartographic silence, I argue that *Targets* appears as an altered map of the US itself, through foregrounding one way in which it has interacted with and dominated other countries.

From the foundation of these explorations of the interpretative encounter with the cartographic artwork, I then move to a more focussed discussion of my reading of *Targets* as enacting a panoptic viewing position. Inhabiting the centre of the walk-in globe, the viewer is closely surrounded by painted maps of target countries, and it is through reading *Targets*' imaginative geographies that critical reading of the power in this viewpoint is both forwarded and nuanced.

My focus on the effect that viewing in this relation may have on the viewer comes directly from my reading of the artwork itself; I draw on the panoptic and the Apollonian as modes of abstract viewing that enable a productive analysis of the complex form of viewing that is staged in *Targets*. I take panoptic viewing and Apollonian viewing as conventional cartographic abstractions that are both undermined and reconfigured in the abstract viewing position staged by *Targets*.

Finally, I draw together these strands of the analysis to suggest that it is worthwhile to read *Targets* as both nuancing and extending the cartographic view from nowhere as a cartographic abstraction, into an inhabitable viewing position combining elements of both panoptic and Apollonian viewing. Interpreted in this way, I suggest that *Targets* affords an opportunity to reorient and extend critical cartography's traditional concern with a Foucauldian critique of power and the techniques and technologies of social domination towards a critical awareness of the role of abstraction in cartography and its efficacy in the world. I see this in effect in *Targets*' staging of a viewing position that opens out relations of engagement and complicity as against control and domination of the viewed.

Joyce Kozloff's Cartographic Art

Working frequently with maps, Joyce Kozloff (b.1942) has made a number of individual cartographic artworks, as well as frequently working with ongoing series over periods of years. Kozloff is known for exploring feminist themes in her artwork and was an original member of the Pattern and Decoration movement, prominent during the 1970s and 1980s, particularly in the US. The artists involved sought to challenge the minimisation of pattern and decoration in visual art as concerns traditionally labelled 'feminine' and marginalised as being less important concerns than those championed by the abstract schools of painting and by conceptual art more broadly (Princenthal and Earenfight, 2008, p. 29).

In her earlier career, Kozloff worked on a number of public art projects and commissions emphasising abstract geometrical pattern, and particularly with an interest in unsettling the boundaries between pattern as decoration and pattern as a visual

register with the capacity to shift the atmosphere of a built space. I suggest that a continuity can be seen from these early and interestingly spatial works to the form seen in *Targets*, in which visual pattern takes the form of map segments and comes to actively structure the viewing space and surface.

Kozloff's early aesthetic interest in pattern expands and extends into cartography as a fundamentally visual, aesthetic mode of creating meaningful geometrical patternings of space and of the epistemologies that we bring to bear on that space and on those patternings. Cartography is noted for its dual character as both text and image simultaneously, never only about information or data but always also centrally concerned with the aesthetic form that data takes. In Kozloff's work, the aesthetic dimension of cartography is always to the fore. Cartography increasingly becomes a means of expanding the aesthetic and political concern with pattern into a conceptual concern with how 'knowledge' is 'patterned', or organised visually.

In *Celestial + Terrestrial* (2001–2) the concern with pattern gives on to the concern with the patterning of spatial understanding. This theme is prominent in the work's form as a pair of installation paintings, each in the shape of twelve gores, or vertical segments of the globe, flattened and abutting one another in a row, in a reference to sixteenth-century world maps. *Dark and Light Continents* (2002) depicts a world map projection centred on Africa, a scattering of stars across the painted surfaces seeming to indicate a global night, concentrations of white paint suggesting the concentrations of light emissions frequently depicted on cartographic images showing electricity or internet usage across the globe; the whiter areas appearing in the 'global north'—Europe, North America, Russia and Japan—'unlit' areas predominantly in South America, Africa, central Asia and Australia.

The title irresistibly refers to the Western colonial-imperial conception of Africa as the 'dark continent', against which is posed the notion of 'light continents' by the title, those 'lit up' by the light of industrial development, the light of global capital, 'light' here potentially corresponding to imperialism as a global mode of the extraction of value from the 'global south' and its accumulation in the 'global north'. Cartography is a central technique of imperialism, and in *Dark and Light Continents* we see it as a visual method for re-organising the patterning and, more deeply, the signification of the world map; the physical geography of the world at night re-signifies industrial development and the expansion of global capital.

Spheres of Influence (2001), the companion piece of *Dark and Light Continents*, is harder to read as a rendering of a world map projection, despite the suggestion from the form of the work, in its twelve segments, of the image's being a world map. Reading some of the text scattered across the segments of bright yellows, oranges, greens and the pale blue of seas, 'TYRRHENUM/INFERUM MARE', 'AEOLIS', and 'ARABIA', and seeing a line in the shape of (an) Israel over 'IUDAEA' suggests the 'spheres of influence' of historical geographies of a range of parts of the globe. An alternate, geopolitical patterning of the land reorganises and reselects which areas are relevant for this cartographic image, and the play of colours across the composition both escapes a geometric patterning and offers an irregular sense of order across the pictorially discontinuous maps. 'Order' is understood here as both a visual and a geopolitical function, and again we see cartography's powerfully ordering efficacy in the world.

These works show the development of Kozloff's concern with the nuanced relationships of pattern—in both colour and form—to the underlying epistemological patterning that is fostered through cartographic depiction.

Other significant cartographic works in Kozloff's oeuvre include *Boys' Art* (2002–3), concerned with boys' socialised relationship with war and violence, in the form of twenty-four drawings based on military maps dating from the Han dynasty through to the twentieth century onto which are collaged children's drawings of soldiers and violent figures.[1] *Rocking the Cradle* (2003) lines a wooden cradle with a painted map centred on Baghdad, while *American History* (2004) is an extensive series of collaged drawings relating to US military history. *Masks* (2004–6) is a large series of works, one strand of which is formed of Venetian full-face masks painted with maps of Mediterranean islands, and *Knowledge* (1998–2000) is a cycle of frescoes and decorated globes depicting changing conceptions of the form and extent of the terrestrial globe through history.

A World Turned Inside Out: *Targets*

Targets, the main artistic focus in this chapter, is a nine-foot walk-in globe, on whose exterior can be seen the ribs and sections of the wood construction (see Figure 1.1) and whose interior is painted with maps (see Figure 1.2) depicting countries that have been bombed from the air by the US between 1945 and the work's making in 2000.[2]

Figure 1.1 *Targets* on display at the Venice Arsenale, exterior view
Source: The artist & DC Moore Gallery, NY

Figure 1.2 Targets (2000), interior view
Source: The artist & DC Moore Gallery, NY

The globe form is deployed in this work to produce a claustrophobic 'world' of the mapped and fragmented geographies of these targeted places. Viewers are able to stand inside the curved structure and pull closed a door formed of one of the painted sections. The painted panels are formed of canvas stretched on wooden frames, and while the external supports resemble lines of latitude and longitude, they also suggest "a bathysphere or an early spaceship or perhaps a giant hand grenade" (Princenthal and Earenfight, 2008, p. 14).

Visual associations with weaponry and with technology are present from the beginning of the visual encounter with *Targets*, and with its careful, skilled and deliberate creation by human makers. From the outside of the structure, the interior map paintings are visible, evoking commercial wallpaper featuring enlarged maps that has become popular in the period since the making of this work in 2000. The initial view is of shapes of bright colour, varied and butting up close together, the characteristic play of the maps' lines and symbols visible at a distance before any detail can be ascertained.

A hemispherical dividing line corresponds to the equator, and top-to-bottom linear divisions correspond to meridians, such that curved trapezoidal panels are formed. The panels are curtailed at the base where they meet the floor—the area in which the viewer stands—and at the top where they meet around an oculus above which

is mounted a bright light, giving a uniform illumination into the viewing space. Access for the viewer is afforded by one of the trapezoidal panels forming a door, mounted on castors, which the viewer is able to close on themselves once inside (see Figure 1.3).
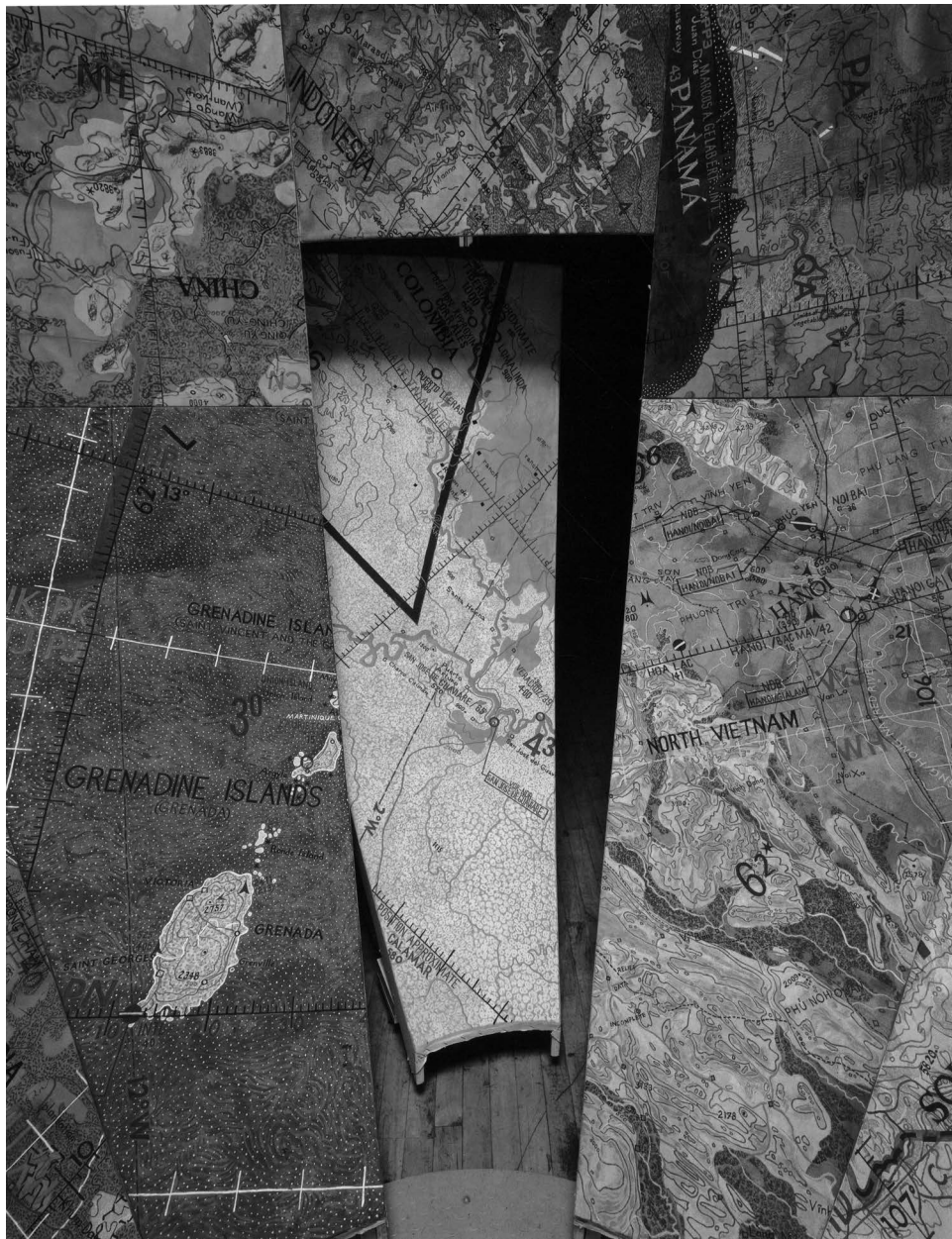
Figure 1.3 Targets, interior view with door
Source: The artist & DC Moore Gallery, NY

The physical form of this installation work is very important. This multi-coloured, self-contained cartographic structure opens into an oculus at the top, which admits an even, artificial light into the viewing space. The viewing experience of *Targets* is made possible by means of artificial light, whose angle does not alter with the time of day. In this way, no shadows fall on the painted map surfaces, and the notion of time implicit in the physical relation between the sun and the earth is suppressed, or not selected for depiction, in the composite map that *Targets* presents. The initial view of a contained, coherent whole in *Targets* gives way to the detailed geographies of the fractured selections from the world that may be read from a closer viewing position—that available within the installation.

Reading *Targets*: Map Reading and Remote Viewing

Interpreting artworks and maps is an active process that engages the viewer as a thinking body. This is as true of 'in-person' viewing experience as it is of what I am calling 'remote viewing' experiences—in this case, the experience of viewing the artwork remotely, through images in books and online. Hawkins has recognised the creative and constructive 'power' of geographical discourse, including cartography, in *For Creative Geographies: Geography, Visual Arts and the Making of Worlds* (2014). I also draw on her proposals regarding the interpretation of and encounter with the artwork: "the encounters staged by art contain within them the possibilities to challenge our typical ways of being in the world; disrupting our systems of knowledge, we are in effect, forced to (new) thought and actions" (Hawkins, 2014, p. 11).

In this spirit of close attention to the importance of interpretation as a process, my reading of *Targets* acknowledges both my position as a 'remote viewer' of this work, encountering it through books and online images, and also the importance of the experience of reading the map as a text. To literally 'read' a map is to read in many directions non-continuously, as the eye encounters discrete instances of text, which do not individually form sentences or phrases, often, but collectively form a text, brought into (mental) being as a unique text in the mind of a unique reader. It is as a remote reader, then, that I offer a partial reading of *Targets* that remains one of many potential readings of the work. My approach in this case draws on Hawkins's discussion of the encounter with the artwork but acknowledges that the nature of my encounter as a reader is not that of a spectator in the installation.

Kozloff has said of *Targets* that

> some of the sections are inverted, laid sideways or upside down, forcing the viewer to twist to read place names, reflecting the way airplanes swoop above the earth. There is a disorienting echo inside the globe, so that visitors' voices are amplified if they speak to one another from within, creating a kind of claustrophobia.[3]

This embodied, very physical interaction with the artwork does not feature in my own reading, then, but remains important to my understanding of *Targets* as a work that stages a particular, embodied mode of engaging with cartographic abstraction as a viewer. As Princenthal and Earenfight describe *Targets*,

> This world turned inside out captures something of the physical consequence of aerial warfare, in which buildings and bodies are ravaged and exposed. But that horror runs deep beneath the deliberately numbing tidiness and bloodlessness of

Targets, emphasised by the light- and air-admitting oculus at its apex. Modeled [. . .] on the Roman Pantheon, this opening conflates rational order with carnage in a way that only intensifies the viewer's sense of being caught inside a world devoid of safety or escape.

(2008, p. 15)

Critical cartographer Denis Wood picks up on these impressions of claustrophobia, danger, and feeling trapped in his description of his own encounter with *Targets*:

Standing inside the globe was devastating. It forced me to confront how much of the world the United States has bombed during my lifetime, with my tax dollars, and so with my tacit support. It made me feel like *crawling* out of it.

(Wood et al, 2010, p. 190, emphasis in original)

Wood's experience of this work supports Hawkins's account of being forced to new thought or action; both of these accounts of the viewing experience emphasise negative feelings and reactions, claustrophobia, the disorienting echo, numbing tidiness, being caught, confrontation. The prominence of negative reactions, these commentators finding the viewing experience difficult and emotionally challenging, are the particular aspects of *Targets* that I want to draw out in relation to the Apollonian mode of cartographic abstraction in this chapter. I position my own reading of *Targets* as a form of remote reading, embodied yet not present to the constructed space of the viewer in the artwork. It is with these accounts of embodied experiences and remote viewing in mind that I read a section of *Targets*.

The book *Joyce Kozloff: Co+Ordinates* is open in front of me to pages 70–71. A colourful spread of curved map segments fills the glossy double page. Yellow, greens, dark greens, reds or ochres, some blue. In the centre, my eye is first drawn to the diagonal word 'AFGHANISTAN', written in block capitals, slanted downward across a field of dark yellow. A wavy, grey-green line traces across the field of yellow, other words nearby, some numbers, 'WEST ADIZ', '11', and, smaller, '8'. 'ADIZ' means, to me, demilitarised zone, and having never been in one, it prompts me to imagine barbed wire, planes overhead and armed guards in watchtowers, the Berlin Wall.

Afghanistan, West ADIZ. Leaning in, the wavy grey-green line becomes a border—the words 'AFGHANISTAN' and 'PAKISTAN' snake alongside the line, upside-down as I read them. Because I want to put together a clearer sense of the locations that are depicted in the painted segments, I want to see names of places that I might be able to find in a gazetteer and on a standard reference map—such as Google Maps—as I won't be looking up the same tactical pilotage charts that Kozloff used in making this work.[4] This map-painting is oriented with north-east at the top—beside a bright blue lake at the top of the segment I read 'MATA KHAN'.

Referring to Google Maps, the search term 'Mata Khan' produces this image (Figure 1.5). The lake seems to match up, the border here a thin black line, most of the landscape a shadowy blank. The words 'Mata Khan' disappear from the image, such that the only point of commonality I can use to read between this cartographic image and Kozloff's painting is the lake.

Looking more closely at the lake, changing to the satellite view, I find it named 'Bande Sardeh', a beautiful, delicate eau de nil and sapphire blues, unlike the bold, electric blue of Kozloff's painting. I don't see any sign of the 'ruins' that are indicated

Figure 1.4 Screenview of Google Maps, 'Mata Khan', June 2017[5]
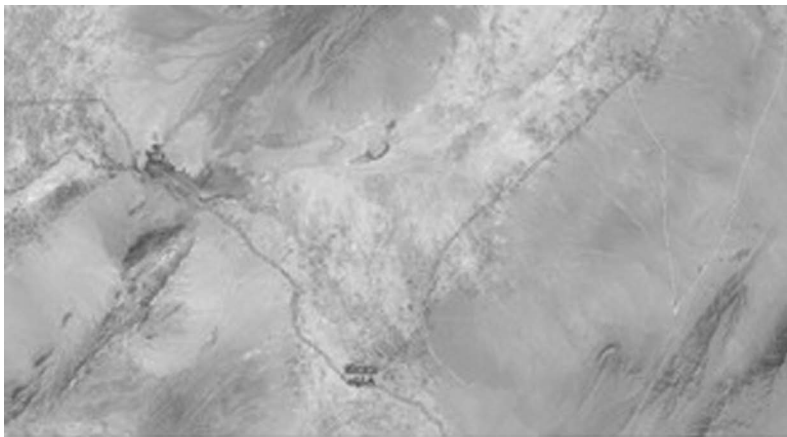
Figure 1.5 Satellite view of Google Maps, 'Mata Khan', April 2015

in Kozloff's version, in the middle of the lake's northern shore. In Google Maps I can zoom in and out to get a sense of the context of the mapped area, while looking at the painting I am stuck, constrained, with no further information at hand. I know the region I'm looking at but don't have a sense of scale, how close this might be to the sea or to Pakistan.

Looking again at *Targets*, near the words 'MATA KHAN', and near the meeting point of what I take to be a line of latitude and a line of longitude, but which looks like crosshairs, I also read the word 'SOLTANI'. Dotting the 'I' is a small white square, which I take to be the symbol for a town, or at least a named settlement. Asking Google Maps to 'direct me' between the two places produces a perplexing, impractical image.

Repeating the same search request some months later produces a slightly enhanced line; where the top of the first line (Figure 1.6) appears unconnected to either Mata Khan or Soltani, the second line (Figure 1.7) has, somewhat inadequately, connected two now-named locations. Zooming in produces a blurred, de-scaled image of indistinct desert land and blurred shapes for fields and buildings, which disappear from the cartographic image in the switch to map view, removing the visual information relating to agriculture, cultivation, labour and human inhabitation.[6] Another year later, the Google Maps image is almost completely unchanged. It's not possible by this method to learn very much at all about these places—my prevailing impression is that this place is unknowable from this perspective. I continue to look at a painted map of part of the Afghanistan–Pakistan border, mountains, a lake, the cartographic grid, and a warning:

> "WARNING All FLT shall obtain clearance at least 15 min prior to entering PAKISTAN AIRSPACE."

To the right-hand side of the painting, the wavy, grey-green border, the mountains and the lines of latitude and longitude butt up against a light grey-green land, letters and numbers upside-down as I look, areas of cream colour to the top and bottom of the green area. At the bottom of the segment, also upside-down, I read 'CUBA'. I pick up the book and turn it upside-down, wondering, if I ever see *Targets* in person, if I will
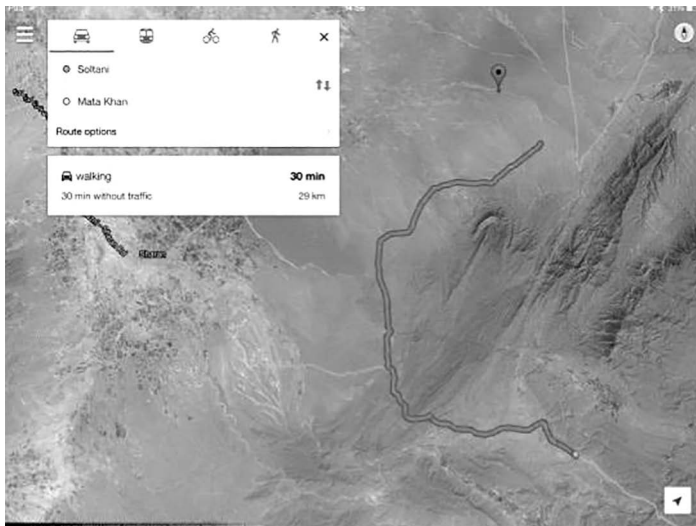
Figure 1.6 Route between Mata Khan and Soltani, screenview, July 2014

Figure 1.7 Route between Mata Khan and Soltani, screenview, January 2016

'twist to read place names, reflecting the way airplanes swoop above the earth' as Kozloff described. As it is, viewing remotely, in print, 'CUBA' has become somewhat more legible, but nothing jumps out at me as a centre of the image. I read 'VARDER', 'ABANDONED', 'Smokestack 585 (235)'. I read 'PEDRO BETANCOURT', 'AGRA-MONTE', 'mangrove' and 'numerous ditches'. Reading further down the painting, in almost vertically slanted red capital letters on a cream-coloured bay, I see 'BAHIA DE COCHINOS', and 'underneath' these words, in smaller letters, and in brackets, I read '(Bay of Pigs)'. This, then, is the 'centre' of the painting that I was missing a few moments ago.

Through Google Maps the bay appears as a beautiful sweep of dark blues, greens, grey and green patterns of the national park to the left, turquoise waters and few signs of human habitation. Whether the viewer is able to connect 'Bay of Pigs' to the organising concept of *Targets* depends on knowledge gained, or not, outside of the artwork; the bay is the site of the failed 1961 US invasion of Cuba.

Figure 1.8 Screenview of Google Maps, 'Bay of Pigs'

A non-historian, this brings to my mind vague TV images of the Kennedys, black and white, the Cold War, men in thick-framed glasses and suits, in strong contrast with my image of the US that continues to bomb Afghanistan in the present. These associations and images are not readily understood in terms of 'knowledge' or 'history'. This cartographic image of Cuba, evoked at the moment of 1961, stands alongside the Afghanistan of the beginnings of the War on Terror (although Afghanistan was first bombed by the US in 1998).

This 1961 Cuba also stands alongside, as I read, the Afghanistan of 2017 and its geographical and political relationships with the Cuba of 2017[7] and the undepicted place to the east of this map painting—Guantanamo Bay detention camp. Guantanamo Bay is in the south-east of the island of Cuba, made famous as one of the destinations of illegal rendition flights conducted by the US, with the assistance of other nations, under the auspices of the War on Terror.[8] The detention centre at Guantanamo Bay occupies part of the US Naval Station Guantanamo Bay,[9] in operation since

the US leased the facility from Cuba as part of the Cuban-American Treaty of 1903 following the US invasion and occupation.[10] The present stage of the shifting meanings of 'Guantanamo Bay' began after 9/11, in 2001, shortly after *Targets* was made; for me, as a remote Western viewer, 'Bay of Pigs' continues to have only one significant connotation; and Cuba and Afghanistan continued to stand alongside one another as part of *Targets* as Cuba–US rapprochement was established in 2015–16.

The choice of aerial bombardment as the theme of this larger, collaged map has also had the effect of de-selecting Guantanamo Bay detention centre from the cartographic depiction of violence that plays out in *Targets*. However, remembering Kozloff's idea of claustrophobia and Wood's 'devastating' encounter, I read a form of control and limitation in the viewing experience of *Targets*' disjointed maps, as one is unable to scroll up or down, unfold the next section of the map, or turn the globe to read the adjoining area. The viewer is controlled, then, constrained to view only the selection, although the implied or imagined or inferred view may also accommodate the twenty-first-century remote viewer's association of a map depicting Cuba with the present political standoff or settlement of Guantanamo.

The 'devastating' and 'claustrophobic' encounter that is staged within the structure may indeed amount to a punitive experience on the part of the viewer, with its physically controlling environment and harsh lighting referencing a kind of solitary confinement chamber. Thinking of the artificial light of *Targets*' interior in relation to Guantanamo brings up images from news and TV dramas of sound torture and sleep deprivation with bright lights, musicians protesting the use of their songs for torture and the idea of music transforms into another tangential association, of Pete Seeger singing 'Guantanamera'.[11] I imagine standing inside *Targets* to hear the echo, 'guajira Guantanamera'.

Targets' Geographical Imaginations[12]

In this personal and highly selective account of viewing and reading part of *Targets*, I have attempted to highlight the disjuncture in the viewing experience brought on by the 'border'—in this case, that between Afghanistan and Cuba. While borders as geopolitical demarcations do feature in the trapezoidal map paintings, for example, Afghanistan-Pakistan, Kuwait-Iraq and Serbia-Macedonia, the border is also present physically and structurally in the work in the points at which the map segments are joined. As Earenfight notes,

> From the outside, one sees that the 'painting' is made of twenty-four wedge-shaped, curved plywood panels that come together to form a sphere, their joints forming the latitudes and longitudes. [. . .] The 'equator' formed by the joining of the upper and lower wedges provides an artificial horizon in an otherwise disorienting space.
>
> (Princenthal and Earenfight, 2008, p. 28)

The horizontal join is here characterised as both an 'equator' and, simultaneously, an 'artificial horizon', at once part of the cartographic grid and a visual device to enable orientation during flight. If we read the boundaries of the map segments as already lines of latitude and longitude and the map segments as primarily an array,

we may overlook the boundaries as also being points at which each map is cut off, altered and disrupted and at which each map is newly conjoined to another. None of the neighbouring maps depicts contiguous areas as we know them to be positioned on the globe. Therefore, new cartographic juxtapositions are created as we read and view *Targets*.

I have noted *Targets*' concern to depict US aerial bombardment undertaken between 1945 and 2000. However, the artist understands the map paintings to relate not strictly to countries but to bombing campaigns carried out by the US.[13] On a closer reading, a neat correspondence cannot quite be drawn between Kozloff's list of bombing campaigns, based on *Killing Hope: U.S. Military and CIA Interventions Since World War II* by William Blum (1995/2004) and the depictions of the paintings.

Of the twenty-four map paintings that form *Targets*, two depict Iraq—one painting centres on Baghdad, while the other shows the Kuwait–Iraq border—although Kozloff cites Iraq only once, as having been bombed from 1991–2000, and some of the bombing campaigns Kozloff cites are not depicted. What is presented, then, is not an encyclopaedic account of US aerial aggression, and in this the work underscores one of cartography's most central procedures—the assertion of a total and cohesive depiction across both the space of the cartographic image and the space of the mapped area. Kozloff here functions in the role of cartographer, performing the selection, while the rationale and mode of selection remain obscure in the resulting compiled image, as in all cartographic images.

Rather than geographic contiguity, it is the mapped places' status as *having been targets* that provides cohesion and the rationale for selection. In considering the issue of targeting in the context of a broader epistemological violence, Samuel Weber writes,

> Targeting [. . .] constitutes the condition of all *execution*, the execution of acts no less than that of judgments and sentences, such as the death-penalty. Every such execution, as targeting, is potentially and tendentially lethal, for by taking aim at its object, it isolates that object from its relation to its surroundings, removing everything that might *distract* its aim from the place it seeks to secure: that is, to occupy and to appropriate. Since, however, the place targeted is always enmeshed in a net of relations that is intrinsically inexhaustible and unlimited, or, as Freud would say, *overdetermined*, the act of targeting is an act of violence even before any shot is fired. It is this act of violence that registers as 'guilt'.
>
> (2005, p. 105, emphasis in original)

Such an 'isolation' of the 'object'—here, the mapped place—'from its relation to its surroundings' is performed in *Targets*. By removing the individual cartographic segments from their geographic relationships, the visualised places are abstracted—in the sense of selected out, removed—and compiled into a new form.

While at one level this new form is a totalised image of US aerial bombardment, it also cites a history that can be indicated in a listing of dates and locations, such that the artwork could be interpreted as potentially simply a creative way of thinking about the histories in question.[14] However, the viewer's experience of *Targets* as a source of information and historical instruction depends on their prior knowledge. The specific histories of each 'target status', each bombing campaign, are not themselves depicted

in the artwork. While it is beyond the scope of this study to address these histories in detail, I am also concerned to read the artwork in terms of what it is and does more than what it may be understood to stand in for. I see *Targets* as largely concerned with a middle ground between a fully abstract image of 'war' and a list of geographically depicted histories, a view that is both specific and totalising. I offer, then, one way of exploring some of the specificities of *Targets*' totalising view, in turning to a brief exploration of (some of) the 'borders' conjoining *Targets*' disjunctive mappings. It is this question that opens out on to a closer, though still partial and necessarily incomplete, reading of the geographies of *Targets*.

Having proposed that it is not straightforwardly countries themselves that find depiction in *Targets*' painted maps, in reading images of the work it is hard to overlook the point that many of the segments feature a country name fairly prominently, in larger lettering, such that they may be read across *Targets*' surface like phrases or sentences lacking their grammar: Nicaragua-Korea-Peru-Afghanistan-Cuba, Nicaragua-Korea[15]-Peru-Yugoslavia-Kuwait/Iraq, Nicaragua-Kosovo-Bosnia-Korea. These concatenations of place names rely on reading left to right, but in the map we are not bound so strictly to read in a particular way, and so we may also read Congo-El Salvador-Cuba, Sudan-Libya-Iraq-Kuwait/Iraq-Yugoslavia-Peru. We may even, perhaps with a view toward the twenty-first-century present of this reading, in which the so-called War on Terror continues, read in a frustrated loop Afghanistan/Pakistan-Kuwait/Iraq-Iraq-Kuwait/Iraq-Pakistan/Afghanistan-Kuwait/Iraq-Iraq.

Here an Afghanistan of 1998 borders a Kuwait/Iraq of 1991–2000, which borders another Iraq, one that does not correspond neatly to the list of bombing campaigns but which cannot help but speak to me of the next war in Iraq that, from the vantage point of the work's making in 2000, was yet to come. The spatiality of the installation de-particularises the distinct historical moments at issue in the work; the apparent particularity of the historical references is subsumed within the broader historical referent of 'since 1945'. In this way, the historical particularity is not actively occluded but is assimilated into the broader referentiality of the whole structure.

To the 'north', vertically above, this temporally uneasy Baghdad, the River Tigris meets the Florida Strait, which itself gives on to the northern, or lowermost, shore of the island of Cuba. In this region, the bright-yellow ground of Iraq forms an unwilling coastline of the beige or cream Florida Strait, which becomes a small inland sea, bordered by Cuba, Pakistan, Iraq and El Salvador. From the inland sea, to the west rise abruptly the mountains in the west of Pakistan, while to the north-east, beyond El Salvador's small stretch of coastline, we can make out the city of San Salvador in the distance, and further beyond it, Kinshasa. To the south-east of our position, Tripoli, seen here in conceptually either 1986 or 1998, faces eastward from a green Libya on to the Mediterranean.

Geoff King has described the capacity of cartographic grids to "create the reality they often appear merely to represent" (1996, p. 41). Here, the grid organises a new disposition of geographic and political space, establishing a radically altered cartography. Having noted the relationship of this grid to the abstract grid of lines of latitude and longitude which organise global space and world map projections, I want also to link the grid's establishing of regular, delimited viewing areas to the panoptic organising of its viewed subjects. The relationship between 'panoptic viewing' and the physical and conceptual structure of *Targets* is explored in more detail in what follows—for

the moment I wish to note the regularising and individuating capacity of the physical grid performed in the installation.

In the artwork, each 'target' appears in its own confined, delimited space, strictly allocated by the work's form. However, as I have suggested, it is also possible to read relationships and new connections across and among these confined depictions. Appearing here side by side, it would be possible, but reductive I think, to propose a reading of this arrangement as a form of cartographic-political solidarity, as those places sharing the common experience of aerial attack by the US appear together, displaying their status as *Targets*. I read the viewing position constituted in the artwork as offering an identification with an imagined viewing position of the United States. The common link shared by the depicted places is their having been attacked by the US in the latter fifty-five years of the twentieth century, and any cartographic depiction of the US itself is conspicuous by its non-depiction in this re-worked 'world map'.

As Laura Kurgan asserts, "[t]he spaces that maps try to describe can be ideal, psychological, virtual, immaterial, or imaginary—and they are never *just* physical" (2013, p. 16, emphasis in original). One of the spaces that *Targets*' maps describe is the central floor space in which the viewer may stand—the space of viewing. This is a space that appears to be cartographically 'silent', but, as J.B. Harley has shown, cartographic silence is an active part of the process of constructing cartographic meaning.

Harley's concept of cartographic silence is primarily concerned with 'political silences' (Harley and Laxton, 2001, p. 85) rather than those arising from "geographical ignorance, lack of data, error, the limitations of scale, deliberate design or other aspects of specification and technical limitation" (ibid). Following his positioning of maps as texts, he reads silence in terms of the exclusion of elements that could be depicted cartographically or of elements that are de-selected for depiction at the level of the map as a visual, graphic form. He argues for understanding the role of silence in cartography as much more than just the opposite of what is depicted:

> I am deliberately insisting on the term silences in the context of maps, rather than the somewhat negative blank spaces of the older literature, for the reason that silence should be seen as an 'active human performance'. Silence can reveal as much as it conceals and, from acting as independent and intentional statements, silences on maps may sometimes become the determinate part of the cartographic message. So, just as in verbal communication the silence is more than the mere correlate of what is sounded, in the case of a map the silence is not merely the opposite of what is depicted. The white spaces which abound on the maps of early modern Europe, for example, cannot be explained simply by positing 'fact' against 'no fact'. Silence and utterance are not alternatives but constituent parts of map language, each necessary for the understanding of the other.
>
> (ibid, p. 86)

Silence—non-selection, non-depiction—is an active, productive feature of cartographic language and a necessary mode of cartographic abstraction entailed by the

'distortion' (Monmonier, 1996, p. 1) involved in any approach to depicting the four-dimensional world in two-dimensional form.

Silence, emptiness, and blankness are also produced via the cartographic grid, as Ricardo Padrón has argued. He identifies a 'positive emptiness' in the cartographic image that is part of its process of forming meaning, in contrast to the 'negative emptiness'—Harley's 'blank spaces'—relating to ignorance and error. The cartographic grid forms

> the abstract space into which geographies and hydrographies are plotted—a 'positive' emptiness. It subtends the entire surface of the map, but its 'positive emptiness'—its substantial independence from the objects and locations it serves to plot—only becomes visible when we realize that it logically extends far beyond the borders of the image.
>
> (Padrón, 2014, p. 212)

The cartographic grid itself produces an abstract space that organises and produces what may appear within it and so is constitutive, active, 'positive' in producing cartographic meaning rather than negative or empty.

Cartographic silence is particularly important in the context of colonial mapping, especially where 'toponymic silence' (Harley and Laxton, 2001, p. 99) enacts and compounds colonial violence. As Harley argues, "[c]onquering states impose a silence on minority or subject populations through their manipulation of place-names. Whole strata of ethnic identity are swept from the map in what amounts to acts of cultural genocide" (ibid). However, place names can be aggressively asserted as well as effaced. For example, Irish place names have been asserted on colonial maps, as well as being Anglicised, "as part of the enterprise of colonial reinscription and domination" (King, 1996, p. 30); naming can function as a dynamic of appropriation (ibid, p. 28), and the appearance of 'indigenous' toponyms should not uncritically be interpreted as a straightforward good, as cartographic silences may also be produced through selective, coercive or incomplete visibilisation.

Cartographic silence, therefore, becomes a powerful factor when we attempt to read maps critically. In thinking about the cartographic silence referred to earlier, that of Guantanamo Bay (to the eye of the viewer of the War on Terror),[16] I read another such silence in the implication of the US as the space of the viewer. The US is the visually unacknowledged connection between the mapped places that appear in *Targets*, and the sense of complicity coming out of viewers' accounts of the work speaks powerfully of the ability of cartographic silence to actively produce meaning in the experience of cartography.

Having considered *Targets* as a cartographic artwork and its capacity to position the viewer in a newly political viewing space, I want to consider in more detail how reading maps and viewing cartographic imagery has so far been theorised by critical cartography. This is an increasingly established area of critical thought and practice, stemming from the recognition that maps and mapping practices play an important role in shaping our understandings of the world. Critical cartographers recognise that maps do much more than neutrally or passively represent the given world. Rather, maps shape and delimit possible conceptions of the world and the social relations that shape it and do so in the interests of the individuals, institutions, nations and cultures of those who are doing the mapmaking.

Viewing From Nowhere: Beyond the Zenithal and Apollonian Gazes

Cartographic abstraction is a way of understanding some of the ways in which cartographic images are received and how they work in the world—to form knowledge and to actively position the viewer in an abstract relationship to the place that is viewed via the map. An important part of the work that cartographic images are able to do is to form abstract viewpoints, through which the viewer is brought into such abstract relationships. The principal viewpoint is the 'view from nowhere', familiar to us from topographic map sheets, road maps and digital mapping applications.

The view from nowhere is distinctive, as it 'sees' effectively 'from nowhere', compiling or synopsising a uniform view from directly above all viewed points. This compilation or synopsis is one way in which the cartographic image is able to generate 'legibility' of its subject. The visual anamorphosis arising from the curvature of the Earth is removed, and all points are viewed vertically and simultaneously. This is the viewpoint perhaps most familiar from topographic map sheets such as those produced by the Ordnance Survey and other national mapping agencies. Cosgrove has characterised "synoptic vision" (what I am calling the 'view from nowhere') as a "cartographic illusion" (2008, p. 167), highlighting its character as a constructed viewpoint.

Christian Jacob argues that "graphic technique permits the symbolization of the cartographic content: lines, forms, signs. The manifestation of these artificial traits is even indispensable to the identification of the object as a map and to its deciphering as such" (2006, p. 28). The map displays a whole range of information that is not contained in the aerial image, particularly property boundaries and place names.

The view from nowhere forms an authoritative and legible viewpoint, whose legibility is in part derived from its exclusion of perspective. The development of the cartographic 'view from nowhere' has been intertwined with a trajectory of technological development related to aerial viewing. We can see this clearly in contrast with the aerial photograph, whose perspective is "oblique, with its slight deformation of scale and forms" (ibid) as against the point of view of the map, which is a "uniformly vertical point of view" (ibid). The map reconstructs the space that it takes as its subject and provides a more legible image than the space itself. The "uniform vertical gaze over all points of the miniaturized territory" (ibid) is what I am calling here the 'view from nowhere', a mode that synthesises in one image a viewing position imaginatively located directly above all parts of the mapped area simultaneously.

Cartography uses a distinctively synthesising form of viewing from above its subject. Viewing from above has historically been associated with imagination as well as power and the capacity to project knowledge onto geographical areas that have not been encountered empirically by the viewer.

Jacob emphasises this vertical form of seeing as a fantasy that is subsequently realised:

> Seeing the world from above is a timeless fantasy that geographical maps make actual by way of metaphor. This dream pervades literature and science, from the utopia of Gulliver's Travels to the frenetic scenes of contemporary science fiction, from the eye of Icarus to the lenses of satellites that send a reflection of the earth back to us.
>
> (2006, p. 1)

Seeing from above is actualised both by cartography, as Jacob asserts here, and by a history of technologies that have afforded bodily aerial viewing and 'remote' viewing via photography. The view from nowhere, then, is both a condition of possibility for aerial viewing *and*, latterly, one of its outcomes. Views from above that compile in order to produce coherence have been consolidated through the long historical process of being manifested in technologies of aerial viewing, emerging as the naturalised 'view from nowhere'—a composite cultural production that obscures the processes through which it has been constituted (Wood, Kaiser, and Abramms, 2006, p. 70).

We have seen that compilation has a central role in producing the cartographic image, and this function extends from compiling survey data about features that are individualised, differentiated and classified to facilitate their symbolisation in the image to the compilation of the theoretical or fictional viewing position vertically above the viewed subject. The image produced is a conceptual image of a viewpoint that does not have a physical correlate, that may only be 'inhabited' and viewed 'from' conceptually. I read the view from nowhere as an abstraction capable of 'producing' places through synthesising and multiplying the 'view from above' into a non-inhabitable, fully abstract viewpoint. It is important to distinguish the view from nowhere from other formulations of modes of cartographic viewing, and here I turn to an important formulation theorised by John Pickles—the zenithal gaze.

The 'zenithal gaze' is a term put forward by Ola Söderström (1996) to describe an abstract viewpoint that emerges from the 'bird's eye view' as it was deployed particularly in fifteenth- and sixteenth-century depictions of cities from above. From the conceptual position of the bird's eye view, the view of the city from above 'rose' to 'an abstract level' (Söderström, 1996, p. 260). The zenithal gaze initially functioned in the civic and professional registers of urban planning, rendering the city as an entity that could be subjected to rationalist procedures of planning, that is, city-scale intentional action. In this way, its usefulness or efficacy was initially a form of bourgeois ordering gaze, closely connected with notions of improvement and efficiency. I suggest that its terminology should be taken seriously, in that it denotes the highest point of an arc. This characteristic is closely connected to the zenithal gaze's embodied status, which I argue it does possess, despite operating at the 'level of the abstract'; in positing a physical viewing position, the zenithal gaze conceptually proposes a viewpoint that is physically inhabitable, and, indeed, it has come to be 'inhabited' through the development of technological modes of viewing from the zenithal position.

In the view from nowhere, the notion is not present of the highest point of the arc with a corollary body that may trace such an arc through its movement. The zenithal gaze has developed in the twentieth and twenty-first centuries through technological advances, particularly satellite photography and television (Parks, 2005). It is marked by a tension between the atemporal character of the god's eye view and the temporal limits of its positional character. That is, it purports to offer a totalising view, yet from its elevated position (at the highest point of an arc) it is logically able to view only part of the earth's surface at a time.

In his discussion of 'technologies of the social body', Pickles counts the 'zenithal gaze' among the technologies of visualisation and display that have contributed to the formation of the modern subject. His interest here is in subject formation and the associated processes in which maps and practices of mapping play a leading role. Pickles draws on Söderström's (1996) earlier work to consider the broader processes

of the reorganisation of social forms of looking and visualising—intimately connected as they were and are in the present with the influence of the commodity form.

Pickles connects the 'zenithal gaze' to the development of the urban master plan, a visualising form of technology that emerged through the ichnographic plan, first formalised by Leonardo da Vinci in his 1503 plan of Imola (Pickles, 2004, p. 128). This drew on the principles of rational division and representation of the city space put forward so influentially by Leon Battista Alberti, which enabled a shift away from the idea of conceptual aerial viewing as rendering a visualisation of an individual viewpoint, identified with the position of a single observer placed high above the viewed subject, regarding it obliquely.

Bird's eye views are still a popular and widely disseminated form of visualisation of cities; there was not a simple transition from an aerial oblique view to a rationalised, geometrical, planimetric viewpoint but perhaps rather a bifurcation in practices of visual production with the development of the 'zenithal gaze'. Based on measurements and data generated about the mapped subject rather than a conceptualisation of a habitable viewpoint, the development of the zenithal gaze marked

> a shift in the gaze of the observer from horizontal-oblique views to the more unusual vertical. This required a general retraining of the scopic regimes of naturalized perspective and descriptive representations, naturalizing geometrical plans and God's-eye views of the city (the zenithal gaze).
>
> (Pickles, 2004, p. 129)

Söderström characterises this gaze as having 'agency', to assimilate the area under consideration into a coded form that is legible and therefore knowable. The urban 'zone' is not yet a zone until it is made into one, rendered as a zone. Both Söderström and Pickles emphasise the constitutive, creative dynamic at work through the conceptual technology of the production of the abstract, zenithal viewpoint.

Named for an idea of the highest point, an optimal viewing position, the formulation of the zenithal gaze retains an emphasis on positionality. Developing particularly from the bird's eye view form of visualising urban spaces, in invoking the zenith as a spatial position, the zenithal gaze remains conceptually inhabitable by a viewing body. In this respect it presents an important point of convergence and overlap with the historical trajectory of the development of aerial viewing technologies, progressively more capable of actualising aerial viewing positions that were purely conceptual at their inception.

As distinct from the zenithal gaze, then, the view from nowhere synthesises, compiles and conceptualises a legible view of the mapped area, establishing a viewing position that exists as an abstraction and that is not possible to potentially realise through techniques of, in Peter Adey's phrase, 'elevating the self into the air' (2013).

Power and Control: The Panopticon, Apollo and the God's Eye View

Where the view from nowhere is a de-embodying viewpoint, other cartographic ways of seeing actively posit an embodied viewer. Closely related to the view from nowhere and the zenithal gaze, two existing modes of abstract viewing—the panoptic and the Apollonian—are worth exploring in order to consider how these modes are in play in *Targets*. These modes of viewing constitute their viewing subject as, respectively, a

surveilling central presence in a structure of domination and a de-embodied, god-like figure.

I explore some of the valences of this mode of cartographic viewing through two usually distinct areas of debate, Cosgrove's notion of the 'Apollonian eye' or Apollonian gaze and the discussion that emerges from surveillance studies of the tension between the panoptic and viewing from nowhere. The Apollonian gaze is closely identified with the position of god, or a god, in the figure of Apollo, and in this way is embodied figuratively and fictionally but not corporeally or humanly. The panopticon is a figure for a form of viewing that also holds a tension between being embodied or not, between habitability and absence, relying as it does on Jeremy Bentham's original formulation on those who are subject to viewing not having certain knowledge as to whether they are being viewed at any given moment or not.

I do not seek to artificially conjoin these two distinctive forms of viewing but to place them in conjunction with each other as two forms of viewing that play on a tension between inhabitation and non-inhabitation of their constitutive viewing positions. The panopticon form relies on uncertainty (Lyon, 2006, p. 44) regarding the presence or absence of the viewing figure, while the Apollonian form relies on figuration but of a mythological, non-human figure, simultaneously real and non-real, present and absent.

Cosgrove's concept of the 'Apollonian perspective' (2001, p. 106) describes a cultural and historical development of the conceptualisation of "how the earth might look from space" (ibid). The focus of his analysis of this perspective is the question "what have been the historical implications for the West of conceiving and representing the earth as a unitary, regular body of spherical form?" (ibid, p. ix). He frames the Apollonian perspective in relation to how practices of visualising the earth as a globe have contributed to the contemporary discourse of globalisation: "whether pictured as a networked sphere of accelerating circulation or as an abused and overexploited body, it is from images of the spherical earth that ideas of globalisation draw their expressive and political force" (ibid).

The Apollonian view has been described by Cosgrove as "at once empowering and visionary" (2001, p. xi). It is useful to note that, recalling Kozloff, Princenthal and Earenfight's and Wood's accounts of *Targets*, rather than coming to feel 'empowered' these accounts describe trappedness. Against the expansive and anticipatory connotations of 'visionary', here we find confrontation and the closed-in sense of claustrophobia.

Differing from aerial viewing, the Apollonian perspective or Apollonian eye (ibid, p. x) is a viewpoint "above the earth, proclaiming disinterested and rationally objective consideration across its surface" (ibid). This position is an individualised location 'from' which it is possible to conceptualise the earth as a unified form, viewed from above and outside. For Cosgrove, it invokes and synthesises the classical tradition of Apollo as sun god with the Christian tradition of Christ as both human and divine. The viewpoint is identified with celestial and terrestrial harmony as well as divine authority and has provided a unifying perspective of the earth which has subsequently been realised through satellite photography in the twentieth century.

The Apollonian perspective emerges as a cultural form that has fed into conceptualisations of human unity, constructed through the agency of the perspective itself; this perspective is a 'god's eye view' in terms of its relationship with the cosmographic tradition and the construction of a viewpoint that was conceptual before it was actualised

in space flight and satellite photography. As Cosgrove writes, "to achieve the global view is to loose the bonds of the earth, to escape the shackles of time, and to dissolve the contingencies of daily life for a universal moment of reverie and harmony" (ibid, p. 3). The question of scale is central to the Apollonian rendering of the earth in a miniaturised image, which Cosgrove suggests fosters the tendency to visualise the earth in terms of both ordering and controlling it.

I read Cosgrove's Apollonian perspective as a god's eye view that is able to be productive of both knowledge and a nuanced sense of agency for the viewing subject. With the twentieth-century advent of space flight, Cosgrove argues, the long-standing dream or fantasy of viewing the whole earth was realised through technological development. Prior to this development, the concept of a distanced viewing position from which to see the whole earth had been constituted through cartographic visualisation from the medieval period through the Renaissance and into the sixteenth century.

The idea of the earth as a geometrical form was produced in part through colonial exploration and the Renaissance project of humanism. The production of this geometrical earth in the early modern period drew on rediscovery of and re-engagement with classical geographical and mathematical knowledge. Ptolemy's 'Geography' provided a cornerstone of this re-activation of classical approaches to map projection and the plotting of positions accurately within an abstract, geometric pictorial space.

The Apollonian perspective is co-constituted by a range of visual practices, but the cartographic aspect of its production is of most interest here. Drawing on classical and Christian thought, Cosgrove traces the emergence of a distanced view of the earth through mathematical, geographical and theological discourses. Cosgrove identifies the subtle interconnections between ways of constituting knowledge and conceptualisation of the earth in visual terms and theological conceptions of knowledge as a divine characteristic:

> Together with a Stoic recognition of human insignificance in the vastness of creation, the implications of cosmic transcendence include the synoptic vision of the earthly globe and the preternatural, possibly magical capacity to know and intervene in the harmonies between celestial and elemental worlds.
>
> (ibid, p. 27)

The Apollonian perspective's particularly cartographic lineage is traced in Cosgrove's proposition of a 'cartographic genealogy of the Earth in the Western imagination' (the subtitle of his text), in which he takes a non-linear approach to investigating and elaborating the cartographic character of changing conceptions of the earth.

The Apollonian perspective is more figurative than the idea of the god's eye view may suggest. It proposes a distanced, planetary perspective, which is not the same as a viewpoint of absolute knowledge or full legibility. From space, the Earth becomes iconic rather than legible. Highlighting this iconicity, Pickles writes, "[t]he globe has long served as an icon for expansive capitalism and nationalism, and its iconic function continues to inform representations of geographical reach, speed and power" (2004, p. 8). By contrast, panoptic viewing constitutes a more grounded, embodied form of viewing that is institutional and, importantly, a mode through which social control is enacted in the viewing position, to which I now turn in more detail.

The idea of the panopticon was originally put forward by the utilitarian philosopher and social reformer Jeremy Bentham, in 1787, as a model for an ideal prison

(Kaschadt, 2002, p. 114). At first, the form was considered suitable for all kinds of institutional settings, particularly "where the control of a large number of people or animals was an important priority" (ibid). In Bentham's plan, individuals were held in single cells arranged around a central watchtower, such that all inmates could be viewed by the guard without themselves being able to view either the guard or one another. By 1791, Bentham had honed the concept such that it could produce "the absolute surveillance both of the inmates and their guards by a single, superior authority" (ibid).

It is the visuality inherent in the panopticon as a disciplinary apparatus that I want to draw out here. Bentham's panopticon itself was an unrealised plan and not a built structure, and for Foucault the notion of the 'diagram' was central to his use of the panopticon.

The panopticon as a 'diagram' and a 'figure of a political technology' therefore should not be interpreted in the same way as a really existing space. As an 'ideal form', it has provided a rich set of concepts and possibilities for thinking about the exertion of control through visual and structural means and for the potential for removing the direct use of force in the prison situation. It is as a figure for coercion without direct violence that I initially link it to *Targets* and further as a site in which the fantasy of vision-as-control is (extremely influentially) apotheosised.

Foucault characterises one of the panopticon's 'major effects' as being

> to induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power [. . .] this architectural apparatus should be a machine for creating and sustaining a power relation independent of the person who exercises it.
>
> (1977, p. 201)

Rather than constraining its usefulness to architecture or even institutional forms, Foucault insists that "it is the diagram of a mechanism of power reduced to its ideal form [. . .] it is in fact a figure of political technology that may and must be detached from any specific use" (ibid, p. 205). These remarks are important to frame the use that I wish to make of this familiar figure as both a 'diagram' and a resonant structural form. David Murakami Wood also addresses the issue of the simplification or over-use of the panopticon, cautioning that we should recall that Foucault intended it as a diagram and not a "material object or summative theory" (2007, p. 250).

As *Targets* is a built structure, then, it is worth noting the architectural connections between Bentham's concept and Kozloff's artwork, particularly in what these connections may tell us about the role of a god-figure in the panoptic form. Kozloff has said that *Targets* was particularly influenced by the Tempietto and the Pantheon (Princenthal and Earenfight, 2008, p. 53), both of which she spent time with in Rome, where the work was made. The Tempietto, designed by Bramante in 1508, and the Pantheon, completed in the second century CE, are noted for their closely symmetrical floor plans and for being essentially self-contained domes, and in the case of the Pantheon particularly, symmetricality and circularity were associated with being an appropriate symbolic form for a structure dedicated to all the gods, as is emphasised in the structure's common name, meaning 'temple of every god'. While the Pantheon only became a Christian church later, the Tempietto was designed for this purpose. A broader imaginary comes into play here in which churches are understood as

places in which the presence of god or gods may be dwelt with, encountered or perceived and as places associated with strict modes of bodily conduct in which a certain degree of respect is still expected to be performed. It is such a broader imaginary that I suggest is in play in the relationship between *Targets* and the Tempietto and Pantheon.

The panopticon is a disciplinary apparatus that operates through visuality but also, I suggest, draws on the notion of power associated with god:

> The basic principle of the panopticon, the 'power of the gaze', is reflected in its name (Greek: all-seeing). Through purely architectural means, Bentham made it possible for one single authority to carry out absolute surveillance of all activities, and allowed for the establishment of a system of rational order and efficiency. The architectural arrangement and its name evoke the thought of an 'all-powerful', 'God-like' institution which, according to Bentham's ideas, was to be constructed in an urban context as a 'pantheon of punishment'.
>
> (Kaschadt, 2002, p. 115)

The panopticon as a proposed structure, then, and as an extended figure for practices of social control particularly connected with viewing and visual representation relies on an idea of seeing that remains closely associated with the god-figure. While the efficacy of the panopticon is usually located with those who are viewed and understood to be disciplined by the apparatus, I want to turn to the figure of the guard, occupying, or not, the central guard tower, to argue that this position is as subject to the apparatus as is the position of those who are viewed.

A Foucauldian reading of the panoptic proposes the individual (as the 'subject') as the location or the thing on which the social-disciplinary mode of the panoptic operates; the mode is social in its efficacy but individuating and isolating in its operation. David Lyon has argued for the further concept of synopticism, the inverse of the form of panopticism, in which the many view the few:

> Synopticism is a function of the contemporary mass media that publicize the detailed actions of specific individuals, especially politicians and entertainment celebrities. The key dynamic is that the many are able to watch and judge the powerful few as seen through the eyes of television.
>
> (ibid)

Lyon notes that "the panoptic urge is to make everything visible; it is the desire and the drive towards a total gaze, to fix the body through technique and to generate regimes of self-discipline through uncertainty" (2006, p. 44). Lyon argues that the two modes of viewing or the relationship between them is "reciprocal and mutually reinforcing" (ibid, p. 51). In terms of the panopticon as a diagram of power, the figure of the guard is of particular interest, who has the capacity to see without being observed in return: "in the peripheric ring, one is totally seen, without ever seeing; in the central tower, one sees everything without ever being seen" (Foucault, 1977, p. 202).

In relation to *Targets*, I suggest that this directedness towards the viewed comes to 'rebound', so to speak, onto the viewer instead. I use 'rebound' cautiously, as there is a double movement here that is difficult to separate; the viewer's gaze is in some ways structurally rebutted, turned away, by the curvature of the map paintings, and

at the same moment the effect of the gaze is also deflected, returning to the viewer and operating on them. While this mode of visuality is not 'disciplinary' in the senses associated with the panopticon, it is operative on the viewer; it is this idea of the effect on the viewer that I wish to mark. In my reading, *Targets* is importantly operative on the person at the centre—the position of the viewer in *Targets* becomes the position of 'guard' in the panoptic situation, broadly understood.

I think this emphasis speaks to the comments from Wood, Kozloff and Earenfight about reactions to the work, noted earlier: "the maps in *Targets* are coldly clinical, precise. In these maps one sees through the eyes of a pilot, miles above identifiable life. *Despite the impulse to recoil*, the all-encompassing sphere provides nowhere to retreat" (Princenthal and Earenfight, 2008, p. 28, emphasis mine). In considering these responses to the work, I am aiming not to offer an account of the subjectivity of the viewer as they inhabit this panoptic space but rather of some of the effects that may flow from *Targets*' staging of the panoptic-in-the-Apollonian—that is, the Apollonian view disrupted through the deployment of panoptic viewing.

In this context, I return to Wood's encounter with *Targets*; 'It forced me to confront how much of the world the United States has bombed during my lifetime, with my tax dollars, and so with my tacit support'. It is the material emphasis in this remark that is particularly relevant. Wood, as a viewer, connects himself to the abstract violence evoked in *Targets* through the payment of taxes that he is compelled to make, by the state, as one of its subjects.[17] In this way he recognises his complicity in the very production and reproduction of the state's military power, whose significance as an abstraction is highlighted by Kaplan:

> After one hundred years of airpower, even in the face of evidence that today's wars are also very much fought on the ground, the belief that force from the air is the core of a nation state's military might remains pervasive.
>
> (Kaplan in Adey et al, 2013, p. 19)

Wood's account of his experience of the work is strongly inflected by this awareness of his material role in making possible the violence whose implication he finds 'devastating'. It is in this way that I see *Targets* as reconfiguring the panoptic away from a notion of a single direction of travel of coercion—from those with the power to view towards those who are viewed. In this form, coercion is importantly turned back upon the viewer.

A position of absolute vision and absolute knowledge is often characterised as a 'god's eye view'. There is no single account of the god's eye view[18] that may be easily positioned as having influenced most subsequent conceptions. Rather, scholars dealing with visuality, scopic regimes and particularly cartography have offered their own accounts and attributed the god's eye view varying degrees of importance in their own arguments. See for instance Pickles (2004), who addresses the 'God's eye view' in terms of its influence over 'the cartographic gaze':

> The cartographic gaze is dominated by a commitment to modelling a God's-eye view, what Donna Haraway (1991) called the 'God-trick'. This transcendental positioning is both the view from above, an elevated two-point perspective bird's-eye-view, *and* an all seeing eye that views everywhere at the same time.
>
> (2004, p. 80)

A degree of indistinctness characterises critical formulations of cartographic forms of viewing 'from above'. Trevor Paglen regards the god's eye view as limiting and helpfully emphasises its importance for the production of power, particularly colonial power:

> The 'God's eye' view implicit in much cartography is usually not helpful in terms of describing everyday life, nor in describing the qualities of the relationships that cartography depicts. Because of what cartography cannot represent [. . .] it becomes pretty clear why it, and the forms of power that the cartographic viewpoint suggests, have traditionally been such powerful instruments of both colonialism and the contemporary geopolitical ordering of the world.
>
> (Paglen in Bhagat and Mogel, 2008, pp. 44–45)

Where Paglen suggests that the god's eye view is *the* cartographic viewpoint, I am theorising it as one—albeit higher-level—cartographic viewpoint among a number of others. Pickles has characterised the 'god-trick'—"the ability to see everything from nowhere in particular" (Gregory, 2014a)—as an illusion of universal knowledge, power and control, perpetrated by "the rationalizing [. . .] universal gaze" (Pickles, 2004, p. 185). This notion offers a point of conjunction and tension between the figures of the Apollonian gaze and the panopticon. Both viewing forms turn on the construction of a set of viewing relations that claim control and a position of agency for the viewer. The notion of absolute control is often labelled as a capacity that only one in the position of god would have, and as such it is both fictional and agentic.

In the context of the overhead, vertical view in film, Toscano and Kinkle note the capacity of the "modern *scientia dei*, or God's eye-view" to depict "knowledge as an overview" (2014, p. 4), and Chad Harris conjoins Haraway's god-trick and Cosgrove's Apollonian Eye as modes of the 'omniscient eye'. The god's eye view is also omnipotent and productive; Pickles reiterates Harley's assertion that "cartographers manufacture power. They create a spatial panopticon" (2006, p. 12). The god-trick is, therefore, an elusive figure of the abstracting capacity of cartographic viewing to establish viewpoints that are structured through fantasies of power and knowledge conceived from a god-position, disembodied and non-inhabitable by a physical viewer.

In contrast to the cartographic view from nowhere, then, the panopticon and the Apollonian gaze both invoke notions of embodied viewing, while the view from nowhere remains more abstract, uninhabitable and unrealisable through technological development. Inasmuch as god operates as a figure for ideas of knowledge and power that are unconstrained by embodiment and the limitations imposed on viewing from a body, the idea of the god's eye view relies on ideas of both removal of figural limitations and figuration itself to construct a viewpoint of agency that remains theoretically unrealisable yet is also the viewpoint that can be and has been most closely realised through viewing technologies. By contrast, the view from nowhere, cartography's signature viewpoint, remains unassimilable by human embodied experience and may only be 'inhabited' conceptually.

In his discussion of the idea of the 'participant witness', Frank Möller describes a situation in which 'the right to look' (Mirzoeff, 2011) is complicated by an ethical obligation to look at images of violence and suffering: "we not only have the right to look; we have the responsibility to look: not looking is not an option" (2013, p. 50). In the case of *Targets*, while we might agree that 'not looking is not an option', a 'right

to look' is troubled by the questions of what is being looked at, through what means and with what effects. Möller cites Ariella Azoulay to the effect that "the right not to be a perpetrator" "should condition all other human rights today" (Möller, 2013, p. 74). Without wishing to sidestep into a more detailed discussion of human rights, the notion of a right not to be a perpetrator is severely problematised in *Targets*; the viewer, in the position of the panopticon's guard and in the geopolitical position also of the US, is able to experience at the level of the individual the equally abstract reality of state power as manifested in aerial violence.

In this context, a right, anchored in the concept of the individual political subject, is effectively no match for the coercive capacities the state is able to deploy against that individual subject. Those viewers of *Targets* who 'recoil' and feel 'devastated' in a sense posit a right not to be a perpetrator in their feeling that being led to feel this way is a violation. Wood explicitly takes a further interpretative step in identifying his own material role in paying for the relations of violence that he feels abhorrence towards. It is in the possibility of this insight that I locate *Targets*' visual efficacy; the guard comes to recognise her own complicity in the relation of violence in which she is embedded and in whose reproduction she is thoroughly implicated. As against the remoteness and distancing that are associated with the Apollonian perspective, the panoptic here reconfigures a god-like view of power and domination into one of complicity and embeddedness.

Nuancing and Reconfiguring Our Cartographic Viewing

In *Close Up at a Distance*, Kurgan asserts that maps "have become infrastructures and systems, and we are located, however insecurely, within them. [. . .] We do not stand at a distance from these technologies, but are addressed by and embedded within them" (2013, p. 14). This embeddedness, our locatedness within and among larger systems and discursive structures, is an important aspect of what is dramatised in *Targets* and the viewing position it constructs for the viewer to inhabit.

Targets itself shows twelve vertical divisions, which are subdivided horizontally into twenty-four map segments. Its form and its variety of colours at once link it with the conventional globe form, but it cannot be successfully read and interpreted unless viewed from the inside. I have proposed the Apollonian perspective as having relevance to my interpretation of *Targets* due to its capacity to envision the globe as a whole. In *Targets*, however, this distance is turned inward, so that the depicted places are viewed from above as well as from within the globe form.

In the context of Apollonian viewing, *Targets* offers a reversal of the distancing implicit in this view while continuing to stage its synthesising, unifying capacity. A unified world of targets of aerial violence here supplants the harmonious vision of the world figured by Apollonian viewing. I suggest that this reversal positions the viewer of *Targets* in a viewing position that is assigned to the figure of a god in the Apollonian perspective.

Both the panoptic and the Apollonian depend on the notion of remoteness. The control exerted through panoptic visuality is realised by means of a scopic regime, its power relying on visual, though not necessarily physical, remoteness for its social efficacy, and the Apollonian requires its distanced viewpoint to present a conceptually remote view to a physically grounded viewer.

In this chapter, I have traced a development and further abstraction of carto-graphic 'viewing from nowhere' in *Targets*' staging of aspects of both panoptic and Apollonian viewing. In the complex interconnection of modes of viewing that I have argued are staged in this artwork, what emerges is a viewing situation that synthesises multiple 'nowhere' viewpoints in a newly Apollonian *and* panoptic form. Each mapped place is rendered in the view from nowhere, and in this sense *Targets*' composition could be understood as simply offering another, if more selec-tive, compiled view of the mapped area. The maps that form the source images for *Targets*' painted panels have themselves been re-rendered from the flat, two-dimensional form of map sheets into the curved, three-dimensional walls of the enclosed cartographic structure. Rather than 'simply' a different approach to selecting the area to be viewed, as I have argued, both the form and the content of the map paintings introduce the question of aerial violence—through their very selection and the corresponding non-selection of places that have not been targeted for aerial bombardment by the US during the selected timeframe—and the question of power relations. The relation of military domination connects the unseen yet central US to each of the mapped places.

An element that is not depicted in this map is the complex political and geographi-cal relations that exist or have existed in different periods between the mapped places themselves. This absence compounds the sense of domination in the viewing relations; depicted places appear only in their relation to their shared aggressor. In this move, all other relations, histories and understandings are left aside in favour of emphasis on the geography of military aggression. While this degree of selectivity is a necessary feature of cartographic depiction in any context, it is how the selections fall and what effect they have that we must ask about.

I have suggested that *Targets* is able to scrutinise some of the ways in which car-tography establishes abstract viewing positions, which are then taken up or inhabited or occupied by map viewers. Drawing on the panopticon and panoptic viewing in this context, as an almost mythical trope of social control and discipline, allows for the viewing position to be analysed as an apparatus that operates on the inhabiting viewer as much as those in the position of the viewed. As I have argued, this attention on the potential effect that viewing in this relation may have on the viewer does not come from the concept of the panopticon itself; this comes, rather, directly from the artwork.

I want to clarify the distinctive conceptual elements in play in this complex visual situation by considering embodiment. In the panoptic in its traditional sense, embodi-ment, or embodied presence, is required on the part of the prisoner, while the *possibil-ity* of presence is required on the part of the guard. There is a flickering play between presence and absence in the surveillant position (Lyon, 2006, p. 44), such that the disciplinary effect of the panoptic form comes about through the *possibility* of the presence of this central entity, the guard/viewer, whose presence is implied but never confirmed to those who understand themselves to be the viewed.

The mode of social efficacy depicted in *Targets* is not quite the internalised discipli-nary effect of the panopticon but rather a direct relation of force in the form of bomb-ing. However, it is not in this aspect that I draw the connection between the artwork and the panopticon. I suggest that *Targets* stages the controlling, coercive capacity of the panopticon rather through multiplying the cartographic view from nowhere. The mapped places are rendered uniformly in this abstract mode, each map painting

indirectly referring to the violence, pain and terror that has been inflicted at each location by the same central, dominant entity.

Both the panoptic and the Apollonian modes turn on this play of presence and absence, the presence and the absence of a body, a viewer, to inhabit the position. In the Apollonian view, the positing of the figural position has led to the technological 'achievement' of that figural position, through both satellite photography and photography by humans in space (see Adey et al, 2013, p. 15, and Mirzoeff, 2015, p. 8). The viewpoint is initially theoretical and imaginative and is historically 'acted into' or inhabited by techno-physical subjects. The main scope of this development has been provided by satellite photography, but human-made photographs taken from space have had a very significant cultural impact.[19] The body has gradually become elevated into space, so 'realising' the Apollonian position. In this position, then, we see a historical passage from absence to presence, with the conceptual leading and enabling the technological.

Targets significantly combines the militarised view from above with the spatialised, institutional form of panoptic viewing. Möller has stated the political case for attending closely to the power relations involved in viewing or inhabiting the role of the spectator:

> seeing—being a spectator—is also indispensable for those who want to challenge existing power relations. Emancipation [. . .] requires the development of new ways of seeing so as to be able to challenge established forms of visual socialization which are always connected with, reflect, and serve established forms of domination. New ways of seeing potentially open up 'a new topography of the possible'.
>
> (2013, pp. 48–49)

It is possible to challenge existing visually driven social relations, and my aim in scrutinising the modes of viewing in play in *Targets* is to show that cartographic viewing from nowhere can be intervened in such that it no longer produces relations of domination but now a relation in which the viewing position produces relations of engagement and complicity.

I return to the premise that began this analysis of *Targets* as an artwork in which a complex play of viewing modes may be discerned, namely, that in this work, the cartographic view from nowhere is both nuanced and extended through the staging of aspects of both panoptic and Apollonian viewing. To this end, I have positioned *Targets* in the context of Joyce Kozloff's large cartographic oeuvre and suggested that Kozloff's work displays a broader concern with how knowledge may be understood to be 'patterned' or organised visually. I have also investigated the artwork in a range of exploratory modes of reading, opening up, in so doing, the possibilities for creative encounter with cartographic artworks.

I have emphasised in this the necessarily partial and provisional character of interpretation and differentiated my approach as a 'remote viewer' from that of the direct, embodied encounter. I have used exploratory readings as a way of considering the newly juxtaposed geographies that arise through the positioning of the map paintings—as we saw, for example, Afghanistan and Cuba bordering one another and Guantanamo Bay de-selected by the organising rationale of the work, functioning as a form of cartographic silence.

Asking about what we may understand *Targets* to be a map *of*, I have argued that at one level it does form a newly totalising image of US targeting and aerial aggression while simultaneously citing specific historical moments and relationships that remain undepicted in the work. In this way, *Targets* proffers a cartographic view that is simultaneously particularising and totalising.

Reading *Targets* through both the Apollonian and panoptic modes, I have argued for the usefulness of the panoptic in discerning *Targets*' singular disruption to the Apollonian mode. Here I have posed the potential for discerning the role of a god figure in the panoptic, partly through the work's inspiration in two works of religious architecture. *Targets* functions panoptically in terms of its address to the viewer rather than the viewed, and it returns the coercion of the panoptic back on to the viewer. The panoptic emerged as itself reconfiguring, in the artwork, a god-like view of power and domination into one of engaged, complicit and embedded viewing. Where the Apollonian perspective provides a figure for a distanced viewing of the earth as a whole, in the artwork this distanced view is turned inwards, so that the view is simultaneously from above and from within. The unifying capacity of the Apollonian perspective is also active in *Targets*, though productive of an image of violence rather than of distanced harmony.

Pursuing the question of how the cartographic view from nowhere may be understood to be reconfigured in *Targets*, as a further abstraction, I showed a multiplied view from nowhere being staged in the artwork. The form of this view, as itself a mode of cartographic selection, has an active role in determining the panoptic character of *Targets*. Embodiment is an important organising concept for both Apollonian and panoptic viewing in the play of absence and presence in the panoptic and the technological embodiment seen in the development of the Apollonian. Finally, *Targets* emerges as the site of a potentially transformative critical reading, suggesting that cartographic viewing can be creatively disrupted and reconfigured to produce a viewing position, as a cartographic abstraction, that itself produces new viewing relations of engagement and complicity.

Targets operates at a level of abstraction one remove from that of cartography itself; its subject, I argue, is cartographic viewing—or ways of seeing with maps—as against cartography's subject, the 'world'. *Targets* operates on cartographic viewing: by facilitating the experience of cartographic panoptic viewing in the artwork, *Targets* stages an abstract yet embodied cartographic viewing position. *Targets* offers and performs a position from which it is possible to consider the panoptic character of all cartographic viewing and the affinities between social understandings of the panopticon and the social role of cartographic abstraction.

Notes

1 Based on description available at joycekozloff.net, accessed 11 June 2017.
2 Statement about *Targets* from artist's website: "'*Targets*' speaks of the artist's concern about the barbarity of aerial warfare. We are constantly told that our air force has incurred no casualties while dropping bombs on the enemy, but we hear very little about the victims, often referred to as 'collateral damage.' As the idea evolved, it became clear that it wasn't about a particular war, but fifty-five years of US aerial bombardment. China 1945–46, Korea 1950–53, China 1950–53, Guatemala 1954, Indonesia 1958, Cuba 1959–60, Guatemala 1960, Congo 1964, Peru 1965, Laos 1964–73, Vietnam 1961–73, Cambodia 1969–70, Guatemala 1967–69, Grenada 1983, Libya 1986, El Salvador 1980's,

Nicaragua 1980's, Panama 1989, Iraq 1991–2000, Sudan 1998, Libya 1998, Afghanistan 1998, Yugoslavia 1999, Colombia 1990's-2000." Available at joycekozloff.net, accessed 11 June 2017.

3 Available at joycekozloff.net, accessed 11 June 2017.

4 See Princenthal and Earenfight, 2008, p. 14: "Kozloff worked from maps produced by the US Department of Commerce's National Oceanic and Atmospheric Administration, including Tactical Pilotage Charts and Operational Navigation Charts. Both were created to assist civilian as well as military pilots".

5 In the time since this work was first written, in July 2014, four place names have been added to Google Maps' rendering of this part of the globe—Terwa, Dheri, Dewana and Sharan—and a regional boundary has been added as a dashed grey line.

6 In his discussion of Google Earth, Mark Dorrian relates the resolution of Google's cartographic imagery to geopolitical hierarchies, Western interests and property value: "Areas that appear in great detail with a fast refresh rate are typically those with high real estate value. Disaster areas, conflict zones or places where state intelligence has been directed can also suddenly emerge with startling detail" (Dorrian, 2013, p. 302).

7 For example, Cuba becoming a location in the routes of Afghan refugees trying to gain entry to North America (see 'Kabul Libre! One new Afghan trail to the West goes through Cuba', *Washington Post*, April 17 2016, available at https://www.washingtonpost.com/world/asia_pacific/kabul-libre-one-new-afghan-trail-to-the-west-goes-through-cuba/2016/04/16/da214926-0188-11e6-8bb1-f124a43f84dc_story.html?utm_term=.05af3765b630 (accessed 5 October 2017).

8 For a detailed and critical account of 'extraordinary rendition' and its global geographies, see Paglen, Trevor and Thompson, A.C., *Torture taxi: On the trail of the CIA's rendition flights* (Icon, Thriplow, 2007).

9 US President Barack Obama notably failed to close the detention centre known as Guantanamo Bay during his time in office from 2009–2017.

10 See cnic.navy.mil/regions/cnrse/installations/ns_guantanamo_bay.html, accessed 11 June 2017. This is the official US Navy website for Guantanamo Bay. See also Chomsky et al, 2004, p. 143, and Gott, 2004, pp. 142 & 197.

11 See Chomsky et al, 2004, pp. 128–129. The poem 'Yo soy un hombre sincero' by José Martí was adapted into a popular song, 'Guantanamera', by José (Joseíto) Fernández Díaz. 'Guantanamera' has been popularised on the left by the folk singer and political activist Pete Seeger, who sang it all over the world and continues to do so on records and online. For Martí's role in nineteenth-century Cuba as 'revolutionary activist', political theorist, journalist and poet, see Gott, 2004.

12 I have taken up the title of Derek Gregory's influential 1994 work, *Geographical Imaginations* (Wiley-Blackwell, Cambridge, MA and Oxford).

13 See note 12, p. 93. Having been made shortly before 9/11, *Targets* also functions as something of an epochal marker, reflecting on the 'post-war' twentieth century.

14 As Joyce Kozloff has commented on responses to *Targets*, "In Venice, people were interested in *Targets*, period. They got it. In America, I need a wall label with the list of countries and the years they were bombed. The rest of *Voyages*, a more subtle and complex rumination on European colonialism, didn't interest them" (Princenthal and Earenfight, 2008, p. 55). Kozloff does not elaborate on how she comes to regard the viewers in Venice as 'getting' *Targets* while American audiences do not. Her remark is suggestive, though, for while she condemns American viewers as insufficiently interested, the perceived need for a wall label seems to indicate that when some historical information is explicitly presented, the viewers respond with greater interest and engagement.

15 'Korea 1950–53' is included in Kozloff/Blum's list of bombing campaigns (see note 12, p. 93), referring to the Korean War, prior to the establishment of South and North Korea as distinct political and cartographic entities.

16 While *Targets* is not a map of the War on Terror in terms of the time of its making or its geographies, it nonetheless embodies the capacity of appropriative extension that is such a powerful characteristic of mapping, enabled particularly by the capacity of the grid to propose regular geometrical extension. This question is discussed in more depth in Chapter 5. In this context, I suggest that a general character of cartographic images as referential is the

capacity to imply the presence of surrounding map areas that do not appear in the selection of a particular map.

17 The identification of complicity for militarised harm is taken up in a Kantian register by Gregoire Chamayou (2015, see chapter two) and in practical activism by the 'peace tax' or war tax resistance movement—see for example War Resisters International and Conscience: Taxes for Peace not War in the UK.

18 A case in point is the OED definition of 'god's eye view':

after *bird's eye view* [. . .] a view as might be seen by God; a view from a very exalted, or high and remote, position.

1865 J. G. Holland Plain Talks 257 A great city is a huge living creature . . . If we could be lifted above it, and obtain, not a bird's-eye view, but a God's-eye view of it, we should see its arteries throbbing with the majestic currents of life.

1920 A. Huxley Limbo 137 He prided himself on being able to see the thing as a whole, on taking an historical, God's-eye view of it all.

1936 A. Huxley Eyeless in Gaza vii. 85 One has made a habit of not feeling anything very strongly; it's easy, therefore, to take the God's-eye view of things.

1970 Guardian 14 May 9/6 Frank Tuohy's short stories are mostly studies in suburban isolation the God's-eye-view with God on the stage.

2006 Time Out N.Y. 26 Oct. 111/4 "We see underwater swarms of sea anemones, early biplanes taking off and landing with a cute bounce, God's eye views from the Space Shuttle." The cited examples pick up, variously, being able to see the whole, being more than a bird's eye view, being dispassionate, and viewing from a spacecraft. In this connection, Pickles also refers to "the view from space, the God's-eye view" (2004, p. 13).

19 On the significance of the Apollo photographs of the earth from space, *Earthrise* and *The Blue Marble*, see Cosgrove (2001), Kurgan (2013) and Mirzoeff (2015).

2 The Drone's Eye View

Networked Vision and Visibility in Works by James Bridle and Trevor Paglen

Drones of all kinds have prompted extensive criticism and analysis, and this critical attention continues to grow as drone use—as well as private ownership—continues to expand globally. I want to focus in on one particularly important aspect of drone functioning—how they carry out militarised ways of seeing. Drones may not immediately appear to have much to do with cartography. I will offer an interpretation of the 'drone's eye view' as a cartographic abstraction in particular relationship to the 'god's eye view'. I draw relationships between these two modes of cartographic abstraction, specifying and delineating both in terms of their relationships to cartography in general. I also show that the drone's eye view and the god's eye view work in distinctively cartographic ways, constituting modes of cartographic abstraction.

This theoretical formulation arises from my close reading of two artworks by James Bridle—*Under the Shadow of the Drone* (2012–ongoing)—and Trevor Paglen—*Untitled (Drones)* (2010)—that engage in different ways with questions about the forms of viewing that militarised drones may be understood to enact. I first consider a subjective and self-reflexive interpretation of these artworks; I then move to consider the questions that these works raise in terms of the ways in which they perform a critical response to what I am calling the 'drone's eye view'.

I re-work the existing idea of the drone's eye view to include the viewing subject, reading the viewer as co-constituting and being constructed through the technological and human networks that produce drone 'ways of seeing'. As this theoretical formulation has arisen through my engagement with artworks concerned with the ways in which militarised drones visualise their objects, I here offer my readings of these works before articulating the theoretical insights I build from them.

I open up an approach to 'viewing' military drones indirectly through critically engaging with my own subject position as a viewer, remote interpreter, 'critic of violence' and subject of a drone state. James Bridle and Trevor Paglen's artworks attempt, in their own terms, to enact a similar position of critical reflexivity. Where they fail to exceed the existing critical parameters of a politics of visibility, the theoretical framework of cartographic abstraction is useful. Through exploring the technological and scopic regime of drone visualisation, we see the ways in which the drone's eye view constitutes its subjects as targets: through physically indirect visualisation that translates viewed persons and places into data; through visual techniques of assimilation of the subject to pre-existing operational categories, most decisively the category of 'target'; and through techniques of visualisation that seek to render their subjects as fully visible, as spatially accessible and as abstract bodies moving through a fully viewed and conceptualised space.

James Bridle—*Under the Shadow of the Drone*

James Bridle is a multimedia artist noted for his works on themes of surveillance, security, the network and technologies of seeing. Frequently using installation, Bridle also creates projects based entirely online and often produces blogs and essays related to his artistic projects. Bridle often establishes formats for ongoing image-gathering, such as *Laaaaaaandsat* (2013–ongoing), which uses a Tumblr site to display imagery produced by the Landsat project as it is released into the public domain. Landsat is a long-running American satellite photography system jointly operated by NASA and the U.S. Geological Survey (USGS). Cartography itself is not a primary concern in Bridle's work, although an interest in technologies for visualising spatial relations is evident in a number of works.

Dronestagram (2012–2015), for example, whose subtitle is 'The Drone's Eye View', uses reporting by the Bureau of Investigative Journalism to ascertain the locations of military drone attacks in Pakistan, Yemen and Somalia and to upload aerial photographs of these locations in an imitation, an approximation, of the places that are being lethally viewed by such drones.

Locations are not mapped but are catalogued and categorised based on their place names. The interest in documenting and using a geographical factor to delimit the scope of the project can also be seen in *Every CCTV Camera* (2013), a photographic project documenting all the visible CCTV cameras between the artist's home and Dalston Junction in London.

Under the Shadow of the Drone (2012–ongoing) is among Bridle's best-known works and is another open-ended format involving 1:1 scale drawings of the outlines of various models of military drones. This project has evolved into two further projects centred on creating large-scale drawings on the ground. *Rainbow Plane* (2014), takes

Figure 2.1 Website view of part of the *Dronestagram* project

Source: James Bridle

its cue from the distortion produced when satellites compile images of fast-moving objects[1] such as planes, producing a distinctive 'rainbow' effect when viewed in Google satellite imagery. *Satellite Shadow 001* (2016) returns to the idea of the outline used in *Under the Shadow of the Drone*, this time applied to the invisible, overhead satellite and foregoing the strict adherence to the idea of a shadow being cast.

I bring my own interest in cartographic modes of depiction and cartographic abstraction to these works, although they do not directly use cartographic imagery. *Under the Shadow of the Drone* is the focus of the following discussion.

The green outline of an aircraft appears, painted across the pavement and road surface beside a shingle beach, not far from a calm blue sea, on a sunny day. No people or cars obscure the green shape, which I recognise with the generic tag 'drone'. This image is one of many photographs that document *Drone Shadow 003* (2013), a 'drawing' by British artist James Bridle, forming a series titled *Under the Shadow of the Drone*.

The project as a whole places 'drone shadows' in a range of locations, including Istanbul, Turkey (*Drone Shadow 001 and 002*), Brighton, UK (*Drone Shadow 003*), Washington D.C., US (*Drone Shadow 004*), London, UK (*Drone Shadows 006 and 007*), Berlin, Germany (*Drone Shadow 008*) and Karlsruhe, Germany (*Drone Shadow 009*).

The models of the depicted drones vary and usually appear in white. Photographs documenting the work are taken from elevated positions affording a view from above the ground-level drawing, and they sometimes incorporate a human figure nearby,

Figure 2.2 Installation view of *Drone Shadow 003*, Brighton, UK (2013)[2]

Source: A project commissioned by Lighthouse for Brighton Festival 2013. Photo: Roberta Mataityte

Figure 2.3 Installation view of *Drone Shadow 004*, Washington D.C., USA (2013)
Source: James Bridle

Figure 2.4 Installation view of *Drone Shadow 002*, Istanbul, Turkey (2012)
Source: James Bridle

providing a valuable sense of scale. The scale of each drawing is 1:1. To date, Bridle has named nine 'Drone Shadows' as part of this artistic series; here I consider in particular two of the works, *Drone Shadow 003* (2013) and *Drone Shadow 005* (2013).[3] The project, or format, is open ended and ongoing and also includes a handbook for drawing drone shadows such that others are encouraged to produce images in the same 'series', and they need not be authored by James Bridle as the originating artist.[4]

The green outline of *Drone Shadow 003* shows in actual size, a 1:1 scale depiction, something that does not appear here, in Brighton, the iconic British seaside, on the promenade. This is a commissioned piece, so the practical reason the work was made in Brighton is that one; but for me as a viewer it does seem a very particular move to position this 'drone', its would-be trace, on the seafront like this, where 'we' go to relax and enjoy ourselves, get some air when attending conferences, knowing that we needn't scan the horizon for familiar winged outlines, needn't keep an ear cocked for the insistent buzz. The shape intrudes into a place that I most strongly associate with the idea of 'leisure'.

Invisibility and secrecy figure strongly in critical accounts of drones, and this is a double question. They are effectively invisible to ordinary people living in Britain, but not to those they fly over on a daily basis, and some make a very distinctive buzzing noise, which becomes horribly familiar to people living under the drones for real. Here, in Brighton, edging over the pavement and the cycle path onto the road, this shape doesn't belong.

Bridle says, "We all live under the shadow of the drone",[5] which suggests complicity to me, hyperbole, poetic justice, an idea of the population of the 'aggressor' state also being dominated and diminished by that which we are under, yet all the while we fund these means of domination.

The outline form of the drawing is immediately striking, prompting me to think of the hackneyed image of an outline placed around a dead body on the street in TV and films, which forms a residual crime scene after the victim has been taken away. The viewer of the artwork then comes upon the crime scene, all that's left of an implied prior event. I wonder to what extent this visual association is fading or losing broad recognition—if it is in the process of becoming an old-fashioned trope. But my sense is less of a fiction that a drone was killed on this spot or that one crashed here but that one somehow *was* here, flying, being. It has come and gone covertly and left only this trace of its presence, an outline that distances this moment of visibility from a real event—a drone's flying overhead would not, of course, result in this inscription appearing on the ground beneath.

There's also a question about the depiction of time in this work and how one moment is selected for depiction, one instant at which we can imagine the drone caused this particular outline in this particular position; not a line, say, depicting the aircraft's route over the sea, judging from the direction it faces—onshore—which would imply a starting point in this flight and a projected landing point or end of the route. The route has potentially already ended, or the route never existed due to the ambiguity of the outline, the possible reading of it as denoting a crash site as well as the possibility of its recording a moment in a flight. I think of the shark that needs must continually swim; and this particular kind of drone is called 'Reaper', 'a person who reaps', 'death personified', but also 'a mechanical device for cutting grain'.[6] A term, then, that combines the idea of a device that enhances or perhaps supplants the manual, human work of agricultural reaping and the personification of death.

As a viewer, I struggle with the idea that this is a 'campaigning' sort of work whose purpose is to 'raise awareness', to produce particular sorts of reactions in its viewers. Dismay, perhaps; compassion? Complicity? Part of my experience of viewing this documentation of the artwork is a strong sense that I am being asked to take an actively disapproving and critical view of militarised drones and then a further sense of frustration that as I already do take such a view, I am unsure how to 'sit with' or to direct this reaction. As I look, my thoughts turn away from this frustration toward ideas of the geographical place of the work.

The green outline attends the 'British Seafront'; I bring up associations with 'Britishness' and nostalgia, about the Blitz in particular, wonder that perhaps there is a particular horror in the British 'experience', so to speak, of aerial bombardment. It's less horror than pride, though; in the British imagination, if such an unproven thing can be invoked, having suffered the Blitz and yet won the War is often seen as a great mark of character and endurance. This trope is particularly resurgent with the onslaught of centenary fever for the First World War and the 'keep calm and carry on' or modified, 'keep calm and [insert altered phrase here]' commodity phenomenon. That the centenary relates to the First World War and the Blitz to the Second doesn't seem to hinder the popularity of the 'keep calm' slogan for the public.[7] We are re-told stories of our national character, of stoic endurance and modesty, humility, hard work. Victorious, beleaguered, honourable. In this photograph an image of a drone flies not just anywhere but *onshore*. It suggests a course over the sea from the south-east, from Europe—where the Luftwaffe came from—with all the more resonance when I view it in 2017 after the divisive referendum on the UK's membership in the European Union.

The drone, then, has come to threaten *us* —the British, people in Britain, subjects of a drone state—as an aerial aggressor. Why is it here? Why would it appear somewhere so British and so safe, so distant, somewhere that is not a target for drone strikes or aerial bombardment in any form?

British place names are never, for me, those associated with bombing campaigns, aerial violence, military manoeuvring, 'annexation'; this is the violation, then, that this shape should appear in this place. The work places the drone among 'us', in 'our' midst. One has been *here*. Could this suggest a rogue drone whose operators have lost control, and suddenly it has turned on its 'own' country and sets a course over Sussex to—where? The outline seems to have the aircraft heading roughly north-north-west, maybe heading to London, or over to the west, towards GCHQ (Government Communication Headquarters)? Whose side is this drone on? To whom is it loyal? If the drone is a true 'drone' then it can do nothing spontaneously or autonomously; it is a function of remote actors and the infrastructure and networks in which they are embedded. Who, then, has operated it to appear here?

This outline works with and against the unassailable feeling of the drone aesthetic. The imagery widely available online is predominantly of militarised drones in flight, usually without a person or other object near them, such that their scale is difficult to gauge. In these images, the drones fly often at sunset and in clear skies, they are not dusty or caught at ungainly angles, and the iconic form has become the Reaper with its bulbous head full of cameras. Is the outline a threat that these technologies 'we' produce are not only capable of being directed at 'the other'?

This 'drawing' is not primarily to be encountered from above, although this is where it is photographed from, like other drone shadows in the series. I wonder that the viewing position of the walker on the promenade may serve to emphasise the

wide wing span of the drone, like a glider—with what implication? Advanced leisure pursuits? Legibility is favoured less than scale, though a 1:1 map isn't much practical use.[8] Why then a 1:1 scale image of the drone? The viewpoint seems to become very complex now. The title of the series invokes the 'shadow' that we are under, yet this image isn't like a shadow, it's like an outline. The 'shadow' idea positions us, standing on the ground, as beneath something airborne, yet that this is a drawing rather insistently contradicts the 'shadow' claim. We view a drawing that invokes a plan view or/ and a view from below. We are above while simultaneously standing on the ground, perhaps simultaneously positioned in the god's eye view while physically grounded in the human's eye view, with our fleshy vision.

I have not seen *Drone Shadow 005* (2013)—my 'fleshy vision' fails to reveal it to me. Trevor Paglen's phrase for this is "meat-eyes" (Paglen, 2014). Paglen uses this term in his discussion of Harun Farocki's artistic work on 'operational images'— images produced by and for machines, that increasingly come to be unseen and unseeable by humans—to dramatise the limits of human biological vision in 'accessing' the scopic regime of contemporary operational images. Both of these phrases recall Denis Cosgrove's remark that "the eye is always embedded in a fleshly body" (2008, p. 5).

Drone Shadow 005 is perhaps a non-artwork, a project for another drone shadow in the series to be made in Brisbane, Australia, for which permission was withdrawn, for, in Bridle's view, reasons of political suppression. Bridle discusses the process of the work's non-realisation in two pieces of writing. But I want to encounter the artwork—not writing *about* the artwork—even if it has been rendered a non-artwork. I take my cue from the list of projects forming the menu of Bridle's website and take it that a hyperlinked title 'Drone Shadow 005' means, 'this is an artistic project'. It is perhaps an unconventional choice on my part to present a screengrab as an image of *Drone Shadow 005*; however, I want to take seriously the artist's own presentation of the work, which is an online presentation, small text on a white ground, available globally in ways that an in-person encounter with the installed drawing would not have been.

If a shadow is an index in one sense, do I then ask myself whether this webpage may legitimately be considered an index of the non-work? The drone shadows are not shadows after all, but they purport to be through their naming by the artist. They threaten the presence of a threatening shape; could I read the non-appearance of the

The fifth Drone Shadow was commissioned by the Brisbane Writers Festival for Brisbane, Australia. It was prevented from being installed by Arts Queensland, the arts board of the State Government. Read more:

Australia: Drone Shadows, Diagrams, and Political Systems at Booktwo.org

Statement on the Brisbane Drone Shadow at Booktwo.org

Figure 2.5 Website view of *Drone Shadow 005* (2013)[9]

Source: James Bridle

Brisbane shape as in fact the most successful of Bridle's drone shadows? The webpage stands in place of the artwork, a placeholder for a non-appearance.

In reacting to this non-work, I attempt to self-reflexively hold together my responses that are more in the mode of 'researcher' with those that are more in the mode of 'viewer', and an online viewer more particularly, who may click on and off a particular image, return to it, glance very quickly and find myself uninterested, performing in different ways some of the same viewing choices that I make in a gallery setting. As viewer *and* researcher I react immediately; I am also wary of artistic self-aggrandisement in the presentation of a politically thwarted artwork, while immediately according the project more significance for its apparent capacity to cause controversy. The potential drawing of the shape of a drone has had some political purchase in Brisbane, Australia, a place that is not a target of drone strikes. I carry away from my encounter with the non-artwork questions as to whether the 'making visible' that the drone shadows apparently perform is indeed offering any provocation to thought or criticism in the contexts in which they have been made.

Trevor Paglen—*Untitled (Drones)*

Trevor Paglen's work *Untitled (Drones)* (2010) forms the second artistic focus of this chapter. Paglen is also an artist working in multiple media, particularly photography, which he frequently uses to investigate the possibilities of making visible elements of secret state surveillance. Some of Paglen's artistic projects do use cartographic imagery, in particular his two recent diptychs, *NSA-Tapped Fiber Optic Cable Landing Site, Morrow Bay, California, United States* and *NSA-Tapped Fiber Optic Cable Landing Site, New York City, New York, United States* (both 2015). Both works present a landscape photograph alongside a companion image of a map with additional imagery, 'annotating' the primary map. These works form part of Paglen's ongoing project investigating government surveillance of data transmitted via the global network of under-sea cables, part of the material basis of the internet. However, Paglen uses demonstratively high-tech photography much more frequently than cartographic images, including aerial photography, telephoto lenses and observatory cameras.

The Other Night Sky (2007–11), for example, is a series of photographs of classified US satellites created using a variety of photographic devices and realising an extensive project researching satellite tracking and covert government projects. *Limit Telephotography* (2007–12) uses telescopes to enable photography of classified military bases and installations that cannot be seen with the naked eye of a member of the public due to their geographical positioning within restricted access areas of the landscape. *Code Names of the Surveillance State* (2014) takes an interest in the code names of covert US operations and locations, and was realised as a series of projections on buildings in London, including the Houses of Parliament, to accompany the 2014 release of the film *Citizenfour* that focuses on the Edward Snowden revelations of NSA global surveillance.

Trevor Paglen's photographic series *Untitled (Drones)* (2010), the second artistic focus of this chapter, is presented as an elegant grid of square thumbnail images on his website.[10] The images are un-numbered and 'untitled', although after each labelling of 'untitled' there follows the generic name of a model of 'unmanned aerial vehicle' (UAV)—'(Reaper Drone)', '(Predator Drones)'. Each image is also labelled with the information 'C-Print, 48 × 60 inches, 2010'. These online images, then, are in some

Figure 2.6 Documentation of *Code Names of the Surveillance State* (2014)
Source: Trevor Paglen

ways secondary, referring to physical prints. As with Bridle's work, I want to attend to the ways in which I encounter these artworks, on-screen and online.

The first image in the series is called *Untitled (Reaper Drone)* (Figure 2.7) and shows a brilliant red, purple and blue sky, painterly, with the red concentrated at its most vivid toward the bottom edge of the image and a swathe of purple and blue across the top. At the right-hand side, almost at the very edge of the image, I see a black dot. No other physical elements appear in the image, whether persons, landforms or objects. As I look, I feel fairly confident that I am viewing this picture 'the right way up', that is, that it has not been rotated by the artist, but I am simultaneously aware that I cannot pinpoint what it is in the image that I use to build this confidence.

The second image (Figure 2.8) is called *Untitled (Reaper Drone)* and shows a pale yellow and blue sky, the yellow in the lower third of the image deepening toward the lower right-hand edge, the blue rising clear to the top of the image, and some pinkish grey clouds sweep from the right. Higher-level clouds, white, form two curving lines across the blue section and recede into the yellow distance. Below them, in the yellow part of the sky, I see a black dot; again I see no other contextualising elements.

The third image is called *Untitled (Predator Drones)* and shows a very pale blue sky, becoming white toward the lower right-hand corner, with some indistinct shapes of cloud wisps. The clouds are too indistinct to give any sense of scale or distance, and

Figure 2.7 Untitled (Reaper Drone) (2010)[11]

Source: Trevor Paglen

Figure 2.8 Untitled (Reaper Drone) (2010)
Source: Trevor Paglen

again no trace of land enters in. In the lower, white part of the image, I do not see a black dot; in the upper, bluer part of the image, I look but do not see a black dot. The fourth image is called *Untitled (Reaper Drone)* and shows a large central cloud form occupying the central area of the composition, with a feathered edge to the left, giving way to blue sky. The cloud darkens to a mauvish grey at the upper left corner, and a particularly vivid, almost turquoise area of sky appears below this, a small reach of dark-grey cloud below again. At the lower left corner on a ground of slightly dappled pale-grey cloud, I see a black dot.

The images are un-numbered, and I cannot detect the black dot in all of them, the dot that I am taking to be the entity named by the words *Predator Drone, Reaper Drone*.[12] The fifth image shows a vivid sunset with dark clouds, the sixth a delicate mix of blue with pink clouds, the seventh a bright, warm yellow petering into mainly off-white. The eighth (Figure 2.9) feels different, catching me for a moment with the thought that I might be looking at a seascape. I pause to resolve the composition out of being a wave washing over sand; an area of ochre and dappled white in the lower left corner forms a diagonal boundary with a central section of blue showing through tightly rippled white cloud and another diagonal boundary, less definite, with a strong
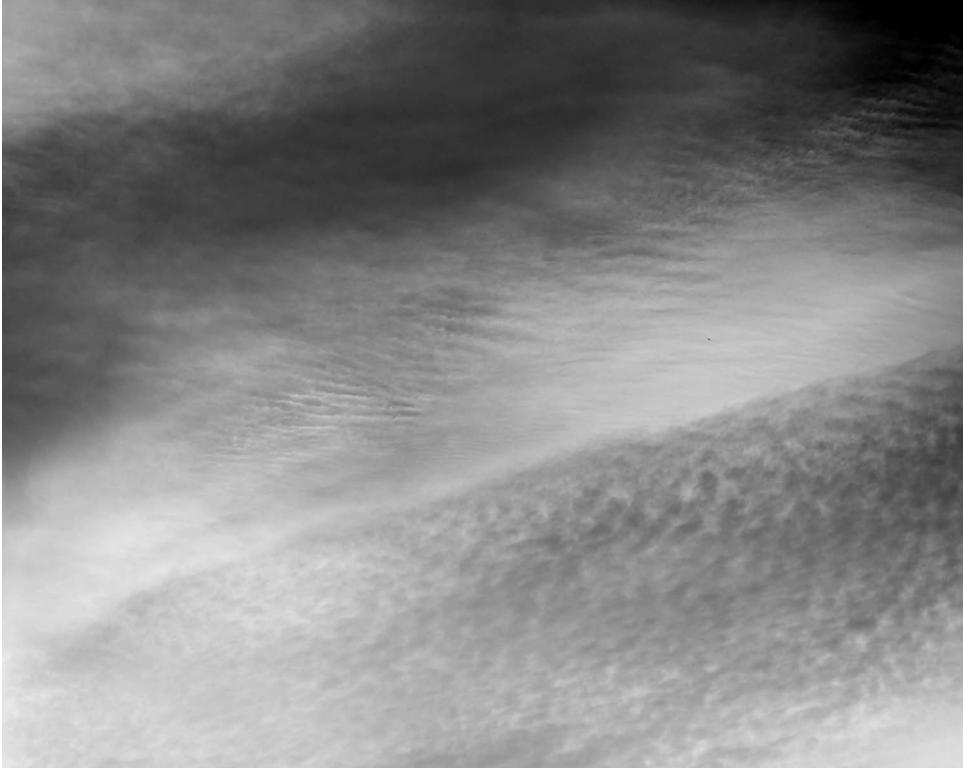
Figure 2.9 Untitled (Reaper Drone) (2010)
Source: Trevor Paglen

band of grey. The tight ripples are the only element that gives me a sense of upright-ness, being the right way up, vertical. To the right-hand side of the central diagonal section, on a ground of tightly creased white cloud, I see a grey dot.

What do I see when I look at these pictures? I have trouble seeing past the immedi-ate move of presenting a series of pictures that are *about* something unseen, unseeable in the given circumstances, unseeable from standing on the ground. From such a position, were I there in person, I would be able to see the sky and all the rest of the visible world that Paglen has de-selected for appearance in this work. The choice to view only the sky feels very important, as does the painterly feeling of the skies that have been chosen. The generic sense of 'sky' is at once familiar and less familiar, attractive yet made unset-tling through appearing in a photographic series that designates these skies as places for drones. I wonder what else might or might not be in that sky. If I think of it as a volume, it might contain more than the advertised drone-planes, like other mechanical bodies, like moisture, which indeed we can see, or detainees in planes, or there might be a bal-loon, or birds, perhaps of more than one kind, or what unseen other things?

The premise of the work is the photographing of drone-planes, so the choice as to when to photograph is delimited by when the drones fly. None of the images shows a clear blue sky. They all show variety and interest, shape, at least two prominent

colours around which the lesser colours range. As a viewer, I am aware of being 'asked' to take it on trust that these images 'contain' one or more drones; in some, the black or grey dot gives me something to anchor this idea, while in others not even this minimal visual element is offered.

In looking at these images, I know immediately that I am looking for something that is not the picture; the picture at once stands for something else, it immediately has no title and a title, and I understand that I am meant to look all the way through and past the picture to the idea of what doesn't quite appear in it. This not-quite-appearing, or disavowal of appearance, is performed in the images and in their titles—the claim of being untitled while being quite particularly titled, though with labels no more specific than the name of a type of drone, no date more particular than the year, no geographical information about where the photograph has been made (from), direction of view, time of day, beyond what we can gather from sunset, not-sunset, whatever sense of time we might gain from the light. The skyscapes are abstracted *from* their particular places, their particular geography, into just skies as a category and a place in general for drones to go about their ambiguous non-appearing.

Turning to a consideration of Bridle and Paglen's series' together, I want to consider what may be drawn out of these experimental, impressionistic and necessarily subjective interpretations of artworks that do not, perhaps paradoxically, perform what we might think of as 'literally' or 'actually' a drone's eye view—video footage or stills derived from a drone's video cameras (whether simulated or 'found' online). I am aiming to re-think the drone's eye view beyond the established parameters and touchstones of existing debates. Secrecy and invisibility are key themes,[13] joined with representational strategies that seek to counter the militarised production of invisibility by taking a decidedly pro-active approach to making things visible.[14] A problematic technofetishism, in close conjunction with a drone sublime, marks both drone 'practice' (for example, marketing images) and critical and creative responses.

I want to ask slightly different critical questions to offer ways to move beyond the discourse of (in)visibility; working with the idea that a 'higher-order' structure of abstraction organises the production of a variety of contemporary manifestations of cartographic abstraction, I explore here how this theoretical approach may enable critical progress beyond the paradigm of visibility. For this reason, I explore an approach to developing an avowedly subjective interpretation of two critical artistic projects that engage with the drone's eye view in ways that do not immediately evoke the point of view of the drone as an aircraft.

This approach, as seen for example in Bridle's ongoing critical artistic project *Dronestagram*, reproduces the limited legibility of the photographic aerial view. As Parks has argued in relation to the orbital satellite view, this positions the viewer in such a way that while we may see, we are not furnished with the training and experience necessary to generate a meaningful interpretation of what we see. "[T]he citizen-viewer is invited to temporarily occupy the orbital gaze but lacks the intelligence necessary to decode and interpret the view" (Parks, 2005, p. 96). It is with this problematic in mind that I reconsider *Under the Shadow of the Drone* and *Untitled (Drones)*.

Both works engage with the ambiguity of the question of making the drone aircraft visible, *Untitled* in its appearance in the skyscape and *Under the Shadow* in a fictional and immaterial presence at ground level. A human-photographic viewpoint is performed in *Untitled*, with photographic vision yielding images in which the visual is intentionally unable to be productive of knowledge of the drone, as it appears as

a dot or speck without the capacity to produce the signification 'drone' outside its relationship with the information provided by the artist alongside the image. The drone appears as a distant and unknowable form, moving between appearance and non-appearance, visibility and non-visibility.

An element of the drone sublime is in play in particular in the two *Untitled* images depicting the sky at sunset—a classic pictorial device of promotional military photography. A critically somewhat unfashionable beauty is also an important element of Paglen's *Untitled* images. The skyscape appears as a site of scaleless space, unrelated to the scales of the human, the urban or the landscape. Within this pictorial space, the drone is rendered as the human target frequently encounters it: a remote and inscrutable threat, moving between visibility and non-visibility. A question of the production of the drone's eye view is at stake here, in the form of viewing at a distance that is performed at the ground level of the (non-aerial) human.

Under the Shadow of the Drone produces a more complex viewing position. The in-person viewer encounters the drawing from their own height, and it appears at ground level, while the viewer of documentary photographs views from the elevated position of the photographer, looking down on the drawing from a more-than-human height. Both views perform a simultaneous viewing from above and below the drone aircraft that is posited by the 'shadow', as the drone outline reads as the same shape viewed imaginatively from both directly above and directly below.

These approaches to visibilising the drone continue to focus on the physical form of the drone aircraft, and where I read *Under the Shadow* as more complexly engaging the production of an abstracting viewpoint in relation to the drone, its reproduction of the physical drone as an iconic visual form remains a critically limiting factor in terms of engaging with the ongoing reproduction of the abstraction of the drone's eye view. I return, in what follows, to the importance of enabling an approach to the networked character of drone vision that emphasises the interdependence of elements beyond the register of the technological. Similarly, recognising productive interdependence as a condition of drone viewing must also enable critique to move beyond engaging only with the register of the visual. Critical creative emphasis on the drone-as-aircraft, then, risks foreclosing wider recognition of the non-visible elements that structure the production and reproduction of the drone's eye view (for example, workers, both military and non-military) and through it the use of the drone as a form of aerial domination.

In the rest of this chapter, I consider the more theoretical concerns arising from my engagement with Bridle and Paglen's artworks. I take a self-reflexive approach to theorising my own critical position in the context of the drone's eye view, as a viewer who is 'grounded', viewing at ground level, while also inhabiting and performing a networked mode of vision. I argue for the need to work productively and thoughtfully with the positionality of the 'critic of violence' (Chamayou, 2015, p. 199) who is also a 'subject of a drone-state' (ibid, p. 18)—the condition of millions of us living in the present.

Self-Reflexivity and Viewing From 'Somewhere'

I articulate a resistant critical position that moves beyond the exclusionary and binarised formulation of 'aggressor' and 'victim' to work towards a much broader formulation of being critically resistant to practices of militarised domination—specifically in the register of drone practices—through drawing on notions of complicity, locatedness

within the 'heartlands of capitalism'[15] and self-reflexivity. These concerns inform the conception of the drone's eye view that I am putting forward; where it is beyond the scope of this study to elaborate on all of these points I still think it worthwhile to indicate what I see as the political possibilities that both inform and flow from an elaboration of cartographic abstraction and its lived effects at the level of real persons.

Trevor Paglen and Gregoire Chamayou offer useful points contributing to a recognition of the necessary 'return'[16] to these 'heartlands' of techniques, technologies and modes of visualisation that have developed with an orientation toward domination and visualising of the other—and 'return' here does not necessarily indicate a time lag. Paglen has noted such a return of material and social effects of technologies of bombardment into the originating landscape—that is, unintended consequences of developing increasingly advanced destructive capacities, in the form of the material degradation of the land, water, air and subject-bodies of the heartland. In his discussion of the US development of 'stealth' flight in the 1980s, whose negative effects began to be publicly noted in the 1990s and 2000s, Paglen remarks that

> The stealth program had taken an unforeseen turn [. . .] the chemicals leaking through the ground and cracks in the walls of the Skunk Works factory and the thick smoke from burning pits at Groom Lake brought the reality of the stealth program to land and bodies. Stealth insinuated itself into the groundwater, the soil, and the flesh of communities in its vicinity [. . .] even making its way into the bodies of the workers around it.
>
> (2010, p. 765)

Paglen's emphasis on the physical, embodied nature of workers and persons as parts of communities reinforces the claim for the deeply interconnected and networked character of the drone's eye view. Chamayou considers the 'essence of combatants' particularly in terms of drawing a distinction between legitimate fighting and non-legitimate assassination. Chamayou draws on Kant's argument that it must be regarded as illegitimate for a state to turn its subjects into assassins because of the degradation this would entail for the idea of the citizen: "The theoretical principle Kant formulates here concerns what *a state may not make its citizens do* [. . .] The underlying idea is that what a state can make its subjects do is limited by what that would make them become" (2015, p. 196, emphasis in original).

Chamayou considers the limits of applying ethical conceptions at the level of the individual soldier and attends to the broader question of posing a resistance to the moral degradation of the soldier by asserting the shared interest of a 'common humanity' in what soldiers may become. This form of resistance was posed particularly by the American anti-war movement in response to the American war in Vietnam.

For our purposes here, it is worth pausing over Chamayou's discussion for its relevance to the critical position I take up in relation to Bridle and Paglen's artworks. I want to draw from Paglen and Chamayou a broader possibility to pose and problematise an idea of a 'return' or a rebounding of negative consequences to the 'heartlands of capitalism'. I locate and enact this critical insight in the position of the (self-reflexive) viewer of these particular artworks that address 'grounded' viewing, because this offers the possibility to expand the overly narrow terms through which drone discourse is currently limited. In this way, the twin focus on drone

operator and drone victim can be extended to engage the position of the subject who views, or fails to see, drone-bodies; who contributes to the ongoing reproduction of the drone through the social relation of money; who makes artworks and critical writings, and whose networked form of viewing is manifested online; who awaits an already-present "future of video surveillance with armed drones [. . .] if we don't prevent it" (Chamayou, p. 204).

In seeking to move beyond the established terms of ethics and rights, Chamayou states the problem as a question of 'becoming'. For the soldier who would not become an assassin, "[t]he crucial, decisive question is not 'What should I do?' but 'What will I become?' I believe that within this question of what agents of armed violence become there lies a very important point: what is the subjective position that a critic of violence can adopt?" (Chamayou, 2015, p. 199). Where anti-war movements have sought to pose resistance to militarised violence, Chamayou asserts the need to "move on from a personal refusal to a general refusal, in other words a political one" (ibid, pp. 199–200), and a broadened, generalised position of refusal is, for Chamayou, one that "contests the violence of the state on the basis of the essence of its constituent subject" (ibid, p. 201). While I support his insistence on expanding the terms of refusal, Chamayou's argument is ultimately rendered ineffectual in its insistence on attaining a politically cleansed position for the individual subject. The political objective is not to secure a satisfactory ethical position for the individual subject, but rather to resist and overcome state-led violence.

It is this concern with broadening the scope of the critical debate that I want to draw from this particular area of Chamayou's argument rather than solely his emphasis on the ethical implications for the subject. As Chamayou rhetorically poses this problem:

> The generalization of such a weapon implies a change in the conditions that apply in the exercise of the power of war, this time in the context of the relations between the state and its own subjects. It would be mistaken to limit the question of weaponry solely to the sphere of external violence. What would the consequences of becoming the subjects of a drone-state be for that state's own population?
>
> (ibid, p. 18)

The Scopic Regime of the Drone's Eye View: Persistence, Totalisation and Targeting

The subject of the drone state, who views from somewhere rather than nowhere, is subjected to multiple technologies of visualisation. These technologies constitute the " 'scopic regime' through which drone operations take place",[17] and Derek Gregory and Chamayou have given them the most concerted scholarly attention. 'Drone' is the colloquial term in use to designate mainly aircraft, and particularly those that have been weaponised and are used in military contexts, most particularly in the 'War on Terror' and predominantly by the US. As Chamayou notes,

> In the official vocabulary of the U.S. Army, a drone is defined as 'a land, sea, or air vehicle that is remotely or automatically controlled'. The drone family is not

composed solely of flying objects [. . .] Provided there is no longer any human crew aboard, any kind of vehicle or piloted engine can be 'dronized'.

(2015, p. 11)

In the broadest sense, 'dronization' simply designates remote control. In attending to 'the drone' as a mode of visualisation, it is clear that contemporary drone technology has indeed borne out Chamayou's claim that military drones' "history is that of an eye turned into a weapon" (ibid).

However, against his assertion that the "best definition of drones is probably the following: 'flying, high-resolution video cameras armed with missiles'" (ibid, p. 12), it is important to note that recent models of military drones coming into widespread use are not directly weaponised. The largest drone aircraft as yet developed, the RQ-4 Global Hawk, does not itself carry ordnance.[18] In identifying the drone's eye view as an abstraction, this claim must enable us to pay attention to, rather than prevent us from noting, the specific modes of visualisation that are enacted by militarised drones.

The capacities that are currently being prized in drone development are those that enable drones to visualise their targets more intensively: in terms of 'persistence', that is the capacity to remain airborne for extended periods; 'wide-area' surveillance capable of visualising an area the size of a city; and operator flexibility in terms of moving between different levels of detail seamlessly as required. 'Gorgon Stare' and 'Argus' designate the most up-to-date in militarised visualisation systems about which significant information is available in the public domain.

They are two systems developed—and being continually refined—essentially simultaneously, the Gorgon Stare by the Sierra Nevada Corporation and Argus by DARPA[19] and BAE Systems,[20] with both systems in use with US Air Force (USAF) drones.[21] Argus is an acronym, standing for Autonomous Real-time Ground Ubiquitous Surveillance Imaging System, or ARGUS-IS. The arms producer BAE Systems describes this system as "the next generation of wide area persistent surveillance",[22] enabling "unprecedented capability to monitor events in real time, using a 1.8 gigapixel color camera, at resolutions supporting tracking of people and vehicles" (ibid). It is a system that has been developed to function distinctly from drone technology per se and is 'mounted' onto a range of types of aircraft, including the A-160 Hummingbird, which is a drone, or 'unmanned', helicopter.[23] Similarly, the Gorgon Stare system is

> a spherical array of nine cameras installed onboard General Atomics MQ-9 Reaper remotely piloted aircraft (RPA). It provides real-time situational awareness for both soldiers and commanders involved in large scale operations. Near-real-time forensics capability provided by the system enables rapid adversary pattern-of-life analysis.[24]

The developers of both systems emphasise the ease with which operators of the systems can move between different scales of visualisation, making it a simple matter to track individual persons or vehicles through the complexity of the urban environment. The Gorgon Stare is deployed on unmanned aerial vehicles (UAVs), and the aircraft on which these visualisation systems are deployed are significant in constituting the effectivity of the visualisation. Longer 'loitering' times afford

more extensive opportunities for gathering visual data. Gorgon Stare also offers the capacity to visualise the target area during darkness. While the Argus system was initially operational only in daylight, an infra-red version was developed by DARPA.

The names applied to these visualisation systems are significant, as Mark Dorrian has noted:

> mythic and magical attributes are implied by the names of the visual technologies carried by drones, which invoke archaic monsters of vision [. . .] the giant Argus Panoptes—the mythic all-seeing servant of Hera whose hundred eyes, in Ovid's telling, are commemorated in the peacock's tail—is reinvested as an acronym.
>
> (2014, p. 48)

The Sierra Nevada Corporation's emblem of the Gorgon Stare incorporates an image of a Gorgon head alongside the motto 'oculus semper vigilans', or 'always watchful eye' (ibid). As the mythological Gorgons possessed the capacity to turn those who viewed them to stone, Dorrian has rightly further noted the implication of the lethal power of seeing:

> Commentaries on the Gorgon Stare epithet have of course linked the name of the technology to its purported ability to arrest through representation. But the real desire to which the name points is the collapse of the acts of seeing and killing into one another, the conferral of death in the moment of visualization.
>
> (ibid, p. 49)

However, as noted, the contemporary development of unarmed drones argues against this notion of a general and impractical drive towards visualising-as-killing. The emphasis is rather on knowledge and control over the option to exercise lethal power as desired.[25]

The 'Light of God' is a further term for one of the technologies involved in the drone's eye view. It has become associated with 'buddy-lase' laser targeting technology, which again is associated with but not exclusive to drones. 'Buddy-lase' refers to the capacity for aircraft to emit a laser identifying a target to other operating forces in the immediate vicinity. This targeting signal is visible only to those equipped with the appropriate visualising equipment, night-vision goggles. USAF identifies both the MQ-9 Reaper and the MQ-1B Predator as having buddy-lase capability, but not the RQ-4 Global Hawk or the RQ-11B Raven.[26] An officially sanctioned article describes this technology: "The Buddy Lase system provides a precise laser spot for terminal guidance of laser-guided bombs and missiles. [. . .] 'The new capability is extremely valuable,' said Maj. Tanner, 489th Reconnaissance Squadron pilot."[27]

The term 'Light of God' has been popularised through Omer Fast's 2011 film artwork *5,000 Feet is the Best*, which deals in part with a fictionalised account of a former drone operator's experiences in combat operations and his subsequent diagnosis with post-traumatic stress disorder (PTSD):

> We call it in, and we're given all the clearances that are necessary, all the approvals and everything else, and then we do something called the Light of God—the

Marines like to call it the Light of God. It's a laser targeting marker. We just send out a beam of laser and when the troops put on their night vision goggles they'll just see this light that looks like it's coming from heaven. Right on the spot, coming out of nowhere, from the sky. It's quite beautiful.[28]

It is noteworthy that the account of this technology that associates it with 'god' derives in large part from an artistic work, whereas the US military's official terminology associates this targeting capacity with co-operation and even friendship in the colloquial 'buddy'. Where a drone deploys the buddy-lase system of laser targeting, it enacts the capacity to target remotely and to 'call in' a lethal strike that is enacted by other aircraft, whether manned or unmanned. The distinctive quality of the buddy-lase system, and the wide-area airborne surveillance systems currently epitomised by the Argus and Gorgon Stare technologies, is that when they are 'mounted' on drones as opposed to manned aircraft the extended loitering capacities of drones mean that these visualising systems are employed for much longer periods than have hitherto been possible.

The capacity to surveil for extended periods has also contributed to the discontinued practice of 'signature strikes' (Schuppli, 2014, p. 2), whereby 'pattern of life' analysis identifies people as targets based on their behaviour. As Derek Gregory writes,

'High Value Targets' are named and made the object of 'personality strikes'—although in Afghanistan many of them have been nexus targets with only proximate associations to senior Taliban or al-Qaeda fighters—but most targeted killings are 'signature strikes' against anonymous ('faceless') subjects. They are brought within the militarized field of vision through the rhythmanalysis and network analysis of a suspicious 'pattern of life', a sort of weaponized time-geography.

(2014a, p. 13)

Persons are targeted and killed through this method on the basis of their conformity with, or sufficient similarity to, a pattern that has been pre-determined as signifying terroristic activity.[29] This mode of constituting the viewed persons and places uses a schematic approach, assimilating the viewed to the operational category of 'target'. The ability to accumulate data on movements through time, and thus to ascribe target status to surveilled persons, accrues to the drone through the combined operation of its capacities to loiter, to view in close detail and to apply pre-formed schema with which to apprehend the surveilled subject.[30]

Aerial Viewing: The God's Eye View, the Drone's Eye View and Derealisation

In order to contextualise cartography's view from nowhere as both a development and a condition of possibility of aerial viewing, I want to consider a technological trajectory of instantiations of viewing from above. Here the god's eye view is re-inhabited, re-materialised, instantiated by the militarised figure of the drone. In the shift from the god's eye view to the drone's eye view, 'god' is substituted for drone-eyes, computers, cameras—a networked, technological and distributed vision. Benjamin Noys has suggested a convergence between the figure of god and the capacity of mechanical flight to act into the god-position in quoting Mary Butts's short story 'Speed the Plough': "great aeroplanes dipping and swerving, or holding on their steady flight like

a travelling eye of God" (Noys, 2014, p. 1). He highlights the intimate conceptual link between god-seeing, from the god's eye view, and technological seeing, embodied yet elevated, human yet always-already mediated. Militarised technologies have played an important role in the development of the technological capacities that facilitate and construct human viewing from above.

Aerial modes of bombing and surveillance have been co-constituted primarily in the context of military reconnaissance. As Allan Sekula has noted in his influential 1975 article 'The Instrumental Image: Steichen at War',

> [t]he First World War was the first occasion for the intensive use of aerial photography for 'intelligence' purposes. The previous half-century had yielded combinations of balloons and draftsmen, balloons and cameras, rockets and cameras, and, absurdly enough, pigeons and cameras. With airplane photography, however, two globalizing mediums, one of transportation and the other of communication, were united in the increasingly rationalized practice of warfare.
>
> (1975, p. 27)

Likewise, in her discussion of the emergence of 'militarised aeromobility' (Adey et al, 2013), Caren Kaplan characterises aerial viewing as intricately bound up with military needs and the technological developments driven by them. Militarisation, she argues, is an intrinsic process of the nation-state and has motivated the emergence of a series of technologies designed to instantiate an aerial view of the earth's surface. Introducing the volume in which Kaplan writes, Peter Adey, Mark Whitehead and Alison J. Williams position the development of aerial viewing technologies strongly in their militarised context:

> Height and verticality are values that are commonly associated with dominance and the projection of force. The USAF motto ['Above All.'] implies a totalising position difficult to equal. [. . .] Violence, security and a whole terrain of movements, technologies, practices and representations—like those portrayed on the hour and every minute during the war in Iraq—rely on height and the vertical. This book asks difficult questions of this view, as for all its spectacle and beauty, we must be careful not to celebrate it.
>
> (Adey et al, 2013, p. 2)

Jeanne Haffner further argues for the capacity of the aerial photographic view to produce coherence through abstraction: "Abstracting the outline or form of different sections of the front was especially important" so that "[t]he result [. . .] was a 'holistic' view of the battlefield—a 'vue d'ensemble' such as could not have been obtained from ground-level excursions alone" (2013, p. 12). As Monmonier has shown, the aerial photograph, and by extension the satellite photograph, remains a perspective view, whereas the distinctively cartographic view is planimetric (1996, p. 33).

Planimetric distance is horizontal distance measured on a plane; consequently, this view suppresses vertical distance in the two-dimensional map image, whereas a 'vertical aerial photograph is a perspective view' "with points displaced radially from their planimetric positions" (ibid). Monmonier describes this as 'radial displacement due to relief' or 'relief displacement' (ibid, p. 34). "An exception is the *orthophoto*, an air-photo image electronically stretched to remove relief displacement. An

orthophotomap, produced from orthophotos, is a planimetrically accurate photo-image map" (ibid, p. 34, emphasis in original). This is also a description of the reconstruction of the cartographic view from nowhere via the newer visualising technique of photography, whereby the orthophotomap is the photographic parallel of the view from nowhere. Aerial viewing is therefore deeply entwined with cartographic planimetric or synoptic viewing, and the two modes converge in drone vision as a particular form of militarised aerial vision. Drone viewing is an extension or production of the cartographic abstraction of the view from nowhere.

Considering militarisation as a productive force in the development of aerial viewing allows us to keep in view the economic and social factors that contribute to the reproduction and development of the cartographic mode of viewing from above. The tension between embodiment and disembodiment is dramatised in the contemporary icon of the drone and may be elaborated through Michael J. Shapiro's concept of 'derealization' (Shapiro, 1997). Shapiro positions 'geographic imaginaries' (1997, p. ix, Gregory, 1994) and cartographic imaginaries as underwriting the discursive objects of international relations and security studies while holding away from analysis the production of these discursive objects. He is concerned with "the cartographic dimensions of representational violence" (Shapiro, 1997, p. xiii) and its relations to the production of nation-states and their contemporary discourses of war.

In the context of the first Gulf War, Shapiro identifies a transition in the practice of war toward "remote forms of enactment" (ibid, p. 74), in which "each technological development produces a more prosthetically mediated warring body and an increasingly virtual geography" (ibid). In this increasing distancing and mediation, Shapiro identifies an effacement of the victim of war:

> the technologies that permitted killing in the absence of seeing had removed specific, suffering bodies in a way similar to the way they are effaced in the theoretical language of war, as war discourse has increasingly moved from images of flesh to images of weapons and logistics.
>
> (ibid, p. 75)

The first Gulf War is seen here as an exemplary scenario (ibid, p. 80) in the advancing of technological mediation of war, and Shapiro argues for the importance of media in this context: "the targets of lethal violence were glimpsed primarily on video devices and were rarely available to direct vision" (ibid). However, this is not seen as a completely new situation but a nuancing of the existing character of large-scale combat:

> Although it has always been the case to some extent that during large-scale hostilities the enemy/object of violence is familiar neither to the antagonistic populations nor to the combatants, in modern warfare, the visioning and weapons technologies render the antagonists even less familiar by derealizing or dematerializing them—by apprehending and targeting them primarily through remote visioning devices.
>
> (ibid)

The concept of 'derealization' is "the process by which increasingly abstract and distancing modes of symbolic representation mediate the relationships through which persons and places acquire meanings" (ibid, p. 88). In Shapiro's argument, this process begins

with the First World War and culminates in its contemporary phase, inaugurated with the Vietnam War and the extensive use of aerial reconnaissance techniques, producing an extended 'kill chain' (Gregory, 2011a). Shapiro identifies 'derealization' with a loss of contact and presence, as increasing technological mediation combines with an increasing role or presence of "reigning abstractions" (1997, p. 89), such that in the context of military targeting, the body of the victim comes to be effaced and unseen.

Drawing on Karl Marx's analysis of the money form, Shapiro deploys a narrative of increasing distance and separation in the development of the money form as the universal equivalent to support his narrative of increasing abstraction in militarised human relations. He sees a comparable trend toward derealisation in Marx's account of the money form, which progresses from "the development of extended equivalents in which, to employ his metaphor, one commodity serves as the 'mirror' of another" (ibid, p. 90), such that the value of each commodity is 'expressed' in the bodies of all other commodities.

From this extended relation of equivalence, the universal equivalent develops, facilitating the commensuration of radically different forms of human labour and forms of exchangeable objects. Shapiro sees Marx as having "lamented [. . .] the obscuring of the human involvement immanent in the production of value when commodities are read only on the basis of exchange value" (ibid, p. 91). Exchange takes place among 'abstract individuals' (ibid) whose relations to one another are depersonalised and distanced by the mediation of the money form.

The concept of derealisation is useful despite being somewhat one sided, directed toward an idea of continual increase of loss or effacement. The intimate yet remote view in which the drone pilot encounters a target person runs counter to Shapiro's emphasis on derealisation as somehow yielding 'less' seeing in the effacement of the victim. In drone viewing, the victim is newly and vividly visible (see for example Gregory, 2011a, p. 198) to the grounded-yet-virtually-aerial drone operative. The construction of this form of remote viewing is reflected in contemporary attitudes and state discourses that foreground a removal of the body of the pilot from 'harm's way' while tacitly or overtly endorsing the extensive and increasing deployment of armed drones against civilian targets.

Derealisation must be understood to operate in productive tension with the embodied and networked character of drone viewing, reliant as it is on 'operatives' (pilots), military personnel in distributed locations, and traditional pilots (Gregory, 2014b). Gregory's emphasis on the importance of understanding the drone as embedded within networks of geographically dispersed actors and technologies chimes with a broader theoretical nuancing of the Baudrillardian position of a progressive loss of the real in the postmodern transition to the hyperreal. As King remarks on Baudrillard's discussion of the Gulf War, "bomber crews saw not the actual target but its image on screen" (1996, p. 7), yet this deepening of the degree of abstraction present in 'militarized aeromobility' should not be uncritically interpreted as a progressive or increasing loss of the real (King, 1996).

The separation of the body of the drone pilot and the body of the drone aircraft also has implications for the understanding of subjectivity and agency in the drone's eye view and in other forms of abstract, cartographically structured viewing. Thrift and Pile draw attention to the relationship between subjectivity and the body:

> Nowadays, the subject and subjectivity are more likely to be conceived of as rooted in the spatial home of the body, and therefore situated, as composed of and by a

'federation' of different discourses/persona, united and orchestrated to a greater or lesser extent by narrative, and as registered through a whole series of senses.

(1995, p. 10)

This subject is in some ways very flexible and changeable, and in other ways it continues to be fixed and reliable. But it is always "located in, with and by power, knowledge and social relationships" (ibid, p. 11).

In the present context of cartographic abstraction, I read the tension between the displacement of the subject, derealisation and an increasingly networked, materialised drone vision as being mediated through the further abstraction of the cartographic god's eye view.

A degree of tension between technofetishism[31] and figuration, particularly anthropomorphisation, marks many contemporary accounts of drones, whether critical, scholarly or popular. As Gregory writes, "[m]uch of the critical response to drones is unduly preoccupied with the technical (or techno-cultural) object—the drone" (2014a, p. 7) and neglects the wider networks of technologies, actors and sites through which drones are able to enact violence. The drone is figured as at once sinister and lonely, powerful and sad.

With reference to Trevor Paglen's artwork, it has been claimed that "[t]he use of the 'drone's eye view' allows us to see as it sees, reinserting humanity back into the machine by using fiction, aesthetics and video to anthropomorphize the planes; the drone as a pair of eyes, albeit several stages removed."[32] The drone is figured as being an entity that is able to 'see', even as the lack of 'humanity' in the 'machine' is noted.

Paglen himself has also described drones in strongly anthropomorphic terms in relation to his 2010 video work *Drone Vision*, which uses 'found' US drone footage obtained via an unencrypted satellite link:

> The vast majority of the images are the drones targeting, practicing looking at roads very methodically, but there are a few moments where a drone looks around, looks up, looks at its surroundings. So it's like this drone is lost, looking at the world around it.[33]

Paglen characterises the drones as 'targeting' and 'practicing looking'; while targeting is a process that is increasingly subject to autonomisation, 'practicing' still suggests a very human process of learning a new technique. There is a conflation of an implied human operator with the 'techno-cultural object' of the drone 'itself' in this account, whereby the drone is figured as the entity that is seeing and looking around itself, rather than the drone operator being imagined as seeing and manipulating the drone's assemblage of cameras. The drone's 'looking up' suggests, for Paglen, a sympathetic state of lostness rather than a mechanical procedure.

Anthropomorphisation is also used by video artist George Barber in *The Freestone Drone* (2013), in which a rebellious drone[34] voices over footage of 'itself' in flight:

> While narrative unravelled on screen resists easy categorisation, the artist draws the viewer to empathize with the antagonist. Engendered with human consciousness and independence, the drone is a poet who disobeys orders and does his own thing, a child within a machine.[35]

Artist Kate Rich describes The Freestone Drone as "a familiar, impossible chimera—the soulful killing machine", and, referencing the Drone's squeaky speaking voice and appropriation of imagery of Thomas the Tank Engine, speculates that "our collusion with the drones goes way back beyond Playstation (the usual suspect) to toddler TV."[36] Early viewer training in anthropomorphic interpretation of machines is posed as a potentially more relevant forerunner than video games of the discursive tendency towards figuration and anthropomorphism in the context of drones.

Technofetishism is a feature of drone discourse that is closely linked to anthropomorphisation; the claims made by supporters of drones regarding their accuracy, extended flight times, and capacity to access targets who would remain inaccessible to conventional military techniques frequently celebrate the advances in technological capacity that are made possible through the removal of the pilot. Human error can also be figured as detrimental to the effective functioning of the drone, as Jordan Crandall (2013) notes in his account of a drone crash caused by a loss of 'situational awareness' on the part of the crew and resulting in the aircraft crashing into the side of a mountain.

The drone is imagined as being 'let down' by its attendant humans and their attendant weakness. Regarding this trope of technofetishism, in which we may read a certain narrative of perfectibility, Susan Schuppli has noted that "[a]s this new era of intelligent weapons systems progresses, operational control and decision-making are increasingly being outsourced to machines" (2014, p. 2). In this light, the application of technofetishism to drone discourse serves to facilitate both the increasing 'outsourcing' of decision making to non-humans and also public inattention to problematic implications of this development.

Where a technofetishistic attitude regards drone technology as more neutral, durable, reliable and less prone to bias and politics than the human operator or political decision maker, moments of 'going rogue' or 'wilfulness' are cast as a 'human' element that will be minimised with further autonomisation. The drone's non-human or anti-human viewing position and technologies are further reinforced as a position of power, control and knowledge generation.

Drone Vision as Networked, Dispersed and Composite

The thoroughly networked character of drone viewing may be read as a critical countering of the technofetishistic approach to drones. Emphasis on this networked and material character offers a critical purchase on destabilising the conception of 'the drone' as a sublime, solipsistic 'techno-cultural' object and enables an unpacking of the elaborate processes through which vision and failures of vision are produced.

Derek Gregory in particular has championed the need to critically explore this area. Noting the increase in the capacity of drones to capture vast quantities of visual data, Gregory writes, "to manage this image surge, the analytical field has expanded" (2011a, p. 194). A large number of human workers, technologies and locations are needed to carry out the surveillance, targeting and bombing functions of drones:

> UAV operators in the United States are embedded in an extended network that includes not only troops and Joint Terminal Attack Controllers using Remotely Operated Video Enhanced Receivers (ROVER laptops) on the ground in Afghanistan, but also senior commanders, mission controllers and military lawyers at

> CENTCOM's Combined Air and Space Operations Center [sic] (CAOC) at Al Udeid Air Base in Qatar [. . .] and data analysts and image technicians at its Distributed Common Ground System (DCGS) at Langley Air Force Base in Virginia.
>
> (ibid)

Gregory's recitation of the jargon and military 'officialese' with which institutions, technologies and locations are named underscores the proliferation of bureaucratic and support functions that accompany the material production of the drone's network. Gregory further emphasises that "UAV operators are never alone" (ibid), as well as the point that this situation constitutes "a dramatic change from the pioneer airmen celebrated [. . .] in the 1920s, and, for that matter, the experience of most other combat pilots today" (ibid). While the experience of these combat pilots is also produced through extended networks of logistics and labour, Gregory's insistence on the networked character of drone vision is based on the live interaction that takes place among operators, other pilots in the battle-space, analysts and particularly the video feeds which are analysed and used to inform operational decisions immediately.

A perspective from the wider military industry supports Gregory's position:

> Ground control is an often overlooked aspect of unmanned aerial vehicles (UAVs). Indeed, UAV is a misnomer because these aircraft are anything but unmanned [. . .] The role of the ground control station (GCS), therefore, is of paramount importance not only as the point of control but also as the point from where information is understood, disseminated and acted upon. As far as technology goes, the UAV could be said to contain the "senses" while the GCS, is both the central nervous system and the brain.[37]

Metaphorically likening the drone network to the human or animal body, this account figures the drone as the sensory apparatus of a system whose decision-making capacities are physically separate. This interpretation supports Chamayou's characterisation of drones as a "network of eyes [that] remains in constant communication with one another" (Chamayou, 2015, p. 2). Taking into account this distributed character of the functions of 'seeing', decision making, control of the drone in flight and real-time analysis of data, the production of the drone's eye view emerges as the production of a networked view.

The concept of the networked view also offers greater coherence to the theme of the removal of the drone pilot from the aircraft and drone fallibility. The fantasy of the removal of the human body from 'harm's way' is often cast as a humanitarian concern, and indeed Chamayou notes the question of vulnerability: "[s]elf-preservation by means of drones involves putting vulnerable bodies out of reach" (2015, p. 12). However, as he goes on to note, this vulnerability is less to potential suffering than to the capacity of the body to be taken prisoner. In a highly significant footnote, Chamayou quotes a *New Scientist* article published in 1972 to argue that the removal of the embodied pilot from the bomber aircraft appeared to

> offer the solution to the political contradictions of the Vietnam War: "The intensified bombings of North Vietnam since the beginning of the year has swelled the ranks of the more than 1600 American servicemen believed held prisoner in

Indochina. Taking the pilots out of the bombers will remove a serious obstacle to the Nixon Administration's avowed intension [sic] to maintain American air-power in South Asia.

<div align="right">(2015, p. 233)</div>

Pilotless flight therefore addresses the dual desire to remove the problematic body from the scene of bombing and to move closer to a technically mediated dominance akin to the invulnerable power performed in the god's eye view (discussed in more detail in what follows): "it becomes a priori impossible to die as one kills" (Chamayou, p. 13). The withdrawal of the pilot and the expansion of the network contributes to the fantasies of invulnerability and perfectible vision. However, as Gregory emphasises, this networked mode of visualising importantly produces occlusions and invisibilities.

In a close analysis of an air strike[38] carried out in Afghanistan in 2010, Gregory argues that the role of the US drone's video feeds was more than "a predisposition on the part of the Predator crew to (mis)read every action by the victims as a potential threat." Rather,

> the Predator was not the only 'eye in the sky', its feeds entered into a de-centralized, distributed and dispersed geography of vision in which different actors at different locations inside and outside Afghanistan saw radically different things, and the breaks and gaps in communication were as significant as the connections.

Rather than affording full knowledge of unfolding events, therefore, the drone's eye view must be understood as a complexly produced abstraction that is 'distributed and dispersed'. The viewing practices and the interpretative practices that it fosters produce occlusion and unclarity, as well as unprecedented levels of data on viewed subjects. This capacity to produce huge amounts of data supports the concept of the 'all-seeing eye' associated with drone viewing. However, as the capacity to gather data is not matched by capacity to interpret,[39] what is produced through these practices is necessarily also 'breaks and gaps', silences, and invisibilities: "these visibilities are necessarily conditional—spaces of constructed visibility are also always spaces of constructed invisibility" (Gregory, 2011a, p. 193).

Gregory has noted the changing 'kill-chain' (2008, p. 9) with the inauguration of widespread drone use:

> the targeting cycle [has] accelerated, and the 'kill-chain' has since been further compressed by the introduction of adaptive targeting, which depends on the local identification of emergent 'targets of opportunity' by ground forces who call in close air support from fighters already in the air. At the same time, it has been possible to increase dramatically the distance between target and command centre.

<div align="right">(2008, p. 9)</div>

'Compression'[40] of the kill-chain refers to its temporal compression; a geographical expansion has accompanied this temporal compression, such that numerous actors in a wide range of locations are involved in targeting and killing. The kill-chain is also an interpretative chain in which widely dispersed actors both form and act upon interpretations that are necessarily formed through access to data that is incomplete.

The fantasy of full visibility and full knowledge that is so strongly connected with the contemporary discourse of the drone is one of the most important manifestations of the god's eye view. The distance or slippage between the god's eye view and the drone's eye view produces an area of political ambiguity, in which full vision and therefore full accuracy of drone strikes continue to be both claimed and disavowed.

In light of Gregory's analysis of the networked character of drone operation, I propose that the drone's eye view incorporates at once the aspects of fantasy that shape drone discourse (seeing everything and everywhere, persistence, invulnerability) and the realities of drone practice (imperfect and complex technologies, human and technological constraints, fallibility). Where aerial surveillance and bombardment by means of drones is imagined by its advocates as precise, surgical and humane,[41] these desires and interpretations exist with, and indeed constitute, the complexity and distributed character of drone viewing that is productive of its occlusions.

A counterpoint to the production of these occlusions and invisibilities is the new visual intimacy that is produced through drone operators' close viewing, via live video feeds, of attacks, killings and the aftermath of aerial bombardment. As Gregory further notes, "[c]ontrary to critics who claim that these operations reduce war to a video game in which the killing space appears remote and distant, I suggest that these new visibilities produce a special kind of intimacy that consistently privileges the view of the hunter-killer" (2011a, p. 193). With the increasing remoteness of drone operators from those they surveil and kill, there has also developed an increasing and problematic intimacy of the viewing experience of the operators (Benjamin, 2013, p. 89).

While many drones operate at altitudes that render them invisible to the naked eye of the target persons and communities, operators are both physically close to the screens via which they view and receiving a newly close-up view of their targets.[42] Critical and political concern about this mode of remote control has emphasised the resulting trauma that drone operators can experience, giving a disproportionate level of attention to the suffering of the 'aggressor' over that of the 'victim'. However, I suggest that this development may be read more constructively as a new, if problematic and partial, recognition that performing the role of 'hunter-killer' or bomber or aggressor importantly has detrimental effects on real persons. Thinking in a more explicitly visual register, the drone operator's (prominently, though not exclusively) visual experience is thus characterised as potentially harmful. In this there is a possibility of loosening the binary construction of aggressor and victim, and a challenge for the underlying conception that through the abstraction of the god's eye view, some degree of access is possible to a ubiquitous knowledge and a ubiquitous vision.

The drone's eye view, while networked, distributed and increasingly 'autonomous', continues to be inhabited by human subjects whose experience also becomes part of the discourse that shapes the future conditions of possibility of the drone's eye view. Gregory has also taken up Donna Haraway's critique of the god's eye view:

> the possibility of what Donna Haraway famously criticized as 'the God-trick'— the ability to see everything from nowhere in particular—is also compromised by the networks within which these remote platforms are deployed.[43]

Drone viewing, indeed, always takes place from somewhere in particular, multiple ground-level sites, often located in different countries and continents from the drone

aircraft. The abstraction of 'the drone operator' is also always embodied by real persons working in distributed yet networked locations. This necessary embodiment works against the fantasy of non-embodiment found in the god's eye view and problematises the conception of physical distance in remote control as a dematerialising practice. Rather than dematerialising viewing, drone viewing brings about extended networks of infrastructure, locations and bodies.

Produced in and through multiple persons, places and technologies, the networked view is importantly a *composite* view. It joins, increasingly seamlessly, visual data that is produced at multiple moments and from multiple vantage points into a composite rendering of reality 'on the ground'. This is particularly evident in considering the forensic analysis capabilities advertised in the Gorgon Stare and Argus systems, but applies to drone visualisation of the present as well as the past. The networked view compiles multiple views, moments and sources and forms of data, abstracting them into a newly operational rendering of the viewed persons and places.

The satellite view is a form of highly elevated visuality that is worth scrutinising briefly for its performance of a distinctive mode of technological 'inhabiting' of the god's eye view (which I turn to in what follows). The critique of technofetishism is also relevant for satellite or orbital vision. Parks offers the term 'global presence' as a way of naming "an imaginary construct or Western fantasy" (2005, p. 23) of "'liveness' or 'presence'" (ibid) established by early satellite televisual broadcasts in the 1960s. The satellite view came to be regarded, in the context of television, as affording the possibility of 'liveness' as well as extensive access to the viewed terrain in the context of satellite photography. Parks cites Arthur C. Clarke to emphasise the transformative potential that was associated with satellite technology early in its development, such that it would "enable the consciousness of our grandchildren to flicker like lightning back and forth across the face of this planet" (ibid, p. 25).

The fantasy of omniscient viewing came to be associated with satellite technology, and Parks identifies as 'diachronic omniscience' the satellite image's digital status; it is not a 'mechanical reproduction' of an event but is *a composite formed of multiple recorded exposures*, whose "ontological status differs from that of the electronic image" (ibid, p. 91). As satellite image data is usually archived, it only becomes selected and displayed as an image when a particular reason for doing so emerges, so that

> [a]rchives of satellite image data thus create the potential for *diachronic omniscience*—vision through time—because they enable views of the past (and future with computer modelling) to be generated in the present that have never been known to exist at all, much less seen. Our understanding of the temporality of the satellite image should be derived through the process of its selection, display, and circulation rather than formed at the instant of its acquisition.
>
> (ibid, p. 91, emphasis in original)

The digital satellite 'image', then, is primarily digital data, which has often not been formed into an image until long after it has been 'captured'. While Parks' specification of a particularly diachronic mode of omniscience may be somewhat tautological, as knowledge of all times as well as time itself is surely part of what is claimed by the notion of omniscience, the emphasis on vision through time is helpful. Considering

the satellite view in relation to the god's eye view, the capacity for producing imagery of the past, which is received as authoritative, aspires to a more-than-human, god-like capacity to view all *times* as well as all locations.

Satellite visuality is marked, like drone visuality, by the production of huge quantities of data that are not necessarily operationalised immediately. Indeed, the satellite at times "randomly acquires information about all kinds of places for no apparent reason at all. Because of this, it can either be mobilized as representing the ultimate authority of the state (and of our unspoken faith in cartography) or as a completely abstract and uncertain point of view" (ibid, p. 95). That the satellite 'views' at all, then, does not immediately lead to the production of knowledge or actionable intelligence.

Where imagery of what drones are 'seeing' is widely reiterated through YouTube,[44] media programming and artworks, it affords more apparent immediacy than the satellite view, which remains aloof and frequently highly ambiguous. However, video and still images themselves afford the viewer no access to the means by which target persons, buildings, vehicles, communities or landscapes have come to be targeted, surveilled and photographed. Such knowledge is not usually made available to the 'citizen-viewer' who attempts to inhabit the drone's eye view. In this way, the extensive production of imagery associated with 'drone culture' only purports to offer knowledge and insight, or 'omniscience', while substantially occluding and de-visibilising the social relations, politics and technological forms through which such images are produced.

The God's Eye View

The phrase 'god's eye view' functions in contemporary culture as a broad, non-specialist 'handle' for indicating a viewpoint, whether visual or conceptual, that affords total knowledge, oversight and access to unmediated truth. Closely connected to this conceptualisation is the use of 'god's eye view' to name a longstanding problematic in Western philosophy of the question of the possibility of objective knowledge[45] of the world external to the human mind. I focus here on delineating the god's eye view as a visual trope, and pinpointing its relationships with cartography, rather than offering a comprehensive account of its historical and contemporary usage.

The god's eye view affords sight of objects, actions or landscapes from a highly elevated or abstracted position. As Chamayou describes,

> [t]he eye of God, with its overhanging gaze, embraces the entire world. Its vision is more than just sight: beneath the skin of phenomena it can search hearts and minds. Nothing is opaque to it. Because it is eternity, it embraces the whole of time, the past as well as the future. And its knowledge is not just knowledge. Omniscience implies omnipotence. In many respects, the drone dreams of achieving through technology a miniature equivalence to that fictional eye of God.
>
> (Chamayou, 2015, p. 37)

I further specify this broad concept to denote the cartographic convention of viewing from conceptually above the mapped subject, particularly in contexts that perform

knowledge production. Although I will focus here on the god's eye view as a visual form, it is also important to indicate something of how this debate about abstract viewing positions arises from and draws on the larger problematic of objectivity and subjectivity. To briefly contextualise this discussion, I draw on and diverge from Thomas Nagel's account of the 'view from nowhere' (1986) as a position between a conceived fully external view and a solipsistic conception of mind isolated within the individual human. The problem is of

> how to combine the perspective of a particular person inside the world with an objective view of that same world, the person and his viewpoint included. It is a problem that faces every creature with the impulse and the capacity to transcend its particular point of view and conceive of the world as a whole. [. . .] The difficulty of reconciling the two standpoints arises in the conduct of life as well as in thought. It is the most fundamental issue about morality, knowledge, freedom, the self, and the relation of mind to the physical world. Our response or lack of response to it will substantially determine our conception of the world and of ourselves, and our attitude toward our lives, our actions, and our relations with others.
>
> (1986, p. 3)

Cartography has historically been, and remains in the twenty-first century, a significant and widespread mode through which 'our conception of the world' is organised, delimited, and reproduced. The abstract conception of the world as a whole,[46] unified entity, beyond the experience available through sensory perception, is produced in part through cartographic visualisation. The god's eye view, as a visual construction, naturalises an externalised and elevated perspective. This perspective corresponds to the objectivity that Nagel describes—an external standpoint that attempts to transcend the specificities and limitations of the individual, embodied, personal perspective. Nagel also notes that an ultimate or 'correct' reconciliation of the external and the internal, or the objective and the subjective, is neither possible nor desirable:

> instead of a unified world view, we get the interplay of these two uneasily related types of conception, and the essentially incompletable effort to reconcile them. The transcendent impulse is both a creative and a destructive force.
>
> (1986, p. 4)

Where a 'unified world view' is understood to be an 'incompletable' project, then, the critical focus shifts to how external and internal conceptions vary depending on their context and how they co-constitute and re-work one another. I must leave aside the complexities of this philosophical debate in the interests of focussing on its application to the critical visual study of objectivity–subjectivity or external–internal perspectives. Critical cartography, as a sub-disciplinary field emergent since the 1980s, has itself reflected the longer-term critical problem of reconfiguring understandings of the non-availability of any politically neutral and external perspective[47] in both conceptual and visual terms. The 'transcendent impulse', also applicable to cartographic visualisation, structures the cartographic desire for a god's eye view that is able to provide objective and authoritative knowledge.

Trevor Paglen summarises the contemporary sense to be found in the fields of critical and experimental geography that the god's eye view is both an outdated and unhelpful cartographic trope:

> Contemporary geography has little more than a cursory relationship to all varieties of cartography. In fact, most critical geographers have a healthy skepticism for the 'God's-Eye' vantage points implicit in much cartographic practice. As useful as maps can be, they can only provide very rough guides to what constitutes a particular space.
>
> (2008, p. 28)

For Paglen, using the god's eye view in studying 'what constitutes a particular space' is a limited and limiting approach, able to produce little useful insight. It is no longer regarded as a helpful means for producing authoritative knowledge, being understood instead to operate with problematic assumptions that knowledge may be unambiguously correct, true and attainable. Indeed, as we have seen, the god's eye view is frequently framed as 'the god trick' and positioned as something to be overcome (Pickles, 2004, p. 192). The two conceptual poles or philosophical fantasies of extreme objectivity, identified with the theoretical god position or god's eye view, and extreme subjectivity or solipsism, provide the parameters within which contemporary explorations of cartographic viewing and its 'conceptual positioning' effects take shape. Rather than positioning the god's eye view as having been superseded, I argue for interpreting it as continuing to operate and to influence contemporary understandings of cartographic viewing, remote viewing, such as the technological forms embodied in satellites and drones, and the capacity of aerial viewing to perform and convey agency.

As a cartographic abstraction, the god's eye view structures and organises some of the attributes of the drone's eye view. I do not suggest that the god's eye view is the only relevant mode of visuality concerned in the production of the drone's eye view; rather, it is a significant element structuring desires and fantasies in relation to drones and their capacities. As I have argued, the key fantasies for the drone's eye view turn on total vision and therefore total knowledge of viewed subjects. The cartographic abstraction of the god's eye view supports and lends coherence to, indeed provides one of the conditions of possibility for, the contemporary discourse of the drone's eye view as embodying an enhanced position of agency, even as the human agent is conceived as being physically removed from that position.

Embodiment, disembodiment and inhabitation are important themes that run through my analyses of abstract cartographic viewpoints. In the view from nowhere, the zenithal, the bird's eye view, the Apollonian and the panoptic, the modes of viewing are more concerned with embodiment and the idea of conceptual inhabitation of the viewpoints. The god's eye view is the only cartographic abstraction under discussion that I argue remains fully uninhabitable and unattainable by human, technological and 'techno-cultural' forms. Its effectivity is performed in its functioning as a fantasy of totalising vision and knowledge that fosters the desire and the aspiration in the drone's eye view.

I have identified the 'god's eye view' as a 'higher-level' cartographic abstraction, such that it is not directly experienced but has the capacity to organise other modes of cartographic viewing. While the god's eye view is not a concept that is confined to cartographic depiction, I have argued for specifying it in the register of cartographic

abstraction. This positioning allows for a reinterpretation of the god's eye view as an active, operational abstraction that has effects in contemporary practices of viewing and aerial violence, rather than a concept that is no longer operative or that constitutes a hindrance to critical inquiry. The power of the god's eye view is in its capacity to offer a fantasy of total knowledge, oversight and access to unmediated truth. It functions as a figure of the illusory capacity of cartographic viewing to establish viewpoints that are disembodied, non-inhabitable by a physical viewer and thoroughly abstract. In this light, the god's eye view emerges as a complex, enduring and adaptive cartographic abstraction.

The drone's eye view is proposed as an abstract viewpoint that is not itself solely cartographic, but that is significantly organised through cartographic abstraction. The drone's eye view here encompasses both the popular conception of drones as all-seeing and its status as an abstraction that organises this fetishised appearance. In this, I draw on Gregory's insistence on the materiality of the networked form of drone vision to situate it in the register of production and reproduction of an abstract viewpoint, to bring the problematic of drone vision into the analytical terms of cartographic abstraction. This abstract viewpoint functions to contribute to the ongoing reproduction and extension of distanced and networked viewing from above, both drawing from and performing the unattainability of the older abstraction of the cartographic god's eye view. The drone's eye view incorporates at once the aspects of fantasy that shape drone discourse and the realities of (military) drone practice.

It also accommodates in a productive tension both conceptual 'extremes' of the all-seeing drone as a solipsistic figure of military agency and the networked, abstract and material nature of the view that the drone constructs. These potentially contradictory understandings each condition and thereby have a role in the reproduction of the other. The fantasy of total vision both drives and is reinforced by its technological manifestation. The fantasy of full visibility and full knowledge that is so strongly connected with the contemporary discourse of the drone is one of the most important manifestations of the god's eye view.

In terms of the theoretical concern with embodiment in this study, the drone's eye view, while networked, distributed and increasingly 'autonomous', continues to be inhabited by human subjects whose experience also becomes part of the discourse that shapes the future conditions of possibility of the drone's eye view. Drone viewing, indeed, is always situated inasmuch as it 'takes place' from somewhere particular, frequently a 'somewhere' that is on the ground rather than in the sky, often located in another continent. The abstraction of 'the drone operator' is also always embodied by real persons working in distributed yet networked locations, communicating in 'real-time'. This necessary embodiment works to complicate the fantasy of non-corporeal agency found in the god's eye view; the god's eye view can be understood as part of the networked and interdependent character of the drone's eye view that is constituted across multiple sites, persons, technologies and practices.

To sum up, then, in this chapter I have sought to open up an approach to 'viewing' military drones indirectly through critically engaging with my own subject position as a viewer, remote interpreter, 'critic of violence' and subject of a drone state. James Bridle and Trevor Paglen's artworks attempt, in their own terms, to enact a similar position of critical reflexivity. Where they fail to exceed the existing critical parameters of a politics of visibility, the theoretical framework of cartographic abstraction is useful.

Through exploring the technological and scopic regime of drone visualisation, we see the ways in which the drone's eye view constitutes its subjects as targets: through physically indirect visualisation that translates viewed persons and places into data; through visual techniques of assimilation of the subject to pre-existing operational categories, most decisively the category of 'target'; and through techniques of visualisation that seek to render their subjects as fully visible, spatially accessible and abstract bodies moving through a fully viewed and conceptualised space. Through these concrete procedures of abstraction, the drone is framed, technofetishistically, as an entity embodying the capabilities to see, to know and to strike at any time and in (potentially) any place.

I have also explored the god's eye view as a cartographic abstraction that operates much more extensively than the cartographic discourse. In this way, I have argued that the god's eye view functions, in part, to organise the complex contemporary form of the drone's eye view. The god's eye view extends its abstract capacities of totalising vision, knowledge and authority to the drone's eye view.

I have explored the possibility of responding to and interpreting the position of the viewer in relation to the drone's eye view. Through this approach, I give a renewed interpretation of the drone's eye view that extends beyond the register of the visual to understand this abstract viewpoint as contributing to the continued production and reproduction of this abstract, distanced and networked mode of viewing from above.

Notes

1 Bridle's description is available at http://booktwo.org/notebook/rainbow-plane-002-kiev/ accessed 11 June 2017.
2 Photo by Roberta Mataiyte. Available at http://jamesbridle.com/works/drone-shadow-003, accessed 11 June 2017.
3 By James Bridle. Available at http://shorttermmemoryloss.com/portfolio/project/under-the-shadow-of-the-drone/andhttp://shorttermmemoryloss.com/portfolio/project/drone-shadow-005/, accessed 5 June 2016.
4 By James Bridle. Available at http://jamesbridle.com/works/drone-shadow-handbook, accessed 11 June 2017.
5 Artist statement available at http://booktwo.org/notebook/drone-shadows/, accessed 11 June 2017.
6 OED online definition of 'reaper', available at http://0-www.oed.com.catalogue.ulrls.lon.ac.uk/view/Entry/158995?redirectedFrom=reaper#eid, accessed 4 April 2015.
7 This consumer phenomenon is reflected and furthered in websites such as www.keepcalmandcarryon.com and www.keepcalm-o-matic.co.uk, a retail site and meme- and poster-generator respectively, accessed 11 June 2017. Keepcalm-o-matic claims to have generated over 11 million parodies of the 'Keep Calm' slogan, and the UK government has characterised it as "one of the most recognisable slogans in British history" (available at https://history.blog.gov.uk/2014/06/27/keep-calm-and-carry-on-the-compromise-behind-the-slogan/, accessed 11 June 2017).
8 The idea of the 1:1 scale map appears to have come up first in Lewis Carroll's 1893 novel *Sylvie and Bruno Concluded* and was taken up by Jorge Luis Borges in his 1946 short story *On Exactitude in Science*. In both fictional worlds, a 1:1 scale map has been created and then found to be useless.
9 Available at http://shorttermmemoryloss.com/portfolio/project/drone-shadow-005/, accessed 5 June 2016. Artist statements on the project are available at http://booktwo.org/statement-brisbane-drone-shadow/ and 'Australia: Drone Shadows, Diagrams, and Political Systems' available at http://booktwo.org/notebook/australia-drone-shadows/ both accessed 11 June 2017.

10 See www.paglen.com/?l=work&s=drones, accessed 11 June 2017.

11 Images are available at www.paglen.com/?l=work&s=drones&i=1, accessed 11 June 2017.

12 The experience of viewing a large-scale print in the gallery space is clearer, with the black dot more clearly taking on the shape of an aircraft.

13 On secrecy, particularly in relation to the production of abstract space, see Trevor Paglen and Rebecca Solnit, *Invisible: covert operations and classified landscapes* (Aperture, London; Thames and Hudson, New York, NY, 2010) as well as 'Six Landscapes' available at www.youtube.com/watch?v=j56s46e97Lo, accessed 11 June 2017.

14 See for example James Bridle, *Dronestagram*, available at http://dronestagram.tumblr.com/ accessed 11 June 2017. The strapline of the project is "the drone's eye view", and it seeks to make visible the locations of reported drone strikes through the use of Google Maps satellite imagery. The artist's description and rationale for the work are published at http://booktwo.org/notebook/dronestagram-drones-eye-view/, accessed 11 June 2017. Bridle's use of the phrase 'the drone's eye view' in connection with *Dronestagram* is an important factor in my decision to take up the phrase. Bridle and Paglen are not quite working with the same idea of the drone's eye view that I put forward here; they are more concerned with the paradigm of visibilisation as such, which I am attempting to push beyond.

15 I borrow this phrase from Alberto Toscano and Jeff Kinkle (2015, p. 17).

16 Medea Benjamin also makes this argument in terms of "a horrific blowback", quoting Ralph Nader's 2011 turn of phrase (Benjamin, 2013, p. 81). She outlines growing concerns in the US context over state, military and private surveillance carried out with commercially available drones and the increased potential for domestic terrorism.

17 Gregory, 'From a View to a Kill', 2011, p. 190. I follow Gregory's interpretation of 'scopic regime' as having been "uncoupled from any specific forms, displays and technologies to denote a mode of visual apprehension that is culturally constructed and prescriptive, socially structured and shared" (ibid). In the same influential article, he also identifies 'visuality' as a closely connected term, "meaning culturally or techno-culturally mediated ways of seeing [. . .] intended as a critical supplement to the idea of vision as a purely biological capacity (I say 'supplement' because the embodiment of vision remains of more than incidental importance)" (ibid). I have hinted at the tension, suggested here in Gregory's account, in the idea of 'fleshy vision' as to how—as viewers—we interpret our own experience of viewing. As Gregory usefully asserts here, the question of embodiment does not recede in the face of using 'scopic regimes' as a way of analysing vision and its modes of construction.

   As an aside on Gregory's extremely influential article, it is worth noting that the title's referencing of the famous 1985 James Bond film and Duran Duran song 'A View to a Kill' appears to be unacknowledged as yet in the literature. This is of interest because upon googling the article name 'From a View to a Kill' online, the whole first page of results (in June 2016 and again in May 2017) concern the film and the track rather than Gregory's article; and even more pertinently because the promotional music video accompanying the film's release in 1985 features members of Duran Duran atop the Eiffel Tower in Paris intercut with action scenes from the film itself and depicting a band member using his Walkman as a remote control device for a helicopter which (he) then crashes. As well as being an early film depiction of weaponised drone use, the film would reward further analysis in terms of fantasising aerial power for its positioning of a boardroom within an airship in flight above San Francisco (Silicon Valley), depicted as a position of direct and indirect lethal power; the music video also features early depictions of the seated environment of the drone operator. Available at www.youtube.com/watch?v=ZlCyzU5dsas, accessed 11 June 2017.

18 Published information from USAF available at www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104516/rq-4-global-hawk.aspx accessed 11 Jun 2017. Drones are also developing into smaller forms that have the ability to behave collectively as swarms, suggesting that increasing size will not continue to be the dominant developmental trajectory. See 'Coming soon: A SOFWERX for drones and robots' available at www.defensenews.com/articles/coming-soon-a-sofwerx-for-drones-and-robots accessed 11 June 2017. That such information is readily available of course means that it is no longer regarded as sensitive by USAF. The detail they provide is relevant rather for what it can tell us about how military actors shape the discourse about visibility and advanced technological means of visibilisation.

19 DARPA stands for Defense Advanced Research Projects Agency, the advanced research arm of the US Department of Defense. Limited details of the Argus-IR programme available at http://aviationweek.com/defense/darpas-argus-ir-wide-area-sensor-taking-shape, accessed 11 June 2017.

20 See the Sierra Nevada Corporation's 2014 press release available at www.sncorp.com/press-releases/snc-gorgon-stare/, accessed 11 June 2017, and BAE Systems' press release available at www.baesystems.com/en/article/bae-systems-wins—49–9-million-contract-to-develop-on-board-processor-and-integrate-darpa-s-argus-ir-nighttime-persistent-surveillance-system, accessed 11 June 2017.

21 See published information from USAF available at www.af.mil/AboutUs/FactSheets, accessed 11 June 2017.

22 Information from BAE Systems ARGUS-IS brochure, 'AUTONOMOUS REAL-TIME GROUND UBIQUITOUS SURVEILLANCE IMAGING SYSTEM ARGUS-IS' available at www.baesystems.com/en-us/product/autonomous-realtime-ground-ubiquitous-surveillance-imaging-system-argusis, accessed 11 June 2017.

23 See 'A160 Hummingbird: Boeing's Variable-Rotor VTUAV' by Defense Industry Daily staff, www.defenseindustrydaily.com/a160-hummingbird-boeings-variable-rotor-vtuav-03989/, accessed 11 June 2017.

24 'Increment 2 Gorgon Stare imagery system gets operational clearance from USAF', available at www.airforce-technology.com/news/newsincrement-2-gorgon-stare-imagery-system-gets-operational-clearance-from-usaf-4308198, accessed 11 June 2017.

25 While the clear connection between the naming of these systems and mythical power in general has been noted, there is some ambiguity about the mythical sources in the literature. For example, Medea Benjamin runs together the Argus Panoptes and Gorgon myths: "The Air Force is currently developing a technology named the Gorgon Stare after the many-eyed monster from Greek mythology 'whose unblinking eyes turned to stone those who beheld them'" (2013, p. 48). I think the naming may be more directed at the idea of an in-person encounter, disavowing again how the fate of being killed by a drone bearing one of these systems depends upon the victim not being 'in person' with the drone operator or the drone aircraft.

26 Published information from USAF available at www.af.mil/AboutUs/FactSheets, accessed 11 June 2017. 'Buddy-lase' is listed among the 'missions and tasks' that the Predator, for example, is able to perform: "Predators can also perform the following missions and tasks: intelligence, surveillance, reconnaissance, close air support, combat search and rescue, precision strike, buddy-lase, convoy/raid overwatch, route clearance, target development, and terminal air guidance." Predator factsheet also available at www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104469/mq-1b-predator.aspx, accessed 11 June 2017.

27 This 2013 article—Cummings, B. 'MC-12W now boasts 'Buddy Lase' capability'—underscores the capacity of this system to be 'mounted' on both manned and unmanned aircraft. Therefore it is not a technological capacity that is exclusive to drones, but it is significant for my argument that it has become particularly associated with drones in popular discourse. This point speaks to the technofetishism connected with drone discourse, discussed in more depth in what follows.

28 Quoted from *5,000 Feet is the Best*, excerpted in Harger (2012).

29 Chamayou (2015) provides a detailed discussion of this mode of targeting in chapter 6, 'Pattern-of-Life Analysis', including its propensity to lead to the targeting and killing of persons subsequently shown not to meet the relevant criteria and the use of data from cell phone networks to confer target status on a wide range of persons.

30 On the concept of the emergent 'target of opportunity' and the broader context of a contemporary 'militarization of thinking', see Weber (2005).

31 Technofetishism is defined by Benjamin Noys as "not quite what Marx meant by fetishism (in his account of the fetishism of the commodity) or what Freud meant by fetishism (as a diagnostic category of sexual perversion), but something which mixes both. It is the inflation of the technological object to something that horrifies and fascinates, electing it out of history into a natural or metaphysical realm" (Noys, 2014, p. 3).

32 'Art in the Drone Age' by Susanna Davies-Crook, available at www.dazeddigital.com/artsandculture/article/16183/1/art-in-the-drone-age, accessed 11 June 2017.

33 Paglen cited in ibid.

34 Medea Benjamin also notes the issue of loss of control in the military context: "Drones can also 'go rogue,' meaning that the remote control is no longer communicating with the drone. In 2009, the US Air Force had to shoot down one of its drones in Afghanistan when it went rogue with a payload of weapons. In 2008, an Israeli-made drone used by Irish peacekeepers in Chad went rogue. After losing communication, *it decided on its own to start heading back* to Ireland, thousands of miles away, and crashed en route" (2013, p. 24, emphasis mine).

35 Text of voiceover available at http://waterside-contemporary.com/exhibitions/the-free-stone-drone/, accessed 11 June 2017.

36 'View from a Kill' by Kate Rich, available at www.metamute.org/editorial/articles/view-kill, accessed 11 June 2017.

37 Unattributed article, 'Come in Ground Control: UAVs From the Ground Up', available at www.airforce-technology.com/features/feature101998/, accessed 11 June 2017.

38 'The God-trick and the Administration of Military Violence', keynote address given at As Above, So Below: Colloquium on Drone Culture, University of Lincoln, 24 May 2014. Quotations are from the conference abstract.

39 As Crandall writes, "[a]s drones gain the ability to 'dwell and stare'—recording activities on the ground over much longer timeframes—the vast amounts of data they absorb can easily outrun the capacities of personnel. On a single day the Air Force must process nearly 1,500 hours of full motion video and another 1,500 still images. Cameras and sensors become ever more sophisticated, yet they are of limited value unless they can be accompanied by improved human intelligence and skill" (2013, p. 283).

40 See Adam Herbert, 'Compressing the kill chain', Air Force Magazine 86 (2003).

41 As Chamayou asserts, that the "drone *looks like* the weapon of cowards [. . .] does not prevent its supporters from declaring it to be the most ethical weapon ever known to humankind" (2015, p. 17, emphasis in original).

42 See Gregory, 2011, p. 197.

43 Conference abstract, As Above, So Below: Colloquium on Drone Culture, University of Lincoln, 24 May 2014.

44 See Dorrian, 2014, pp. 51–52: "The principal mode for the dissemination of video captured from drones in Iraq and Afghanistan—what some have called "drone porn," showing short sequences of attacks and killings—has been via official US Department of Defense or DVIDS (Third Army/US Army Central) accounts on YouTube. Presumably intended both to promote the technology for a domestic audience and to threaten opponents, by 2009 these had reportedly received more than ten million views."

45 See Weber (2005), in particular: "In the Western tradition [. . .] the faculty of vision has been most closely associated with the constitution of knowledge and hence with its power to overcome distance and assimilate alterity" (2005, p. 6).

46 See in particular Pickles (2004), chapter four, 'The cartographic gaze, global visions and modalities of visual culture': "Perhaps one of the abiding dreams of modern science has been to map the globe in its totality; to map 'everything' and to map it as a unity [. . .] From atlases to national exhibitions to commercial advertising for imperial products, the globe has circulated as an image, icon and trademark for science, technology, imperial power and commercial vitality since the Renaissance" (ibid, p. 78).

47 J.B. Harley led the way in asserting the importance of re-positioning maps as fundamentally social, interested images. For example: "Maps cease to be understood primarily as inert records of morphological landscapes or passive reflections of the world of objects, but are regarded as refracted images contributing to dialogue in a socially constructed world. We thus move the reading of maps away from the canons of traditional cartographical criticism with its string of binary oppositions between maps that are 'true and false', 'accurate and inaccurate', 'objective and subjective'" (Harley and Laxton, 2001, p. 53).

3 Remote Viewing, Cartographic Abstraction and the Antipodes
Three Works by Layla Curtis

The antipodes do not tend to appear on modern maps. The term 'antipodes' finds its origin in ancient Greek geographic thought, naming the persons theorised as existing with their 'feet against' the feet of those people living in the *oikumene*, the 'known world'. Persisting from a time before the terms 'European' and 'Western' took on their present sets of associations, the antipodes names an idea of the other as existing in opposite geographical relation to the position of the theorising ('European', 'Western') subject. The antipodes names the problem of where that other may live and what their land might be like in the context of the earth as a globe.

In this chapter, I explore how the idea of 'the antipodes' can be newly understood as a form of cartographic abstraction. I aim to show that re-thinking the antipodes in this way is helpful to us as viewers, because it enables us to consider in depth how a particular conceptual framework for thinking about the structure and arrangement of the physical world has become incorporated into cartographic thinking and how this cartographic thinking informs our conceptualising of the physical world.

'The antipodes' is a rather awkward phrase to use in the singular. The term 'antipodes' initially named both the inhabitants and land whose existence opposite the known world was theorised by ancient Greek philosophy (Hiatt, 2008; Goldie, 2010). Through the introduction or incorporation of the cartographic grid, I argue, the antipodes developed into a de-particularised geometric form able to construct 'diametrically opposite' locations on the earth's surface as being related to one another.

The term 'antipodes' can, therefore, indicate a range of distinct referents—both persons and lands, relations between places and relations between persons. In this chapter, I will attempt to be clear about which element of the antipodes I am discussing by using the (rather cumbersome) phrases 'antipodal relations' and 'antipodal viewing'. I aim to put forward a conception of the cartographic and cultural figure of the antipodes as a cartographic abstraction and to show how this joins with other forms of cartographic viewing to enable us to 'see' with maps.

I explore the issues of antipodal relations and antipodal viewing through a detailed consideration of my viewing experience of three artworks by Layla Curtis. Each of the artworks is concerned with visually presenting antipodal, or diametrically opposite, relations between places. *Message in a Bottle from Ramsgate to the Chatham Islands* (2004), *78 Degrees North, 67 Degrees South* (2007) and *Antipodes* (2013–14) are each concerned with evoking and examining antipodal relations in both cartographic and photographic terms. This creates an opportunity to examine how this particular—antipodal—form of cartographic viewing does not operate in a vacuum but rather combines with other viewing techniques (i.e. photographic) to produce a

framework for conceptualising the world. This antipodal framework is able to construct relationships between disparate geographical locations, based on little more than the observation that they are diametrically opposed on the surface of the Earth. I examine this antipodal method of conceptualising through this particular selection of three artworks in order to understand how cartographic vision both works with and depends on other ways of seeing for its power and effectiveness.

In this chapter, therefore, I discuss the artworks first, in chronological order, and draw out a series of visual and conceptual themes that emerge from the discussions. I argue that the works are each concerned with evoking and examining antipodal relations, using both cartography and photography. I identify habitation, a non-production of knowledge, communication, selection and reversal as key visual and conceptual themes appearing across the artworks as a group. The viewing position formed by these artworks is structured as one through which 'knowledge' is produced of abstractions and abstract relations in the conceptualisation of remote and unknown regions of the globe. Antipodal relations are, therefore, a way of producing certain geographical understandings of the world by means of a cartographic abstraction—antipodal relations.

My primary argument is that 'the antipodes', as a cartographic abstraction, become a productive factor in how we form knowledge about antipodal locations through viewing them remotely and conceptually.

Following consideration of the artworks, I will explore 'antipodal theory' in more detail in order to show how early geographical thought used ideas of oppositeness and theoretical habitation to posit persons living in other parts of the Earth and to speculate about them. Antipodal thought is engaged in the implication of bodies and places through having theorised their existence prior to 'discovery', that is, encounter with the West. One of the implications of this history of theorising other persons is that we have a way of forming 'knowledge' of the other that works horizontally rather than vertically. That is, through horizontally conceptualising the other as existing on another, potentially opposite, part of the Earth's continuous surface rather than conceptualising the other vertically, through imaginatively 'looking down' on them from above. This point enables us to consider how cartographic viewing works not only through conceptual viewing from above but also through horizontality and through establishing relations of oppositeness.

In speculating about unknown persons and lands, antipodal theory has figured those persons and lands as subject to 'knowability', or coming to be known, through techniques of visual conceptualisation. The claim that knowledge can be formed of subjects through theoretical 'remote viewing' has historically formed one of the conditions of possibility for the West's subsequent 'mobilisation' (in the form of colonialism and imperialism) into the location of the antipodes. Because this mobilisation has been such a historically and politically consequential force, it is worth examining how antipodal thinking has been cartographically constructed and how it is functioning as a mode of twenty-first-century cartographic viewing.

In contrast to the other forms of cartographic viewing that are discussed in this book, antipodal relations and antipodal theory are self-consciously concerned with theorising their subjects, as opposed to 'reflecting' them. Antipodal theory actively posits its object and speculates about its characteristics.

When the abstraction of the regular, geometric cartographic grid joins with antipodal theory, a powerful claim to knowledge production becomes established for

cartography. Its capacity to speculate and theorise comes to be obscured by its capacity to know and to depict. In the particular case of the antipodes, the quality of generalised oppositeness comes to be substituted for the particularity of unequal relations of power between the 'known' and 'unknown' worlds. The political content of the geographical relation is evacuated. The form of antipodal relations that we may find in Layla Curtis's artworks is this evacuated form, which appears to have both profundity and explanatory power while actually having neither.

By thinking with Curtis's artworks in this chapter, I aim to offer a way to critically re-engage with some important questions about cartography's modes of knowledge production, particularly the de-politicising or apparent neutralising of cartographic ways of seeing. I argue that antipodal relations should be understood as a form of cartographic abstraction—a conceptual entity that is more than an abstraction of thought yet is not materially real either. It is a socially constructed conceptual entity that has the capacity to organise knowledge and shape the conditions of our seeing.

Encountering the Artworks: Viewing *Message in a Bottle From Ramsgate to the Chatham Islands, 78 Degrees North, 67 Degrees South* and *Antipodes* by Layla Curtis

Message in a Bottle from Ramsgate to the Chatham Islands (2004) is a multi-media artwork in which messages from residents of Ramsgate, Kent, UK and GPS tracking devices were released in bottles from off the south-east coast of England. The purported destination of the bottles is the Chatham Islands, part of New Zealand, in the South Pacific Ocean. The description offered by Curtis's website states:

> Fifty bottles containing messages were released into the sea near Ramsgate Maritime Museum, Kent. Their intended destination, The Chatham Islands in the South Pacific Ocean, is the nearest inhabited land to the precise location on the opposite side of the world to Ramsgate Maritime Museum.[1]

The project was commissioned by Turner Contemporary and exhibited at Droit House, Visitor Centre for Turner Contemporary, in Margate, Kent, 27 May–4 July 2004.[2] The gallery presentation included a projection of the live GPS drawing that was recording the transmitted coordinates of the released bottles; a bottle and instruction leaflet were exhibited; and sea charts depicting Ramsgate and the Chatham Islands were positioned diametrically opposite each other on the gallery walls.

The coordinates of the bottles were displayed in the form of a real-time GPS drawing, while the bottles themselves were equipped with instructions to enable those finding them to report their location.[3] Reported locations are mostly on the shores of Kent and the Netherlands. The bottles, never having been equipped or intended to arrive at the Chatham Islands, are presumably now being eroded on beaches, occupying landfill sites or perhaps have been recycled or found their way into people's homes.

The artwork, then, comprises all of these multimedia elements and arises from them as, in part, an exploration of the trope of the 'message in a bottle' as a whimsical notion of unlikely, hopeful communication. At the same time, the work carries out a material enactment of mapping and depicting the movements of fifty instantiations of this trope of the 'message in a bottle'. The relationship posited in the work's name is of central interest here. The Chatham Islands figure as a silent, would-be recipient of one

or all of the released bottles; more particularly, the residents of the islands are cited as the reason for choosing to focus the project on the Chatham Islands. The Antipodes Islands (also part of New Zealand) lie slightly closer to the mid-ocean position of the antipode of Britain but are uninhabited and so have not been selected as the subject of this work.

The Chatham Islands are cited as being the focus of the work due to their offering the 'closest fit' to the formula of the diametrically opposite location of Ramsgate and, by extension, Britain. In this way, land, and particularly inhabited land, is designated as the object that is to be made visible through the deployment of the antipode as a mode of positing a geographical relation between two disparate locations. However, the posited object of visibility, or we might say of geographical visibility, remains unseen; the formula for positing the Chatham Islands as part of the work comes to perform instead their non-visibilisation. That is to say, the viewer gains no further visual or geographical knowledge or understanding of the Chatham Islands through engaging with *Message in a Bottle*. Instead, the non-production of such knowledge is performed by the project.

The progress of the bottles is charted in an apparently scientific, technical manner, through GPS devices that were fitted into the bottles and rigorously tested to ensure successful functioning.

The resulting GPS drawing reinforces the emphasis on a process of research and investigation that is being made manifest in the visual productions of *Message in a Bottle*. What is produced, however, is not knowledge of the Chatham Islands, which is rather held away from the viewer, continually posited and deferred within the work. In this way, a non-production of knowledge of the Chatham Islands, one of the geographical objects of the project, is performed in the work.

78 Degrees North, 67 Degrees South (2007) is a "two channel video (animated webcam stills), colour, silent".[4] Paired photographic images depict the changing seasons at two unnamed antipodal locations via webcam. The description offered by Curtis's website states,

> Every minute for one year, the images transmitted from two webcams, each at opposite ends of the planet, were captured and compiled to create the time-lapse work 78 Degrees North, 67 Degrees South.
>   Beginning on the southern hemisphere's longest day (and subsequently the northern hemisphere's shortest day), the two videos are viewed side by side tracking the contrasting seasons and extreme weather conditions at these diametrically opposite locations.[5]

A sequence of stills presented on the artist's website (Figures 3.1–3.3) depicts pairs of out-of-focus photographs, taken at opposite times of day, in predominantly snowy locations. Each shows a body of water and some mountains, and the pairs of images record the conditions of the webcam's automated 'seeing' as well as the landscapes themselves in moisture forming on the lens (Figure 3.1) and mist preventing a clear view (Figure 3.2).

Implicit in this format is an acceptance of the position of the webcam as the viewpoint that will endure through the progression of days and whole seasons. The right-hand view is not quite straight but is more sharply focussed than the left-hand view. Location is only specified in the work in terms of latitude, assimilating to each image
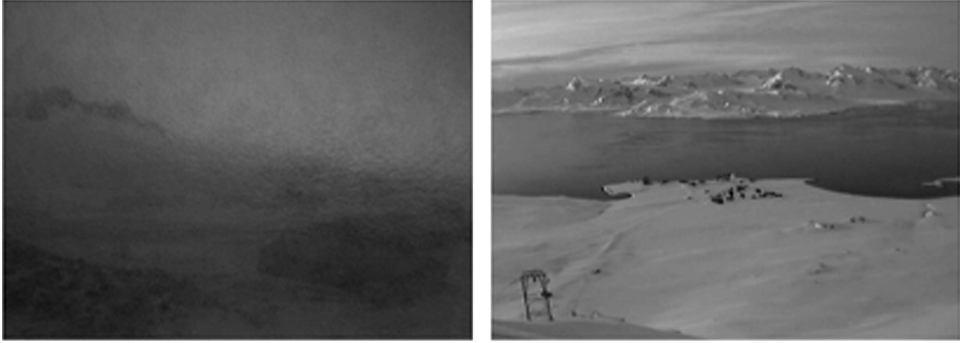
Figure 3.1 First image in website presentation of *78 Degrees North, 67 Degrees South*, laylacurtis.com
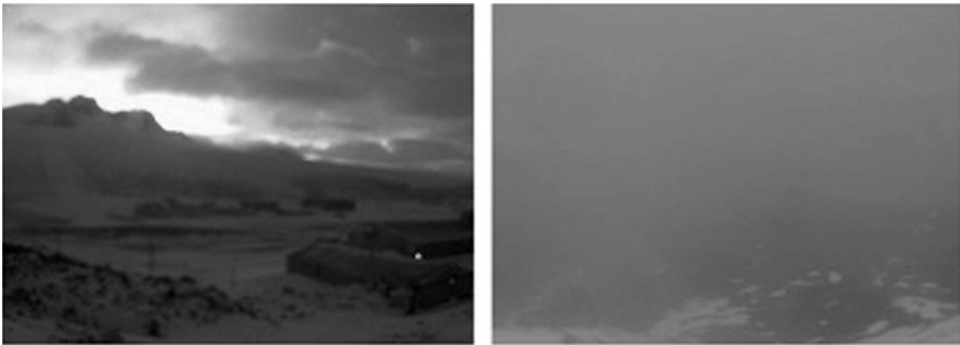
Source: Image courtesy of Layla Curtis

Figure 3.2 Second image in website presentation of *78 Degrees North, 67 Degrees South*, laylacurtis.com
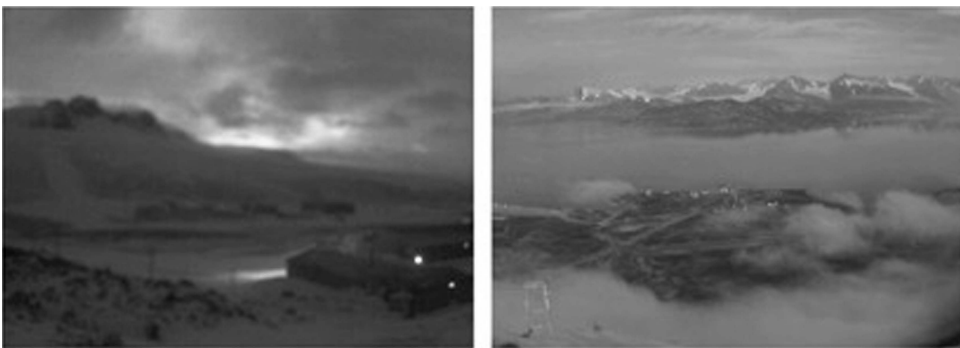
Source: Image courtesy of Layla Curtis

Figure 3.3 Third image in website presentation of *78 Degrees North, 67 Degrees South*, laylacurtis.com

Source: Image courtesy of Layla Curtis

an association with potentially the full range of land locations found at each latitude: at 78 degrees north, the line of latitude passes through Svalbard (Norway), Russia, Canada's Northwest Territories and Nunavut, and Greenland; and at 67 degrees south all land is part of Antarctica, predominantly territory claimed by Australia.[6] The right-hand view, then, depicts both '67 degrees south' and 'Antarctica'.

The name of the work, *78 Degrees North, 67 Degrees South*, proposes to the viewer that each pairing of photographs combines an image of a place at 78 degrees north, followed by, that is, bordered on its right side by, a photograph of a place to be found somewhere along the line of latitude called 67 degrees south. In this way, the series of pairings depicts the earth as a sphere described by lines which are themselves conceptually formed through the abstraction of the earth as a regular geometrical form.

Lines of latitude arise from the cartographic figuring of the earth as a regular sphere, rotating on an axis, which forms a vertical; this vertical is then re-articulated through the generation of perpendicular, horizontal divisions, which are regularly spaced across the planimetric surface of the sphere. The inclusion in the artwork of lines of latitude as the only points of orientation, then, de-particularises the photographs, generalising and abstracting them to the level of the entire line of latitude rather than a longitudinally specific point somewhere on that line.

A doubled mode of visualisation is therefore in play in *78 Degrees North, 67 Degrees South*, such that the 'underlying' cartographic and geometric structure of the earth, as a cartographic abstraction itself, effectively gives rise to abstract photographic depictions of cartographic abstractions. The photography of these latitudinal locations is 'delegated' or 'outsourced' by the artist to webcams so that the viewer does not conceptually inhabit a viewpoint formed by the artist behind their camera; rather, the webcams 'view' and photograph automatically, having been positioned and networked for purposes that are not made visible within the artwork by unacknowledged persons.

The site of 'viewing' has been selected, apparently, for its conformity with a formula that has been pre-determined by the artist. In this way, the content of the image is determined through a process of selection of a formula for viewing established by the artist. The images appear in the work as the result of, or the fulfilment of, the application of the selection criteria. They carry out, or enact, the formula of 'existence on line of latitude x' plus 'webcam available'. This way of producing images is used again and taken further in Curtis's 2013–14 multimedia work *Antipodes*.

Antipodes (2013–14) is an online artistic project that takes up and extends the concept of the antipodes that is explored in *Message in a Bottle* and *78 Degrees North*. In this work, antipodal locations are identified and paired, or 'twinned', via online webcams, and over the course of a year, live footage from the webcams was streamed on the project website. These live images took the same form that we saw in *78 Degrees North*, as paired landscape images. On accessing the project website, the first image presented is a doubled world map projection (Figure 3.4) marking the locations of the selected antipodal sites. Each site allows the viewer to click through and see the photographic images particular to that site and its antipodal 'twin'.

Following the year of live streaming, a 'residual' presentation takes the form of pairs of still photographs connected to a specified antipodal relationship, which the viewer may in turn click through to view a gridded composition of multiple images that trace the sequence of a day at each site (Figure 3.5). Although the project is characterised
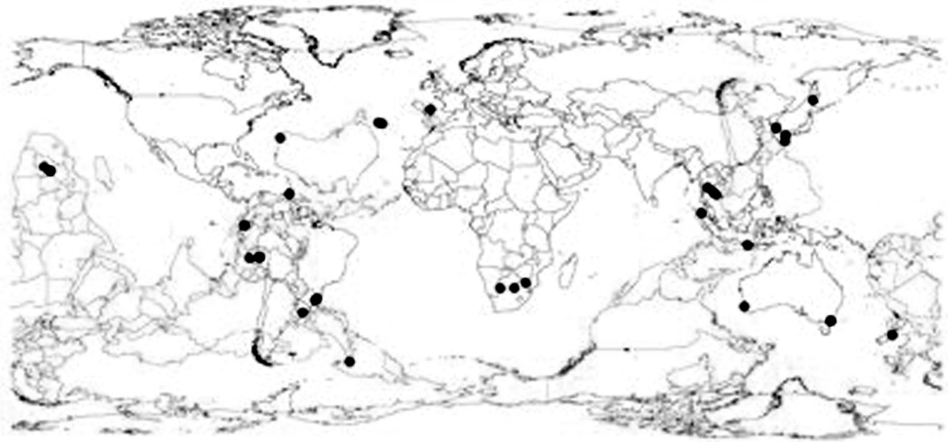
Figure 3.4 Antipodes—Doubled map projection, antipodes.uk.com
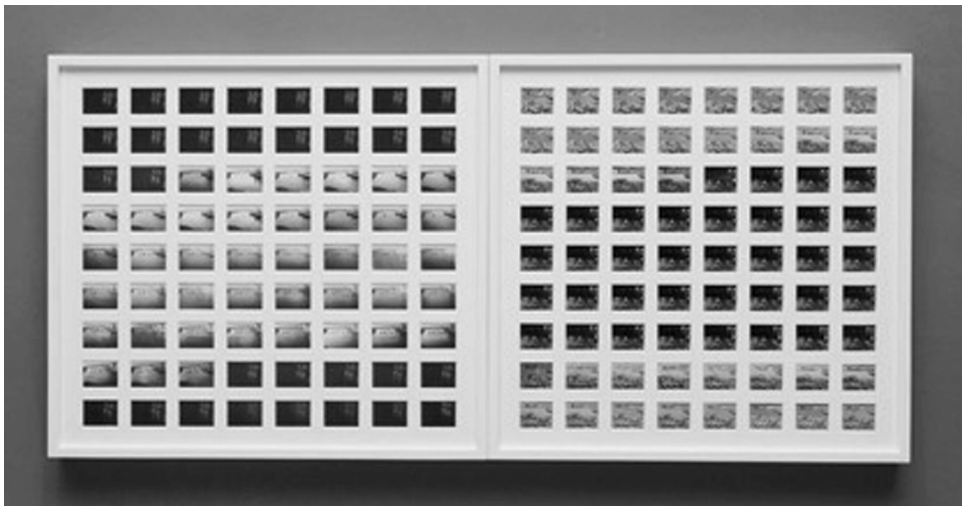Source: Image courtesy of Layla Curtis

Figure 3.5 Antipodes—Gallery view of gridded pairs of photographs[8]
Source: Image courtesy of Layla Curtis

as an "online artwork",[7] it has also been presented in galleries (Figures 3.6–3.7), including Phoenix, Leicester, UK, and Spacex, Exeter, UK, both 2013, and as part of 'Epiphany—Frontiers of Solitude', DUUL, Ústí nad Labem, Czech Republic, 2016.

A doubled world map projection is the first image of the project that greets the online viewer (Figure 3.4), in outlines on a white ground, with grey circles marking featured locations. The grey outlines delineate the layout of the world map projection
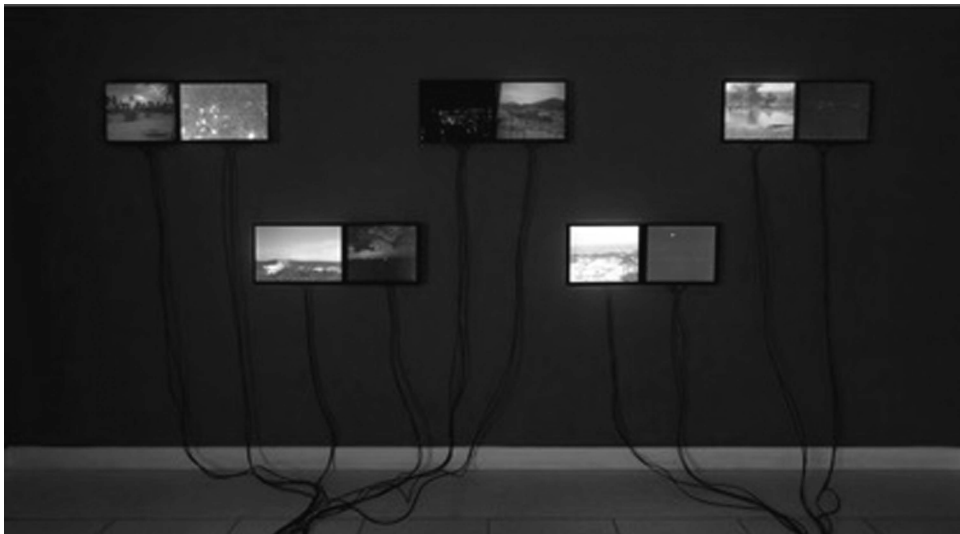
Figure 3.6 Gallery view of *Antipodes*
Source: Image courtesy of Layla Curtis

Figure 3.7 Gallery view of *Antipodes*[9]
Source: Image courtesy of Layla Curtis

most familiar to European viewers, oriented north and centred on Africa. The red outlines appear to duplicate the familiar outline, but the image is oriented south.

A closer look shows that the red-outline map has also been reversed; indeed, it has effectively been mirrored, so that the implied position of the viewer becomes suddenly quite complex. Regarding the grey outlines, the viewer is positioned in the familiar 'view from nowhere', as though spatially above the earth's surface. In relation to the red outlines, by contrast, the viewer effectively inhabits a 'view from nowhere' positioned within the earth, spatially beneath the earth's surface.

However, as this first image engages two world map projections rather than depicting the mapped earth as a sphere, to suggest a viewer 'within' is an awkward fit when the would-be containing surface no longer 'contains' in this three-dimensional sense. As the world image has here been flattened, how may we then conceptualise the structuring of the viewer's position? It is necessarily paradoxical, an image in which contradictory notions of 'within-ness' and 'without-ness' are asserted simultaneously.

Seen simultaneously from conceptually both far above and far below, the surface of the earth operates as a plane of convergence on which these opposed viewpoints meet; both views, though conceptually they are spatially opposite, focus on visualising the surface of the earth as a series of outlines evoking both coastlines and internal national boundaries. I return to the question of the doubled map image in what follows.

Antipodes, then, is concerned with elaborating a series of pairings of places based on a geometrical conception of antipodal relationships. The work takes up the formulation of antipodal relations that proposes every point on the surface of the global cartographic grid as having a diametrically opposite point. This formulation draws on the aspect of 'antipodal theory' that emphasises oppositeness as such rather than depending on Europe to provide a basis or starting point for the conceptualisation. In this way, every point on the globe's surface, conceptualised planimetrically, has its own antipodal 'other'.

As the *Antipodes* project website explains, the method chosen for selecting the specific places to be paired in this work was first a requirement that both 'ends' of the antipodal relation must be on land. Again as the site explains, this reduces the number of potential locations to around 4 per cent of the earth's surface. The second methodological requirement was for publicly available webcams to be accessible in chosen locations. The pairings of webcams yield a significant quantity of imagery, which is presented in a range of ways.

One such way is the pairing of still photographic images in the form of a diptych, or pair of photographs. Each double image combines a webcam still from each antipodal location, captured simultaneously, such that the local time of each picture is twelve hours apart from its paired image. A second format in which the webcam images are presented in the project is in the form of pairs of grids, showing seventy-two images of each location in sequence. This mode of presentation is used in the web project, as well as being realised in print form in the gallery (Figures 3.5 and 3.7).

The website's introductory text describes the project as having "observed the planet" for a year and been continuously updated with new images derived from webcams. More than two million images are now archived on the site. Time-lapse videos and photographic pairings have also been created, as well as drawings and an installation of live webcam feeds.

For the online viewer and reader of the project website, the project's description offers a starting point for interpretation and forms part of the viewing experience of

the artwork. A number of questions are raised and concerns signalled in the introductory text.[10] The time, indeed the temporality, at stake in the project remains unclear. The reader learns that the artwork was 'constantly updating' and that the paired webcams were 'live', as well as the point that the project updated 'for exactly one year'. This firmly establishes the live character of the image production as an important feature of the project, even as we view it after this period. The reader is also given guidance as to how to interpret the 'results' of the project: "The chosen antipodal webcams display obvious day/night, summer/winter contrasts but also reveal surprising architectural, cultural and topographical similarities."[11]

This statement emphasises the tension between automation and selection in *Antipodes* as a whole, and indeed, as I will argue, in the cartographic abstraction of the antipodes itself. Here, the networked webcams' performance of automated seeing is facilitated by the artist's acts of selection. Indeed, the appearance of automation is itself in play in *Antipodes*, as the webcams' locations and the content of their imagery have played an important role in the selections as to exactly what images appear as part of the work. Images incorporating human figures appear to have been de-selected for inclusion, although a number of pairings feature cities, while, as the introductory statement suggests, a tendency toward 'similarities' has informed the selection of landscape views, supporting the work's inclination to affirm similarity in preference to difference.

Figure 3.8 shows one of the photographic pairs that displays very strong similarity in terms of both content and pictorial composition. In Ecuador, a plume of grey smoke rises from a volcano in the far distance, surrounded by white cloud, while in the foreground trees and shrubs are visible. In Indonesia, a plume of smoke again rises, to the right of centre, as white cloud encircles the volcano and trees and shrubs mark the foreground. As another online description puts it, this time the commissioning body, "the volcanic peak of Tungurahua in Ecuador is shadowed by the majestic summit of Sinabung half a world away in Indonesia".[12] The characterisation of one 'peak' as being 'shadowed by the majestic summit' of another identifies the important point that the images function both as two single images beside each other and as one image with two distinct halves. In the pairings that present the clearest similarities between

Figure 3.8 Antipodes—Detail of paired images, Volcan Tungurahua, Ecuador—Gunung Sinabung, Indonesia

Source: Image courtesy of Layla Curtis

the two halves, a doubling of the similar images emerges as a theme in the work as a whole. This theme is rather over-emphasised by the press release about *Antipodes* from the commissioning body, Film and Video Umbrella, which says,

> As far away from each other as it is possible to be, these distant 'twins' often possess *surprising affinities*. [. . .] Curtis revels in drawing out these points of connection: finding topographical echoes in the landscape, as well as architectural and cultural similarities. A number of photographic diptychs, distilled from the stream of webcam footage, press the point home. Highlighting both the distance and the difference between us, they also remind us how technology is bringing us closer together.[13]

This reading of *Antipodes* as emphasising similarity despite distance is repeated across numerous reviews, blogs and institutional web copy.[14] The theme proposed by the project's title, that of antipodal relations, seems to be contradicted to some extent by this emphasis on similarity. Finding similarity where possible has been a guiding factor in the selection of webcam views, but a theme of oppositeness may also be read in the gallery view of gridded pairs of photographs (Figure 3.5). Here a clear pattern of opposite days and nights can be read and is also present in the gallery monitor display (Figure 3.6). The broader theme of sameness and difference has been important in 'antipodal theory' and is discussed in more detail in what follows. Here, the trope of diametrically opposite locations produces themes of both sameness (Figure 3.8) and opposition (Figure 3.5).

Habitation, Knowledge and Technologies of Visualisation

Some important themes emerge from the foregoing discussions of *Message in a Bottle from Ramsgate to the Chatham Islands, 78 Degrees North, 67 Degrees South* and *Antipodes*. The concept of antipodal relationships between places is explored in both *Message in a Bottle* and *Antipodes*, and in *78 Degrees North* the images enacted the cartographic 'formula' posited by the work. In this chapter, I seek to understand antipodal relations and cartographic 'formulae' as properly cartographic abstractions, which come to be generative of imagery and understanding beyond the scope of direct personal experience. While this point in itself is not particular to cartography, in these works it is the cartographic abstraction that is used as a means to generate remote viewing experiences of distant parts of the world. This generative capacity of cartographic abstraction is deployed in these works as a methodological guide to producing photographic knowledge of distant places, and I discuss this further in the next section of this chapter.

Landscape photography, including seascapes and cityscapes, emerges as a central concern in both *78 Degrees North* and *Antipodes*. There is a shared emphasis on landscape and place as the visual registers these works are concerned with, while direct depiction of persons is notably absent. The role of persons in the antipodal relationship is discussed further in what follows in the context of 'antipodal theory'.

Message in a Bottle posed as an attempt by unspecified residents of Ramsgate to make contact, through their written messages, with residents of the Chatham Islands in the South Pacific Ocean. Here, the islands' inhabitedness became a decisive factor

in their being chosen as the proposed destination of the bottles and their messages (as detailed on the project website). In his essay on *Message in a Bottle*, presented as part of the exhibition leaflet at Droit House, Jeremy Millar frames the work's 'attempt' to send a message as a productive 'failure' of communication. He suggests that to send a message in a bottle is "scarcely a means of communication at all" (Millar, 2004), given the sender's inability to know who might receive their message. To send bottles in this way appears to be "an act of the utmost folly" (ibid), and, Millar argues, we risk misunderstanding how such a work operates if we see it this way. Rather, we should consider the work to open up a space, "through which can travel not only the bottles themselves, and our imaginations, but also many new possibilities" (Millar, 2004).

It is certainly an important feature of *Message in a Bottle* that it proposes a destination for the bottles and messages in light of the effective impossibility of that destination being reached. Millar suggests that we read this situation as a knowing gesture, which has the effect of opening out a space for imaginative reflection and 'many new possibilities'. The possibilities he goes on to consider amount to the bottles being found and re-found by unknown others as they are circulated by ocean currents.

I interpret this question of 'failure' more performatively and argue that the non-production of knowledge of the Chatham Islands, one of the geographical objects of the project, is performed in the work. In this way, the possibility of knowledge generation is not straightforwardly foreclosed and figured as impossible. Despite the unlikeliness of communication passing from Ramsgate to the Chatham Islands, it is not a clear or decisive 'failure' that is presented but rather a confrontation with not knowing. The reference to the Chatham Islands in the work, as the nearest inhabited land to the precise geospatial location of the antipode of Ramsgate, installs the islands as an unseen and undefined 'elsewhere' of Ramsgate. Knowledge of this elsewhere remains held away from the viewer of *Message in a Bottle* both in the posited non-arrival of the messages and in the antipodal position itself remaining outside of visual and theoretical consideration in the work. Habitation, rather than precise location, emerges as the stronger concern both in terms of the institutional texts that frame the work and in the selection of The Chatham Islands themselves.

The precise antipodal location of anywhere in Britain is mid-ocean in the South Pacific; rather than pursuing this precise formulation of the antipodal relationship, this artwork addresses the question of a proposed mode of communication between persons rather than between locations on the earth's surface. These persons are framed as being in relationship with one another by means of the concept of the antipodes.

The idea of the message and of communication between antipodal locations does not form part of *Antipodes*, by contrast. The human figure and the concept of direct communications between persons or locations are not examined in *Antipodes* and appear only in the form of the messages-in-bottles sent to unknown, far-off would-be recipients.

Another distinct theme that emerges from this group of artworks is that of technologies of communication and image making, in particular the GPS tracking devices used in *Message in a Bottle* to generate a map of their movements, and the webcams to which the photography in *78 Degrees North* and *Antipodes* is delegated, or outsourced.

In his essay 'Local Time', reflecting on *Antipodes* after its year of live viewing, Patrick Langley describes the webcams as having been "hijacked"—commandeered

by the artist for an artistic purpose rather than the webcams' original purpose.[15] The same point applies equally to *78 Degrees North*. Langley describes the webcams as "cameras which have no awareness of the yearlong conversation in which they are taking part" (Langley, 2014). The cameras participate in the production of images without awareness of either their production or their networked relationship with the rest of the world. They 'view' continuously, day and night, presenting an enduring view that cannot be performed by unaided human vision.

In another way, the webcams' view is indeed 'susceptible' to human conditions of viewing in that they continue to 'view' at night, even when nothing may be seen in the resulting images (those that view unlit locations). The webcams' remote viewing of the antipodal locations generates a huge quantity of visual and cartographic data in particular, and a process of selection is thereby necessitated. Here we see a mode of generation of cartographic and visual data that is highly automated, operating within closely defined parameters, and the artistic mode of production is one of selection among a mass of data.

Selection operates in *Antipodes* and in *78 Degrees South* in both the cartographic and photographic registers. Locations come to be selected for inclusion in *Antipodes* through a process of selection from among the mass of spatial data presented by the whole globe. The relative specificity of locations is an important feature in *Antipodes*. Where this work addresses longitude as well as latitude, *78 Degrees North* deals only with latitude. The website notes that only 4 per cent of the earth's surface has land at both ends of the antipodal relation. More than 96 per cent of the earth's surface is in this way de-selected for inclusion in the artwork. Indeed, already the choice to engage with the abstraction of a planimetric conception of the earth's surface installs an abstraction as a delimiting, selecting function.

The requirement for a publicly available webcam to be accessible at the relevant locations performs a further act of selection, discounting locations that do not meet this criterion. The photographic imagery produced by the webcams is further de-selected, and a final series of images results. In the cartographic register, the process of delimiting that we saw operating at the level of the globe, continues to organise the selection process in terms of ascertaining antipodal points on the remaining 'less than 4 per cent' of the earth's surface area.

The narrowing down of potential locations, then, is itself a process of abstraction. Through this process, a set of images is chosen and built up, organised by the cartographic abstractions of the globe and of the antipodes. The photographic register in *Antipodes* therefore functions as a visual manifestation, a product, of the 'underlying' cartographic abstractions that have produced it.

I want to take forward the ideas of antipodal habitation, the non-production of knowledge, and the importance of the technologies of visualisation that have emerged from my earlier reading of *Message in a Bottle from Ramsgate to the Chatham Islands*, *78 Degrees North*, *67 Degrees South* and *Antipodes* into a discussion of the antipodes as both a cultural and a cartographic concept. The concept of antipodal relations between places is articulated in cartographic, photographic and performative registers in these three works. In this chapter, I seek to understand antipodal relations in terms of cartographic abstraction. Cartographic abstractions, including the antipodes, come to be generative of both knowledge and imagery that goes beyond the scope of direct personal experience. In this way, I argue for an

understanding of the antipodes as a cartographic abstraction and, as such, as form-ing the further abstraction of the remote (webcam) view, or 'cartographic remote viewing'.

As contributing elements of this cartographic remote viewing, then, the themes identified include the question of habitation of antipodal locations, also a central con-cern of antipodal theory; the non-production of knowledge that we saw performed in *Message in a Bottle*; both mapping and photography as technologies of communica-tion between and about antipodal locations; and the function of selection in the carto-graphic depiction of the antipodes as both a geometric and a cultural form.

In order to explore these questions and issues in the context of the cultural history of the antipodes, I now turn to antipodal theory and its relationship to the carto-graphic grid in more depth.

Remote Viewing: Spatial Extension and the Cartographic Grid

The cartographic grid is an important example of cartographic abstraction. It introduces a logic of regular extension and extensibility into the world image and completely normalises and makes invisible its own role in helping to create carto-graphic coherence. As Geoff King suggests, maps are extremely useful for 'imposing meaning' on a complex reality that cannot be easily depicted, and the grid plays an important role in creating the reality that it subsequently appears to represent (King, 1996, p. 41).

As Christian Jacob describes, Claudius Ptolemy's *Geography* of c.150 BCE intro-duces the mechanism of the grid into cartographic thought and practice. Ptolemy's text does not use graphic depiction but rather lists the positions of named places with their latitudinal and longitudinal coordinates, coordinates which refer to the regu-lar, two-dimensional space of the grid. This strategy managed to 'stabilise' the map through removing the pictorial element, prone as it was to distortion (Jacob, 2006, p. 120) through successive copyings by individuals with differing skills and motivations. Further, "[t]he grid generates a specific geometry based on the recurrence of the same units, on a strict horizontal and vertical alignment ruled by right angles" (ibid, p. 121).

The grid organises the cartographic image on principles of coherence, homogene-ity, logical extension and uniformity (ibid) and "stresses its own logic of expansion, its task of covering the entire space" (ibid). Through this extensive logic, the grid "betrays a will to master and control" (ibid), to conceptually organise and dominate geographic space. As Denis Cosgrove has further argued, as Western processes of exploration and surveying began to reveal that the distribution of land masses and seas did not fit the expected, strongly symmetrical pattern, some Europeans responded by "ruthlessly impos[ing] their visions of spatial order across conquered territories through the applied geometry of geodesy, survey and cartography, while others imag-ined ever more esoteric symmetries hidden beyond the earth's surface geography" (Cosgrove, 2008, p. 21).

The importance of gridded space is that it figures a "mathematical relation with reality" (Farinelli cited in Jacob, 2006, p. 121), an abstract form of space, and because it is completely regular and consistent it allows for the conceptualisation of the earth as a sphere, which is consequently able to have all the properties of a sphere, including an axis, a circumference (the equator) and a radius and diameter.

I am particularly interested here in the grid's role in producing the cultural and mathematical concept of the antipodes. This is initially a conception of cultural difference and opposition, becoming subsumed by the mathematical abstraction of the globe as a sphere and more particularly its diameter; the diameter of the sphere comes to be expressed in the formulation of the antipodes as points diametrically opposed on the surface of the globe. The imposition of the cartographic grid onto the abstraction of the Earth-as-globe is, as King argues, also a way of imposing meaning onto the world. The grid enables the mapping, and thereby the constitution, of territory, and actively creates the reality that it appears, misleadingly, to represent.

It is the regular form of the grid that matters, as King further argues:

> all classificatory grids are arbitrary. They have no necessary or absolute status. It does not matter what kind of grid is used on the map. Any system of lines and points of reference can be imposed to provide orientation, although different mappings may serve very different interests.
>
> (1996, p. 43)

The cartographic grid structures an abstract conception of global space and enables the development—in the cultural form of the antipodes—from a conceptual and theological understanding of global space to a mathematical, geometric subsumption of the antipodal form.

In *Rethinking the Power of Maps*, Denis Wood titles one section 'Maps Give Us a Reality beyond Our Reach' and elaborates, "a reality that exceeds our reach, our vision, the span of our days, a reality we achieve in no other way" (2010, p. 15). The cartographic grid facilitates the abstract extension of cartographic space to encompass and appropriate the globe conceptually. As Monmonier argues in the national context and as is equally relevant in the global context,

> in partitioning an entire country among a largely arbitrary grid of rectangular areas called quadrangles, the national mapping organization willingly sacrifices political, ethnic, and physical boundaries to the convenience of uniformly spaced meridians and parallels—a divide-and-conquer strategy that makes complete coverage seem both doable and essential.
>
> (1996, p. 124)

Monmonier here identifies the cartographic grid in terms of its negative consequences—as 'sacrifice' for the sake of 'convenience'. The assimilative, appropriative role of the grid is also registered here. As a cartographic abstraction, the grid structures the form of remote viewing instantiated here in the cartographic abstraction 'the antipodes'.

Jacob draws on the influential work of J.B. Harley to assert that maps use selectivity about content, as well as their "styles of representation", to provide visual ways of "conceiving, articulating, and structuring the human world" (Jacob, 2006, p. 24). Maps give a visual form to the social relations present at the point of the map's making. The concept of the antipodes was, initially, an expression of an imagined social relation between the West, or what was later Europe, and its 'antipodean other'. As Olsson (2007) discusses, in ancient Greek geography an outer sea was thought of as

the limit of the *oikumene*, the known world, and continental forms often depicted in a more or less symmetrical arrangement.

Alfred Hiatt contextualises the development of the concept of antipodes as a "particular version of *terra incognita*" (2008, p. 3, emphasis in original), the areas marked on maps as 'unknown'.

> The term 'antipodes' initially referred to people dwelling opposite to—literally with feet against—the known world. The concept was the product of classical Greek geometry, which calculated the size and shape of the earth with a remarkable degree of accuracy, and argued that unknown lands and peoples were likely to exist in parts of the world beyond the land mass constituted by Europe, Asia, and Africa.
>
> (Hiatt, 2008, p. 3)

This approach locates the concept of 'antipodes' in its historical context as part of a project of particularly European exploration and cartography. The theorised southern landmass was a crucial part of the European geographical imaginary, both in terms of positing a coherent global disposition of land and in terms of relating European persons to persons thought to inhabit such distant lands.

As European voyages of exploitation progressed through the fifteenth and sixteenth centuries, *'Terra Australis'* became perhaps the most resonant instance of *terra incognita*, as more areas were appropriated as objects of cartographic knowledge and therefore fewer designated as unknown. It was from a European perspective that *Terra Australis* came to be widely known as 'the antipodes', which combines the sense of oppositeness which has carried forward into contemporary uses of the term and the particular relationship of the imagined 'other' of the ocean-going powers. As Hiatt writes,

> *Terra Australis* was a cartographic fiction, the product of cosmological theory and the confusing welter of travel narratives that flooded into Europe during the sixteenth century [. . .] Stitched together, the traces of disparate explorations added verisimilitude to the thesis, in existence since classical times, of a vast Antarctic continent.
>
> (2008, p. 1, emphasis in original)

The 'cartographic fiction', or what I term cartographic abstraction, of *Terra Australis* persists in the common use of the name 'Antipodes' to denote New Zealand and Australia, a formulation that exists alongside the geometric conception of an infinite number of antipodal, diametrically opposed points on the Earth's surface.

Antipodal Habitation

The issue of habitation and of the nature of antipodal persons were central concerns in classical and medieval conceptions of the antipodes. The term began by referring to persons unknown, posited people who live against our feet. Classical theorising about the extent and form of the world gave rise to a range of world images, and theories as to the existence and characteristics of antipodean persons were bound up with

theories as to the potential climate and therefore habitableness of 'southern lands not yet known' (Hiatt, 2008, p. 1). The antipodes have offered a range of ways of conceiving of and theorising about unknown lands and their unknown inhabitants; indeed,

> Plato's works contained the seeds for the classical discussion of the antipodes precisely because they offered more than one model for conceiving of unknown spaces: as opposite to the known world, as multiple other worlds, or seen from above, defining the known world and life on earth.

> (ibid, p. 16)

These alternative ways of conceptualising the antipodes intersected with and contributed to the production of a range of ways of conceiving of antipodean persons.

The antipodal people and places, as Hiatt notes, were not featured on maps "with a purely historiographical function" (ibid, p. 4). Rather, they were altogether a different kind of pictorial proposition; they were theoretical, regarded as inaccessible from the *oikumene* (or the ecumene, the known world), and a geographical and cultural figure that functioned as a device for speculating and reasoning about the nature of antipodean persons.

"Antipodal places and peoples quickly acquired significance beyond that of a dry scientific theory" (ibid, p. 6) and came to offer a productive figure or, as I argue, an abstraction, by means of which theories as to the existence of persons and lands in remote regions could be constructed. As Hiatt observes, the antipodes appeared on cartographic world images whose purpose was less historiographic and more theoretical, belonging primarily though not only to the tradition of 'zonal maps'.

Zonal maps depicted the known as well as the unknown world, "ecumene and antoecumene" (ibid, p. 4). They are the pictorial expression of an idea in classical geometry that considered the earth as a geometrical form divided into five zones of latitude. As Hiatt describes, two cold zones are located at the poles, north and south, while a hot or 'torrid' zone occupies the equatorial zone, which is largely ocean. Two temperate zones occupy the central band of each hemisphere, north and south, between the hot equatorial zone and the two cold poles. As a result of this geographical theory, a continent was posited in the southern hemisphere to correspond to the landmasses of the northern hemisphere. This landmass was cut off and inaccessible from the northern hemisphere, as the equatorial zone was thought to be impassable. The idea of the equivalence between the two temperate zones "meant that it was possible, even attractive, to envisage inhabitants of the southern, unknown temperate zone, and in the case of the cosmic vision, to see antipodeans in relation to dwellers in the known world" (ibid, p. 16).

The figure of the antipodean person and range of attributes that it came to embody importantly responded to theories about the climate and habitability of the regions of the globe outside the known world. Whether these regions were straightforwardly too hot or too cold to sustain human living was an important question in theories about those regions' potential inhabitants.

The 'southern, unknown temperate zone' gradually took the form of the 'great southern land' and a fictional object that provided a strong motive force for exploration by the European powers well into the nineteenth century.[16] The possibility that a huge southern continent could be found was in part so significant because it had been

theorised as habitable, therefore inhabited, and as possible to communicate with and engage with economically and culturally.

Classical geographical theory proposed the existence of more than one landmass and more than one 'other' of the *oikumene*. In Crates's influential contribution to classical zonal theory,[17] a second landmass was proposed that must exist in the northern hemisphere, to balance that of the known world, as well as two corresponding quadrants in the southern hemisphere, effectively on the 'underside' of the known world.

> Crates' theory [. . .] meant that the distinction between the known and unknown worlds could be made not only in terms of temperature (temperate, frigid, and torrid zones), but also in terms of the relations between inhabitants of the various parts of the earth.
>
> (ibid, p. 17)

The people who were posited as dwelling in the theorised regions of the earth were also divided into categories arising from their theorised geographical relationships to the known world. These categories were termed

> perioikoi (around from the known world, i.e. the underside of the northern hemisphere), antoikoi (in the southern hemisphere opposite, i.e. due south of, the oikumene); and antipodes (on the underside of the southern hemisphere). All three other worlds are represented from the perspective of the known, and in all at least the possibility of habitation is assumed. A fourth term, antikthones, was derived from Pythagorean theories of 'another earth, lying opposite our own', and tended to be used to refer to those furthest away from, and having least in common with, the inhabitants of the known world.
>
> (ibid, p. 17)

Therefore, the antipodes, in terms of both place and persons, were not straightforwardly a figure of reversal and oppositeness, although these are important features of the abstraction of the antipodes understood more broadly. In relation to this point, it is worth noting Hiatt's discussion of multiple antipodeans in classical conceptions of geography (2008, p. 53). Noting a considerable degree of contradiction and confusion in one influential account, Hiatt identifies a 'proliferation of antipodeans' as an outcome of the range of ways that remained open for figuring persons and places in antipodal theory:

> Once the relationship of known world to unknown moved beyond binary opposition between 'we' and 'they' to encompass multiple unknown peoples, error (in its literal sense) could infiltrate and disrupt analogy. Wandering from one group of unknown people to the next, the desire to explain the totality of terrestrial habitation caused *a proliferation of antipodeans*: ours, those of the antoikoi, those of the equatorial dwellers—each the other's antipodeans. Description here serves to blur and break down differences, to undo, rather than reproduce and reinforce, categorization.
>
> (ibid)

'Oppositeness' is here figured and extended in three dimensions, as a feature of relations between the known world and its geographical 'others' in both the northern and southern hemispheres. The term 'antipodes' has today come to denote, predominantly, what in Crates's theory is termed the *antikthones*, those persons and regions diametrically opposed to the known world. This is the version of antipodal relations that is explored visually in Curtis's works *Message in a Bottle from Ramsgate to the Chatham Islands*, *78 Degrees North, 67 Degrees South* and *Antipodes*.

While the human or other form of the posited antipodal inhabitants is not visualised in *Message in a Bottle*, in the tradition of antipodal theory they have been imagined in a range of ways. The theorised inhabitants of unknown regions frequently took the form of fantastical creatures and altered human forms in the pictorial tradition of *mappae mundi*, medieval encyclopaedic world maps.

Mappae mundi are a family of medieval world maps produced in the thirteenth and early fourteenth centuries that conveyed historical, religious and political information in a geographical framework (Black, 2000a, p. 5). They emphasise ideological concerns—religious, political and social—as an important subject for depiction. The geographical framework primarily provides a means of representing a relationship between God and the world and the map's patron. A significant example of the *mappa mundi* is the Ebstorf Map (Figure 3.9), the largest known example of the genre. In this case, the body of Christ has become the cartographic depiction itself, so that his head, hands and feet stick out of the map imagery at the top, bottom, left and right. Like other maps of this type, the Ebstorf Map places Jerusalem at the centre and east at the top.

This map form represents the world as known to medieval European mapmakers but with a strong emphasis on synthesising biblical and classical geographical knowledges with contemporary political and theological concerns (Delano-Smith and Kain, 1999, p. 32). For example, biblical geographical knowledge is referenced by the inclusion of the garden of Eden, which in the Ebstorf Map is placed immediately beside the head of Christ, to the east of India. Here it is possible to see a 700-year-old map in which the communication of geographical information is of secondary importance. Its primary emphasis is ideological and subjective: specifically religious and political. This subjective form of mapping, therefore, is not a recent or postmodern development but is present at the foundation of the Western tradition of cartography upon which colonialism is contingent.

The map includes information about commercial and pilgrimage routes (Barber and Harper, 2010, p. 80) and gives prominence to the regional possessions of the Duke of Brunswick, whose principal seat was at Lüneburg, where the map is believed to have been made. The map is bound up in (and creative of) the expression of social and political status. Knowledge from classical sources, especially Pliny's writing on geography, is manifested in the fantastical creatures depicted at the far right of the map, a device also seen in other *mappae mundi*. In the Hereford *mappa mundi*, for example,

> between the upper Nile and the ocean, the map shows a series of ten strange races, mostly of peculiar physique. They include the people with only one leg and one eye [. . .], those who cannot open their mouth so have to take nourishment through a straw [. . .], those who walk on all fours [. . .] and two peoples with their face in their chest.
>
> (Harvey, 2002, p. 48)

Figure 3.9 Ebstorf Map, maker(s) unknown, c.1239–1300. 357cm diameter. Made at Ebstorf
          Convent in what is now Germany.

Cynocephali are also depicted, a people with the heads of dogs (ibid, p. 36), usually
appearing in India or Ethiopia, but in the Hereford map they appear in Scandina-
via. While not specific to the geographical concept of the antipodes, these altered
human forms figure the wider themes of otherness that mark (cartographic) antipodal
discourses.

   This manifestation of the conceptualisation of antipodal inhabitants is not the
one we see explored in Curtis's works. The inhabitants remain unseen yet posited
for the viewer of *Message in a Bottle* and are not in question at all in *78 Degrees
North* or *Antipodes*. In the development of these three works, then, there is clearly
a move away from an emphasis on habitation and the question of inhabitants.
However, in *Message in a Bottle*, the selection of the Chatham Islands as the pro-
posed destination of the bottles depended in large part on their being the closest
inhabited location to the relevant antipode. As against a notion of sending bottles

to a mid-ocean coordinate, here the sending of bottles is proposed as a method of communication, positing a recipient who will, at least potentially, receive the message. That the journey to the Chatham Islands is apparently never completed remains implicit in the work. In this way, the antipodal inhabitant remains unseen yet posited by *Message in a Bottle*.

In the case of *Message in a Bottle*, the cartographic abstraction of the antipodes functions not to produce 'knowledge' of but to theorise distant and unknown persons and their geographical presence. In *Antipodes* and *78 Degrees North*, emphasis on the question of habitation and the antipodal person gives way to a concentration on a more thoroughly spatial cartographic rendering of the antipodes.

Knowledge Production and the Unknown: The Antipodes as *Terra Incognita*

A second contributing element of this cartographic remote viewing, more broadly, is the theme of the 'non-production of knowledge' that we saw performed in *Message in a Bottle*. By 'non-production' I mean the proposing of a setting in which knowledge of distant regions and persons is to be produced and in which ambiguous visualisations are produced instead. I use the term 'non-production' to characterise the proposed and incomplete communication with The Chatham Islands, as well as the visualisations that make up *Antipodes* and *78 Degrees North*. The photographic pairings depicting two 'twinned' locations, antipodal and latitudinal respectively, participate in a strictly curtailed visualising of their locations. This mode of visualisation initially proposed to generate live viewing and therefore knowledge of the cited locations, which it did, but its mode of doing so was situated, partial, addressed to a narrow range of view and ultimately more emphasising of the relation between the two places than the 'content' or particularity of each place. The antipodal character of the relation itself becomes the emphasis.

To return briefly to another moment of *Antipodes*, in the period since its year of live broadcast, the online mode of presentation had itself begun to break down before being refurbished in 2016. Many of the more detailed elements of its functionality had stopped working (Figure 3.10). As *Antipodes* is conceived as a distinctively online presentation, this presents some interesting interpretative possibilities. Viewing the artwork online, in its intended form, performs an analogous viewing position to that of the viewer of the cartographic image per se. One views what is given, what is made available, and is not usually involved in understanding the production process of the image or the work.

This is not the same as asserting that research may not be undertaken and independent knowledge generated. At the time of writing, I can indeed find for myself a website called, for example, http://webcamsdeasturias.com/, which makes available live webcam views from across the principality of Asturias in north-west Spain, including a webcam view of the small fishing port of Tapia de Casariego. In this way, it is of course possible to learn more as a viewer than is presented in the finished form of the work. What I am concerned to do, however, is to approach what it is that is actually presented to the viewer and to ask about what is actually visible and knowable in the context of the artwork. Here, knowledge of the appearance of the Port of Christchurch is proposed as being available in the viewing experience yet ultimately held away from the viewer.
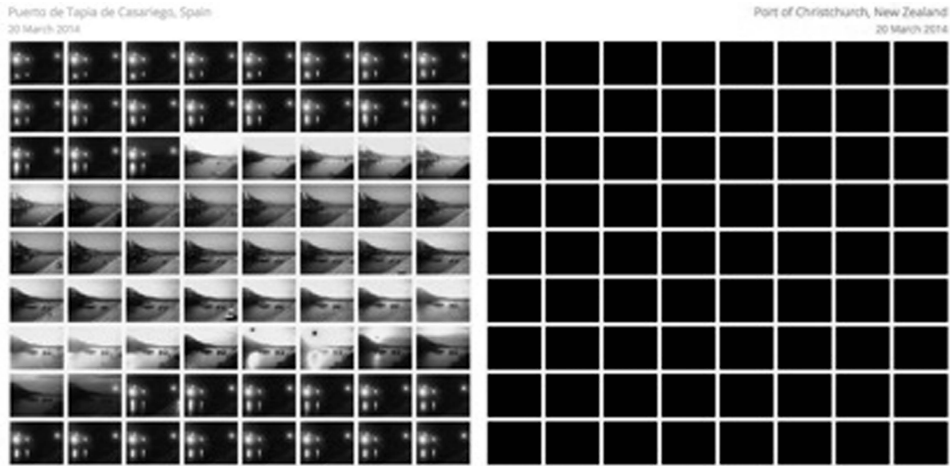
Figure 3.10 Antipodes—Online view of Puerto de Tapia de Casariego, Spain, and Port of Christchurch, New Zealand

Source: Image courtesy of Layla Curtis

In this way, the visualisations in *Antipodes* come to depict the cartographic relationship, the doubleness or 'twinning' itself, to an important extent: knowledge of form rather than content. A spatial understanding emerges from the work, in which a relationship between two places and a method for forming relations between places is generated through the use of the cartographic abstractions of latitude, longitude and the globe. As we saw, a detailed set of criteria conditioned which places could come to be depicted in *Antipodes*, such that the criteria came to be the focus of knowledge production rather than the places in question. Put another way, the mode of viewing itself becomes the (self-reflexive) object of inquiry and of understanding.

The performance of the non-production of knowledge, then, emerges as a productive deployment or mobilisation of cartographic abstractions. In *Message in a Bottle*, *78 Degrees North* and *Antipodes*, cartographic abstractions (particularly latitude, longitude and the globe form) are used to interrogate cartography's central epistemological claim—that it functions to produce spatial and topographical knowledge of 'the earth' broadly understood. Rather than contradicting this claim, I argue that the explorations of cartographic relations articulated in these artworks rather nuance and delimit the focus to a particular, antipodal mode of abstraction through which cartographic conceptualisation becomes possible. Put another way, this conceptualisation is produced and enabled through the functioning of cartographic abstractions. I use the idea of non-production here to emphasise the way in which, in the three works, cartography's epistemological claims are not straightforwardly critiqued or refused but nuanced and extended.

Hiatt characterises the antipodes as spaces that have been "integral to world maps, located outside of geographical experience, yet not beyond the bounds of geographical reasoning and imagination" (ibid, p. 3). More than a process of progressive

visibilisation, the "history of cartography is not simply a narrative of the gradual documentation of the earth's surface; it is also the story of non-places, of lands that are not and never were, but that—often for considerable periods—existed on maps" (ibid, p. 3). These 'non-places', *terrae incognitae*, no longer find depiction in the world image after the beginning of the twentieth century. However, the particular cartographic abstraction of the antipodes continues to organise spatial and geographical conceptualisation.

Some clarity is needed in relation to the uses of terminology in this area. The term *terra incognita*, with its plural form *terrae incognitae*, designates lands 'unknown' from the perspective of a European production of knowledge of the form, extent and geography of the earth. In this discussion, I am drawing on Hiatt's work closely as a key theorist of the antipodes, but the term *terra incognita* is widely used and known, to the extent that it is "now a metaphor" (ibid, p. 3) and a brief online search shows a wide popular uptake of the term to name films, albums and computer games. As we have seen, Hiatt positions his analysis of the history and conceptualisation of the antipodes as a specification of the much broader historical phenomenon of *terrae incognitae* (ibid, p. 3). While it is beyond the scope of this chapter to articulate the rich and complex and often contradictory histories of European cartographic imagining and reasoning about knowledge of distant lands and their peoples, we can note the capacity of the abstraction *terra incognita* to organise the production of knowledge by Europe of its geographical and social others.

In terms of the (medieval) conceptualisation of the earth as a whole, Hiatt further argues that the

> hypothesized terrae incognitae [function] as a necessary element of the whole, but one that inevitably disrupts wholeness. Whether the product of a lectio philosophica, a part of the world image asserted by philosophers, a popular legend, or an element of classical literary tradition that continued to invite adaptation, the antipodes derived potency from their position beyond the thresholds of knowledge, yet within the world. They could not be known, but attempts to show and discuss the world recurred to their possibility because to think spherically was to think of the other side of the world, and to consider its habitation.
>
> (ibid, p. 115)

In this way, the concept of *terrae incognitae* as such has functioned as a figure and a rubric for positing unknown places and persons themselves, as well as for constituting some of the conditions for this broad practice of theorising and imagining. Here the antipodes, as a particular form of *terra incognita*, draws its/their capacity to perform 'potency' by virtue of taking up the position of 'beyond the thresholds of knowledge'. To 'think spherically' has been a European modality of geographical knowledge production that, for many centuries, has played a central role in both theorising and constituting knowledge of the 'unknown' and the 'not yet known'.

A further important term in this area is *terra nondum cognita*, land not yet known, which, for Hiatt, "foretold its own assimilation" (ibid, p. 213.) He emphasises the importance of the *nondum*, the 'not yet', as signalling both delay and the incomplete, partial character of the world map image (particularly in the sixteenth century; ibid, p. 217). The figure of 'not yet' was "an imaginative construct that invited mental as well as physical exploration" (ibid, p. 213).

In relation to the idea of the unknown and the not yet known, Hiatt's use of 'non-places' may be confusing. As we saw, Hiatt deploys this term to name 'lands that are not and never were'. However, the term 'non-places' has been made familiar through the work of Marc Augé,[18] who uses it to designate "spaces of circulation, consumption and communication" (1995/2008, p. viii) in the twentieth-century context of globalisation. The term 'non-places' has been even further extended by Jim Brogden[19] to embrace the concept of *terra nullius*. Significant debate has surrounded the use of this term, originally meaning 'uninhabited land' or 'nobody's land'. Having been asserted by Alan Frost[20] as having played a significant role in the legal justification for British dispossession of Aboriginal lands in Australia in the later eighteenth century, more recent debates have refuted Frost's influential claim that the concept was used in this way.[21]

In the context of the particularly cartographic positing and imagining of non-European lands, *terra nullius* functions particularly in the register of property relations. Where *terra incognita* functions largely to indicate a shared level of European lack of knowledge of a place, *terra nullius* functions at the level of intra-European competition and the assertion of colonial ownership.

Mapping and Photography as Technologies of Antipodal Communication

A third element in the formation of cartographic remote viewing at issue here is the functioning of both mapping and photography as modes of communicating about and between antipodal locations. As we saw in *Message in a Bottle*, an act apparently of communication—the sending of the bottles—emerged more critically as a performance of the production of cartographic knowledge through the positing of antipodean persons and an antipodean site. In *78 Degrees North*, photography is deployed to enable the compilation of photographic visualisations of pairs of antipodal locations. In this way, visual knowledge of the chosen locations *as antipodal* is generated in a 'third', online space, as well as for viewers situated in galleries. 'Communication' does not occur between the antipodal locations then, but rather they function as the source, or the site of image production, for consumption by an undetermined number of discreet, distributed viewers. The same production dynamic is used in *Antipodes*, in which the selected locations function as the content of the pre-determined format in which the locations are to appear.

The antipodes are used as a way of conceiving of distant, particularly southern regions at a historical stage in which they were physically inaccessible to Europeans. This mode of conceiving of remote regions functions, I argue, as a factor in the subsequent development of the material conditions of transport and navigation. As Hiatt notes, "[s]titched together, the traces of disparate explorations added verisimilitude to the thesis, in existence since classical times, of a vast Antarctic continent" (2008, p. 1), the 'Great Southern Land' or '*Terra Australis*'. The seventeenth-century Admiralty conceived of this continent in acquisitive political terms: "that of all the regions of the world remaining unexplored the southern continent merited most attention" in terms of "trade, empire, and national prestige" (Williams and Frost, 1988, p. 22).

The official desire to figure the Southern continent as a prospective source of wealth was, although not straightforwardly, a strong factor in ongoing exploration

of the southern Pacific through the sixteenth to the nineteenth centuries.[22] In this way, the cartographic conception, which I argue for understanding as a cartographic abstraction, of the antipodes formed part of the material conditions underpinning the production of imagery of the Southern continent. As Matthew Boyd Goldie argues,

> One can imaginatively reach out to [the antipodes] and physically reach them along a number of very different routes, and the antipodes can also reach us. They correspond to us, but they also correspond with us.
>
> (Goldie, 2010, p. 3)

In being remote yet conceivable, particularly in cartographic terms, the antipodes at once functioned in terms of communication, appearing to do so initially as a figure for its impossibility. This tension between distance and simultaneity in the abstraction of the antipodes is figured in the presentation of the pairings of webcam photographs in both *78 Degrees North* and *Antipodes*.

Reversal, Mirroring and Symmetry

A further theme arising from consideration of Curtis's three artworks is that of reversal, particularly mirroring and symmetry. As we saw, in *Antipodes*'s description 'surprising architectural, cultural and topographical similarities' were foregrounded as part of the official presentation of the project as being centrally concerned with similarity between antipodal locations.

In the context of a cultural history of the *concept* of the antipodes and antipodean spatial relations, Helen Lucy Blythe identifies a shift in the associations of the term 'antipodes',

> from a horizontal movement between the eastern and western hemispheres into a vertical one focused on a southern land associated with reversal, mirrors, the impossible or absurd, the fantastic and the foreign.
>
> (2014, p. 8)

Blythe also describes an antipodal discourse in which New Zealand/Aotearoa is figured as Britain's primary antipode rather than Australia. Blythe argues that

> to emigration reformers in the 1830s, the islands of New Zealand were the literal and figurative geographic Antipodes of England's own isles [. . .] illuminating the unique appeal of New Zealand as a reproduction of England, and deploying the ancient associations with symmetry and reflection to promote the land.
>
> (ibid, p. 10)

The abstraction of the antipodes allows scope for figuring relations between more than one part of the globe and in more than one direction, as we saw earlier. In this case, New Zealand is able to fulfil the form of the antipodes of Britain in terms of its capacity to both reflect and improve on the image of Britain. This dynamic also served to position New Zealand as an appropriate and appealing destination for British settlers.

Patrick Langley also cites the ambiguity and oppositionality that is found in *Antipodes*:

> The landing page of the Antipodes website shows us a reimagined atlas in which, rather than a totalising, satellite-eyed vision of the planet, we are presented with the coexistence of polarized worlds, one in black lines, one in red, one upright (according to the atlases I was raised on) and the other inverted, with no indication as to which is the 'real', privileged worldview. Faced with this ambiguous geography, in which, through a simple act of cartographic collage, our world is turned upside-down, and that which was once singular is now shadowed by its opposite, we are reminded that places are always defined by what they are not, as much as what they are.
>
> (Langley, 2014)

A broader question of the figuring of sameness and difference emerges from these considerations of oppositeness, reflection, mirroring and symmetry. This tension appears in *Antipodes* in the doubled photographic images, where the theme of similarity and echoing is at once affirmed and contradicted in the images; they depict similarity at the same time as declaring that the depicted places cannot be any further apart. Hiatt further describes a "state of opposition and mutual relation between known and unknown worlds and their inhabitants" (2008, p. 17). Oppositionality is not simply a mode of confrontation but also a form of 'mutual relation'.

Cartographic Abstraction as Productive

In light of this discussion of the antipodes in terms of habitation and relations among antipodal persons, the production of knowledge by means of the generative capacity of the antipodes as a cartographic abstraction, the modes and possibilities of antipodal communication and the antipodes as a trope of reversal, I want now to draw together some of the key issues in this analysis in terms of cartographic abstraction as a mode of cartographic viewing.

I have identified the cartographic abstractions of latitude, longitude and the globe form as having a productive role in antipodal conceptualisation. The cartographic grid is a distinct though not separate abstraction that organises the spatial concept of the antipodes. I interpret this with emphasis on the organising and structuring of the viewer via the cartographic abstraction of the antipodes rather than focussing on inscription of the European 'other'. This is in part in response to the artworks' attention to remote viewing, with attention on the subject who is configured as a viewer, and in part in response to the non-presence in the artworks of persons who may be understood to be inhabitants of the viewed places. Put another way, persons do not appear in these artworks. What does appear, through the process of interpretation, is a cluster of ways in which a viewing subject is formed. This viewing subject is structured as a remote viewer of lands that have antipodal relations to each other. In *Antipodes* in particular, the mode in which locations are brought together in the work is based on forming relations on a geospatial basis. The classical and medieval concept of the antipodal relation is assimilated to a new geometrical structuring, and in this way the antipodal concept is de-particularised and globalised—no longer pertaining only to

relations between Europe and a fluctuating grouping of Australia, New Zealand, the Chatham Islands and Oceania.

While the antipodal pairings in *Antipodes* do include Australia and New Zealand, the sites are spread across the globe, positing a potentially infinite range of point locations on the gridded surface of the globe. *Antipodes* carries out a generalising of the antipodal form, privileging the abstract cartographic grid as a method for generating spatial relations. The antipodes are now of all places rather than of only Britain or Europe. However, the cartographic grid is an abstraction arising from European geographical discourse as much as is the abstraction of the antipodes itself. While this mode of spatial conceptualisation is regularising, positing all parts of the earth's surface as existing within the scope of one consistent geospatial form, its provenance remains European.

It is this multiple, limitless conception of the antipodes that is evoked in Curtis's work and is immediately delimited through the 'formula' of selection in the artwork, to incorporate only land areas, and then only those at which a publicly available webcam may be accessed. Through deploying this strategy, Curtis subverts the archetypical cartographer's technique of instrumentalised visualisation. The antipodal relation emerges as arbitrary, based not in political or social relations between depicted places but on a Euclidean commensuration of global space; the scopic regime in play in *Antipodes* is operationally, or materially, appropriative. In this way the artwork performs a renewed visibilisation of the spatial relation between conceptually commensurated locations while resisting any straightforward relationship between an abstracting, cartographic scopic regime and the places that scopic regime renders visible.

Hiatt sees the antipodes as constituting

> a representational problem, since, fictitious travellers aside, they cannot be described by first-hand experience. In such circumstances ecphrasis (literally 'speaking out', and in its literary usage a self-contained description of an object) is possible only by analogous inversion (there is here), or by the imposition on the antipodes of other spaces beyond the known world—in classical literature hell, and later purgatory and paradise. At the same time any global vision had either to acknowledge antipodal spaces and people or to deny their very existence; ignoring the question was not possible.
>
> (2008, p. 32)

Antipodal theory emerges as a central problem in the remote cartographic visualisation of unknown and distant regions. The development of a global cartographic vision demands that theorists reckon with the question of these other regions. In order to do so, it becomes necessary to engage with these unknown regions and persons theoretically, by way of the abstraction of cartographic remote viewing.

In conclusion, then, I argue for re-thinking the cartographic and cultural figure of the antipodes as a cartographic abstraction. Through detailed consideration of three cartographic artworks by Layla Curtis that are concerned with visually presenting antipodal relations between places, we have seen that *Message in a Bottle from Ramsgate to the Chatham Islands* (2004), *78 Degrees North, 67 Degrees South* (2007) and *Antipodes* (2013–14) are each concerned with evoking and examining these antipodal relations through both cartographic and photographic techniques. Analysing each artwork in turn, we saw that habitation, a non-production of knowledge,

communication, selection and reversal are important visual and conceptual themes in these works. These concerns matter because they provide the opportunity to consider in detail how cartographic techniques can be investigated through a different medium—artworks rather than maps.

My primary argument here is more concerned with form than content. It is that antipodal relations, or 'the antipodes' as a cartographic abstraction, becomes a productive factor in the formation of knowledge relating to antipodal locations on the part of the viewer. The viewing position is structured as one through which 'knowledge' is produced of abstractions and abstract relations in the conceptualisation of remote and unknown regions of the globe. In this way, I propose that a cartographic abstraction (the antipodes) is central to and, importantly, *productive of* cartography's capacity to perform a conceptual mode of remote viewing.

Notes

1   Available at www.laylacurtis.com/work/display/5-mixed_media accessed 17 June 2017.
2   Available at www.fromramsgatetothechathamislands.co.uk/ accessed 17 June 2017.
3   Available at www.fromramsgatetothechathamislands.co.uk/, accessed 17 June 2017.
4   Available at www.laylacurtis.com/work, accessed 17 June 2017.
5   Available at www.laylacurtis.com/work, accessed 17 June 2017.
6   Information available at www.antarctica.gov.au/about-antarctica/people-in-antarctica/who-owns-antarctica, accessed 17 June 2017.
7   The *Antipodes* 'about' page, available at http://antipodes.uk.com/about, accessed 17 June 2017.
8   Available at www.phoenix.org.uk/content/uploads/2013/10/antipodesweb2.jpg, accessed 17 June 2017.
9   Available at www.laylacurtis.com/public/info_img/378.jpg, accessed 17 June 2017.
10   Available at http://antipodes.uk.com/about accessed 17 June 2017.
11   Available at http://antipodes.uk.com/about accessed 17 June 2017.
12   Quote from www.fvu.co.uk/projects/detail/commissions/antipodes, accessed 17 June 2017. *Antipodes* was commissioned by Film and Video Umbrella in 2013, in association with Spacex, with technical support from Cuttlefish and funding from Arts Council England. Film and Video Umbrella's press release about *Antipodes* is available at www.fvu.co.uk/downloads/PR_Layla_Curtis_final.pdf, accessed 17 June 2017.
13   Ibid. Emphasis mine. Key phrases from the original *Antipodes* 'about' page were repeated in press releases and online copy, including for example "surprising affinities" which appears in Film and Video Umbrella's press release. When the *Antipodes* 'about' page was re-edited in 2016 (a process in which I had a very minor input) the word 'affinities' was removed.
14   See for example the Aesthetica Magazine blog, available at www.aestheticamagazine.com/blog/layla-curtis-antipodes-at-spacex-exeter/, accessed 17 June 2017, Spacex Gallery press release, available at http://spacex.org.uk/wp-content/uploads/2012/06/LaylaCurtis_PressRelease.pdf, accessed 17 June 2017, review by David Trigg, *Art Monthly*, No. 368, July-August 2013.
15   As the *Antipodes* project website states, "The webcams were all pre-existing cameras installed for a variety of reasons: to monitor weather, traffic, surf, ports, and volcanic activity, as well as providing remote viewers opportunities to glimpse wild animals at a desert watering hole, explore a holiday destination or perhaps experience a distant sunset." available at http://antipodes.uk.com/about, accessed 17 June 2017.
16   The momentum of survey voyages was neither consistent nor swift. See Williams and Frost (1988).
17   As Hiatt notes, Crates (c.150 BCE) wrote an influential commentary on Homer and speculated on the seasons and climatic conditions in the antipodes.

18 See Marc Augé, *Non-places: Introduction to an anthropology of supermodernity* (Verso, London).

19 See Brogden's PhD thesis, *Terra nullius: Encountering the non-place*, available at http:// etheses.whiterose.ac.uk/1918/1/Final_PhD_TEXT_July_2011.pdf, accessed 17 June 2017. As he writes, "My own adoption of the term non-place seeks to broaden Augé's definition to include those pockets of abandoned land which are very rarely visited, often prohibited and marginalized by the effects of post-industrial decline since the 1970s in England, pejoratively referred to as 'brown field' sites, or more commonly—'wastelands' " (2011, p. 2).

20 See Frost and Williams, *Terra Australis to Australia* (Australian Academy of the Humanities and Oxford University Press, Melbourne and Oxford, 1988), p. 166, and Alan Frost, New South Wales as *terra nullius*: The British denial of aboriginal land rights. *Historical Studies* 19(1981), 513–523.

21 For these revisionist debates on *terra nullius*, see particularly Borch (2001) 'Rethinking the Origins of *Terra Nullius*' and Andrew Fitzmaurice, The genealogy of *Terra Nullius*'. *Australian Historical Studies* 38(2007), 1–15.

22 See particularly Glyndwr Williams and Alan Frost, New South Wales: Expectations and reality, in: Williams, G., and Frost, A. (Eds.) *Terra Australis to Australia* (Oxford University Press in association with the Australian Academy of the Humanities, Melbourne, 1988), pp. 161–208.

4   Signification in the Soundscape
Bill Fontana's *River Sounding*

Symbolisation is one of the fundamental processes of mapping. Recognising that sound can function symbolically—put another way, that symbols need not be exclusively visual—enables us to problematise and push beyond the domination of cartography by the visual.

In this chapter I turn to a close reading of an installation and sound work, *River Sounding* (2010), by Bill Fontana. I investigate the work using the conceptual framework of cartographic abstraction, established through the preceding chapters, but without positing an abstract cartographic viewpoint with which the work engages. Instead, I bring forward this consideration of a sound work as an opportunity to consider the possibilities and limits of engaging with cartographic abstraction in the register of viewing rather than hearing. With this particular analysis, I push beyond the (productive) trope of the viewpoint-as-abstraction and consider some ways in which viewing can be mediated cartographically as well as sonically in an installation work. Where *River Sounding* remains an artwork in which the visual experience of the visitor is highly significant, the soundscape that it stages offers an opportunity to explore the interplay of sonic and visual registers that depict their object in different ways.

The theme of the 'return of the river' is put forward in institutional copy characterising the installation, and I argue that a particular, historied rendering of the River Thames, London, is at stake in *River Sounding*. I argue that the cartographic object of the Thames is re-spatialised in the work and that what is re-spatialised is a particular abstraction based around moments at which the river is engineered, bridged, altered and delimited. What is evoked, in this historical register, is a temporally and spatially delimited abstraction of the Thames, drawn from 'surveying' key locations of mechanical and architectural intervention along the tidal length of the river.

I also argue for reading the sonic register of the installation as continuing an indexical relationship with the source locations of the audio recordings. *River Sounding* presents a 'soundscape' of the Thames, and this soundscape itself has a complex and shifting relationship with the visual register of representation in the work. Through both registers, the visitor is positioned as 'immersed' within a soundscape and a cartographically constructed conceptual space. This is a form of inhabitation that emerges in *River Sounding* that is markedly different from the modes of cartographic viewing from conceptually *above* that have been explored in the previous chapters.

Bill Fontana and *River Sounding*

Bill Fontana (b.1947) is a 'sound sculptor' and composer known for his installation-based works that bring contrasting sounds into particular public or built spaces. He studied with the composer John Cage in the late 1960s at the New School for Social Research in New York and developed an interest in ambient sounds and the combination of sound and sculpture. Fontana describes his method as 'sculptural thinking' and his mission as "the transformation and deconstruction of the visual with the aural" (Blackson et al, 2010, p. 15). Other key works involving sound environments include *Sound Island* (Paris, 1994), in which he broadcast sounds from the Normandy beaches at the Arc de Triomphe, and *Speeds of Time* (London, 2005), in which recordings of the internal sounds of Big Ben were played in a gallery.

River Sounding is a site-specific audio-visual installation, prepared for the semi-subterranean light wells and coal holes at Somerset House, London, 15 April–31 May 2010. Audio and visual recordings were made at different locations along the River Thames and broadcast in the light wells, the adjoining coal holes (small unlit rooms opening off the light wells) and the Dead House (a tunnel running under the courtyard of Somerset House, usually closed to the public). The recordings were made at twelve locations along the tidal length of the Thames using hydrophone, ambient microphone, accelerometer, shotgun microphone and video camera. The locations include Teddington Lock and Richmond Lock; historic steam turbines at Kew Bridge Steam Museum (now known as London Museum of Water & Steam); a live feed of the Somerset House clock; Millennium Bridge; *HMS Belfast*; Tower Bridge; John Harrison's chronometers at the National Maritime Museum; the Thames Barrier; Southend Pier; and a bell buoy and whistle buoy in the Thames Estuary.

Sounds of water, ticking and chiming are heard throughout the installation, sometimes accompanied by video projections in the coal holes and Dead House. The sounds overlap to such an extent that they are sometimes heard in conjunction with their visual referent in the form of a video projection, though many other sounds are always present.[1] The video projections include the wires of Millennium Bridge; water seen through the gap in Tower Bridge; pedestrians and vehicles passing on Tower Bridge; and the Thames Estuary bell and whistle buoys and falling water at Teddington Lock.

The viewer-listener enters into the 'soundscape' at two possible points, either at the Great Arch entrance or at the courtyard entrance. The Great Arch forms the Embankment entrance to Somerset House, nearest the river, and gives directly onto the pavement beside the busy road. Audio recordings, exhibition signage and an underground video projection mark the opening of the reimagined riverine space of Somerset House at this threshold. Somewhat divided from the main spaces of the installation by the interior spaces, the Great Arch marks the point at which the Thames formerly occupied the underfoot space of the contemporary viewer-listener.

The courtyard entrance offers the viewer-listener the opportunity to descend the stone steps 'into' the imagined former space of the Thames. This descent mirrors points of access to the contemporary river in the form of sets of steps descending to the river (or the shore at low tide). In this way, the viewer-listener is ushered into or admitted into a space that is designated as the physical space of the light wells and lower levels of Somerset House and the metaphorical space of the earlier form of the river.

Within the space of *River Sounding*, the viewer-listener is free to choose their own course among the light wells, the coal holes and the Dead House, and the rooms and corridors running underneath the Fountain Court. Using the handout map as a guide (see Figures 4.1 and 4.2), the visitor begins near the coal holes marked '1' (having

Figure 4.1 Handout map—'The River Sounding Journey'—side 1
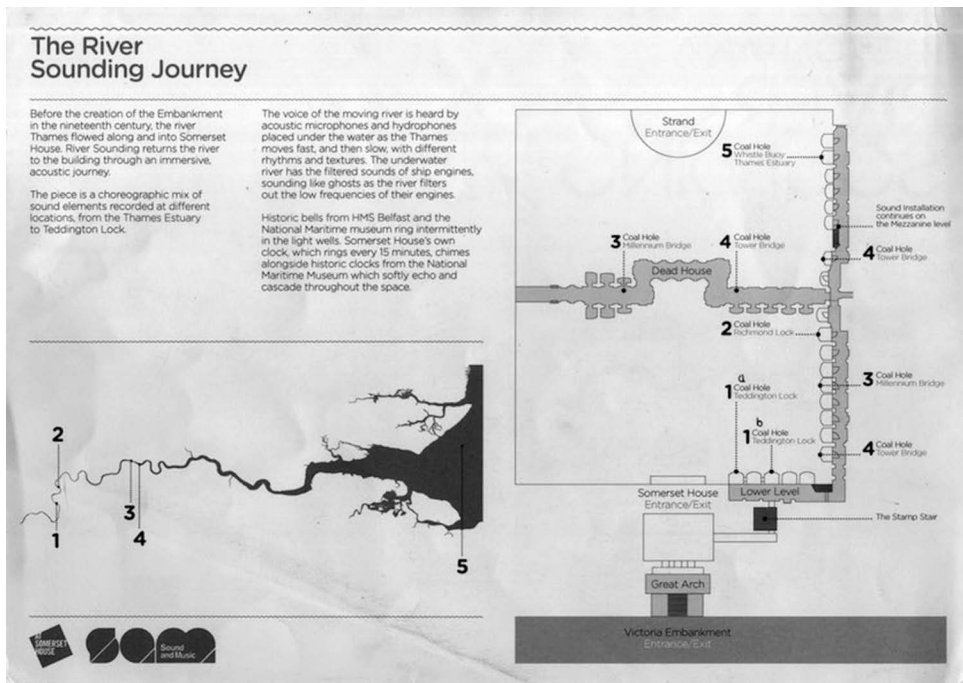
Source: Map by Modern Activity

Figure 4.2 Handout map, side 2
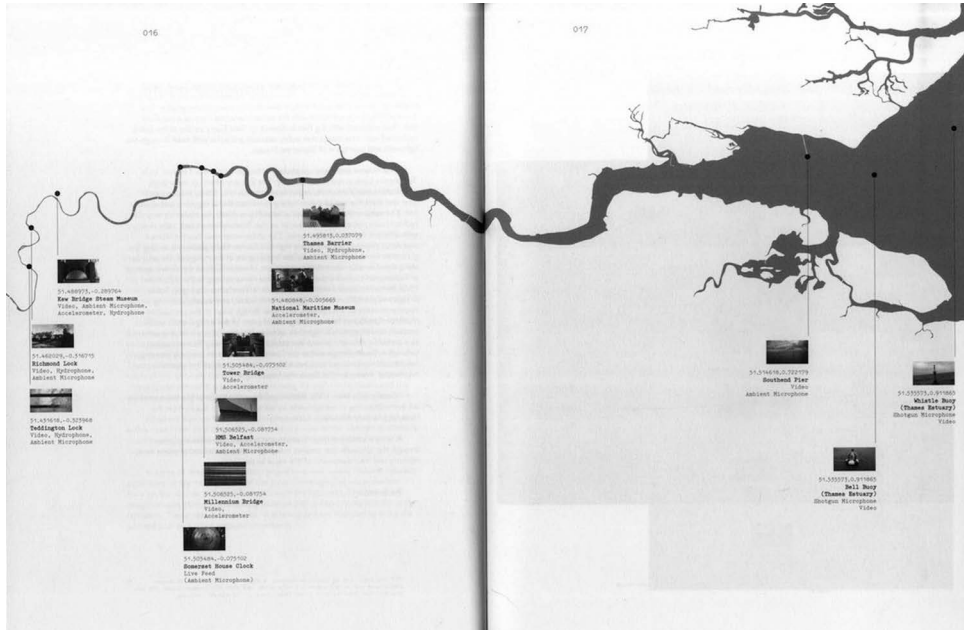
Source: Map by Modern Activity

Figure 4.3 Map of recording locations in *River Sounding* exhibition catalogue[2]
Source: Map by Modern Activity

either descended from the courtyard or entered from the Great Arch). The coal holes are small, dark rooms, with rough walls and floors, housing video projections and accommodating audio playback of recordings of Teddington Lock. The video projections give abstract views of water behind a structure of horizontal elements, perhaps bars or a metal grille. Rather than a view giving the wider visual context of the water—for example, the river with surrounding land and buildings or the lock itself—the view is enigmatic and offers the viewer scope to interpret it in the context of the place name 'Teddington Lock' that is associated with the mapped spaces of the installation in the handout map. I interpret the projected video as depicting part of the lock, but without further familiarity with its structure, the image signifies for me the concept of 'Teddington Lock' as a whole.

Leaving the 'Teddington Lock' coal holes, the visitor turns the corner to the left. Viewing a long subterranean corridor, open to the sky, three further coal holes open into the left-hand wall (see Figures 4.5, 4.6 and 4.7).

Although each coal hole is labelled with a geographic referent—a place name—on the handout map—4 Tower Bridge, 3 Millennium Bridge and 2 Richmond Lock—the video projections offer almost no opportunity for visual recognition of the named locations. This labelling of the spaces of the installation takes place only in the map image and not in the installation itself (directional signage is included in the installation but interpretative signage is not); therefore the visitor may choose whether to encounter the installation in connection with its map or (and) not.

Figure 4.4 View from mezzanine level of part of the system of speakers, Somerset House light wells
Source: Bill Fontana, photo by Claire Reddleman

Figure 4.5 Photograph of coal hole 3, showing video projection of cables on Millennium Bridge
   onto brick wall and pipe
Source: Bill Fontana, photo by Claire Reddleman

Figure 4.6 Photograph of video projection on stone slabs
Source: Bill Fontana, photo by Claire Reddleman

Figure 4.7 View into coal hole, with projection of turbines at Kew Bridge Steam Museum[3]
Source: Bill Fontana, photo by Claire Reddleman

Turning down the corridor into the Dead House, projected video of Tower Bridge is visible on the far end wall (see Figure 4.8). The green-lit corridors, with small side rooms and vestibules, accommodate projections of Tower Bridge and Millennium Bridge, and the sound recordings continue to be heard as the visitor retraces their steps to leave the Dead House and emerge again into the daylight of the light wells. The farthest section of the installation comprises a further coal hole projection of Tower Bridge, with access via steep stone steps to the mezzanine level and a last coal hole housing a video projection of the Thames Estuary whistle buoy (Figure 4.9).

In my experience of the installation, the whistle buoy coal hole seemed to be a culmination of the experience of walking through the installation. As the last coal hole to be discovered, at the farthest point of the installation, it gave me the sense of having reached the end of the spaces available to explore. It also 'resolved' the low, mournful, lowing sound I could hear throughout *River Sounding* as the sound of this particular buoy as the sound synchronised with the video projection.

Leaving the installation requires the visitor to retrace at least some of their steps to one of the two entrance and exit points of the installation space, either the Great Arch or up the steps to the Fountain Court. Leaving the installation involves leaving the metaphorical space of the 'river', or the river as 'returned' to Somerset House by *River Sounding*. The visitor either emerges from the light wells, ascending the steps into the open space of the Fountain Court, or crossing the threshold of Somerset House, through the Great Arch, onto the pavement of the Victoria Embankment and

Figure 4.8 View into the Dead House, towards video projection of Tower Bridge
Source: Bill Fontana, photo by Claire Reddleman

Figure 4.9 Photograph of coal hole video projection (marked '5' on handout map) showing
          Thames Estuary whistle buoy

Source: Bill Fontana, photo by Claire Reddleman

the noise of the A3211. This is the space in which the Thames used to flow, prior to the construction of the Embankment in 1865–70.

Some important themes emerge from the foregoing discussion of *River Sounding*, which I discuss in more detail in this section. The deployment, or activation, of 'history' as an interpretative context for the work emerged in discussing the work's premise of reinstantiating a past form of the River Thames. This past form—an abstraction—of the Thames, was also instantiated through the selection of the sites for audio recordings to be made, which I discuss further in what follows. The question of the installation's layout is of particular interest in terms of the relationship between the artwork and its object, the Thames itself, rendered through audio and visual recordings, but also through cartographic abstraction.

A mode of symbolism is in play between the visual and the aural registers of *River Sounding* and their relationship to the viewer-listener's conceptualisation of the river as the subject of the artwork. I interpret this mode of symbolism in cartographic terms in order to elaborate an analysis of the cartographic positioning of the viewer in relation to the Thames in *River Sounding*. In this chapter, I seek to understand the formation of a 'viewpoint' of the visitor within this work in terms of cartographic abstraction in its construction of a mode of viewing that is 'immersive' as opposed to synoptic. I discuss this mode of viewing in more detail towards the end of this chapter.

Return of the River: Deploying History

River Sounding's institutional presentation, in its handout map (Figures 4.1 and 4.2), published catalogue (Blackson et al, 2010) and website,[4] branded the artwork with the phrase 'returns the river to the building'. The phrase was echoed across all branded promotional copy, still echoes through Bill Fontana's own website, through reviews,[5] and re-appears—though interestingly with less prominence and repetition—in the archived web presence of the installation as stewarded by Somerset House. This phrase centres the work's professed self-understanding for me as both a past viewer and as a researcher who has latterly carried out more research into the work than I would have chosen to do had I remained as 'viewer' only. The idea of 'return' foregrounds the building itself, as the physical embodiment of the institution and brand known as 'Somerset House', as more than a gallery setting for this installation; it is positioned as a co-constitutor of the work's meaning due to its claim to being the privileged site of a material history that is uniquely relevant to the concerns of the artwork.

The Thames did indeed previously 'inhabit' Somerset House in a limited way; when it was built in 1776–1801[6] it was designed to provide a splendid home for a number of government departments, particularly the Board of Admiralty (responsible for running the Navy) and the King's Bargemaster (an office of the royal household responsible for royal transport on the river). Access to the river was required for the King's Bargemaster, meaning the building was required to open directly on to the river. This arrangement persisted until the building of the Embankment in 1865–70 to provide for a new road directly beside the Thames, as well as sewers and an underground line. As Somerset House's account notes,

> the introduction of the Embankment *had the effect of distancing the river from the buildings* along its north bank, particularly significant for Somerset House, which had been designed to rise directly from the water. The new embankment truncated the elevation of Chambers' masterpiece; the Aberdeen granite base of the Embankment Building was concealed by the substructure for the road, the two Watergates were demoted to being entrances from the new raised carriageway, and the Great Arch with its two adjacent barge-houses became landlocked.[7]

The sense evoked here—'distancing', 'demoted', 'landlocked'—is negative and regretful at the change in the building and its character.[8]

The idea of 'return' in the institutional rhetoric of *River Sounding* functions both to justify the validity of the installation and to evoke a sense, if not of nostalgia, of belonging. The appeal to a historical justification functions to make the artistic proposition 'safe'; what I was presented with as a visitor was not flood, destruction, damage, a catastrophic incursion of the river into a protected and important space, potentially making connections to climate change and an attendant politics of the future, all of which might be concepts that I would otherwise have associated with the idea of a river's presence in the lower level of a building. Not catastrophe, then, nor future, but history was foregrounded as the appropriate interpretative context for the work.

I read the rhetoric of returning the river to the building in connection with the installation's construction of an abstraction of the River Thames. Its history is deployed here in a context of promoting Somerset House as a cultural hub. This 'activation' of a discourse

of history contributes to concretising and stabilising the abstract category 'Thames' as one coherent entity that has demonstrable continuity through time and social and political life in the city—particularly through its geography.[9] I read this call on history, both in the rhetoric and in the work itself, as calling on an earlier instantiation of the specific abstract category 'Thames'. The moment of the construction of the Embankment marks the point at which the river and building were divided, and the prior moment to which *River Sounding* 'returns', then, is a loose period 'before' the Embankment, which is not specified by the installation or its commentaries.

Therefore, as I experienced *River Sounding* it was with this loose periodising factor in mind; some time before the construction of the Embankment, the river took a different form in which it flowed into Somerset House. However, Fontana and the exhibition materials are also explicit that it is not the complete Thames that is being invoked by *River Sounding* but only its tidal extent, which ends at Teddington Lock in Ham in the suburbs of west London.[10]

The first lock at Teddington was constructed in 1810 and open in 1811, and in the present day the name 'Teddington Lock' denotes an arrangement of three locks, each constructed at different times, a second in 1857 and a third in 1904.[11] At the time of the Embankment's construction, then, a lock had been in existence at Teddington for just over fifty years and two locks had been there for seven years. Therefore, we may periodise the abstraction at hand, and state that the Thames in its present-day state of mediation through engineering, with the reach of its tides stopped at Teddington, has existed since 1810.

What is being addressed by the artwork is therefore not an all-encompassing, unhistoried idea of 'the Thames' but a particularised Thames, specified both spatially and temporally. It extends from Teddington in the west to the Estuary and the North Sea in the east spatially and from 1810 to the instantiation of *River Sounding* in 2010 temporally. The deployment, or activation, of 'history' as an interpretative context for the work therefore emerges from the work's premise of reinstantiating a past form of the River Thames.

Sonic Mapping, Spatial Sound and Signification in *River Sounding*

As we saw, a second critical theme of signification emerges from the foregoing consideration of *River Sounding*. I argue that a mode of signification is in play, connecting the visual and the aural registers of *River Sounding* and mediating the viewer-listener's conceptualisation of the river as the object of the artwork. More than a simplistic 'restorative' or counter-hegemonic move is performed in *River Sounding*'s acoustic approach to instantiating the Thames within the installation spaces of Somerset House. The aural register does not supplant the visual register but rather supplements it. The 'soundscape' of *River Sounding* is integral to its spatial and visual modes of signification. Through all three, sound, space and visuality, the river is re-spatialised within the new context of the installation space. As Denis Wood has argued,

> [m]aps are about relationships. In other words, they are about how one landscape—a landscape of roads, rivers, cities, government, sustenance, poison, the good life, [. . .]—is positioned in relation to another. The map synthesizes these diverse landscapes, projecting them onto and into one another.
>
> (Wood et al, 2010, p. 98)

This projective and active capacity of cartographic depiction may also be seen in *River Sounding*'s more literal projection of aural and visual recordings into the installation space. Through both aural and visual registers, the river is rendered in the form of projected images and sounds, which come to stand for the abstraction of the river. Here I interpret this mode of signification in cartographic terms, because the re-spatialisation of the Thames is carried out in part through the cartographic positioning of the viewer in relation to the geography of the Thames.

Bill Fontana has proposed that *River Sounding* presents a form of sonic mapping,[12] in which sounds take on the symbolic role that cartography typically assigns to visual marks appearing in the map image. While I agree with the notion that a form of sonic mapping is in play in the artwork, I disagree with Fontana's suggestion that this mapping is of the lightwells themselves. Instead, I will argue that the artist carries out a process of sound recording that may be read as analogous to cartographic processes of surveying. The resulting sounds are re-presented in the installation space as a soundscape that, I will show, enacts a dual particularising and de-particularising tendency in terms of the relationships between sounds and some of their visual referents in the video projections. While sound functions cartographically in *River Sounding*, I see this functioning as engaging processes of cartographic abstraction while not producing something that can be understood as a map. To draw out this argument I turn to Denis Wood and John Fels's exemplary close reading of the depiction of nature in print maps, later in this chapter. First, I consider the artwork's official rhetoric of the 'return of the river', discussed earlier, in connection with *River Sounding*'s 'return' of the aural dimension to the cartographic abstraction of the Thames as it is figured in Fontana's work. I therefore consider how this aural dimension, or soundscape, is produced both through recording practices and through published commentary on those practices.

Constituting the Soundscape

The sounds that constitute the aural dimension of the installation were themselves made through a range of technological mediations orchestrated by the artist (and his team). Using video, hydrophones, ambient microphone (including live feed in some cases), shotgun microphone and accelerometer, sounds were recorded at Teddington Lock, Richmond Lock, Kew Bridge Steam Museum, Somerset House, Millennium Bridge, *HMS Belfast*, Tower Bridge, the National Maritime Museum, the Thames Barrier, Southend Pier and two locations of buoys in the Thames Estuary (Blackson et al, 2010, pp. 16–17). The processes involved in producing the sounds that form part of the installation are characterised by more than one writer in the artwork's catalogue essays as having been neutral means of 'transferring' sounds from their source location to the location of *River Sounding*. Sounds were 'collected', 'heard', 'offered up', 'harvested' (ibid, p. 36), 'assembled' (ibid, p. 3) yet also 'captured', and the Kew Bridge Steam Museum and National Maritime Museum are figured as having the potential to 'yield' interesting sounds.

The process of recording using accelerometers is also characterised as one of revelation rather than construction, of revealing something already in existence: "In *River Sounding* [accelerometers] have been used to listen in to and record the sounds *hidden* within architectural structures" (Whitelaw in Blackson et al, 2010, p. 36, emphasis mine). This vocabulary is echoed in the promotional poster for *River Sounding*

(Figure 4.10), which describes the experience available within the installation as a "journey through the *hidden* sound worlds of the River Thames" (emphasis mine).

I note these linguistic choices as they offer a suggestive comparison between the practice of the surveyor and the practice of the sound artist accompanied by technicians. The sounds that are chosen for examination by the artist are figured in the artwork's discourse as pre-existing their neutral representation through technological means that merely make available to the interested viewer-listener sounds of which they were previously insensible.

As with the dual process of (non-critical, or conventional) cartography, first surveying then subsequently 'representing', the artist here proposes a comparable dual
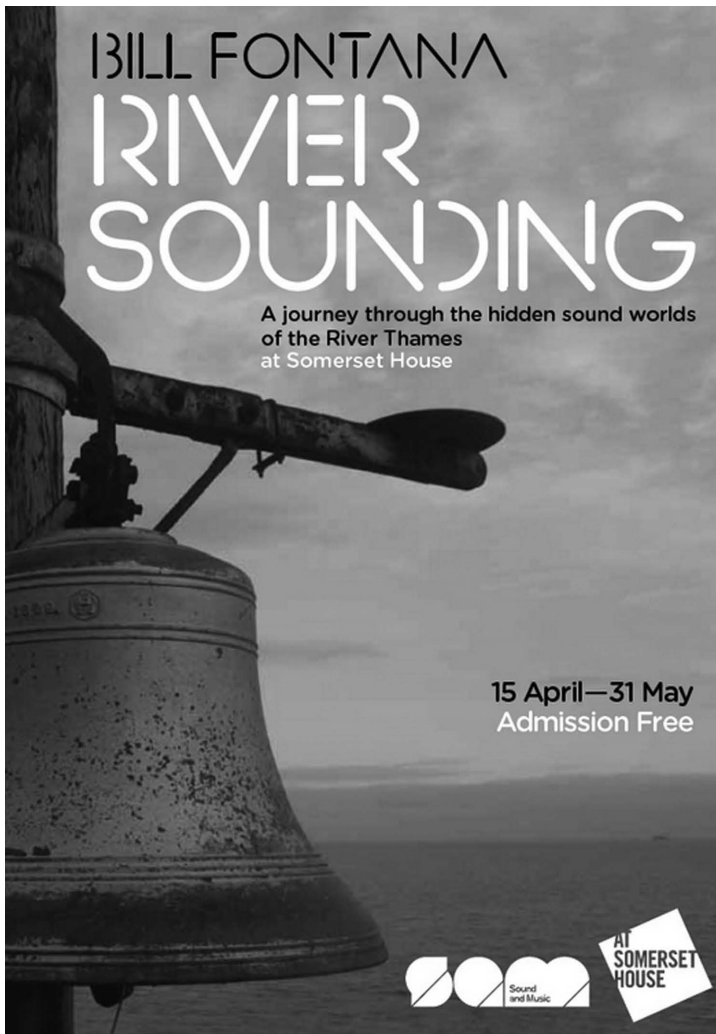
Figure 4.10 Promotional poster for *River Sounding*

Source: Bill Fontana & Artworklove

process of surveying (recording) and subsequently representing the data (presenting the recordings in the installation in a finished form). The step in this procedure that critical cartography has emphatically pointed out is the selection made by the 'cartographer'. Here 'cartographer' indicates not necessarily a lone, artistic individual who may be understood as analogous to the 'author' or the 'artist' but the larger constellation of persons, institutions, practices and entities that, in combination, produce the map object.

In this broader sense, then, the selection made by the artist-cartographer is not a free choice made by a self-determining subject but an interested choice made by a combination of parties to the endeavour. The form in which the commission was offered to Fontana in this case may be read as the initial moment in *River Sounding*'s process of selection; Fontana was specifically directed to attend to the historical relationship between Somerset House and the Thames. The artist, like the cartographer or surveyor, has a particular interest or agenda. I argue that in the selection process, Fontana (or the Fontana-led artist-constellation perhaps) has constituted a personal 'Thames' through attending to a careful selection of means by which the form and use of the river has been altered through mechanical or structural intervention.

A brief review of the recording locations of *River Sounding* makes clear the human-made character of Fontana's selections. This is particularly relevant as the viewer's attention is explicitly drawn to the map of recorded locations incorporated in the handout map (Figures 4.1 and 4.2) as well as the exhibition catalogue. These emphasise each location as specifically the technological mediation that is present there rather than the location or geographical form being prior and the form of mediation being incidentally at the same location.

The information about recording locations is provided to the viewer as part of the experience of *River Sounding* and informs the interpretation that may be made of the sounds as they are heard, sounds that, in themselves, will not signify their specific location or nature to most viewer-listeners. I return to this in what follows; but first note some of the significances of the recorded locations. Teddington Lock delimits the tidal extent of the Thames, marking a significant division of the river that coincides with its location in the western suburbs of London; the lock itself enhances the navigability of the river, marking off 'London's' river as against the 'Home Counties' river as it continues westward. The London Museum of Water & Steam (formerly Kew Bridge Steam Museum) houses a collection of historic steam turbines that furnished Fontana with "amazing mechanical rhythms and textures" (Blackson et al, 2010, p. 15); this museum forwards a situated history of the use of the river as a source of water for the population of London and its industry, beginning from the construction of the original pumping station in 1820.

The Somerset House clock is heard in *River Sounding* by means of a live feed and connects to the recordings of the Harrison chronometers made at the National Maritime Museum. Both recordings cite a history of the Thames as a central location in the development of cartography and the expansion of global capital through the functioning of the Board of Admiralty, referenced by the Somerset House clock, and the state-sponsored project to create the means of finding longitude at sea (achieved by John Harrison's marine chronometers), which was so fundamental to the development of maritime navigation in the latter part of the eighteenth century.

Millennium Bridge and Tower Bridge afford 'navigation' in a further sense, of persons and land-going traffic, and their selection as locations again draws a

particular history into the artwork, with Tower Bridge having been constructed from 1844[13] largely in response to the needs of capital in the form of the London docks, and Millennium Bridge developed from the late 1990s in response to more 'cultural' needs.[14]

Recordings made at *HMS Belfast* further cite the naval history of the Thames, referring to the Second World War and associated discourses of Britain as a naval power lasting into the twentieth century.[15] The Thames Barrier at Woolwich Reach has been operational since 1982, and recordings made in the service tunnel of the structure cite further histories of flood management and the needs of commercial capital to be protected from the dangers of the very hydrological system that formed one of the conditions of possibility of the city itself—the River Thames.[16]

Recordings made at Southend Pier invoke a history of the Thames as a site of tourism, particularly for nineteenth-century Londoners for whom Southend was a resort destination; the pier both forms and marks this history, with its first instantiation in wood open from 1830 and its latter form in iron open from 1887,[17] this being the form encountered by Fontana.

Lastly, recordings of the bell buoy and whistle buoy call upon a history of navigating in the Thames and the North Sea, largely for commercial and industrial purposes, and all 'navigational aids' in the Thames are managed by Trinity House, established in 1514 by Royal Charter, having been petitioned for by the shipping industry.[18] Each recording location, then, is the location of a particular form of technological mediation of the physical river, and the form of mediation engaged with at each location registers particular histories of the uses of the river and particular ways in which the river has been rendered as a useful and a knowable entity.

I have indicated these larger histories and narratives that are referred to by the recordings and the maps deployed as part of *River Sounding* to sketch the larger problem of *what* may be understood as being signified by these sounds. I argue that the sounds available to the viewer-listener continue to function in their indexical relation to their original sources; that is, the sound of a whistle that I heard and followed through the light wells of Somerset House continues to be an index of the sound made by the whistle buoy at 51.535573, 0.911865[19] on the particular day in February 2010 on which Fontana, sound engineer Scott George and producer Richard Whitelaw stepped aboard the Trinity House ship *T.H.V. Alert* at Harwich, Essex, to search for sounding buoys in the Thames Estuary. As Whitelaw describes,

> on a foggy day we travelled out on a maintenance vessel and after some hours we came across these beautiful and lonely sounds. Here, at the most remote location visited, the calling and rhythm of the buoys rose and fell with the waves. The rich breathy quality of their tones was made more poignant by their isolation and continuous unanswered beckoning into the grey void.
>
> (Blackson et al, 2010, p. 40)

Prior to having read this account by Whitelaw, I too felt myself to be drawn onward through the light wells to reach the 'source' of this mournful sound. The place at which I felt myself to have 'arrived' at this source, mentioned earlier, is indicated on the handout map as "5 Coal Hole/Whistle Buoy/Thames Estuary" (Figure 4.2). In this light well was housed the video projection of the recording made of the whistle buoy

(Figure 4.9), and so at that moment of viewing, the sonic index of the whistle buoy was brought into and encountered in the same spatial location as its photographic index.

As Brandon LaBelle has noted, sounds may become symbolic when "divorced from their geographic particulars and corporeal referents" (2006, p. 231), and this process of dislocation is part of the complex of significatory processes at work in *River Sounding*. Throughout the installation, the "sonic choreography" (Blackson et al, 2010, p. 14) is fluid, with sounds heard throughout all parts of the light wells, coal holes and Dead House, usually without the presence of their visual referent in the form of video projections. At particular moments of experience in the installation, the visual and the sonic coincided.

Soundscape and Cartographic Signification

I want to show that the formation of the soundscape in *River Sounding* follows a process of cartographic abstraction that may be productively analysed through comparison with the visual process of cartographic signification put forward by Denis Wood and John Fels. It is their investigation of how symbolism and signification function in cartographic depiction that I draw on here and relate to *River Sounding*'s constitution of its cartographic object—the tidal, engineered Thames. Wood and Fels argue that

> The map is a highly complex supersign, a sign composed of lesser signs, or, more accurately, a synthesis of signs; and these are supersigns in their own right, systems of signs of more specific or individual function. It's not that the map conveys meanings so much as unfolds them through a cycle of interpretation in which it is continually torn down and rebuilt; [. . .] this is not really the map's work but that of its user, who creates a wealth of meaning by selecting and subdividing, combining and recombining its terms in an effort to comprehend.
>
> (Wood and Fels, 1992, p. 132)

Wood and Fels articulate a theory of cartographic signification[20] that attempts to accommodate and explain how cartographic meaning is generated at both the level of the individual who reads and interprets the map and the level of the conventional and social construction of cartographic signs. In order to develop this account, four constitutive levels of intermediate signification are identified, embracing the most 'basic' level through to the most complex. As Wood and Fels write,

> If we intend to explain how the map generates and structures the signing processes by virtue of which it is a map, then we need at least four strata or levels of signification: the *elemental*, the *systemic*, the *synthetic*, and the *presentational*.
>
> (1992, p. 133, emphasis in original)

The elemental level of the cartographic sign is the level of the simplest complete sign, which denotes a 'distinct geographic entity' (ibid). Wood and Fels offer the problematic suggestion that we may understand distinct geographic entities to be 'features', whether they are concrete or abstract. He does acknowledge that a firm identification of 'features' presents some difficulty: "this criterion is easily confused [. . .] The

elemental map sign operates at the lower bound of the map's content taxonomy, and below this bound reside connotation and characteristic but nothing that can be construed as feature" (ibid, p. 134). What comes to be designated as 'feature' depends on social assent and convention: "*features only exist when we recognize them as such*" (ibid, p. 137, emphasis in original). Wood and Fels caution that attempting to find a strict compatibility with linguistic theories of signification can be problematic when dealing with the ways in which graphic elements are able to signify in the map, and this is an ambiguity that I return to later in relation to *River Sounding*. The 'feature' is specified more clearly in *The Natures of Maps* (2008), whereby "[a]t the *elemental* level, individual graphic marks within the map denote specific instances or occurrences of preformed conceptual types: a road or highway, river or stream" (2008, pp. 172–173, emphasis in original).

At the systemic level of signification, elemental signs agglomerate into 'supersigns' which are "composed of similar elements, forming systems of features and corresponding systems of marks" (1992, p. 133). For example, a system of isolines that is deployed across the whole map image or a network of city symbols, so that each individual isoline and each individual black dot (for example) need not be decoded individually but read as a class of signs all describing the same category of features.

The synthetic level is the level at which systems of signs interact and form meaning in relation to one another rather than only in relation to their own constituent signs. This is the level at which, for example, a river system is signified in relation to a road system and a mountain system to form a coherent set of systems that "offer meaning to one another" (ibid) in the context of a complete cartographic image.

The presentational level addresses the cartographic image's multiple relationships to its context, whether in terms of contextual images and text on the page of an atlas, on a smartphone screen, "perspex-slabbed shopping center guides [. . .] or place mats for formica diner tables. Presentation is more than placing the map image in the context of other signs; it's placing the map in the context of its audience" (ibid, p. 141). At this level, the map is "injected into its culture" (ibid, p. 142) and engages in complex social processes of signification and meaning production. It is important to note that Wood and Fels do not position this taxonomy of signification as fixed "stages in a sequential process, which, set in motion, moves inexorably toward a condition of greatest or least integration [. . .] These interpretative levels are *simultaneous states*" (ibid, p. 133 emphasis in original). All stages may be accessed and interpreted by the map viewer.

In their discussion of 'Nature as system',[21] Wood and Fels consider how the abstraction 'nature' comes to be posited and constructed through maps. To this end, they give a close reading of three maps dealing with—ostensibly—the same cartographic object, the US state of North Carolina. In this context, Wood and Fels develop the theory of signification, briefly outlined here, into an analytical framework of 'cognitive cartographics' to more fully theorise the capacity of maps to make 'postings', or assertions, in the visual code of the map image. The factual claims made in this way rely on intricate processes of prior categorisation and generalisation that are not made evident in the resulting image.

The North Carolina maps posit the stable category of 'North Carolina' as their object of inquiry, and in the same way, a stable category of 'Thames' is posited in *River Sounding*. Working within this category, a further specification is made in terms of the map's interest; an example from Wood and Fels's analysis is soil types. Reading the

'General Soil Map of North Carolina', a series of coloured areas indicate distinguishable geographic areas of soil types:

> The soil polygons themselves appear in the legend as sixty-six entries, organized by province and accordingly grouped into families of like colours. Each entry represents a 'soil association' [. . .] Within each provincial grouping of soil associations, these are further grouped based on general soil characteristics and topographic setting, with anywhere from one to eighteen in each of these subgroupings.
>
> (2008, p. 170)

In this case, the level of this intricate process of categorisation of soils that finds expression in the cartographic image is primarily the soil association. Such detailed modes of generalisation are fundamental for cartographic depiction.

Further, "maps like the geologic map or soils map illustrate the systematic deconstruction of the natural world into recognizable and identifiable elements that can be spatialized as cartographic postings of relatively certain location and extent" (2008, p. 172). A posting, in Wood's terminology, is a claim, proposition or assertion about what is depicted in the map. "What transforms a proposition into a posting is its expression *in the sign plane of the map*" (Wood et al, 2010, p. 53, emphasis in original). The significance of this idea of 'postings' is that this offers a framework for understanding how the object of the cartographic image finds depiction in the image. The claim of a posting is that an entity, or 'feature', exists in a particular spatial relationship to other features. It is both specifying and delimiting, asserting where the feature is and is not found in the terrain that corresponds to the cartographic image.

The level of detail available in this analysis is useful for my purposes in this chapter, because where Wood and Fels describe a process of cartographic signification, this analysis informs my interpretation of *River Sounding* as producing an altered, spatialised form that engages with cartographic signification.

I argue that the sound and video recordings, then, continue to index their original locations and circumstances, the specificity of what could be recorded on a particular day, in particular weather, at a particular time. Regardless of the amount of information informing the visitor's interpretation in the installation, these indexical relationships existed but did not form part of my perception and interpretation while experiencing the installation. In the installation the 'sonic choreography' functions to detach the sound-signifiers from their original, particular signifieds and to re-assign them to a broader yet still particular signified, thus coming to symbolise a particular abstraction *of*, or *from*, the Thames; Fontana's selection and construction of a technologically mediated and delimited river. It is in this way that Fontana has performed the cartographer's role of determining the object to be rendered in the map image, as Wood and Fels describe. While understanding 'itself' to be a sonic sculpture rather than primarily a cartographic artwork, *River Sounding* re-performs that modality of cartographic abstraction through which a particular abstraction of place is formed.

In this way, the 'soundscape' of *River Sounding* signifies the particular abstraction of 'the Thames' that finds depiction in the work as a whole. While moments of synchronicity between the visual referent and the recorded sound do occur, considered discretely, the aural register of *River Sounding* presents a de-particularised range of sounds to the visitor. In contrast, the particularity of the locations depicted in the

visual register of the work is secured and reiterated through the inclusion of place names in the handout map. The visual register is therefore tied to particularity in a way that the aural register is not.

A mode of symbolism operates between and among the visual and the aural registers of *River Sounding* and their relationship to the viewer-listener's conceptualisation of the river as the subject of the artwork. I seek to interpret this mode of symbolism in cartographic terms in order to elaborate a theorisation of the cartographic positioning of the viewer in relation to the Thames in *River Sounding*. I now turn to consideration of the 'immersive'[22] character of viewing in this work and the role of the soundscape.

Immersive Installation Viewing

In this chapter, I seek to move beyond the trope of the viewpoint and of cartographic *viewing* to explore how sound may be understood to function cartographically. *River Sounding* offers the opportunity to consider this question because of the complex interaction it stages between a visual re-spatialisation (of the river) and a sonic re-spatialisation. With this concern in mind, I read this immersive 'sound sculpture' in cartographic terms, although to do so is to read it somewhat askance or against its genre. *River Sounding* was not explicitly positioned, in its manner of presentation, in terms of mapping or cartographic practices; despite presenting the viewer with a handout map with which to navigate the relevant spaces, a cartographic approach to the representation or evocation of spatial experience was not articulated by the official presentation of the work. However, I have suggested two key ways in which it may be productive to consider the processes at work in *River Sounding* in terms of cartographic abstraction. The first, discussed earlier, is the way in which cartographic signification is performed in the work but through recorded sound rather than graphic depiction. Second, to which I now turn, is the way in which *River Sounding* performs a re-spatialisation of the Thames into the installation space. It carries out a re-spatialising, or a spatial rendering, of the river by creating a 'soundscape' of the Thames within the spaces of the lightwells.

I argue that *River Sounding* instantiates an 'immersive' viewing experience of the abstraction of the Thames. The visitor is positioned metaphorically within the space of the 'returned' river, both aurally and visually. The visitor is also positioned immersively in a cartographic sense; the perceived space of the light wells is mapped for the viewer, and so, simultaneously, is the abstract cartographic space of the Thames (most notably in the use of place names to label the coal holes). The visitor is 'immersed' within the abstraction that, following Brandon LaBelle, I am calling the 'soundscape'.

In the terminology that has developed to analyse and theorise sound art and creative and experimental approaches to sound as a mode of artistic practice,

> 'Soundscape' refers to environmental sound as found in given places and at given times. As Paul Rodaway describes: "The soundscape is the sonic environment which surrounds the sentient. The hearer, or listener, is at the center of the soundscape. It is a context, it surrounds and it generally consists of many sounds coming from different directions and of differing characteristics . . . Soundscapes surround and unfold in complex symphonies or cacophonies of sound." [. . .] the

soundscape is that which exists and of which we are a part, as noisemakers, as listeners, as participants.

<div align="right">(LaBelle, 2006, p. 201)</div>

I take up this active, participative approach to understanding the sonic environment in the context of *River Sounding*. Here, the continual interplay of listening to the aural register of the installation and moving through it, making choices as to where to look and to move, surrounds the visitor in the particular soundscape of *River Sounding*. LaBelle further characterises the soundscape as "all sounds that flow and get carried along in the full body of the sound spectrum, from above and below audibility" (ibid, p. 202). This approach figures the soundscape as a substantial, physical entity that has existence outwith the human subject. By acknowledging the involvement of sounds not usually audible to the participant, the soundscape is understood as independent of the subject, as possessing a degree of autonomy from the perceptual processes of the listener. LaBelle describes an emphasis on drawing out or extrapolating sounds from their place of origin:

> [w]hat these artists and approaches underscore is the proximate and the local: found sounds mirrored back to their origin, *local sonics amplified through architectural construction*, a listening to what is immediately surrounding, in public and private spaces.

<div align="right">(ibid, p. 197, emphasis mine)</div>

In my reading of *River Sounding*, the 'local sonics' that are 'amplified through architectural construction' here describe the sounds that Fontana renders through sound recording techniques. In the context of 'acoustic ecology', "environmental sound, or what acoustic ecology has deemed the 'soundscape'" (ibid, p. 197) offers the opportunity to connect the experiencing subject with the 'world' of sound much more broadly. Indeed, LaBelle argues that attending to sound as energy, in the context of the soundscape, enables the listener to connect their experience with "the earthly whole" (ibid, p. 192). Rather than the—notably cartographic—abstraction of the earth as a whole, I argue that what the listener is 'connected' to is the abstract 'sound world' of the Thames. The sounds experienced by the visitor to *River Sounding* contribute to the constitution of a discrete, abstract entity—the cartographic abstraction of the Thames.

LaBelle differentiates further between 'installation' and 'acoustic ecology':

> Whereas sound installation [. . .] works with locational sound as a bounded geographic space, acoustic ecology situates local sound in relation to the ecology of the planet, and the presence of a single sound is understood to activate the entire field of sound [. . .] to listen to a sound is to listen to the entire body of the sound world in microdetail.

<div align="right">(ibid, p. 197)</div>

On this description, I would identify *River Sounding* as a sound installation rather than an acoustic ecology or an approach to experiencing acoustic ecology. It works with creating sounds that come to symbolise 'a bounded geographical space', that of the tidal and engineered Thames. Rather than connecting the listener with a concept

or experience of the world as a whole, I argue that, as *River Sounding* is an installation, the soundscape of the work involves or immerses the visitor in the cartographic abstraction of the Thames that is at stake in the work itself. This is a much more delimited reading than that suggested by LaBelle's characterisation of acoustic ecology. For LaBelle, acoustic ecology is concerned with

> an aesthetic experience in which listening, environmental awareness, and global relations come into play. Thus, composition becomes a form of research conveying cartographic routes in and through relations to place.
>
> (ibid, p. 198)

In the specific context of *River Sounding*, I suggest that global relations do come into play, though these relations are cartographic and socio-political rather than 'global' in LaBelle's sense of giving access to a world imaginary. We can see this in the work's selection of sites for recording, which favour human interventions in the river as the 'terrain' to be 'surveyed' by means of sound recording technologies. Thus, the immediate environment Tower Bridge, the Millennium Bridge, Teddington Lock and the whistle buoy in the estuary are what is evoked through the soundscape in *River Sounding*. This delimited soundscape, existing only within the spaces of the installation, is a re-spatialised and miniaturised form of the Thames.

Indeed, as LaBelle argues,

> these sounds [of acoustic ecology's artistic and musical works] are given weight by their continual referral to the actual site of their origin: the streets of Vancouver, the flows of the Hudson River, or the array of bird calls taking place in the deserts of the American Southwest make apparent an artistic practice taking place, out there in the fields and deserts, on the city streets, and in the forests, while being transformed, through the particulars of an artistic practice, into cultural objects.
>
> (ibid, p. 198)

Both the soundscape and the visual register of *River Sounding* are 'transformed', through Fontana's artistic practice, 'into cultural objects'. I therefore affirm LaBelle's understanding of 'place-based sound' as an 'opportunity' "to situate a listener within an intensification of immediate experience that expands beyond a point of focus to an environmental situation" (ibid, p. 197). I differ with his interpretation in seeing the 'environmental situation' that the listener is imbricated with as being a delimited cartographic abstraction rather than a higher-level abstraction of a global whole.

LaBelle's work is helpful in identifying Bill Fontana's oeuvre as an important exploration of 'place-based sound' with a particular emphasis on technological mediation:

> Focussing on the work of Fontana will allow for considering soundscape composition that works with the given interferences of technologies and the dislocation of place-based sound. Fontana harnesses soundscape composition's contradictory tendencies by making complex musical systems that keep place alive even while transposing it onto extremely distant locations.
>
> (ibid, p. 199)

He sees soundscape composition as having 'contradictory tendencies' due to the mediating processes of representation. "The recording of place often leads to contrary results, for to bring place to life one has to contend with the interferences of its very representation, mediation, and ultimate dislocation" (ibid, p. 199). I take issue with this interpretation as to what is happening in Fontana's work, and particularly in *River Sounding*. LaBelle figures place here as both something that one may 'bring to life' and something that is 'kept alive' in Fontana's work, within the same page. Place is incoherently theorised as at once inanimate or dead and living.

My interpretation of *River Sounding* is more in accord with the notion of 'bringing to life', in terms of seeing cartographic abstraction as generative and productive, in contrast to the notion of an essential 'liveness' being preserved and re-presented in the artwork. Far from keeping the River Thames 'alive' while 'transposing' it into the alternative location of Somerset House, I argue that in *River Sounding* Fontana creates a further abstraction of the river through the representational registers of sound recording and photography. This abstraction is a new entity rather than a transfer of something that exists innately within the river. The 'transposing' involved is a re-spatialisation of the Thames into the built environment of the lightwells, forming a new abstract space in which the viewer is perceptually immersed.

As LaBelle asks, "in what way does sound inform me of my sense of location, as an immediate and distant geography? And how does such relation form the basis for an artistic project?" (ibid, p. 199). I suggest that in *River Sounding*, the visitor is positioned within the 'immediate geography' of the light wells, coal holes and Dead House and simultaneously within the 'distant geography' of the tidal Thames. In this way, the experience of encountering the artwork involves becoming 'informed' of two senses of location at once, in the built environment and the sonic environment.

I have argued, then, for taking up LaBelle's term 'soundscape' to articulate the sound environment that is presented in *River Sounding*. The installation instantiates an immersive viewing experience of the Thames. The visitor is positioned spatially within the abstract 'returned' river in terms of both the built and the sonic environment. The visitor is also positioned immersively in a cartographic sense; the perceived space of the light wells is mapped for the viewer and so, simultaneously, is the abstract cartographic space of the Thames (most notably in the use of place names to label the coal holes). The visitor is 'immersed' within the abstraction of the 'soundscape', which performs a new mapping of the spaces of the Thames *into* the spaces of the installation.

While I have suggested that the trope of the cartographic viewpoint is *not* precisely the way that cartographic abstraction is in play in this artwork, viewing continues to be an important factor, as the visual register of *River Sounding* is experienced simultaneously with the soundscape. The viewer-listener is positioned cartographically in the work but through being positioned *within* the cartographic space rather than viewing from conceptually *above* the cartographic space as we saw with the cartographic modes of viewing discussed in the foregoing chapters. Deploying modes of both visual and sonic symbolism and elaborating a depiction of a delimited geographical object, *River Sounding* positions the viewer within the space of the lightwells and of the cartographic abstraction of the river. I see this positioning as a mode of inhabitation of the cartographic space in contrast to the other forms of cartographic viewing I have considered, which position the viewer outside and conceptually above the viewed space (including, for example, in the case of *Targets* as discussed in Chapter 1).

In terms of the cartographic re-spatialising of the Thames within the installation, I have identified the handout map as a central means through which *River Sounding* proposes itself to be a transposition of a delimited section of the Thames into the representational space of the artwork. In the map, numbers are assigned to recording locations, such that location 3, Millennium Bridge, appears in the main light well as well as the Dead House, as does location 4, Tower Bridge. A loose spatial ordering of the recording locations is evident in the two coal holes labelled '1' corresponding to Teddington Lock and location 5 corresponding to the most easterly recording location, the Thames Estuary whistle buoy. The coal holes and projections evoking Millennium Bridge, Tower Bridge and Richmond Lock are spatially distributed in between these two extremities, though their distribution in relation to one another does not correspond to a linear ordering. Their numbering does, however. Location 2, Richmond Lock, is downstream of Teddington Lock, and location 3, Millennium Bridge, is the next chosen point to the east of Richmond Lock. Tower Bridge follows, and, as mentioned, location 5 is the most easterly geographical location as well as the farthest part of the installation from the coal holes numbered '1'.

Therefore, the viewer-listener cannot directly map their own position within the light wells onto the geographical space of the Thames other than at the named and numbered locations marked on the handout map. In this way, areas of the installation are 'anchored' to areas of the Thames, while between these specified areas a more de-particularised space of the Thames is in play—for example, in moments of walking away from one video projection and before the next comes into view, yet the soundscape is still fully 'active' for the viewer-listener. The particularity of the viewer-listener's position within the installation shifts from close correspondence to looser correspondence with the geographical space of the river. Moments of close correspondence between the position of the viewer-listener and the location evoked through the combination of map, video projection and soundscape punctuate the visitor's experience. These moments present a convergence between the soundscape and the visual mode of re-spatialisation in *River Sounding*.

I have focussed on the connections between the spatial, visual and sonic registers of the depiction of the River Thames in *River Sounding*, attending to the distinctively cartographic positioning of the viewer in relation to the mapped object, or place, in this artwork.

To sum up, in this chapter I have advanced an interpretation of how the critical framework of cartographic viewing may be developed in relation to a sound-based artwork. Although *River Sounding* remains an artwork in which the visual experience of the visitor is highly significant, the soundscape that it stages offers an opportunity to explore the interplay of sonic and visual registers that depict their object in different ways. I have argued for interpreting some of these ways as cartographic.

Initially discussing the theme of the 'return of the river' that was put forward in institutional copy characterising the installation, I argued that a particular, historied rendering of the Thames is at stake in *River Sounding*. Before considering the ways in which the cartographic object of the Thames is re-spatialised in the work, I argued that *what* was to be re-spatialised was a particular abstraction based around moments at which the river is engineered, bridged, altered and delimited. We saw this particularly with reference to the work's taking Teddington Lock as the western boundary of the particular 'Thames' in question, as the site of the engineered limits of the Thames's tides. We saw that what is evoked, in this historical

register, is a temporally and spatially delimited abstraction of the Thames drawn from 'surveying' key locations of mechanical and architectural intervention along the tidal length of the river.

Second, I argued for reading the sonic register of the installation as continuing an indexical relationship with the source locations of the audio recordings. I offered an interpretation of *River Sounding* in terms of its presentation of a 'soundscape' of the Thames. This soundscape itself has a complex and shifting relationship with the visual register of representation in the work. Through both registers, the visitor is positioned as 'immersed' within a soundscape and within a cartographically constructed conceptual space. I interpret this as a form of inhabitation that emerges in *River Sounding* that is markedly different from the modes of cartographic viewing from conceptually above that have been explored in the foregoing chapters.

Notes

1   It is important to note the simultaneity of the sounds of the installation, which are experienced as overlapping and continuous, in contrast to the visual emphasis of cartography on delimiting, defining and bounding spaces in a way that is not possible in relation to sounds.

2   Image captions left to right: 51.431618,-0.323968 / Teddington Lock / Video, Hydrophone, Ambient Microphone; 51.462029,-0.316715 / Richmond Lock / Video, Hydrophone, Ambient Microphone; 51.488973,-0.289764 / Kew Bridge Steam Museum / Video, Ambient Microphone, Accelerometer, Hydrophone; 51.505484,-0.075102 / Somerset House Clock / Live Feed (Ambient Microphone); 51.506525,-0.081754 / Millennium Bridge / Video, Accelerometer; 51.506525,-0.081754 / HMS Belfast / Video, Accelerometer, Ambient Microphone; 51.505484,-0.075102 / Tower Bridge / Video, Accelerometer; 51.480848,-0.005665 / National Maritime Museum / Accelerometer, Ambient Microphone; 51.495813,0.037079 / Thames Barrier / Video, Hydrophone, Ambient Microphone; 51.514618,0.722179 / Southend Pier / Video, Ambient Microphone; 51.535573,0.911865 / Bell Buoy (Thames Estuary) / Shotgun Microphone, Video; 51.535573,0.911865 / Whistle Buoy (Thames Estuary) / Shotgun Microphone, Video.

3   The Kew Bridge Steam Museum was refurbished and rebranded in 2014 and is now known as the London Museum of Water & Steam.

4   Available at www.somersethouse.org.uk/about/press/press-releases/bill-fontana-river-sounding, accessed 22 December 2014.

5   Writing in the exhibition catalogue, Bill Fontana says that *River Sounding* "will return the river Thames into this building by creating an acoustic journey, that becomes an architectural one, in which the river again enters under the Great Arch and flows into areas of Somerset House that are at the same level as the Thames—the light wells" (2010, p. 14). Reviews of the work were generally very positive and accepted the institutional framing of the 'return of the river'. For example: Gramophone review, available at www.gramophone.co.uk/blog/the-gramophone-blog/listening-to-the-thames-bill-fontana%E2%80%99s-river-sounding "Fontana has returned the river to the building" accessed 22 December 2014; Frieze review www.frieze.com/shows/review/bill_fontana/ "The Thames [. . .] returns to the building by means of sound", accessed 22 December 2014; the curator Robert Blackson, also writing in the exhibition catalogue, suggests that "Fontana brings the Thames back to Somerset House" (2010, p. 26); Whitelaw in the catalogue cites "the reunification of river and building" (2010, p. 40).

6   The original plan for Somerset House was completed in stages and with changes of architect. For Somerset House's own account of the history of the building see www.somersethouse.org.uk/history/since-the-18th-century, accessed 17 June 2017. The then-Director of the Somerset House Trust, Gwyn Miles, writing in the *River Sounding* exhibition catalogue, uses the dates 1785–1803 (2010, p. 5).

7   Available at www.somersethouse.org.uk/history/since-the-18th-century, accessed 17 June 2017. Emphasis mine.

 8 Gwyn Miles, then-Director of the Somerset House Trust, writing in the *River Sounding* exhibition catalogue, also echoes the sense of the building of the Embankment as a loss for Somerset House: "Although this radical engineering project improved communications, transport and sanitation for the city, it cut Somerset House off from the river and compromised the waterfront design of the building" (2010, p. 6). This comment is in context with a narrative of Somerset House as a resurgent cultural centre, a narrative that foregrounds and celebrates Somerset House as an "architectural masterpiece" (ibid, p. 5) with a rich history. Miles emphasises the institutional concern with history in the commissioning of *River Sounding*: "We were delighted when Bill Fontana accepted our invitation to create a work in response to Somerset House's historic relationship with the river Thames. We are particularly pleased to be working with Sound and Music [the production company] to bring Bill's vision 'River Sounding' into the building where it belongs" (ibid, p. 6). Richard Whitelaw also characterises the artwork as "recreating a sound environment lost to the building in its orphaning from the river" (ibid, p. 45), a moment of division that he also figures as the 'driving' of a "concrete wedge between the Thames and a building specifically designed to afford direct access to the river" (ibid, p. 40).

 9 In this connection, William Raban's 'Thames Film' (1986) has contributed to the production of the notion of the Thames as a stable entity, able to both incorporate and transcend history. Re-shown as part of the Museum of London Docklands interesting but ultimately incoherent 2013 exhibition 'Estuary', Raban commented, "The appearance of the river has changed dramatically in the intervening twenty-seven years but *essentially the power of the river remains timeless* and will always be a rich source of inspiration for artists" (emphasis mine). Available at: www.museumoflondon.org.uk/corporate/press-media/press-releases/estuary/#sthash.ZDkUMzx7.dpuf accessed 16 May 2015.

10 See Fontana, "from the Thames estuary to Teddington Lock" (Blackson et al, 2010, p. 14), and "from Teddington Lock down to the Estuary" (ibid, p. 15).

11 See www.visitthames.co.uk/about-the-river/river-thames-locks/teddington-lock, accessed 17 June 2017.

12 Fontana in Blackson et al, 2010, p. 14: "*River Sounding* is a hybrid sound sculpture that combines a large-scale *sonic mapping of the light wells* with a series of discrete video installations in various chambers off of these beautiful subterranean passages" (emphasis mine). It is also worth considering the meaning of 'sounding' in relation to mapping. As well as meaning the emitting of sound, the term 'sounding' also carries the sense of 'investigating' and of ascertaining the depth of water by means of measuring line and lead, a process that also gives its name to the data obtained through measuring ('soundings') and parts of seas and rivers where it is possible to reach the bottom using the lead (Onions, C.T. and Friedrichsen, G.W.S. (Eds.) 1978. *The shorter Oxford English dictionary*, 3rd ed. Clarendon Press, Oxford, p. 2056). This process of measurement and recording both depth and the materials forming the sea- or river-bed has also entered into place names (for example, Puget Sound, Washington, USA, or Lancaster Sound, Nunavut, Canada). In the context of Fontana's artwork, then, the title simultaneously evokes the river itself emitting sounds and the river being measured and charted by someone (the artist) who is investigating and recording it.

13 See www.towerbridge.org.uk/bridge-history, accessed 17 June 2017, for the contemporary institutional presentation of Tower Bridge and its history.

14 Details available at www.londonmillenniumbridge.com, accessed 17 June 2017. On a previous version of 'the bridge's' website, Arup Group Ltd characterises the bridge as specifically linking St Paul's Cathedral and the Tate Modern Gallery, two major cultural and tourist locations in central London.

15 Details available at www.iwm.org.uk/visits/hms-belfast, accessed 17 June 2017. *HMS Belfast* is stewarded and presented to the public as a tourist attraction under the auspices of the Imperial War Museum.

16 The Thames Barrier's distance from central London mitigates against its success as a tourist attraction, which is reflected in its dispersed web presence, at en.wikipedia.org/wiki/Thames_Barrier, www.environment-agency.gov.uk/homeandleisure/floods/117047.aspx and available at www.visitlondon.com/things-to-do/place/26941-thames-barrier-information-centre accessed 17 June 2017.

17 Details available at en.wikipedia.org/wiki/Southend_Pier, accessed 17 June 2017.
18 See www.trinityhouse.co.uk/th/about/detailed_history, accessed 17 June 2017.
19 Blackson et al, 2010, p. 17 and handout map (Figures 4.1 and 4.2). The catalogue and handout map provide coordinates for each recording location.
20 Wood and Fels's theory is laid out in detail in *The Power of Maps* (1992), chapter 5, 'The Interest Is Embodied in the Map in Signs and Myths'. The theory is elaborated in relation to his well-known close reading of the 1978–79 'Official State Highway Map of North Carolina' and draws on the semiotic theories of Ferdinand de Saussure, Roland Barthes, Umberto Eco and Eduard Imhof in particular.
21 'Nature as system' is chapter 9 of Wood and Fels, *The natures of maps: Cartographic constructions of the natural world* (University of Chicago Press, Chicago and London, 2008).
22 I use the term 'immersive' here in its traditional sense of 'being surrounded by' rather than in the sense it has acquired in relation to being 'immersed' in a virtual reality environment.

5   Cartographic Abstraction
A Material Modality of Thought and Experience

We use maps to visualise the world. The ways in which cartography goes about creating its image of the world are abstract—physical features are named, measured, surveyed, categorised, symbolised and depicted and constituted as features. The theoretical critique of cartography has, so far, not attended seriously to the materiality of the processes of abstraction involved in cartographic depiction. These processes are central to the ways in which maps are able to operate as profoundly useful and naturalised image forms, in contemporary life as well as historically. 'The map' as such, and its procedures and techniques, needs to be re-conceptualised as the site of the production of distinctively abstract ways of seeing and knowing.

In this chapter I outline some proposed relationships between the modes of cartographic abstraction at work in the formation of a complex range of viewpoints that are both deployed in, and problematise, modes of cartographic viewing. I revisit and develop some of the issues identified in the foregoing chapters as the theoretical concerns that I take up from critical cartography, particularly the position of the viewing subject and their constitution through the hegemonic power of cartography to create the world-as-image. I then rearticulate my theoretical proposals in the more particular area of the abstract viewpoints that I argue cartographic depiction instantiates and enacts.

Through the close readings of cartographic artworks in the preceding chapters, I identify a range of critical approaches to cartographic viewing. I develop the theoretical aspect of cartographic abstraction further; in this chapter I take stock of the suggestions and conclusions about cartographic abstraction that have come out of the analyses of abstract viewing positions and draw from them a working theory of cartographic abstraction.

While the art historical image has undergone a wide-ranging critique in terms of its methods of constructing the viewing subject as a site of knowledge through the well-established critique of perspectivalism, the cartographic image has not and cannot undergo the same process of critique. The cartographic image continues to resist the disruption of objectivity that has taken place in art-oriented theory and remains a powerful site of knowledge production and normative views of the world. I show that the cartographic image uses techniques of remote viewing, disembodied viewing, symbolism and projection to produce viewing positions that become socially real (through abstraction).

In the second part of the chapter, I address a series of issues arising from materialist accounts of abstraction. Here I articulate a trajectory of thought engaged in theorising the materiality of abstraction and interpret cartographic abstraction in terms of

real abstraction or, in Alberto Toscano's formulation, 'materialism without matter' (Toscano, 2014). I connect my theory of cartographic abstraction to existing debates about abstraction in relation to Marxist and materialist approaches to philosophy. I demonstrate the relevance of critically approaching the Marxian-informed concerns with 'visualities' and the production of appearances in connection with commodity fetishism and the exchange abstraction. This exploration of cartographic abstraction, grounded in interpreting artworks, gives access to a more detailed account of the functioning of real abstraction in the contemporary social formation. I show that the critique of capitalist abstraction can and must be expanded to address the specifically visual ways in which the viewing subject is structured within the capitalist social formation. Some of these visual 'ways' are cartographic, and forms of abstraction in cartography can be understood through the capacity of artworks to destabilise and examine forms of 'seeing' and knowledge formation.

Cartographic Subjects

Throughout the previous chapters, I have put forward a series of analyses of abstract viewing positions and the ways in which they are constructed through cartographic techniques of depiction. In this section, I return to considering the various viewpoints that have been examined so far. I take the opportunity here to re-examine the concept of the 'viewpoint' with which I have been working and to position it in relation to cartographic abstraction. I suggest that the viewpoint as an abstraction is one feature, or mode, that we may find at work in cartographic abstraction. Considering it in conjunction with forms of cartographic viewing that do not work in quite the same way will allow for a fuller theorisation of cartographic abstraction.

Questions of vision, visuality and the constitution of "visual subjectivities" (Ramaswamy, 2014, p. 4) have been central to the field of visual culture, as well as being important to art history's concern with perspectival practices of depiction. In placing close readings of artworks at the centre of my approach to theorising the functioning of cartographic abstraction, I both draw on and diverge from established lineages of research addressing the relations between viewers and viewed objects. As Sumathi Ramaswamy argues in a postcolonial register, "empire and art—or more broadly, power/knowledge and visual subjectivities—are mutually constituted and entwined, both in the colonies and in the metropole" (ibid). I draw on this recognition of mutuality in the constitution of visual subjectivities in the theory of cartographic abstraction put forward here. It is worth briefly considering how non-cartographic images have been understood as producing subjectivities and to position the theory of cartographic abstraction in relationship to these established areas of scholarly concern.

One such area of established critique is the role of perspectival depiction techniques in constituting viewing subjects. 'Cartesian perspectivalism' has come to be seen as the predominant and hegemonic mode of visuality in Western modernity. Emerging with Renaissance visual art and strengthened through Descartes' positing of a geometrical and completely regular form of space existing objectively outside the mind of the observing subject, this form of visuality both privileged and helped to constitute a sovereign subject. Perspectival techniques worked to render three-dimensional objects convincingly on a two-dimensional surface, using the framework of a cone or pyramid of lines extending away from the implied viewer to a vanishing point within the image (Jay, 1988, p. 6). While a variety of permutations of perspective were developed

and used, the 'Artificial Perspective system' (Hale, 1981, p. 244) seen as originating with Brunelleschi in fifteenth-century Florence and subsequently articulated by Alberti is often taken to be the signature mode of perspectival depiction. The effects of the Albertian model of vision have been far reaching. As Amelia Jones observes, the terms of this model "came to determine the contours of modern to contemporary conceptions of the making and viewing subject in European culture" (Jones, 2013, p. 365).

This paradigm has been widely problematised, as Martin Jay argues: "Cartesian perspectivalism has, in fact, been the target of a widespread philosophical critique, which has denounced its privileging of an ahistorical disinterested, disembodied subject entirely outside of the world it claims to know only from afar" (1988, p. 10). Further problematising the notion of Cartesian perspectivalism as hegemonic, Jay in particular has proposed to understand it as a predominant mode of the organisation of the visual within modernity, but a mode that is not exclusive of others (Jay, 1988, 1993).

In terms of positioning the viewing subject and constituting it in relation to that which is viewed, Cartesian perspectivalism proposes a monadic subject, distanced from the viewed as it apprehends "an external and pre-given world of objective truth" (Crary, 1988, p. 33). In this scopic regime, "the bodies of the painter and viewer were forgotten in the name of an allegedly disincarnated, absolute eye" (Jay, 1988, p. 8).

In his influential account of a paradigm shift in visual practices, centred on the camera obscura as a device for making perspective images, Jonathan Crary (1988, 1990) links the critique of Cartesian perspectivalism to the emergence of nineteenth-century investigations of the physiology of the eye and the physical processes of sight. The model of the distanced viewer, apprehending a rational and homogeneous space, is problematised by studies of visual phenomena. After-images and the recognition that visual effects could be produced corporeally (Crary, 1990, pp. 135–150) and not as a result of seeing something existing in the world outside the viewer's mind and body challenged the notion of the sovereign yet disembodied viewer posited by Cartesian perspectivalism. The viewer could no longer remain distanced and monadic, as the body came to be recognised as capable of originating sensory experience, "to be the site and producer of chromatic events" (1990, p. 141) rather than passively and objectively receiving sensory input from the objective world outside. As Crary argues, this 'discovery' enabled a new conception, "of an abstract optical experience, that is of a vision that did not represent or refer to objects in the world" (1990, p. 141). The link of referentiality between mind and world is therefore disrupted. For Crary, the paradigm shift away from the dualistic model of mind and world, figured by the camera obscura, gave on to a perceiver whose vision was no longer measurable and rationalised. Also following the critique of perspectivalism and the overturning of the notion of the distanced viewer and knower, Donna Haraway has argued for an understanding of knowledge as situated and always-embodied, in order to "reclaim the sensory system that has been used to signify a leap out of the marked body and into a conquering gaze from nowhere" (Haraway, 1988, p. 581). The abstract mode of viewing as though from nowhere is a 'leap out of' or an eschewing of the embodied quality of situated viewing—and it does so in order to adopt a 'conquering' relation to what it views.

While this study is influenced by the range of issues that have emerged in the wide-ranging critique of perspectivalism—the nature of the knowing subject, relations of power between viewer and viewed, the question of objectivity and subjectivity—these

concerns cannot be applied directly to the cartographic image. The history of cartography and present concerns in critical cartography disclose a very different relationship (than that of art history) to the idea of the individual author-artist. For the cartographic image, Cartesian space continues to be an operative paradigm. Where, broadly, the 'image' for art history has undergone the critique of perspectivalism and with it the critique of the viewing subject as the site of objective vision, the cartographic image has not been dependent on perspectival techniques, and so the inquiry into its methods of constitution of the viewer cannot proceed along the same lines as those laid out in the art historical critique. The cartographic image implies and constitutes its viewer using distinctive visual techniques whose relationships with perspectival and painterly techniques have not yet been critically explored. I turn, then, in the latter part of this chapter, to the alternative paradigm of abstraction in the Marxian tradition in order to make use of the concept of real abstraction as an approach to conceptualising space and a very different conception of the viewing subject. First, I re-visit the abstract viewpoints that have been articulated and investigated through the foregoing chapters to draw them together as a coherent theory of cartographic abstraction.

Cartographic Viewpoints as Abstractions 1: The Bird's Eye View, the Zenithal Gaze, the View From Nowhere and the Panopticon

I have argued that the key viewpoint of cartography is the view from nowhere,[1] the most familiar and commonplace form of viewing that is used in cartographic depiction. It is helpful to consider the cartographic viewpoints discussed here in terms of the range of conceptual heights that they take up, or claim, in relation to the viewed. Having said this, the view from nowhere is an exception to the other viewpoints, in that it can operate at any conceptual height above the viewed area, whether appearing to be very close to the ground or extremely high above it, as for example in a world map projection. Its consistent feature is that it always gives a viewpoint that appears to be directly above all points of the viewed area at once.

The view from nowhere is formed through the construction of a *compiled* image of the viewed area that provides a virtual view from directly above all parts of the chosen area simultaneously. This is the feature of the cartographic view from nowhere that sets it apart from the other viewpoints that are used in cartography—the shift from a perspectival view that can be identified with a position in space relative to the viewed area to a non-perspectival view that virtually establishes a viewing position that cannot be identified with a spatial position at all. The viewer is placed conceptually above the viewed area, but the idea of our having a *position* from which we look downwards is set aside in order to create the visual effect of seeing from all potential positions at once.

In favour of coherence, legibility and interpretative stability, this mode of depiction 'foregoes' or de-selects for depiction diverse features of the viewed area (as do other cartographic viewpoints). Through its form, it enacts a capacity of totalising extension. The compilatory, synthesising capacity of cartographic visualisation is here understood as part of the modality of visual abstraction through which the viewer is constructed and positioned in a complex relationship to 'the viewed'. Indeed, the idea of what is being viewed and by whom is very much in question in the concept of the view from nowhere.

The bird's eye view and the zenithal view are closely related to the view from nowhere, but crucially, I argue, they both rely on the notion of an embodied viewing position—in other words, they are perspectival views. Bird's eye viewing shades into zenithal viewing, whereby the planimetric mode of elevated cartographic viewing became increasingly naturalised in use, particularly in the depiction of cities. Where the bird's eye view deploys horizontal and oblique viewing angles, the zenithal view or 'gaze' moves to a conceptual viewing position directly above the viewed area. The bird's eye view has not fallen out of use even in contemporary cartographic depiction, but nonetheless the conceptual view from directly above the viewed area has become the predominant viewpoint used in much contemporary mapping.

In the 'transition' to the zenithal gaze—and beyond, to the view from nowhere—the distinctive conceptual move is that of the viewpoint positioning itself 'at the level of the abstract'. I have adopted Ola Söderström's turn of phrase here and use it to indicate the decisive moment of de-embodiment in the viewing position, as Söderström's 'zenithal gaze' forms a viewpoint that no longer posits an embodied viewer. As the view from nowhere is a synthesis of already-abstract views, it ceases to refer 'back' to evoking a viewpoint that can be conceptually inhabited by an embodied viewer. I distinguish here between Söderström's conception of the zenithal and my own; I have argued that the terminology and thus the conceptualisation of the zenith does not go far enough in evoking the highly de-particularised, dis-embodied and thoroughly abstract viewpoint that is inaugurated through the transition to cartographic depiction based on the principle of compilation. The term itself describes the highest point of an arc and so evokes the movement through space of an object or body from which viewing may conceptually 'take place'.

By contrast, in the view from nowhere, I argue, it is this very 'taking place' that is left behind, so that viewing from nowhere explicitly cannot be coherently associated with the concept of an embodied form of viewing—even if such conceptual 'embodiedness' may rely on the notion of the bodies of planets or god(s). At the level of form, the view from nowhere assimilates all details of the particularity of the viewed place into a regularised viewing plane. The viewer no longer has any implied physical relation to the land or place that they view, whether in terms of height, directionality or locatedness. The view from nowhere admits only a vertical apprehension and in this way removes the possibility of conceiving of its form of viewing as having an embodied locatedness in relation to the viewed. What is distinctive and consequential about the view from nowhere is its resolute departure from the conceptual possibility of inhabitation or embodiment.

Considering the Apollonian view in relation to the view from nowhere, bird's eye and zenithal forms, it is, again, very concerned with a theoretically embodied mode of visualisation. In Chapter 1, we saw that Denis Cosgrove contextualises the globe form as a powerful imaginary that has, though not straightforwardly, contributed to fostering ideas of unity and harmony in association with viewing the whole earth. The Apollonian perspective or 'Apollonian eye' is a viewpoint positioned outside and above the earth, such that the earth may be conceptually apprehended as a discrete entity. This is in contrast with the 'flat' mode of viewing from nowhere; because its mode of visualisation engages with the viewed as a flattened surface, when the view from nowhere attempts to visualise the earth as a whole it does so in the form of the world map projection rather than the globe.

The Apollonian viewpoint, in contrast to the view from nowhere, posits an individualised, embodied location 'from' which it is possible to conceptualise the earth as a unified form, viewed from above and outside. Cosgrove interprets this perspective as "at once empowering and visionary" (ibid, p. xi). The Apollonian gaze is closely identified with the position of a god, in the figure of Apollo, and in this way is embodied figuratively and fictionally but not corporeally or humanly. The Apollonian perspective emerges as a cultural form that has fed into conceptualisations of human unity, constructed through the agency of the perspective itself; this perspective is a 'god's eye view' in terms of its relationship with the cosmographic tradition and the construction of a viewpoint that was conceptual *before* it was actualised in space flight and satellite photography. In this way, the Apollonian viewpoint has contributed to the development of technological forms of viewing—including the satellite and the space telescope—that come to realise the concept and the fantasy of viewing the earth from space. The abstraction of the Apollonian viewpoint, therefore, first posits a viewpoint from outside the earth and then fosters its technological realisation, or its inhabitation, through human-made objects. And more than objects, of course—humans have also come to inhabit the Apollonian view, via technological objects (and the workers, knowledges, systems and material infrastructures that produce them) enabling space flight. Indeed, the human inhabitation of this viewpoint has contributed enormously to the naturalisation of photographic and digital 'views' of the whole earth.

'The panoptic' has been proposed in this study, in close relationship to Apollonian viewing, as a mode of cartographic abstraction. While I have drawn on the panopticon as a figure for cartographic viewing because of its distinctive relevance for the analysis of the specific artwork *Targets*, I suggest that it also has relevance for cartographic abstraction more widely. The panoptic posits an embodied form of viewing that also depends on a tension, an uncertainty, between being embodied or not—between presence and absence.

The efficacy of Bentham's original formulation turned in large part on those persons who are subject to viewing not knowing whether they are being viewed at any given moment. Lyon has suggested that "the panoptic urge is to make everything visible; it is the desire and the drive towards a total gaze, to fix the body through technique and to generate regimes of self-discipline through uncertainty" (Lyon, 2006, p. 44). In this I see a movement slightly away from or at odds with the observation that the panoptic turns on undecidability regarding the presence or absence of the viewer. The 'panoptic urge' is not 'to make everything visible' as Lyon suggests; rather, the key idea in the panoptic mode of viewing is its disciplinary effect on the viewed subject. The aim of the panopticon is to make the person who is being viewed *internalise* the fear that they *might* be being viewed at any given moment. It is explicitly *not* about actually watching the subject at all times. The technique aims at domination of the subject by means of the *threat* of total visibilisation rather than the practice of it.

The idea that the panoptic urge is to make everything visible moves away from the notion of visibility as a means to an end and re-positions it as the desired end in itself. This tension, or perhaps confusion, between visibility as a means and as an end is itself relevant to a parallel 'urge' toward visibilisation in cartographic practice. Where critical cartography has so thoroughly exposed the practical relationships between mapping and Western domination, the 'panoptic urge' may show a relationship at the level of the form of viewing involved. That is, in addition to the capacity of the view

from nowhere to assimilate and render knowable that which it visualises, we may perhaps identify a complementary drive toward visibilisation as both a means to an end—domination—and an end in itself—visibilisation. In this way, the addition of the panoptic view to the analysis of the view from nowhere further discloses the totalising tendency of the view from nowhere.

Embodiment and de-embodiment are important themes that run through my analyses of abstract cartographic viewpoints. I use 'de-embodiment' to indicate the viewpoint's capacity to posit a viewing position that may not be physically inhabited by a viewing person—that is, to posit a de-embodied cartographic subject. Some of the modes of viewing addressed here do posit an embodied human viewer; some posit a viewing position that is conceptually compatible with embodied viewing (and, in the case of the Apollonian, has fostered its own realisation). By contrast, the god's eye view posits a viewer that has the attributes of god rather than a human subject—omniscience and omnipresence. The efficacy of the god's eye view lies in its capacity to structure a viewing position through which the human viewer may conceptually inhabit a position through which all may be seen and known. The limited horizon of situated human viewing is extended, through the abstraction of the god's eye view, to encompass potentially any place and time. The god's eye view has effects in its own right and also goes on to structure more particular or specialised modes of viewing, notably the drone's eye view and the view from nowhere.

In the view from nowhere, the zenithal, the bird's eye view, the Apollonian and the panoptic, the modes of viewing are more concerned with embodiment and the idea of conceptual inhabitation of the viewpoints. In the next grouping of viewpoints, the modes of viewing are more thoroughly already-de-embodied and already-networked. In the final viewpoints discussed, we see a turn back towards embodiment, in terms of the totalising character of cartographic viewing, through looking at the case of the antipodes as a cartographic abstraction and through considering cartographic signification and the role of sound.

Cartographic Viewpoints as Abstractions 2: God, Drones and the Antipodes

In the preceding chapters, I have identified the 'god's eye view' as a 'higher-level' cartographic abstraction, such that it is not directly experienced but has the capacity to organise other modes of cartographic viewing.[2] While the god's eye view is not a concept that is particular to cartographic depiction, I have argued for interpreting this fairly broad concept in a more specific way, in the register of cartographic abstraction. In this context, the god's eye view designates a viewpoint, whether visual or conceptual, that affords (or purports to afford) total knowledge, oversight and access to unmediated truth. The god's eye view affords sight, in particular, of objects, actions or landscapes from a highly elevated and thoroughly abstracted position.

Pickles has characterised the 'god-trick' as an illusion of universal knowledge, power and control, perpetrated by 'the rationalizing universal gaze' (Pickles, 2004, p. 185), and Gregory has termed it 'the ability to see everything from nowhere in particular' (Gregory, 2014b). The god's eye view provides a model for the interpretation of human agency in elevated, technological settings. I use 'god's eye view', then, to denote the cartographic convention, of using views from 'above' the mapped subject that present the appearance of claiming 'the ability to see everything from nowhere in

particular' in the context of the view from nowhere, simulating viewing from directly overhead of all parts of the mapped area simultaneously. I propose the god's eye view as a 'higher-level' abstraction in order to distinguish its more general capacities—of naturalising an externalised and elevated perspective—from the more specific capacities of the view from nowhere, for example, which naturalises an externalised and elevated perspective *through* performing a de-embodying and synthesising view.

This notion offers a point of conjunction and tension between the figures of the Apollonian gaze and the panopticon. Both viewing forms turn on the construction of a set of viewing relations that claim control and a position of agency for the viewer. The notion of absolute control is often labelled as a capacity that only one in the position of god would have, and as such it is both fictive[3] and agentic. Because the notion of god is a fiction or a social construction, there is no entity that underwrites the capacity for agency in the god's eye view; in spite of this, as I argue, it is able to have effects in the world and to perform some degree of agency in terms of constituting other viewpoints. The god's eye view, then, is a figure of the illusory capacity of cartographic viewing to establish viewpoints that are disembodied, non-inhabitable by a physical viewer and thoroughly abstract. In this light, the god's eye view emerges as a complex, enduring and adaptive cultural construction, which provides a model for the interpretation of human agency in elevated settings (for example, space flight) made possible through technological development.

The drone's eye view has been proposed as an abstract viewpoint that is not itself solely or primarily cartographic but that is nonetheless significantly organised through cartographic abstraction. The 'drone's eye view' here denotes both the popular conception of drones as all-seeing and the viewpoint's status as an abstraction that organises this fetishised appearance. In this I draw on Gregory's insistence on the materiality of the networked form of drone vision to situate it in the register of production and reproduction of an abstract viewpoint, bringing the problematic of drone vision into the analytical terms of cartographic abstraction. This abstract viewpoint functions to contribute to the ongoing reproduction and extension of distanced and networked viewing from above, both drawing from and refuting the older abstraction of the cartographic god's eye view. The drone's eye view is understood as incorporating at once the aspects of fantasy that shape drone discourse and the realities of (military) drone practice.

The drone's eye view, then, identifies drone viewing as incorporating both conceptual 'extremes' of the all-seeing drone as a solipsistic figure of military agency and the networked, abstract and material nature of the view that the drone constructs. These potentially contradictory understandings condition and thereby have a role in the reproduction of the other. The fantasy of total vision both drives and is reinforced by its technological manifestation. Rather than understanding the god's eye view as having been superseded, then, I argue for interpreting it as continuing to operate and to influence contemporary understandings of cartographic viewing, remote viewing, such as the technological forms embodied in satellites and drones, and the capacity of aerial viewing to perform and convey agency. I suggest that, as an abstraction, the god's eye view transfers some of its attributes to the more specific abstraction of the 'bomber's eye view', such that this viewpoint comes to be popularly understood in a simplified form and, importantly, in a form that conflates attributes of the god's eye view with the bomber's eye view. A disproportionate degree of sight comes to be associated with the position of the bomber, which I suggest is transferred from or conferred by the

god's eye view as the organising abstraction in question. The fantasy of full visibility and full knowledge that is so strongly connected with the contemporary discourse of the drone is one of the most important manifestations of the god's eye view.

In terms of the theoretical concern with embodiment in this study, the drone's eye view, while networked, distributed and increasingly 'autonomous', continues to be inhabited by human subjects whose experience also becomes part of the discourse that shapes the future conditions of possibility of the drone's eye view.

Drone viewing, indeed, is always 'situated' inasmuch as it 'takes place' from somewhere particular, frequently a 'somewhere' that is on the ground rather than in the sky—the drone operator's 'cockpit'—often located in another continent. The abstraction of 'the drone operator' is also always embodied by real persons working in distributed yet networked locations. This necessary embodiment works against the fantasy of de-embodiment found in the god's eye view; the god's eye view can be understood as part of the networked and interdependent character of the drone's eye view, that is constituted across multiple sites, persons, technologies and practices.

In discussing the capacity of cartographic depiction to enact a mode of conceptual remote viewing, I have analysed antipodal relations, or 'the antipodes' as a cartographic abstraction. The antipodes is a particular form through which the broader question of cartographic remote viewing may be specified and investigated in more depth. The abstraction of the antipodes becomes a productive factor in the formation of knowledge relating to antipodal locations on the part of the viewer. The viewing position is structured as one through which 'knowledge' is produced of abstractions and abstract relations in the conceptualisation of remote and unknown regions of the globe. In this way, the cartographic abstraction of the antipodes has formed part of the material conditions underpinning the historical production of imagery of *terra australis*, the Southern continent.

The 'higher-level' or more general cartographic abstractions of latitude, longitude and the globe form have a productive role in antipodal conceptualisation, and the cartographic grid is a distinct, though not separate, abstraction that organises the spatial concept of the antipodes. By means of the cartographic abstraction of the antipodes, the position of the viewer is structured and organised as one through which 'knowledge' is produced. This particular knowledge is of abstractions and abstract relations as they are deployed in the conceptualisation of remote and unknown regions of the globe. In this way, a cartographic abstraction is both central and, importantly, productive in the capacity of cartography to perform a conceptual mode of remote viewing.

The classical and medieval philosophical concept of antipodal relations was subsumed by the form of the cartographic grid: "By 1500, the old mappaemundi had come to be replaced, among the learned at least, by a new type of map derived from Ptolemy's Geographia, which had been reintroduced to Western Europe early in the fifteenth century" (Padrón, 2014, p. 212). In this way, the antipodes persisted as an abstraction used for visualising unknown persons and places but was re-constituted by the grid form. The 'addition' of the grid to the more situated and place-bound conception of antipodal relations allowed for its transformation and extension into a figure of oppositional relationality, through which conceptualisations are formed of the globe as a unified form and relations of otherness are figured among persons. This transition is subsequently consolidated in the shift from the antipodes being understood to denote the Southern continent, and then Australia and New Zealand, and latterly any diametrically opposed points on the surface of the globe. This transition

de-centres Europe as the originary location of viewing and of knowledge formation, and in this way the antipodal concept is de-particularised and globalised.

While 'the antipodes' as an abstraction is productive and active in the process of constituting a Western visualisation of unknown regions of the globe and, later, the Southern continent in particular, it does not take the form of a viewpoint. Rather, the antipodes is a cartographic abstraction that enables and facilitates cartographic visualisation on the part of the West, or the Western imagination. This abstraction makes possible what I have called cartographic remote viewing, whereby a visual and spatial conception of lands and persons that are unknown to experience comes to constitute what may be known and understood of remote locations.

The role of the grid is particularly significant in this complex mode of cartographic visualisation. With the advent of the grid as a predominant form in cartographic imagery, as Ricardo Padrón has argued,

> geometric space—abstract and homogeneous—came to be deployed for the first time in Western culture. The consequences of this development were felt by Europeans and non-Europeans alike, especially as the universalist claims of the new, abstract spatiality empowered modern, Western European culture at the expense of premodern others.
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> (2014, p. 214)

As a way of viewing the unknown from a distance, or cartographic remote viewing, the antipodes is strongly bound up with cartographic practices of viewing without itself functioning in the same way as an abstract viewpoint. It functions as part of the broader modality of cartographic remote viewing. The antipodes and remote viewing contribute to the broader framework of viewpoints and abstract techniques that together constitute cartographic abstraction as a material modality of thought and experience.

Lastly, in terms of reconsidering the modes of viewing that have been proposed in the previous chapters, we turn to another mode of cartographic viewing and spatialisation that does not directly posit a viewpoint. Moving beyond the terms of viewing only, the staging of cartographic abstraction that we saw in the installation *River Sounding* draws on a range of registers other than the visual, and it gives the opportunity to expand the consideration of cartographic abstraction as well.

To the extent that a viewpoint is at stake in this discussion, then, it is a viewing position that is immersed within the cartographically structured space of the installation. The viewing experience positions the viewer physically in a way that the other viewpoints do not and positions the viewer within the cartographic space. This is in marked contrast to the viewpoints that, as we have seen, posit the viewer in a position conceptually above the viewed space, as in the view from nowhere, the bird's eye view and the Apollonian gaze. In the drone's eye view, we saw the importance of bodies inhabiting positions on the ground as part of the networked nature of that abstract viewpoint. This theme of being on the ground and viewing at ground level also emerges here but quite differently. The drone's eye view is a mode of positing the viewing subject that is much more directly physical and embodied than we saw in the other viewpoints. The listening and viewing subject is structured as a subject in motion, moving through the cartographic space and experiencing it from one position at a time, as opposed to viewing one image that provides an overview.

It is important to consider whether this more experiential staging of a cartographic space has a direct bearing on forms of abstraction present in cartography. In analysing the re-spatialisation of the mapped place, in discussion of *River Sounding/* we saw a version of the cartographic project of miniaturisation and the re-spatialisation of the mapped into the two-dimensional terms of the cartographic image. Considering the situation in three-dimensional terms, however, the mapped place is re-spatialised into a smaller and, importantly, different-shaped space. Clear points at which the installation space and the mapped space could clearly be said to concur, or directly 'map onto' one another, are few. However, the simultaneous functioning of both the visual and the sonic registers opens out the possibility for experiencing cartographic space more dynamically. Without a strict correspondence across spatial, visual and sonic registers, a much freer play of phenomena is encountered by the viewer-listener-embodied visitor.

We see a cartographically constructed conceptual space emerge that positions the viewer within rather than above the cartographic space. This cartographic space also engages with sound as part of the entity being mapped as well as part of the mode of its presentation in the conceptual space. In this way, we may suggest that a materialist mode of abstraction is at stake in this conceptual space that re-spatialises the mapped place and positions the viewer within rather than above the abstract cartographic space.

A Theory of Cartographic Abstraction

Through considering this series of cartographic viewpoints and positioning them as cartographic abstractions, I am attempting to articulate a case for bringing the theoretical framework of real abstraction into dialogue with the current literature engaging with critical cartography. I see this as a contribution towards a broader project to unfold the implications of real abstraction for visual culture and the ways that we may start to theorise the disruption, non-reproduction of or progressive intervention into the contemporary dynamic of real abstraction, which has such a significant role in structuring our capitalist present. This echoes the commitment expressed by Alex Loftus, "to consider the geographies produced through abstraction and the development of a philosophy of praxis that might be adequate to critique and challenge that abstract reality" (Loftus, 2015, p. 366), in light of the context in which "one of the central features of modern capitalist society is rule by abstractions" (ibid).

Maps are about relationships (Wood et al, 2010), and so part of what they are is a technology of the visualisation of social relations and the propositions that are made about those relations, particularly connected with their framing as non-constructed or immutable. In articulating this range of modes of cartographic abstraction particularly associated with viewing, I aim to open out the different modes of cartographically constructing a view from above and what relations those views may propose and entail.

The theory of real abstraction through which I seek to articulate my critique of cartographic abstraction was put forward by Alfred Sohn-Rethel (1978), which he proposed as the critique of epistemology that would function as extension of and corollary to Marx's critique of political economy in *Capital*. He proposes real abstraction as a description of the process enacted in commodity exchange, as the constant moment in which all socially necessary labour time is commensurated as abstract

labour, and this fundamentally abstract action plays a constitutive role in the formation of the exchanging subject's consciousness and, by extension, the consciousness of all subjects living within the social formation of capital. My critique of cartographic abstraction draws on Sohn-Rethel's concept of real abstraction, and I take up his recognition of real abstraction as an abstract yet socially constitutive process. I attempt to bring real abstraction to bear on my analysis of cartographic abstraction to open a potentially fruitful new direction in critical cartographic debates.

My emphasis is on cartography as a matrix of practices that is productive of further processes of abstraction, in an ongoing process. In this respect I take a view that departs from the related conclusions put forward by, in particular, Wood and Pickles, who conceive of the development of cartographic practice in terms of an expansion of forms of mapping, as well as a diversification of the people we recognise as mapmakers, in an implicit narrative of development towards greater democratisation and participation. In contrast, I theorise cartography as a material, open-ended form of discourse, that is always-already historical and as such must be understood as subject to ongoing transformation. Rather than seeing cartography as productive of finite, distinguishable understandings, objects or knowledges, I see it as a conceptual process of continuous 'becoming', as opposed to consisting of only those processes involved in its technical production.

In this light, I have outlined what I see as the broad concerns that have animated critical approaches to cartography before now. A first broad area of discussion has identified processes of abstraction as intrinsic to the process of making any sort of map image, including selection, projection, miniaturisation and symbolisation. A second area, engaging more wide-ranging debates, has addressed cartography in terms of new critical frameworks emerging and gaining interpretative currency through the second half of the twentieth century, taking account of deconstruction, semiotics, structuralism and post-structuralism, power-knowledge, historical analysis and counter-histories, discourse and phenomenology (Jacob, 2006). The 'objectivity claims' made by cartography have receded in importance in light of these critical movements, for academic commentators at least; that said, the complex relationships between maps and a, or the, 'real' still animate most map use and production. A third area of discussion has seen the map less as an object of scrutiny and more as an object in motion, with distinctive contexts of use and readership, access and the dissemination and circulation of cartographic knowledges.

Materialist Approaches to Abstraction

In this part of the chapter, I draw on a range of Marxian and materialist perspectives on the role of abstraction within capital and identify connections between the mode of cartographic abstraction that I theorise and the socially synthetic capacity of capitalist abstraction. I use these Marxian perspectives on abstraction to draw together my own account of material abstraction. I argue for identifying cartographic abstraction in light of this account of real abstraction while not being directly an expression or production of real abstraction.

The Marxian theory of commodity fetishism enables us to recognise the abstract action that lies at the heart of commodity exchange. In order to examine the relationship between cartography and real abstraction, I want to briefly consider Sohn-Rethel's theory of real abstraction in conjunction with a useful reading of commodity

fetishism by Thomas Keenan. This enables us to look more closely at the exchange abstraction itself, which Sohn-Rethel posits as the origin of real abstraction and its social efficacy and which gives rise to Marx's theory of commodity fetishism. Commenting on the opening declaration of *Capital (Volume One)*, "The wealth of societies in which the capitalist mode of production prevails appears as an 'immense collection of commodities' [*ungeheuere Warensammlung*]; the individual commodity appears as its elementary form" (Marx, 1867/1990, p. 125), Keenan identifies the question of appearance as the central problematic of commodity fetishism. He translates *ungeheuere* as 'monstrous' rather than 'immense', stressing the connotations of horror and appalling unnaturalness in wealth's appearance as a collection of commodities. As he further argues,

> [t]he matter at issue is the appearance or self-announcement of something as something else, the rhetorical structure of simile or metaphor (*als, comme*): semblance, shine, simulation or dissimulation. In those societies where the capitalist mode of production prevails, something (economic) shows itself by hiding itself, by announcing itself as something else or in another form.
>
> (1993, p. 157)

This is the central movement of value as an abstraction—the displacement of value from one thing into another thing, from the worker into the commodity, and from the commodity into the money form necessitated by the logic of exchange.

As Keenan describes, the crucial moment of exchange is the moment when things are made commensurable through the creation of a 'third term', an abstraction created in the moment of exchange:

> When things are exchanged as commodities, they are related to each other not as use values but as exchange values, *in terms of something else*. This shared third term, the *axis of similarity*, enables a comparison, makes the different uses or things commensurable, relatable as quantities of the same thing rather than different uses or qualities.
>
> (ibid, p. 162, emphasis mine)

It is in this sense that Sohn-Rethel's characterisation of exchange as a 'thoroughly abstract action' resonates; the action of commodity exchange is thoroughly abstract because the buyer in the exchange engages with the commodity as a use value, while the seller engages with the commodity as an exchange value, and in so doing the posited abstract labour within the commodity is realised. The abstract action of commodity exchange organises social relations by means of a 'third term', value, the 'axis of similarity' between and among things. In this theoretical context, real abstraction constitutes the moment or event and the process of 'social synthesis' in Sohn-Rethel's terminology.

Sohn-Rethel says that Marx's first mention of abstraction as originating in material phenomena is to be found in *A Contribution to the Critique of Political Economy* of 1859, "where he speaks of an abstraction other than that of thought" (Sohn-Rethel, 1978, p. 19). Sohn-Rethel is referring to Marx's statement from the *Contribution*, "[t]his reduction [to simple labour] appears to be an abstraction, but it is an abstraction which is made every day in the social process of production" (Marx, 1859/1970,

p. 24). Anselm Jappe sees Sohn-Rethel (discussed in more detail in what follows) as making one of his key interpretative errors in relation to this statement. As Jappe argues, Sohn-Rethel

> identifies Marx's conceptual précis of the value form's development with an historical outline in the belief that 'simple value form' ever actually existed (an error that Engels, together with very nearly the entire body of orthodox Marxism, had previously fallen victim to).

<div align="right">(2013, p. 11)</div>

However, I do not see the question of whether Sohn-Rethel regarded the simple value form as having existed historically as undermining his insight that there is a crucially under-theorised concept of a material form of abstraction that we may draw out from Marx's account of capital.

The idea, in Marx, of an abstraction that does not originate in thought has been developed subsequently by Sohn-Rethel into the theory of real abstraction. This area of Marxian thought builds from Marx's identification of abstraction as a fundamental force in capital, as well as his insistence on deploying a complex *method* of abstraction with which to study the object—capital—which is itself so thoroughly mediated through abstractions. 'Real' or 'concrete' abstraction is Marx's understanding of the way in which abstractions are produced by persons—or more properly, the social, as against individual persons acting autonomously—but which then become socially operative and take on the reality status of concrete things. Real abstraction is a way of describing this process and what it produces.

Real Abstraction in Sohn-Rethel

Sohn-Rethel articulates a development of Marx's assertion of a form of abstraction 'other than that of thought': real abstraction. As Sohn-Rethel describes, "abstraction can be likened to the workshop of conceptual thought and its process must be a materialistic one if the assertion that consciousness is determined by social being is to hold true" (1978, p. 18). In this formulation, then, real abstraction is an avowedly materialist process but not one that is disconnected from thought. For Sohn-Rethel, the consciousness itself is formed "by the procedure of abstraction" (ibid). Further, as Toscano notes, "Sohn-Rethel's derivation does not move from the density of empirically observable and palpably material social relations to the supposedly distorting and transcendent illusions of philosophy; rather, it takes its cue from Marx's conception of value as a social form to ground ideal abstractions in real abstraction" (Toscano, 2014, p. 1229).

The role Sohn-Rethel sees for abstraction as a social force is therefore not entirely negative or melancholic, as it has a fundamental role in the origination of consciousness itself and in the possibility of 'thinking the object'. This is not yet a developed concept of real abstraction proper, for which Sohn-Rethel turns to an examination of the 'commodity abstraction'.

Sohn-Rethel takes an unorthodox position in declining to identify abstract labour as the source of the abstractness found in the commodity. Abstract labour is the commensuration of all specific instances of labour, and it is this commensuration that equates all forms of labour in terms of the value they produce. The category of abstract labour gives rise to exchange value, that quality-less form of value that renders all labour commensurable and all commodities exchangeable. This is a quantitative

differentiation, which gives rise to the exchange value of the commodity, as opposed to the qualitative differentiation giving rise to the commodity's use value. Marx identifies abstract labour as the specifically capitalist form of labour, as a historical category that arises out of the social relations present in the era of the capitalist mode of production broadly understood. Sohn-Rethel insists that when the value that has taken on the commodity form subsequently takes on the money form, it does so as "an abstract *thing* which, strictly speaking, is a contradiction in terms" (ibid, emphasis in original). This apparent 'contradiction' is resolved through the insistence on identifying a materialist mode of abstraction, that is, real abstraction.

Beverley Best also identifies, via Marx, "a social mechanism of abstraction as the defining characteristic both of the capitalist mode of production and of *his method of analysis* of that object" and that this "singular mechanism of abstraction structures all activity and spheres of activity in capitalist society" (Best, 2010, p. 6, emphasis in original). Abstract labour is the 'social mechanism of abstraction', and it is realised and effectuated as a social relation in the commodity exchange, the exchange abstraction.

The 'fundamental', 'singular' mechanism of abstraction in societies organised on the basis of commodity exchange is abstract labour for Best, whereas for Sohn-Rethel, the decisive moment of the social effectivity of abstraction is to be located in the exchange abstraction itself. Emphasising the materiality of capitalist abstraction, Best asserts that:

> It would be a mistake to conceive of the mechanism of abstraction as a strictly formal process played out on real, concrete labor. Nor is abstraction a cognitive process where real, individual labor practices are reduced in thought to their common denominators; abstract labor is not an idea
>
> (ibid, p. 17)

It is this assertion of the materialist character of abstraction within capitalist social relations that I draw on in support of Sohn-Rethel's formulation of real abstraction as being actualised in commodity exchange.

The most important aspect of the commodity abstraction, for Sohn-Rethel, is that it originates in people's actions rather than their thoughts. He emphasises that although the concept of value exists only in the human mind, it is originated not by the mind but by the social action of real people engaging in commodity exchange, who generate this abstraction without having any awareness of it. Sohn-Rethel sees the existence of real abstraction as the 'discovery' that really sets Marx's analysis in opposition to the philosophical tradition, although this opposition was not fully explored by Marx. Sohn-Rethel makes critical mention of Louis Althusser for understanding the commodity abstraction metaphorically, where it must be understood as real, social and material.

The abstraction from use is not something done in the mind of either the seller or buyer, capitalist or consumer, and it is not a charade in which all parties pretend that time is not passing. Rather, it is the engagement of the parties in a thoroughly abstract activity, exchanging objects for the money form of value, the universal equivalent, apprehending the object as a commodity and proceeding to deal with it according to that one aspect of its rich, specific and varied realness. It is what is being done that is of utmost importance for Sohn-Rethel rather than what is being thought or not-thought during the act of exchange. "It is the action of exchange, and the action alone, that is abstract" (1978, p. 26). The abstraction is firmly established as taking

place within action, within external reality, emphatically not as a process of thought, reflection or consciousness.

Sohn-Rethel describes the buying and selling of commodities as the only way in which a society can cohere when it is predicated on private production of use values. The social bond becomes one of dependency as production and the knowledge and skills required for production become increasingly specialised. "The only solution to their interdependence is commodity exchange" (1978, p. 29). Sohn-Rethel calls this social bond the 'social nexus' and the 'social synthesis' and emphasises the selling of commodities as the decisive action over their production or the circulation sphere over the production sphere.

Sohn-Rethel states that Marx was explicit on the point that the value abstraction never actually attains a representation as such, as itself, as the value abstraction, but is represented instead in exchange as the equivalence between commodities. Money is here seen to be "a metaphor of the value abstraction it embodies, not this abstraction itself" (1978, p. 34). This point emphasises that money is not itself value but a representation of value. More specifically, it is a representation not of the value abstraction itself but of the commensurated use values embodied in all commodities. As we saw earlier, the value abstraction does not attain its own representation as such but is mediated through the representation of use value.

In the context of a society in which social relations are mediated through the exchange abstraction, then, Sohn-Rethel's theory of real abstraction enables a focus on the social and political effectivity of abstraction in the wider context of capitalist social relations. This foregrounding of abstraction as social process opens the opportunity to investigate other modes of abstraction in terms of their social effectivity, and in this light I have proposed my interpretation of cartographic abstraction.

While I have not drawn directly on the concept of space as a concrete abstraction, as theorised by Lefebvre (Stanek, 2008, 2011; Lefebvre, 1991), in my analyses, its pivotal contribution to the theorisation of spatial abstraction demands engagement. Lefebvre's ideas have had a wide-ranging influence on current scholarship addressing spatial practices, including experimental geography, and so to some extent the understanding of space as socially produced and as an integral part of capitalist reproduction has a presence in this study. Lefebvre constructed his theory of space as a concrete abstraction through analogy with Marx's approach to theorising labour and drew on Marx's concept of concrete abstraction in order to theorise space as "a product of historically specific material, conceptual and quotidian practices" (Stanek, 2008, p. 62). Lefebvre understood concrete abstraction as a social abstraction (ibid, p. 68), produced through practices rather than thought or convention.

Without undertaking an exhaustive comparative analysis of contemporary uses of varying inflections of abstraction, it is possible to indicate some useful distinctions. Where Lefebvre positions concrete abstraction as an instance of social abstraction, John Roberts assimilates Lefebvre's concept into a wider category of 'spatial abstraction', incorporating the more recent developments in critical spatial thinking such as globalisation (Roberts, 2010, p. 136). Roberts also distinguishes between social abstraction and real abstraction, identifying social abstraction in terms of "the material and symbolic structures of domination" (Roberts, 2014, p. 94) that attain expression in the forms of the built environment and division of space. Real abstraction, on this view, denotes "the organization of production and consumption through the discipline of the value-form" (ibid), which is broader than Sohn-Rethel's specification

of the exchange abstraction in one sense, but a more limited reading in the sense that Sohn-Rethel's formulation sees itself as able to give an account of the 'social synthesis' itself, beyond the 'organization of production and consumption'.

As my formulation of cartographic abstraction builds from the interpretation of artworks and engages primarily in theorising viewing and the positionality and subjectivity of the viewer, it is not immediately congruent with concrete, spatial or real abstraction. However, I think cartographic abstraction offers possibilities for constructing stronger links with these approaches to abstraction that are directly grounded in Marxian theory.

The theoretical framework of real abstraction in this study may be seen as a 'materialist provocation'. This is an area of Marxian thought that is attracting increasing scholarly attention, in part, I think, because of its interest in identifying abstraction as part of everyday life and being within commodity societies (Loftus, 2015) and the actions of commodity exchangers as being fundamentally mediated through abstraction. Sohn-Rethel's compelling claim that commodity exchangers engage in 'thoroughly abstract action' leads me to attempt to explore this claim with reference to how we may develop new theoretical approaches to cartographic visuality. Where cartography has already been explored in terms of 'making worlds' (Hawkins, 2014; Pickles, 2004, p. 93), I wish to ask about how those 'worlds' are 'made', engaged with and reproduced at the level of the individual who uses maps, visualises mapped content and internalises and acts on those understandings.

Anselm Jappe has argued that Sohn-Rethel's main virtue (in relation to the issue of real abstraction) is in having posed the problem: "Sohn-Rethel's real merit is to have articulated the whole issue of real abstraction. But the answer he gives cannot be accepted unconditionally" (Jappe, 2013, p. 9). Where Jappe sees Sohn-Rethel as having gone wrong is in abjuring the central Marxian concept of abstract labour, as the source and substance of capitalist abstraction, to install in its place the notion of 'exchange abstraction'. For Jappe, this theoretical move indicates a certain 'hollowing out' of the explanatory power of the framework of real abstraction such that, without abstract labour, real abstraction is unable to account for the abstract content of exchange and positions abstraction as a strictly formal or even psychological phenomenon (Jappe, 2013, p. 12). The value of posing the question, for Jappe, is that in doing so, Sohn-Rethel "contributed to drawing attention to the importance of the category of 'real abstraction' for the understanding of the hidden core of capitalist society" (Jappe, p. 14). Without attempting to fully adjudicate this question, I wish to retain Sohn-Rethel's provocative emphasis on identifying the action of exchangers as thoroughly abstract. It is this identification, of abstraction existing outside of the thought and consciousness of individuals, that I pursue in terms of cartographic ways of seeing and knowing.

In agreement with Denis Wood's claim that 'maps are about relationships', I also claim that this understanding helps us to re-position the map—and the cartographic image more broadly, including artworks—as fundamentally concerned with social relations. These social relations exist among persons, places and conceptions relating to persons and places. I draw on Sohn-Rethel's emphasis on the materiality and social nature of capitalist abstraction to approach cartography and cartographic visualisation as simultaneously practice and object, an abstract practice that is productive of abstract 'objects' or abstractions as things. My own trajectory of thought about cartography began with critical cartography and attempts to develop its critical concern

with the material, social and political efficacy of cartography by bringing its insights into contact with the understanding of the efficacy of social abstraction to be found in theories of real abstraction. In this way, I argue that 'the map' as such and its procedures and techniques may be 're-visualised' as the site of the production of distinctively abstract ways of seeing and knowing.

Real abstraction has also been further theorised by Alberto Toscano, who offers a formulation of real abstraction as 'materialism without matter'. I draw on Toscano's more philosophically oriented writings on real abstraction (2008a, 2008b, 2014a, 2014b) to anchor my approach to real abstraction in terms of visual modalities of abstraction and specifically in connection with concerns found in cartography and cartographic art. In light of renewed theoretical interest in 'new materialisms' and associated interest in 'matter and materiality', Toscano "revisits the heterodox Marxian thesis" (2014, p. 1221) of a materialism that has "nothing to do with a reference to matter" (ibid) and expands it into the proposition of a 'materialism without matter'.

The emphasis is on positioning "materialism as the critical analysis of real, social abstractions" (ibid). Toscano poses this analysis of materialism without matter as a 'recovery' (ibid) of an existing understanding of materialism as concerned with abstractions. Central to this formulation is an overturning of the assumption of 'matter's anteriority to thought'. Toscano identifies a continuing influence from the "echoes of philosophical combats" (ibid, p. 1222) into the field of theory, whereby "there is still a certain aura, in the field of theory, which attaches to the declaration, be it in thought or discourse, of the primacy of matter" (ibid). In terms of materialism and what sort of materialism is at stake, Toscano sets up the terms for this inquiry as being the relationship between idealism and materialism. More specifically, materialism is identified as performing "a specular inversion of idealism" (ibid). Etienne Balibar's claim (as interpreted here by Toscano) is that Marx 'displaced' the whole distinction between idealism and materialism in the sense of casting it into terms that are productive of new understandings of the distinction.

I take up this way of seeing abstraction, as social, as a proper object of concern for materialist thought and politics, as proposing a difficult but necessary 'third term' to loosen the unhelpful binary of material/ideal. The problematic of abstraction has also been seen in terms of displaying opposing tendencies—in its capacity to abstract 'from', in the sense of 'to remove' or 'to separate off', and its capacity to create 'third' or additional forms with which to comprehend and theorise. The question of 'opposing tendencies' in the problematic of abstraction is discussed by Peter Osborne as both a loss of particularity and at once a condition of possibility for thinking the object (2004). These apparently opposing tendencies may also be framed as a problem of 'reversibility':

> Abstraction, as a concept, is reversible, 'equally applicable to our attempts to achieve intellectual understanding and our involvement in activities and practices that prevent us from doing so'. Its reversibility derives from Marx's critique of commodity fetishism as a form of real abstraction, located not in consciousness, but in actions, in exchanges that presuppose and reinforce the valuation of labour for its relational properties. At the same time, these actions extend to consciousness, for abstraction, especially in the work of Alfred Sohn-Rethel, equally 'refers to both intellectual labour and manual labour'. Consciousness is at once

enabled and limited by abstraction, which serves as its condition of possibility and impossibility.

<div align="right">(Colesworthy, 2014, p. 1175)</div>

The 'reversibility' of abstraction is also seen here as a question of enabling and limiting simultaneously. The very attempt to bring something into conscious thought that is not a part of conscious thought entails abstraction—in order to render in thought something that is itself not thought. 'Ascending' and 'descending' are another way of describing the 'opposing tendencies' at work in abstraction, whereby Marx uses the metaphoric figure of an 'ascent' from the most abstract forms to the most concrete forms.

Colesworthy's emphasis on "thinking beyond a familiar dynamic of concealment and revelation" (ibid, p. 1174) also motivates the emphasis in this study as a whole on problematising the notion of 'revelation' as an end in itself. The epistemological project or task is frequently marked off as being visibilisation as such. However, critiques of social abstraction must go beyond 'revelation', in the present context where, as Alex Loftus argues, "[t]he mediating role of the exchange abstraction [. . .] has produced a perverted reality in which things—money, socially necessary labour time, buildings, wages, and infrastructures—dominate people" (Loftus, 2015, p. 366). In the context of this 'perverted reality', "[i]t is difficult to overestimate the violence generated by processes of abstraction" (ibid, p. 366, and Sayer, 1987). Loftus advocates the need for a renewed 'historical-geographical materialism' (2015, p. 378) in order to engage with disrupting and overcoming "the violence of geographical abstractions" (ibid, p. 373). The violence of abstraction is not a concern that exists only in the realm of theory—it is a material practice and phenomenon that plays an important part in organising our social relations in the capitalist present.

Perspectives on Abstraction

A persistent problem in philosophical approaches to abstraction is identified by Peter Osborne in "the commonly held view, across a wide variety of theoretical standpoints, more or less explicit, that there is some inadequacy inherent to abstraction per se" (2004, p. 21). This is the issue of abstraction as 'loss' or 'deprivation'. We can recognise this already in critical cartographic accounts of cartographic depiction as entailing loss of detail, complexity, richness, perceptual information and social relations that exist in the mapped subject—the world outside the map. In talking about the 'epistemological melancholia' associated with philosophical approaches to abstraction, he illustrates "the melancholy, which at times takes on tragic tones. For Georg Simmel, for example, 'the fact that the higher concept, which through its breadth embraces a growing number of details, must count upon increasing loss of content' is 'the tragedy of human concept formation'" (ibid, p. 22). Osborne poses the problematic of epistemological abstraction in particular in terms of a loss of perceptual, cognitive and sensory access to the 'object', the 'real', which perception, cognition and sensory experience purport to apprehend. Contesting this 'melancholic' interpretation of abstraction, Osborne proposes to "clear the way for a thinking of the idea of 'actual abstractions' as the medium of social experience in capitalist modernities" (ibid, p. 21). This emphasis on the experience of abstractions and on abstraction as process

is central to my conceptualisation of real abstraction more broadly and cartographic abstraction more particularly.

As well as the 'melancholy' associated with formulations of conceptual abstraction, Osborne also identifies an element of shame and complicity:

> Increasingly, it seems, from a variety of different standpoints, abstraction—understood here as conceptual abstraction—is accompanied by both a certain melancholy (loss of the real object) and a certain shame (complicity in the domination of the concept and hence repression of the other, more vibrant, more creative aspects of existence).
>
> (2004, p. 21)

I have discussed the notion of complicity in the context of the potential for panoptic viewing to be deployed 'against' viewing from nowhere (in Chapter 1) as a mode of the reclaiming or re-inhabiting of agency within the subject positions constituted partly through cartographic abstraction. I see this formulation as compatible with Osborne's conception of abstractions both as experienced and as the *medium* of experience within 'capitalist modernities'.

Osborne draws out a distinction, or opposition, that appears in philosophical discourse between conceptual and non-conceptual modes of abstraction. As we have seen, conceptual abstraction can embody a certain "epistemological negativity" (ibid, p. 22), associated with the problematic of the 'loss of the object'. On the other hand, an emphasis on 'non-conceptual' or 'actual abstractions' affords a recognition of the complexity involved in 'rehabilitating' or reconstructing an account of the experience of subjectivity as mediated through forms of abstraction. Osborne argues that

> abstraction is, historically, philosophically double-coded: it is an epistemological virtue as well as a vice. While abstraction may, in its modern psychological form, be associated with a withdrawal from the reality (or particularity) of the object of experience, and hence a certain epistemological inadequacy, its deeper philosophical history is that of a focusing in on the essence of an object [. . .] as a condition of the possibility of knowledge. Abstraction is a condition of knowledge, of thinking the object; and abstraction is, apparently, a loss of the sensuous particularity of the object.
>
> (ibid, p. 22)

This 'double-coding' presents the moment at which a turn toward materialist approaches to abstraction offers a conceptual 'way out' of the impasse of conceptual abstraction. The apparently aporetic contradiction between loss of the object and the possibility of access to thinking the object is, I suggest, obviated by turning to a conception of abstraction that accepts it as a material modality of both thought and experience. By 'material modality' in this context, I mean to indicate the attempt to treat thought and experience as continuous with, part of, materiality. This formulation stands against a rigid distinction between 'thought' and 'matter' or mind and body. An objective and external 'real' is no longer seen as rendered permanently unavailable to thought and experience but rather as made and remade or produced and reproduced through active, constructive forms of abstraction. In this way, the loss of the object of cognition is re-positioned as a process of the active production of visibility and

occlusion. This is the sense in which I propose the usefulness of adopting specifically visual approaches to investigating the functioning of abstraction; where both conceptual and visual occlusion are figured as produced rather than as a perceptual loss, the production of occlusion and mystification becomes susceptible to analysis and, prospectively, intervention.

The question of the 'reproach' of abstraction, in Osborne's terms, or the apparently contradictory strains in critical thought about abstraction, is figured in analyses by Timothy Bewes and Alberto Toscano as, respectively, a certain 'reversibility' and a 'double movement' of abstraction. Bewes argues that "[w]ithin the Marxist critical tradition, abstraction has figured as a reversible concept, designating two apparently contradictory tendencies: dematerialisation and concretisation" (2014, p. 1199). I take leave of Bewes's formulation of this problem at the point at which he seeks to use it to assert the possibility of "a thought that is not subject to abstraction" (ibid). This would be some form of pure thought that is non-referential in order to 'reserve' a form of thought that is not troubled by the issue of abstraction. This approach sees abstraction as a difficulty or problem to be overcome; but I argue that this 'retreat' from abstraction is unnecessary. Rather, we must engage with the conditions of being in our capitalist present and seek ways to work through and intervene in the culture of abstraction. Rejecting Bewes's formulation, then, I follow instead Osborne's insistence on understanding abstraction as a condition of possibility for thinking the object. I also use Toscano's formulation, whereby the limiting conceptualisation of 'reversibility' is figured instead as a 'double movement', suggesting a (dialectical) simultaneity of movement as opposed to a movement in the direction of either dematerialisation or concretisation.

Toscano crucially proposes a critical 'recovery' of "an understanding of materialism as the critical analysis of real, social abstractions" (2014, p. 1221). This argument seeks to dissociate materialism from a certain "polemical affirmation of matter's anteriority to thought" (ibid, p. 1222), which has contributed to the perpetuation of a categorical opposition between matter and thought, materiality and ideality and materialist and idealist philosophies. Toscano cites literary theorist Marc Shell to assert that "[t]hose discourses are ideological that argue or assume that matter is ontologically prior to thought".[4] Toscano argues that Marx 'displaced' the rigid distinction between materialism and idealism, 'exploding the contradiction' in order to posit 'the category of practical activity'[5] as the grounding of a materialist philosophy and politics that is able to confront the 'culture of abstraction' that marks the contemporary capitalist social formation.

In terms of the question of abstraction's reversibility or double movement, then, I see Bewes's formulation as having the drawback of figuring the terrain of abstraction as a binary, or two irreconcilable poles. By contrast, I draw on Toscano's more nuanced and materialist idea of a double movement in order to understand the critical possibility of real abstraction more multiply as offering a framework for moving among the range of levels of abstraction that are at work in constructing capital-mediated subjectivity in the contemporary social configuration. I see this as the broader context for this study, which seeks to focus closely on one register through which abstraction itself is mediated and manifested in the present moment, that of cartographic abstraction.

The theory of real abstraction offers a crucial resolution to the problem of the contradiction between loss of the object and the possibility of access to thinking the

object. I have suggested that this impasse is obviated by the turn towards a conception of abstraction that accepts it as a material modality of both thought and experience. Understood as a social process rather than a process only of thought or of practice, real abstraction identifies abstract action as a source of abstraction; while Sohn-Rethel investigates this abstract action at the level of the fundamental abstract action in commodity society, that is, commodity exchange, I apply this approach at the level of a practice that I have shown to be concerned with producing abstractions, that is, mapping and cartography. The map is fundamentally concerned with producing abstract conceptualisations that are socially effective, and in so doing, it deploys techniques of depiction that both abstract from their object and construct a new abstraction that cannot be adequately apprehended at the level of thought alone. Because the map is engaged in the production of abstractions, through abstracting methods, it is necessarily engaged in questions of how to negotiate particularity. This negotiation—seen particularly in the fundamental cartographic techniques of projection, symbolisation and scale—is part of the capacity of cartographic imagery to produce abstractions that function both materially and conceptually.

Cartographic Abstraction

The social and practical effectivity of abstraction is the central element of interest in contemporary debates on real abstraction. As we saw, concepts of real abstraction are grounded in or share Sohn-Rethel's commitment to the idea of abstract action as a defining moment within "capitalist reality" (Toscano, 2008b, p. 286). This emphasis on activity, particularly in the act of commodity exchange, is underscored by Toscano, who asserts that "it is the social activity of abstraction, in its form as commodity exchange, that plays the pivotal role in the analysis of real abstraction" (ibid, p. 281). Where activity is understood as abstract and therefore as generating abstract social relations and a whole 'culture of abstraction', I apply this understanding to the field of cartographic visualisation. This move enables a critical focus on a particular area of social activity within contemporary capitalist reality, that is, the production of cartographic visualisations and understandings of space, place and social relations. Mapping and its production of highly coded and abstract depictions of the world are thus positioned as practices that are socially effective in contributing to the constitution of the contemporary 'social synthesis'. While I do not interpret cartographic abstraction as directly an expression of Sohn-Rethel's concept of the exchange abstraction, I do interpret cartographic abstraction as being comprised of abstract practices and conceptions that arise within contemporary capitalist reality. Cartographic abstraction is a modality of thought and experience that operates in the contemporary production of cartographic conceptualisations of space and sociality. Cartographic abstraction currently exists and functions within the contemporary capitalist reality, a reality that is marked by abstraction, and as such I argue for the value of further theorising cartographic abstraction in light of the analysis of real abstraction.

The theoretical possibilities for understanding visual practices of knowledge production and subjectivation in the register of social abstraction are considerable. Further, although I am broadly in agreement with Jappe's assessment of Sohn-Rethel as largely having the merit of having posed the problematic of real abstraction, further development of work on real abstraction and subjectivation

could build useful links between cartographic 'ways of seeing' and Sohn-Rethel's proposals relating to the form of thought and social being in commodity societies. I see cartographic abstraction as part of Osborne's concept of 'actual abstractions' as the 'medium of experience' in contemporary capitalist society; in this light, cartographic abstraction contributes to the contemporary need for deeper theoretical and practical understanding of the relationships between thought, experience and the abstract production of subjectivity.

The account I offer here of cartographic abstraction takes its theoretical cue from but is not a working through of theories of real abstraction. In asking about how cartographic worlds are made, at the broad level, I have attempted to take seriously the identification made by theories of real abstraction of abstraction as existing outside of the thought and consciousness of individuals. Further, I have pursued this commitment in terms of cartographic ways of seeing and knowing.

Sohn-Rethel's identification of the material and social nature of capitalist abstraction helps us to interpret the abstract character of cartography and the conceptual processes involved in cartographic visualisation as simultaneously practices and things. Put another way, cartographic abstraction is an abstract practice that produces abstract objects—abstractions as things. Critical cartography has been at the forefront of recognising cartography as a fundamentally political set of practices and knowledges. This recognition needs to be taken further to recognise the efficacy of social abstraction in the production of cartographic visualisations. We can then see 'the map' as an active site of the production of distinctively abstract ways of seeing and knowing.

Cartographic ways of seeing render the world or the viewed into an abstract surface, viewed by a subject who is actively posited by the cartographic image in particular relations of knowledge production. The cartographic viewer, in this way, conceptually transcends the problem or the limit of locatedness. The abstract positionality of the viewer is constituted through the functioning of cartographic abstraction, more particularly, in the formation of viewpoints. The form of the abstract cartographic viewpoint posits the viewing subject, and as we have seen, the viewing subject is in some cases interpellated as de-embodied. This is most notably the case in the cartographic view from nowhere, the signature viewpoint of modern cartographic imagery.

While cartographic abstraction is not reducible to or directly mappable onto the coordinates and concerns of real abstraction, I have proposed this theory of cartographic abstraction as a productive inquiry into how the subject of an 'abstract thing' may be understood to be constituted by and through that abstract thing. Where the map itself is such an 'abstract thing', this study has attempted a genuinely interdisciplinary investigation of this group of 'objects' that takes seriously the idea of social abstraction as a theoretical starting point.

In the context of a society in which social relations are mediated through commodity exchange, whereby subjects—as commodity exchangers—routinely engage in 'thoroughly abstract action', then, Sohn-Rethel's theory of real abstraction enables a focus on the social and political effectivity of abstraction in the wider context of capitalist social relations. This foregrounding of abstraction as social process is already shared by critical cartographic accounts of the map and its viewer, and drawing on this shared concern allows a critical focus on the social effectivity of cartography in terms of visuality, that is, a theory of cartographic abstraction.

Notes

1 See note 9, p. 39 for discussion of the terminology used here.
2 As I focus on modes of viewing, I do not discuss the area of cartographic practice such as automated interpretation of cartographic imagery in targeting (see Paglen, 2014; "the machines were starting to see for themselves"). It would be productive, I think, to consider 'operational images' (see Farocki, 'Eye/Machine I, II and III' (2001–2003), in the context of a non-visual form of knowing derived from the omniscient character of the god's eye view.
3 John Pickles has characterised maps in general as having a "productive and fictive character" (2004, p. 93).
4 Toscano, 2014, p. 1223. Toscano is citing Marc Shell in 'The Economy of Literature', (1993), Baltimore, Johns Hopkins University Press, p. 1.
5 Toscano, 2014, p. 1222. Toscano is citing Etienne Balibar in 'The Philosophy of Marx', (1995), London, Verso, p. 25.

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